National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: September 26, 2002

In reply refer to: M-02-19 through -21

Mr. John Koenig
President
New York Fast Ferry
52 Shrewsbury Avenue
Highlands, New Jersey 07732

The National Transportation Safety Board (Safety Board) is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge you to take action on the safety recommendations in this letter. The Safety Board is vitally interested in these recommendations because they are designed to prevent accidents and save lives.

The three recommendations address the requirements for crewmember navigational proficiency, the operating standards for navigation in adverse conditions, and the policies for alcoholic beverage service during emergency situations. The recommendations are derived from the Safety Board's investigation of the grounding of the *Finest* outside the Shrewsbury River channel to Sandy Hook Bay on January 4, 2001, and are consistent with the evidence we found and the analysis we performed.[1] As a result of this investigation, the Safety Board also issued a safety recommendation to the U.S. Coast Guard. The Safety Board would appreciate a response from you within 90 days addressing actions you have taken or intend to take to implement our recommendations.

Based on its investigation, the National Transportation Safety Board determined that the probable cause of the grounding of the *Finest* was the failure of the vessel master to use appropriate navigational procedures and equipment to determine the vessel's position while approaching the Shrewsbury River channel. Contributing to the cause of the grounding was the lack of readily visible fixed navigational aids. Also contributing to the cause of the grounding was the failure of New York Fast Ferry (NYFF) to require the use of installed navigation equipment and to set guidelines for operations in adverse environmental conditions.

[1] For further information, read: National Transportation Safety Board, *Grounding of the Small Passenger Vessel* Finest, *Sandy Hook, New Jersey, on January 4, 2001*, Marine Accident Report NTSB/MAR-02/03 (Washington, DC: NTSB, 2002).

On a typical approach to the Sandy Hook Bay Marina (SHBM), the navigator would set the vessel's course for the Shrewsbury River channel after passing buoy 17 and Sandy Hook Point. He would look for the channel buoys visually and attempt to locate the buoys on his radar. The SHBM also presented a distinct target on the radar. The navigator could set the vessel's course in the approximate direction of the channel buoys and the SHBM. Because the bay was sufficiently deep and broad, the navigator would not be required to maintain a precise trackline until he neared the entrance to the channel. After the navigator had sighted the entrance buoys visually, he would make course adjustments into the channel using the buoys as references. The distance from buoy 17 to buoy 2 (at the entrance to Shrewsbury River) is 3 1/2 miles. At 30 knots, it would take less than 8 minutes for the vessel to travel from buoy 17 to buoy 2.

During the trip that the vessel grounded, the master chose to deviate from his normal approach to avoid an ice field. Instead of a direct course (165º true) from buoy 17 to the channel, the master headed the vessel in a southerly (180º true) direction toward the Atlantic Highland breakwater and made the approach to the Shrewsbury channel from the west. To enter the channel, the master had to make a 90º starboard turn without the use of the buoys as references. He had sufficient electronic navigation equipment available to him to execute the maneuver safely.

At the point where he entered the ice field, the approximate distance to the position of buoy 2 was 6/10 mile. The master operated toward the estimated position of buoy 2 at a speed of about 32 to 34 knots and continued to look for the approach buoys visually and by radar. When the vessel was approximately 3/10 mile from channel approach buoy 2, the master began reducing his speed to about 25 knots. He made one final attempt to locate the buoys by having the deckhand go on the bridge wing to obtain a visual sighting. The master then made his turn toward the SHBM based on a visual observation of the SHBM's lights and a radar observation of the SHBM. Attempting this maneuver at such a high speed was not prudent.

At the postaccident interview, the master was asked what could he do differently in the future to avoid grounding the vessel if faced with the same circumstances. He recommended that the Coast Guard break up the ice or have a range installed. He also recommended that the company have an alternate landing site. When asked whether there was an alternative to using the buoys to enter the marina, he stated that he did not know of an alternative.

There were alternative methods of navigation that the master could have used to safely navigate the vessel into the marina. He could have set his radar's variable range marker (VRM) to a range of 1/2 mile to serve as a danger marker. As he approached Sandy Hook Peninsula on his trackline, the distance to the land would close or decrease and would be readily apparent on the radarscope. When the distance to land was 1/2 mile, the range ring would appear to be tangent to the landmass, and the vessel would be at the turning point. If the vessel continued toward the land without changing course, the range ring would pass over the land, indicating that the distance was less than 1/2 mile from the vessel and that, as a result, the vessel was approaching shallow water.

The master could have also determined the true course line of the channel and adjusted his electronic bearing line (EBL) to display either the true or relative bearing from his easterly heading. At the point that the EBL was aligned into the marina, when the VRM became tangent with the landmass, the master would know that the vessel was at the point where it was safe to head toward the SHBM.

The master could also have used a prominent shoreline point to obtain a fix base on the range and bearing to that point. The Atlantic Highlands breakwater light would have provided a prominent mark for the master to fix the vessel's position. Another option that the master could have used to determine the vessel's position was the PinPoint chart plotter with the appropriate global positioning system (GPS) input. Had the master used radar range and bearing or the GPS with the PinPoint chart plotter, he could have established the vessel's position and navigated into the marina without incident.

The master had a radar, a GPS, a paper chart, and an electronic chart available to use to establish the vessel's position. The master could have successfully made the Shrewsbury River transit by using the navigational equipment that was available to him.

The master had never made an approach into the channel when all of the buoys were obscured by ice. On the trip before the grounding, buoy 2 was the only aid visible. Moreover, the master had adequate warning from the *Light List* and the "Broadcast Notice to Mariners" that ice might obscure all of the buoys. The master had traveled the route for months before the night of the grounding. He had ample opportunity to use alternate forms of navigation with the equipment available to him.

Because he did not have an alternate plan before entering the ice field, the master should have taken precautions by devising a plan before approaching the channel. As discussed earlier, his radar could have provided him with the information necessary to establish his position. However, the master continued at the service speed of 32 to 34 knots until he had entered the ice and proceeded to the channel entrance without establishing his position. He relied on visually locating the obscured buoys up until the vessel made the final turn toward the marina.

A vessel's position can be established by plotting information that is determined by radar. The range and bearing to a distinctive landmark or fixed navigational aid is an effective tool for establishing a vessel's position. However, information from the radar must be transferred onto a nautical chart that, depending on the proficiency of the navigator, can take 30 to 60 seconds to accomplish. In pilotage waters, the situation can change rapidly, and the navigator might only be able to use the chart as a guide and not have the time to transfer the radar information to the chart. A vessel traveling at 30 knots advances 1/2 mile per minute. Therefore, if the master had attempted to establish his position by plotting the radar information without slowing down, the vessel would have traveled beyond the turning point and been in shallow water before the master could assess and react to the information and turn the vessel. Further, the existing conditions, including the operations at night, the presence of ice, the lack of floating aids to navigation, and the master's unfamiliarity with the attempted turn maneuver, all demanded a more cautious approach to the turn point at the entrance to the Shrewsbury

channel. Prudence should have dictated that the master approach the turn at a slower speed. The master was going too fast to permit him to safely approach the entrance to the Shrewsbury River channel under the prevailing conditions.

Because it would have taken some time to plan and execute his approach, the master should have reduced speed once he could not locate the buoys visually or identify them on radar. After reducing his speed, the master should have determined his position either by plotting a radar range and bearing or by using the GPS and the electronic chart. Maintaining speeds in excess of 25 knots and relying on visual observations with only limited use of other navigational aids is not prudent when attempting to turn into a narrow channel in a situation in which the vessel's position is not established.

The master had completed a radar course that included instruction in radar navigation. However, proficiency in radar navigation is a skill that is developed from hands-on experience. The principles can be introduced in a classroom environment or with a simulator, but the radar must be used in routine conditions so that the navigator can call upon the skill when needed as circumstances change. The master did not use the PinPoint chart plotter and did not consider using it on the night of the accident. The chart plotter, like radar, buoys, and fixed structures are all navigational aids that should be used, when appropriate, by the prudent mariner. The master of the *Finest*, by his actions and by his answers to interview questions, indicated that he relied primarily on buoys and visual observations to navigate. He used the radar solely as an extension of his eyes for early warning. The observations that he took from the radar were approximations and not measured bearing or ranges. Because the master did not train on or use all the available navigational equipment in routine conditions, he may not have been prepared to use the equipment on the night of the grounding when conditions were not routine.

The Coast Guard and the high-speed small passenger vessel industry have approached the issue of operational safety of high-speed vessels as "partners." The partnership hopes to improve safety by relying on a voluntary versus a regulatory approach. The Coast Guard has issued Navigation and Vessel Inspection Circulars that serve as guidelines to the industry to improve safety. In theory, the company, by joining in the partnership, is supposed to improve the safe operation of its vessels through voluntary action without having burdensome regulations imposed upon it. One such improvement would be to ensure that people are capable of using all the navigational equipment on the ship.

The company hired the master and was responsible for ensuring that the he was prepared to use all of the equipment available to ensure a safe operation. Before the master was promoted, the company's port captain made a few check rides with the master. However, the company did not evaluate the master in the use of the on-board navigational equipment. The company also did not make subsequent evaluations of the master to determine whether he was proficient in the use of all the available navigational equipment. If NYFF had ensured that the master and senior deckhands operating in the capacity of navigator were trained on and used the installed navigational equipment to proficiency, the grounding would not have occurred. Therefore, the Safety Board believes that the NYFF should establish and implement requirements that vessel masters and

crewmembers with navigational responsibilities use to proficiency all installed vessel navigation equipment and institute procedures to periodically monitor their performance.

The NYFF did not have any standard operating requirements for the navigation of its vessels in adverse environmental conditions. In the Safety Board's opinion, the safe navigation of company vessels is as much a responsibility of the company management officials as it is the master of the vessel. To discharge its responsibility, the company should establish minimum operating standards for conducting navigation watches and for specifying actions to be taken by vessel operating crewmembers during periods of adverse environmental conditions. At a minimum, company officials should specify the minimum frequency of navigation fixes and the maximum speeds of advance during adverse conditions and require the use of electronic navigation equipment whenever the environmental conditions deteriorate to reduced visibility from any cause or result in any condition, such as ice, that precludes the use of visual aids to navigation. Had NYFF enforced such operating standards for some time before this accident, the master would have been required to proceed at a slower speed and would have been acclimated to the use of the electronic navigation equipment provided. Had this occurred, this accident might have been avoided. The lack of vessel operating standards for navigation in adverse environmental conditions played a decisive role in the vessel's grounding. The Safety Board, therefore, believes that the NYFF should establish and implement vessel operations standards for navigation in adverse environmental conditions, including fog, snow, heavy rain, and ice.

After the grounding, shoreside vessel management initiated an "open bar" as a means of compensating the passengers for the delay. This gesture included all items at the snack bar, including alcoholic beverages. Complimentary beverage service is a relatively common action in the food service industry as compensation for poor or interrupted service. However, unrestricted alcoholic beverage service could have created a serious problem in this situation. According to the Coast Guard report of this accident:

> It [the postaccident open bar] presented a safety concern that now had to be factored into the planning. We wanted to avoid a situation where we now had inebriated passengers to rescue. This became a grave concern, and if it became necessary, prohibited the USCG from using helos [helicopters] or other assets if feasible.

The Safety Board concurs with this assessment. Throughout the small passenger vessel industry, efforts aimed at customer satisfaction and appeasement must be balanced against the risk to passenger safety. Continued service of alcoholic beverages after an accident creates a potential crowd management problem. While this problem has not been identified in previous Safety Board investigations, the Safety Board feels that it is an important safety issue. These vessels can carry many hundreds of passengers with crews of varying size, depending on what their certification requires. For example, the *Finest* was certified to carry up to 389 passengers with 6 crewmembers, including a master and mate (or senior deckhand). Because the master and mate are responsible for controlling the vessel, that would leave only four deckhands to manage almost 400 people during an emergency. With a ratio of deckhands to passengers of almost 1 to 100, it would take

very few inebriated passengers to overwhelm the ability of the crewmembers to maintain control. This is especially likely because the deckhands on the *Finest* had no training in crowd control management.

The situation on the *Finest* is not unique. All small passenger vessels face the potential of having to deal with an emergency in which the ratio of crewmembers to passengers is very low, in many cases much lower than 1 to 100. Similarly, most deckhands on small passenger vessels are not trained in crowd control management. This raises serious concerns about the ability of such crewmembers to control of inebriated passengers during emergency situations. Serving alcoholic beverages in emergency situations is not a prudent action. Therefore, the Safety Board believes that the NYFF should establish a company policy requiring the cessation of alcoholic beverage service during emergency situations and that policy should be included in its vessel operating manual.

The National Transportation Safety Board, therefore, makes the following safety recommendations to New York Fast Ferry:

> Establish and implement requirements that vessel masters and crewmembers with navigational responsibilities use to proficiency all installed vessel navigation equipment and institute procedures to periodically monitor their performance. (M-02-19)
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> Establish and implement vessel operations standards for navigation in adverse environmental conditions, including fog, snow, heavy rain, and ice. (M-02-20)
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> Establish a company policy requiring the cessation of alcoholic beverage service during emergency situations and include that policy in your Vessel Operating Manual. (M-02-21)

In your response to the recommendations in this letter, please refer to M-02-19 through -21. If you need additional information, you may call (202) 314-6177.

Acting Chairman CARMODY and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

Original Signed

By: Carol J. Carmody
Acting Chairman