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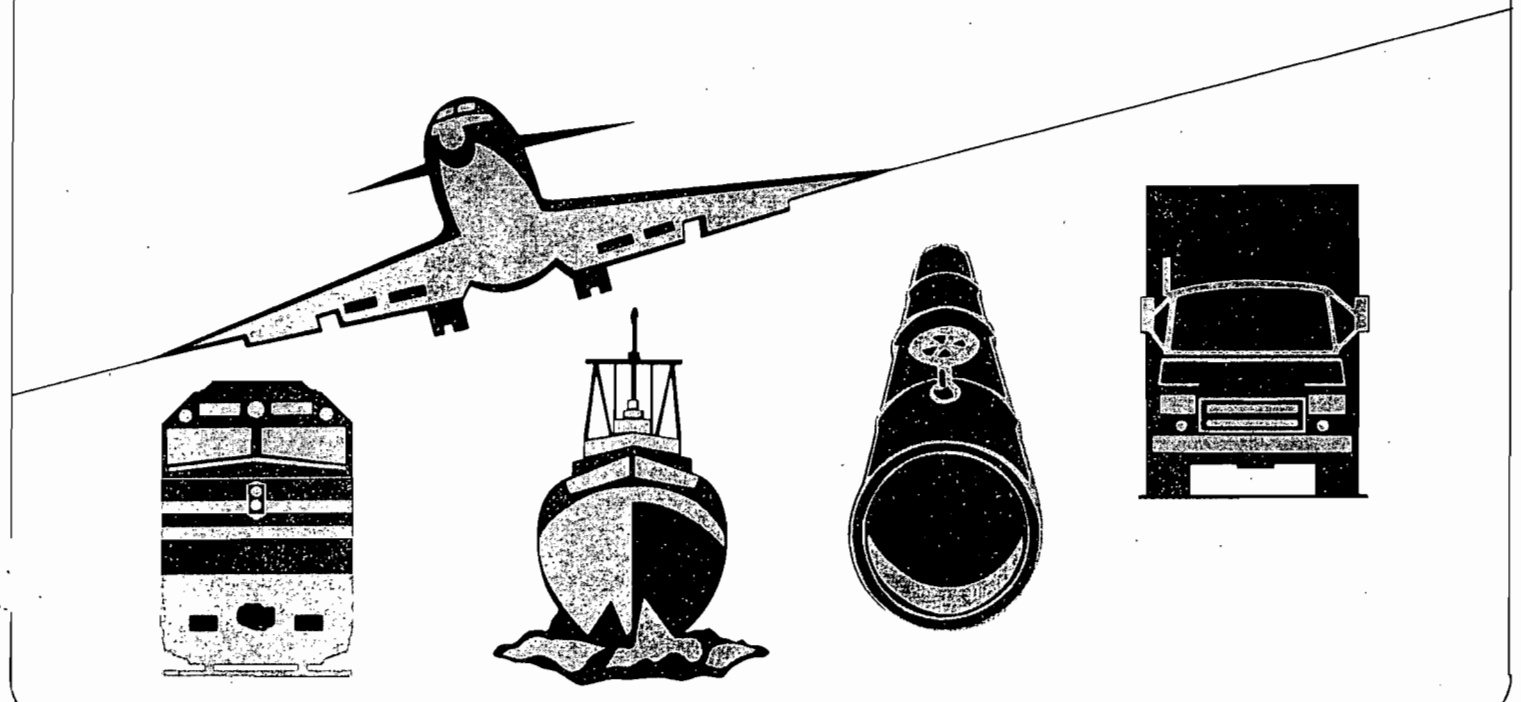
NTSB/MAR-90/01/SUM

NATIONAL TRANSPORTATION SAFETY BOARD

MARINE ACCIDENT/INCIDENT SUMMARY REPORT

GROUNDING OF THE U.S. PASSENGER VESSEL ISLANDER WOODS HOLE, MASSACHUSETTS JULY 29, 1988



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16. Abstract

This report explains the grounding of the U.S passenger vessel ISLANDER at Woods Hole, Massachusetts, on July 29, 1988. The safety issues discussed in the report include vessel maneuvering, pilot/master duties, and lifesaving equipment. Recommendations addressing these issues were made to the U.S. Coast Guard and to the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority.

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National
Transportation
Safety Board
Washington, D.C. 20594

MARINE ACCIDENT/INCIDENT SUMMARY

File No.:	DCA88MM055
Location:	Woods Hole, Massachusetts (latitude 41°30'40.7"N, longitude 70°40'21.7"W)
Date:	July 29, 1988
Time:	1057 local
Owner/Operator:	Woods Hole, Martha's Vineyard and Nantucket Steamship Authority
Property Damage:	$97,621
Injuries:	None
Particulars:	Grounding of the U.S. Passenger/Car Ferry ISLANDER, O.N. 259789, 201 feet long, 60.5 feet wide, 855 gross tons, built in 1950

The Accident

At 1045, on July 29, 1988, the steel-hulled, double-ended passenger/car ferry ISLANDER (see figure 1) commenced the return trip to complete its second round trip of the day when it left Woods Hole, for Martha's Vineyard Island, Massachusetts with 509 passengers and 50 automobiles aboard. (See figure 2.) The 7-mile trip normally took 45 minutes. On the crossing before

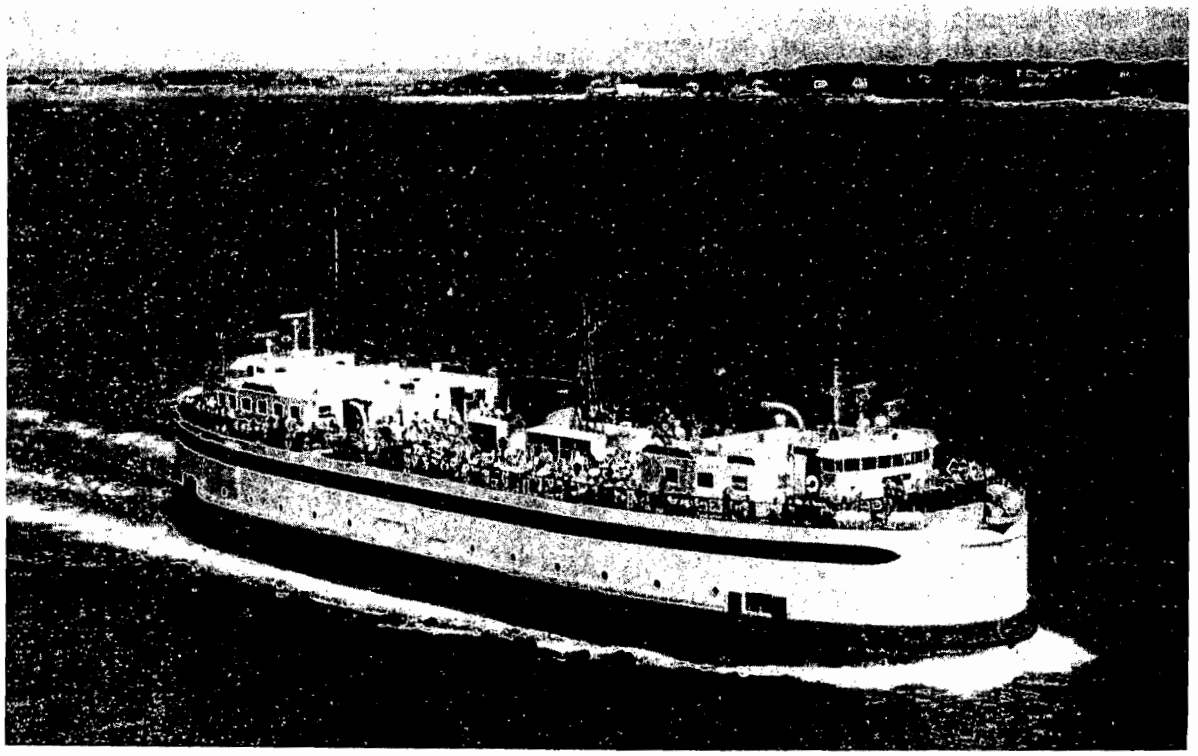

Figure 1.--The Motor Vessel ISLANDER.

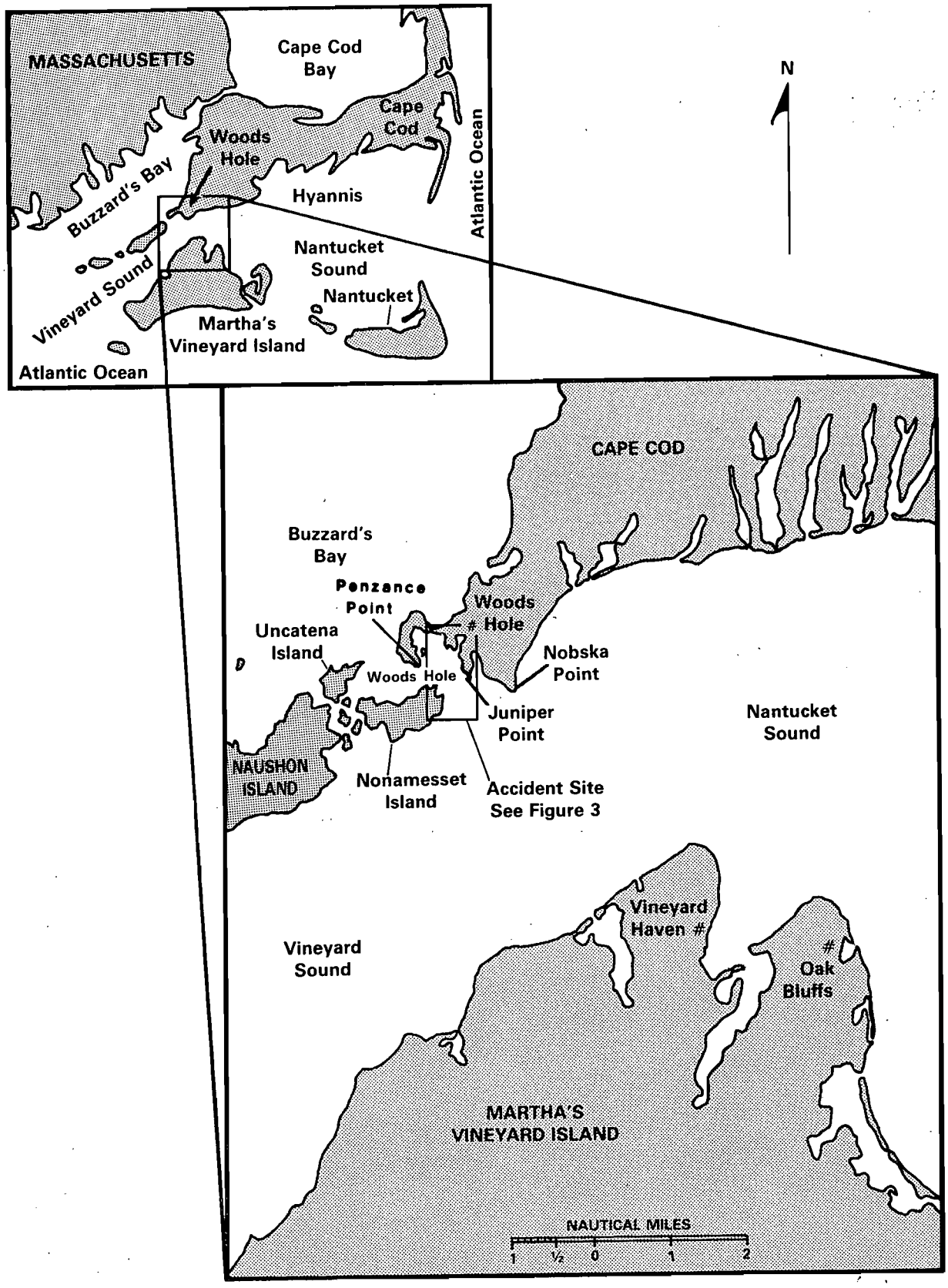

Figure 2.--Location of the accident.

the accident, the ISLANDER required 88 minutes to complete the trip, due to fog and traffic avoidance. The crew stated that the number of pleasure boats was increasing each year and that this was as high a number as they had experienced. The master/pilot (master) assigned two able seamen (AB) as lookouts in the wheelhouse. One AB was positioned at the forward windows while the other AB alternated his watch position between the open port and starboard wheelhouse doors. The master was at the port radar located near the engine controls in the wheelhouse and another crewmember, who was a pilot, was at the helm. There was a light southerly wind with dense fog[1]. The current in the harbor was flooding in an easterly direction at a velocity of 1 to 2 knots. The lookouts described the visibility as "zero," "dense fog....I could just see over the bow, no more than 2 feet over the bow of the vessel...."

Before departing, the master broadcast a security message on VHF/FM radio channels 13[2] and 16[3] stating that the ISLANDER was preparing to depart from the ferry dock at Woods Hole for Martha's Vineyard Island via the main channel of Great Harbor; the master received no replies to his broadcasts. At 1047, after the ISLANDER departed from the Woods Hole ferry dock, the master ordered a left turn to course 160°T to begin the normal transit from Great Harbor to Vineyard Sound. (See figure 3.) The trackline in figure 3, is the master's depiction of his "approximation" of the ISLANDER's track. According to the master there were many recreational small boats in the vicinity and because of the reduced visibility, he sounded fog signals. He stated that he was depending on the radar for both navigation and traffic avoidance information.

While approaching Woods Hole Great Harbor Channel Lighted Buoy 5 (buoy"5"), the master noticed five radar contacts in the channel near buoy "5" and slowed the ISLANDER to bare steerageway, about 3 knots. When the ferry was within 1/8 mile of the radar contacts, the master determined that there was a risk of collision with nearby vessels. He sounded the danger signal and then he stopped and backed the engines to reduce the ISLANDER's forward movement. (See figure 3, position 1.) When the radar contacts near buoy "5" appeared to move, which left more space for the ISLANDER to pass, the master increased speed to 3 knots. When the ISLANDER was abeam of buoy "5", the master identified Woods Hole Great Harbor Channel Buoy 4 (buoy "4") on the radar, and ordered the course changed to 170°T.

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[1]Reduced visibility of 1/4 mile or less is experienced on the average of 98 days of the year at Nantucket Island with 65 of those days occurring between April and September.

[2]Channel 13 (156.65 MHz) is the bridge-to-bridge VHF/FM radio channel used by vessels for the exchange of navigation information.

[3]Channel 16 (156.8 MHz) is the international distress, safety, and calling frequency. It is used to transmit distress and safety information as well as to call vessels or shore stations.

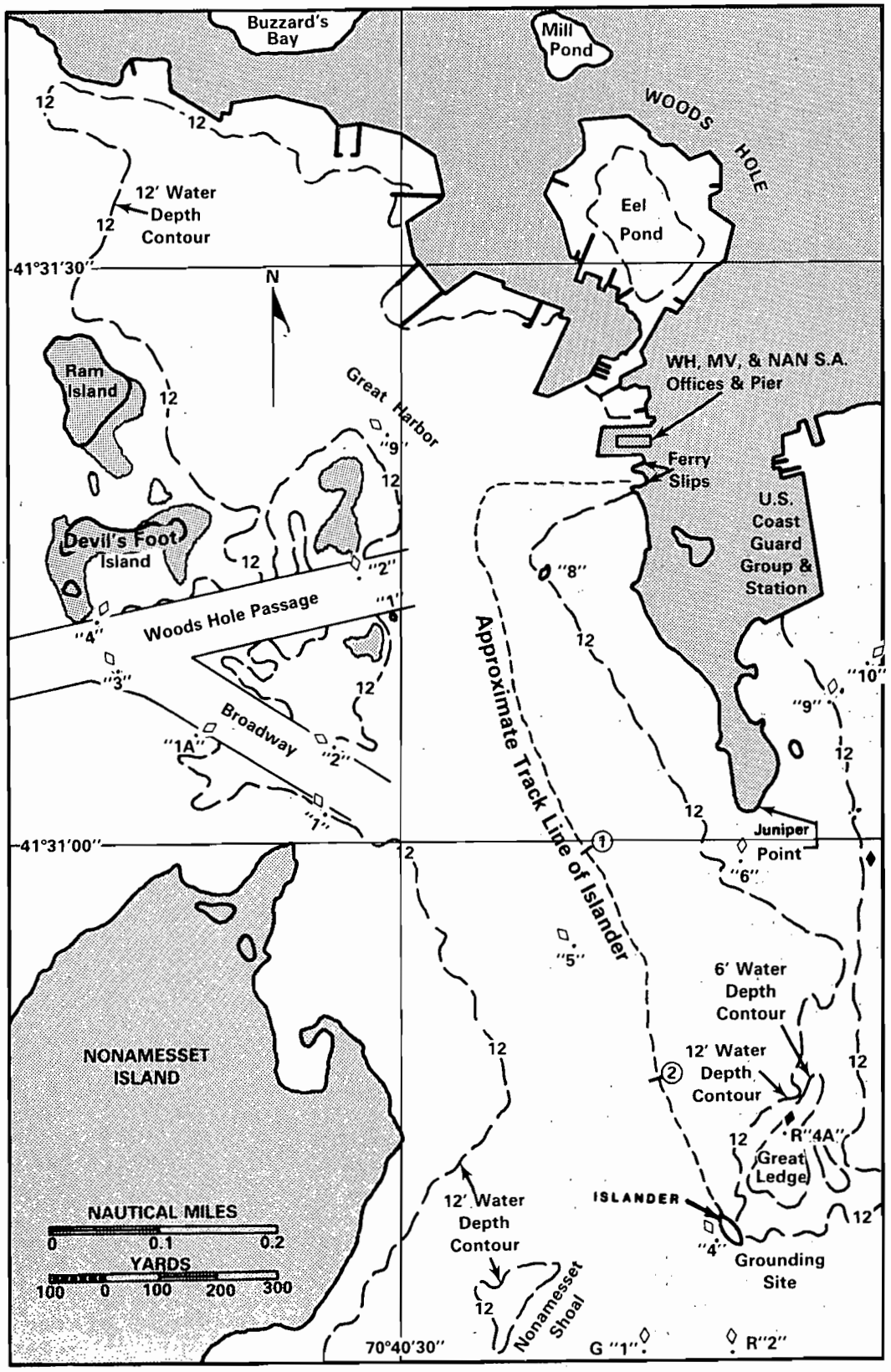

Figure 3.--Accident site.

Shortly thereafter, the master noticed two radar contacts crossing Great Ledge [shoal] approximately 20° on the ISLANDER's port bow on a constant bearing which indicated that the vessels were approaching the ISLANDER on a collision course. Before the vessel was steadied on course 170°T, the master stopped the engines, sounded the danger signal, and backed the engines. (See figure 3, position 2.) One radar contact appeared to slow down while the other appeared to change course. At an undetermined short time later, the master ordered full right rudder and as he "...kicked engines ahead...," the lookout at the forward window reported sighting buoy "4" on the starboard bow. The master immediately backed the engines; however, the maneuver was not made in time to prevent the vessel from grounding on the southwest corner of Great Ledge at 1057, on a heading between 160°T and 170°T. Immediately after the grounding, the master sighted two recreational boats, a 26- to 30-foot sailboat and a 36-foot power boat, about 50 to 60 feet off the port side of the ISLANDER.

After the accident, an AB made three or four announcements on the public address system to advise the passengers of the accident, and then, with two crewmembers, walked through the passenger areas to answer their questions. There were no injuries or fatalities.

The master ordered the mate to sound tanks and examine void spaces to determine if the hull was damaged and whether the ferry was taking on water. The mate found all below deck compartments dry and normal; however, the chief engineer (chief) reported that water was entering the engineroom through a hole in the bottom on the port side. The chief stopped the leak temporarily by stuffing the hole with a life preserver, that the Coast Guard requires to be stowed in the engineroom, and wooden boards. Even though the water level in the engineroom reached a depth of 38 inches, the ferry's pumps were able to control the flooding.

At 1107, the master notified the U.S. Coast Guard at Woods Hole of the grounding. A Coast Guard utility boat was dispatched and arrived on scene at 1111 to assess the ISLANDER's condition. The master requested a tug to standby in Woods Hole in case the ISLANDER had to be pulled off the shoal. The first attempt to back away from the shoal was unsuccessful. At 1120, the master was able to maneuver the ISLANDER off Great Ledge. At 1130, the ISLANDER moored at the ferry dock in Woods Hole and discharged the passengers and the automobiles.

On August 1, after temporary repairs were completed in the engineroom, the ISLANDER proceeded under its own power to a Newport, Rhode Island shipyard for permanent repairs. On August 16, the vessel was returned to service.

In order to have navigated safely out of Great Harbor, the ISLANDER would have had to navigate between Woods Hole Great Harbor Entrance Buoys "1" and "2" (buoys "1" and "2"), leaving buoy "4", which marks the shoal waters of Great Ledge, to port. The master was familiar with these waters and knew the set of the current toward Great Ledge. His selection of course 170°T when abeam of buoy "5" was appropriate for the approach to buoys "1" and "2" and may have required only minor adjustment to leave buoy "4" to port.

However, when he stopped and backed the engines momentarily at position 2, the master should have known that unless he took further action there was a near certainty that the current would move the vessel to the vicinity of Great Ledge. His monitoring of the vessel's movement on radar should have confirmed this expected movement towards Great Ledge. Instead of permitting the vessel to drift toward Great Ledge after stopping the engines, he could have selected a course at minimum speed (for example, stemming the current) which would have avoided collision with nearby vessels, or he could have anchored. Since he did neither, the ISLANDER drifted to the shoal side of buoy "4" before he unsuccessfully attempted to avoid the shoal by backing the engines.

The master was fully qualified to act as a radar observer and was recertified by the Coast Guard in February 1988. Even though the ISLANDER's pilot was also fully qualified to act as a radar observer and to navigate the ferry, a company policy required that the pilot serve as a helmsman until the ferry left Great Harbor. Accordingly, the pilot (helmsman) was steering courses ordered by the master, and was unable to utilize his radar and navigation skills to assist the master despite the fact that the two ABs who were in the wheelhouse were qualified helmsmen. If the company policy had not discouraged the assignment of an AB to be the helmsman, the pilot could have been utilized by the master to monitor the vessel's position on one radar, while the master was monitoring vessel traffic on the other radar. The master, while avoiding traffic, could have depended on the pilot to keep him advised as to the movement of the ISLANDER in the channel. The master was apparently so preoccupied by two vessel radar contacts and the maneuvers to avoid collision with them, that he did not remember to compensate for the current when he stopped or slowed the ISLANDER at position 2 and further did not recognize the vessel's movement towards Great Ledge, on the radar, until it was too late to avoid the grounding. The Safety Board believes that the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority (Steamship Authority) should revise its operating procedures to encourage its masters to make greater use of their pilot's radar and navigational skills while operating during periods of low visibility and other adverse situations.

Damage to Vessel

The bottom plating of the engineroom was indented about 3 inches forward of the engineroom after bulkhead about 2 feet from the keel. A 14-inch by 3/4-inch gash was found in the bottom plating about 3 inches aft of the forward engineroom bulkhead. The internal structural members were damaged in the area of the shell damage.

Stability After Damage

At the request of the Safety Board, the Coast Guard Marine Technical and Hazardous Materials Division in Washington, D.C., performed damage stability calculations to determine if the ISLANDER would have sunk, capsized, or if the main deck would have been awash if the engineroom had completely flooded. The calculations indicated that not only would the ISLANDER have remained afloat and upright had the engineroom flooded, but that it probably

would not have sunk or capsized even if the engineroom and the adjoining forward and aft compartments had flooded.

Vessel Information

The ISLANDER was built in Baltimore, Maryland, in 1950 for the New Bedford, Woods Hole, Martha's Vineyard and Nantucket Steamship Authority which in 1960, was renamed the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority. The U.S. Coast Guard Certificate of Inspection (COI), issued on June 13, 1988, authorized the ISLANDER to carry a maximum of 788 persons.

The ISLANDER had three passenger decks, a main or freight/vehicle deck with six vehicle lanes for 50 automobiles, a mezzanine deck on each side above the outboard passenger car lane, and a top or bridge deck, open to the weather. Two large doors on each end of the main deck opened inward to permit automobiles to be loaded and discharged. The hull was subdivided by eight watertight bulkheads. The two wheelhouses were located at each end of the bridge deck, about 18 feet from the extreme ends.

The double-ended ferry could be operated from either end. Each wheelhouse was equipped with duplicate navigation equipment including two radars and vessel controls. It operated at a draft of about 10 feet.

The ferry's engineroom was equipped with two 750-gallon per minute (gpm) fire pumps with emergency bilge suction capability, one 1,000-gpm emergency bilge pump, one 250-gpm general service pump, and a high water bilge alarm. The main propulsion machinery consisted of one-1,000 horsepower diesel engine for each propeller shaft. It was normal to operate both engines simultaneously from the working wheelhouse. When the vessel was operating at full ahead, the stern propeller pushed the vessel at its full engine power, and the bow propeller pulled the vessel at approximately 70 per cent of its full engine power.

A station bill was posted inside each wheelhouse. The vessel carried 794 adult life jackets and 79 child life jackets as required by the COI. Instructional placards for donning of life jackets were posted throughout the ferry and at the life jacket storage locations. The ISLANDER carried ten 25-person inflatable liferafts with a total capacity of 250 persons. Section 78.14-10 of Title 46 Code of Federal Regulations requires one certificated lifeboatman for each liferaft. The ISLANDER met this requirement. Instructional placards for the launching of liferafts were posted at each liferaft.

Between August 1987 and July 1988, the ISLANDER carried a total of 673,784 passengers between Woods hole, Martha's Vineyard and Newport. During this period, the Steamship Authority's seven ferries carried a total of 2,146,935 passengers. All seven ferries are operated during the summer, while only four ferries are operated during the winter. The ISLANDER carried its largest passenger loads in July and August (averaging 108,722 passengers per month); the least number of passengers carried was in February (20,963 passengers).

Crew Information

On July 29, the ISLANDER was being operated by a 15-person crew consisting of the master/pilot, pilot, mate (non-navigation), 4 ABs, 2 ordinary seamen, a chief engineer, an oiler, and 4 concession attendants. The ISLANDER's COI required an 11-person crew and allowed an additional 7 persons to be carried as part of the crew. The mate was not required for vessel operation from September 15 to May 30. The additional crewmembers normally were concession attendants, messmen, and porters.

The master, age 44, began work with the Steamship Authority in September 1974 as an AB. He was promoted to mate in May 1977, to pilot in April 1978, and to master in December 1980. The master stated that he had been the master of the ISLANDER since 1983, and had also served as master and pilot of other Steamship Authority vessels. He possessed a master's license with endorsements as first class pilot and radar observer.

The pilot, age 26, began work with the Steamship Authority in June 1979 as a porter. He was promoted to AB in December 1981, and to pilot in August 1986. He possessed an inland mate's license with an endorsement as pilot and radar observer. He received his radar training in February 1984.

The mate, age 59, began work with the Steamship Authority in April 1946 and had been mate on the ISLANDER since 1965. He possessed an inland mate's license.

The chief engineer, age 43, had been employed by the Steamship Authority since 1967, except for a four year period. He had been the chief engineer on the ISLANDER for the past eight years. He possessed a chief engineer's license limited to 3,000 horsepower motor vessels, and endorsed for third assistant engineer of steam or motor vessels of any horsepower. He also held an ocean operators license for small passenger vessels.

Waterway Information

Woods Hole is a waterway between the southwestern tip of Cape Cod and the northeastern ends of Uncatena and Nonamesset Islands. It joins Vineyard Sound on the southeast with Buzzards Bay on the northwest. The eastern part of Woods Hole is named Great Harbor. There are numerous ledges and shoals bordering the channels in Woods Hole, generally marked by navigation aids that indicate the 12-foot water depth contour line. About 650 yards south of Juniper Point is Great Ledge, an extensive rocky shoal. (See figure 3.) Great Ledge is marked by unlighted red buoy "4" on the channel side of the 12-foot water depth contour line and by red daybeacon "4A" near the 6-foot water depth contour line. The depth of water over Great Ledge varies from less than 2 to 12 feet. The town of Woods Hole is located on the Northeastern shore of Great Harbor. The minimum distance between the 12-foot water depth contour lines from the ferry dock in the town of Woods Hole to Vineyard Sound measures about 250 yards. The water depth between the 12-foot water depth contour lines varies from 12 feet to 60 feet. The ISLANDER's route between Woods Hole and Martha's Vineyard is never more than 3 miles from land.

Prior Recommendations

As a result of the grounding of the passenger vessel PILGRIM BELLE in Vineyard Sound, Massachusetts, on July 28, 1985,[4] the Safety Board issued Safety Recommendation M-86-61 on July 24, 1986, to the Coast Guard:

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

On February 19, 1987, the Coast Guard responded:

> The Coast Guard concurs with this recommendation in part. Although we recognize the need for survival craft for all persons on board certain passenger vessels, the Board's proposed 30 minute criterion is not concurred with because a vessel could be several miles away from any assistance during such a voyage. Water temperature and distance from shore are more important criteria. As part of the regulatory project to incorporate the 1983 SOLAS Amendments into the Code of Federal Regulations, and to make other revisions to the lifesaving regulations, the Coast Guard will propose new survival craft requirements for passenger vessels. As a general requirement, passenger vessels would have to carry survival craft for all persons on board. Exceptions would be permitted for vessels not in ocean, short international voyage, or coastwise service, and which operate in waters where the temperature is above 15°C (59°F). Another exception would be permitted for vessels operating in narrow waterways (300 meters between the banks) where the temperature is above 10°C (50°F). A third exception would be permitted for vessels operating in shallow waters where the average depth of the channel does not exceed 1 m. [meter]. An Advance Notice of Proposed Rulemaking on this project appeared in the Federal Register of December 31, 1984. A Notice of Proposed Rulemaking should be published sometime in 1987.

On October 10, 1987, the Safety Board responded:

> The Coast Guard's response to this safety recommendation appears to not concur with what is stated, although it will not be conclusive until the Coast Guard publishes its revised regulations on survival craft requirements

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[4] Marine Accident Report--"Grounding of the U.S. Passenger Vessel PILGRIM BELLE, Sow and Pigs Reef, Vineyard Sound, Massachusetts, July 28, 1985"(NTSB/MAR-86/08).

> for passenger vessels. Also, it appears that the Coast Guard has misread the intent of this recommendation regarding the 30 minute criterion. This criterion was meant to apply to '...ferries on river routes on short runs of 30 minutes of less...' In any event, Safety Recommendation M-86-61 will be held in a category of "Open--Acceptable Action" pending the outcome of the Coast Guards's regulatory project to revise the lifesaving regulations.

Following the investigation of the capsizing of U.S. charter fishing vessel FISH-N-FOOL on February 5, 1987 at Roca Ben, Baja California Norte, Mexico,[5] the Safety Board reiterated Safety Recommendation M-86-61 to the Coast Guard. The Coast Guard responded:

> The Coast Guard concurs with the intent of this recommendation. Although we recognize the need for survival craft for all persons on board certain passenger vessels, we do not feel that a 30 minute criterion for river ferries is appropriate. As part of the project to revise 46 CFR Subchapter T for Small Passenger Vessels, the Coast Guard will propose new survival craft requirements. As a general requirement, small passenger vessels in ocean, coastwise, and Great Lakes services, and larger vessels in lakes, bays and sounds, and in river services, would have to carry survival craft for all persons on board which prevents immersion in the water. Exceptions would be permitted for vessels which operate in water where the temperature is above 15°C (59°F), and for vessels in lakes, bays and sounds, and river services operating within 1 mile from shore. The Coast Guard considers this action sufficient to address the intent of the recommendation, and will update the Board as significant events in this regulatory initiative occur.

On October 3, 1988, the Safety Board responded:

> We are concerned that there has been no progress on Safety Recommendation M-86-61 regarding increasing the requirement for primary lifesaving equipment on all passenger vessels since the Coast Guard's first response of February 19, 1987. Based on this lack of progress and on the fact that the number of exceptions listed appears to be too extensive to be considered an acceptable response, we have classified this safety recommendation

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[5]Marine Accident Report--"Capsizing of the U.S. Charter Fishing Vessel FISH-N-FOOL, Pacific Ocean at Roca Ben, Baja California Norte, Mexico, February 5, 1987"(NTSB/MAR-87/11).

as "Open--Unacceptable Action." We urge the Coast Guard to expedite its regulatory project to revise the lifesaving regulations; and while doing so, consider reducing the number of proposed exceptions.

The Board's concern about this issue has been heightened recently as a result of our ongoing investigation of the grounding of the passenger vessel ISLANDER near Woods Hole, Massachusetts, on July 29, 1988. The ISLANDER has a maximum capacity of 788 persons and has 10 liferafts with a total capacity of 250 persons. On the day of the accident, there were 527 persons on board. The proposed NPRM, which the Coast Guard initially indicated would be published in 1987, would require the ISLANDER to have liferafts for only 30 percent of the total number of persons allowed to be carried in summer (May 15 through October 15). The proposed regulations would exempt the ISLANDER from having liferafts for 100 percent of the persons allowed to be carried because the vessel is in lakes, bays, and sounds service and the water temperature is above 15^{0} C (59^{0} F). The Board continues to believe that liferafts should be provided for 100 percent of the persons allowed to be carried on passenger vessels in lakes, bays, and sounds service regardless of the season of the year or the water temperature.

U.S. Coast Guard Notice of Proposed Rulemaking, Lifesaving Equipment (CGD 84-069) dated April 21, 1989, (section 199.261(i)) proposed to exempt cargo vessels operating in water 59^{0}F and above, vessels not in ocean or coastwise service and small vessels operating on the continental shelf of the U.S. in the Gulf of Mexico from the requirement to carry lifeboats, liferafts, and inflatable buoyant apparatus if life floats of sufficient capacity to accommodate all persons on board are carried.

The Safety Board disagreed with this proposal because life floats do not provide out-of-the-water flotation to survivors. Liferafts, lifeboats and inflatable buoyant apparatuses provide more than just hypothermic protection to survivors. It also:

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.

The primary lifesaving equipment issue was discussed also at length in the Safety Board Safety Study: "Passenger Vessels Operating from U.S. Ports," dated October 11, 1989. The Safety Board reiterated Recommendation M-86-61 in that study.

The inclusion of Coast Guard approved inflatable buoyant apparatus as primary lifesaving equipment is a recent development and the Coast Guard has permitted their use to supplement the required lifeboats and liferafts, or to substitute for lifefloats or noninflatable buoyant apparatus. In such cases, the Coast Guard has not required that additional certified lifeboatmen be aboard the vessels to launch and operate the inflatable buoyant apparatus as they normally require to launch and operate any added lifeboats. Consequently, there is now available relatively low cost equipment which can be added to the required lifeboats and liferafts so that all persons aboard the vessels can be provided with out-of-the-water flotation.

It was fortuitous that the crew of the ISLANDER was able to control the flooding which resulted from the grounding in this accident. If the damage had been more severe, causing the master to suspect the vessel might sink, he may have given the order to abandon ship. The passengers and crew then may have been forced to enter the water, because the ISLANDER did not have sufficient primary lifesaving equipment capacity for everyone aboard. For this reason and those reasons stated in the Safety Board's replies to the Coast Guard's responses to the Safety Board's recommendation M-86-61, the Safety Board opposes the continued use of lifefloats and noninflatable buoyant apparatus as primary lifesaving devices and reiterates recommendation M-86-61 made to the U.S. Coast Guard on July 24, 1986.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the grounding of the passenger/car ferry ISLANDER was the lack of corrective action by the master to prevent his vessel from being set out of the channel by the current while maneuvering to avoid traffic in dense fog. Contributing to the accident was the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority's policy of requiring the pilot to steer the vessel in Great Harbor instead of allowing him to assist the master to navigate during periods of reduced visibility.

Recommendations

As a result of its investigation, the National Transportation Safety Board made the following recommendation:

--to the Woods Hole, Martha's Vineyard and Nantucket Steamship Authority:

> Revise your operating procedures to encourage your masters to make greater use of the pilot's radar and navigation skills while operating in low visibility and other adverse situations. (Class II, Priority Action) (M-90-25)

Also, the Safety Board reiterated the following safety recommendation to the U.S. Coast Guard:

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

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

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May 17, 1990

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