



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

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In reply refer to: M-99-18

Mr. Paul Donheffner
President
National Association of State Boating Law Administrators
521 West Short Street
Lexington, Kentucky 40507

During the early morning hours of December 29, 1997, the 34-foot recreational sailing vessel *Morning Dew* struck the rock jetty on the north side of the shipping channel into the harbor of Charleston, South Carolina. The boat was later found about 15 yards south of the jetty, submerged in about 12 feet of water. The owner/operator of the vessel and his three passengers, all members of the same family, died as a result of the accident.¹

The National Transportation Safety Board determined that the probable cause of the sinking of the *Morning Dew* was the operator's failure to adequately assess, prepare for, and respond to the known risks of the journey into the open ocean that culminated in the vessel's allision with the jetty at the entrance to Charleston Harbor. Contributing to the loss of life in this accident was the substandard performance of U.S. Coast Guard Group Charleston in initiating a search and rescue response to the accident.

According to statements of several members of the victims' family, the operator of the *Morning Dew* planned to make the entire trip from South Carolina to Florida within the confines of the Intracoastal Waterway (ICW). While transiting Winyah Bay, however, the operator left the ICW and proceeded into the Atlantic Ocean.

Witnesses stated that southbound boaters following the ICW through Winyah Bay sometimes lose track of the ICW and inadvertently follow the main shipping channel toward the ocean. Based on its investigation, the Safety Board concluded that the route of the ICW through Winyah Bay is marked on the ICW charts and navigation aids such that any boater who properly uses them should recognize and be able to follow the ICW routing through the bay. The Safety Board is concerned, however, about reports that some boaters mistakenly follow the ship channel in Winyah Bay rather than the ICW and on that basis has made the following safety recommendation to the Coast Guard:

¹ For more information, see Marine Accident Report—*Sinking of the Recreational Sailing Vessel Morning Dew at the Entrance to the Harbor of Charleston, South Carolina, December 29, 1997* (NTSB/MAR-99/01).

Review the navigation aids marking the route of the Intracoastal Waterway (ICW) at Winyah Bay and make any changes necessary to reduce the likelihood that southbound recreational boaters intending to follow the ICW will inadvertently depart that waterway and follow the main shipping channel toward the open ocean. (M-99-16)

The operator was more than capable of following the ICW, and if he did inadvertently remain in the shipping channel at Winyah Bay, he was competent and experienced enough to recognize the mistake in time to correct it well before reaching the open ocean. Even if he had been preoccupied with some matter and was completely inattentive to the navigation aids or to the shoreline as he progressed along the shipping channel, he would certainly have realized that he was entering the open ocean when he exited Winyah Bay. At that point, even a novice sailor would have recognized that what lay ahead was the open ocean and not the inland waters of a bay, and certainly not the ICW. The Safety Board therefore concluded that although the Safety Board could not determine whether the operator of the *Morning Dew* departed from the ICW deliberately or by mistake, he at some point made a conscious decision to take the vessel to sea.

The operator and his passengers faced a number of risks that the operator should have considered before deciding to venture into the open ocean:

The operator was the only adult on board. No experienced adult would be available to take over the helm if he should become incapacitated. Similarly, he had no relief if he became fatigued or if he were to be adversely affected by exposure to the elements. Although two of the boys were reported to be experienced at sailing, they were unlikely to be either mature or experienced enough to be able to safely handle the boat in the open ocean, especially in darkness.

The weather was marginal, with potentially hazardous conditions predicted. Nighttime air temperatures were between 45 and 50 °F as the vessel headed into the North Atlantic. The National Weather Service had been issuing small craft advisories for the area all day Saturday, December 27. Throughout the day on Sunday, December 28, forecasts were for nighttime variable winds 10 to 20 knots with 3- to 4-foot seas. Rain was predicted to begin late, and small craft advisory conditions were expected on Monday. Such weather was not favorable for taking small craft on a coastal voyage, even in the daytime.

The seaworthiness of the vessel was unknown. The operator had had only a few hours' experience with the *Morning Dew*, and he could not have known whether the auxiliary engine or the boat's other mechanical and electrical systems would hold up at sea. The failure of any of those systems, particularly the engine, could have seriously jeopardized the safety of the vessel and its passengers.

Much of the trip would take place in darkness. Given the likely progress of the vessel, it would have been about 1600 when the vessel departed Winyah Bay. Sunset at that location was about 1722, leaving less than 1 1/2 hours of remaining daylight. The operator had only a magnetic compass with which to determine the vessel's heading, and only a limited number of lighted reference points on the shore would be visible from the sea. Safely navigating the vessel would thus be a difficult challenge, made more so by the likelihood that at some point in the journey,

fatigue would reduce the operator's powers of observation and analysis and could cloud his judgment.

The operator had not adequately prepared the vessel or its passengers for the risks presented by a winter voyage at night on the open sea. The Morning Dew was equipped with ICW charts,² PFDs of unknown type, quality, and age; a strobe light; signal flares; a horn; a fire extinguisher; and a VHF radio. Except for the radio and strobe light, all this equipment falls into the category of equipment and devices the Coast Guard requires this type recreational vessel to have. Thus, based on the findings of the investigation, the Morning Dew had only the VHF radio and strobe light as additional safety devices beyond those required for all vessels of its type, with no regard to whether those vessels are used on the open sea or on protected waters. In addition to not having another experienced adult sailor aboard, the Morning Dew operator did not carry a liferaft, immersion suits to protect the occupants from hypothermia, a GPS unit to assist in navigation, a backup means of communication, such as a handheld VHF radio or cellular telephone, or an EPIRB that could be used to signal an emergency and direct rescuers to the vessel's location. The lack of these additional devices would not have been so critical if the vessel had remained within the ICW, where the vessel would have been sailing within a short distance of the shore for most of its trip and where help would have been much more readily available in case of an emergency.

In the view of the Safety Board, these factors made the risk of the voyage such that the trip into the open sea should not have been undertaken. If the operator had decided to anchor inside the bay and await daylight and perhaps better weather, he still would have been the only adult aboard a vessel embarking on a voyage in unprotected waters. If the vessel had been better equipped and all its systems proven seaworthy, the skills and awareness of an alert, rested operator would still have been required to ensure its safety. Even a working EPIRB may not have brought help in time to have prevented deaths due to hypothermia once the occupants were in the water. Other safety equipment, even had it been on the vessel, may very well have been rendered unusable or inaccessible by a catastrophic event such as an allision with the jetty. The Safety Board therefore concluded that neither the *Morning Dew*, its operator, nor its passengers were adequately prepared or equipped for a trip into the open ocean, and the ocean voyage should not have been attempted.

Although, as noted above, in the view of the Safety Board, the risks of taking the *Morning Dew* into the open ocean were so great that the trip should never have been attempted, this does not mean that successfully navigating the *Morning Dew* from the entry to Winyah Bay to Charleston Harbor was impossible. The vessel apparently was seaworthy until it was damaged by the allision with the jetty. The weather, while challenging and potentially hazardous, was probably not such that it alone would have caused the loss of the vessel. It would have been possible, then, for a vessel like the *Morning Dew* to have sailed around the jetty and into the harbor—if that, in fact, had been the operator's plan. The Safety Board considered possible reasons why the vessel struck the jetty:

² ICW charts do not show the entrance to Winyah Bay or the coastal area between the bay and Charleston Harbor. Unless the operator had additional charts on board, for which no evidence was found, he did not have a chart that would have shown the navigation aids that would have helped him track the vessel's position as it moved down the coast.

The operator may not have known that the jetty was there. He had no previous sailing experience in the area and therefore would not have been familiar with the visual aspect of the harbor entrance from sea. He did, however, carry charts for the ICW, and one of those charts³ does display the entrance to the Charleston Harbor, with the jetties clearly shown.

If the operator knew about the existence of the jetty, he may not have known his vessel's position in relation to it. The unlighted jetty may have been difficult or impossible to distinguish from the dark background of sea and sky when viewed from the cockpit of the *Morning Dew*. Furthermore, based on the state of dress of the three teenagers, the operator was probably alone topside with no lookout posted when the allision occurred.

It may have been possible for the operator, upon exiting Winyah Bay, to plot a compass course that, if followed, would have taken the *Morning Dew* outside the jetties extending from Charleston Harbor. At that point, the operator could have used the buoys marking the shipping channel to guide him into the harbor where he could rejoin the ICW. Attempting to steer such a course using the compass alone carried substantial risk, however, especially considering that the trip took place mostly at night and in poor weather. Unless the operator could refer to the appropriate nautical chart(s) and use landmarks (few of which would have been visible at night) or floating navigation aids to confirm his position as he progressed down the coast, he would not have been able to accurately gauge his distance from the jetty or determine how much the wind and current may have taken him from his intended course. Based on reported winds from the northeast, he could have found himself sailing closer to the shore, and thus closer to the rock jetty, than he intended.

If the operator had had the appropriate chart(s) that he wished to use to track his progress and ensure a safe entry into Charleston Harbor, he would have needed to be able to read the chart(s) as he progressed along the coast in the dark. He would have needed a portable light in the cockpit, a plastic sleeve protector or other device to protect the chart(s) from the wind and water, and—most importantly—the ability not only to focus on the chart(s) and any aids to navigation but to discern their meaning.

The operator may have been impaired by fatigue and hypothermia. The investigation could not determine at what time the operator and his companions arose on the morning of December 28. Assuming that they arose late, say 0900, the operator would have been awake for more than 17 hours at the time of the accident. Furthermore, at the time of the accident, the operator was in the nadir of his biological rhythm. Moreover, he was operating in a severe environment that exposed him, for as long as 9 hours, to wind and possibly rain, to spray from waves, to constant vibration from the engine, and to air temperatures between 45 and 50 °F. These conditions, exacerbated by the continual pounding of the vessel by waves and the stress of constant steering to counter the effects of the following and increasingly stronger quartering winds, certainly would have been conducive to producing severe physical fatigue.

In addition to fatigue, the operator also faced the threat of hypothermia. Hypothermia is defined as the gradual lowering of the body's core temperature below the normal 98.6 °F by

³ ICWchart 11518, Casino Creek to Beaufort River.

prolonged exposure to cold air or water. It is an insidious condition, since its victims often do not recognize its symptoms. The onset of hypothermia is usually marked by muscle stiffness and increasing shivering. As the body's core temperature continues to decrease, vasoconstriction and numbness occurs, followed by increased and sometimes uncontrollable shivering. Reduced body core temperatures cause mental confusion with uncoordinated gross muscle action, characterized by stumbling and the inability to use the hands. Unconsciousness will occur soon thereafter if nothing is done to reverse the condition.

The first protection against hypothermia is the knowledge of what it is and the recognition of the conditions under which it can occur. For example, hypothermia can occur, as in this accident, under conditions that do not involve extremely cold temperatures. In the case of the *Morning Dew*, the operator should have prepared himself by having clothing at hand commensurate with the expected air temperature of 45 to 50 °F that occurred on the night of December 28-29. Such clothing would generally consist of several loose layers of clothing, at least one of which is wool. Additionally, a waterproof outer garment can prevent clothing from becoming wet and thus losing its insulating value. Finally, a wool hat (to prevent heat loss from the head) should be available, along with mittens or insulated gloves and wool socks.

The body of the operator was found dressed in a nylon jacket, a windbreaker, two T-shirts, a sport shirt, a pair of nylon foul-weather pants, a pair of blue jeans, jockey shorts, dress socks, and boat shoes. The unusual combination of clothing suggests that he became increasingly colder as the trip progressed and that he added layers of clothing as he found them in his personal belongings. Unfortunately, the clothing he brought for the trip was not designed for the environment in which he found himself and did not adequately insulate him against the cold and wet conditions for any length of time.

Thus, the Safety Board concluded that after about 13 hours under way, with 9 of those hours at sea, the *Morning Dew* operator was probably severely fatigued and hypothermic to such a degree that his judgment and ability to keep track of his position may have been severely impaired. The Safety Board concluded that the dissemination of information about the circumstances surrounding this accident will help dissuade other boaters from taking such unnecessary risks and may thereby prevent a similar tragedy in the future.

The National Transportation Safety Board therefore makes the following safety recommendation to the National Association of State Boating Law Administrators:

Use, in your recreational boating education programs, the circumstances and lessons learned from the accident involving the sailing vessel *Morning Dew* as a means of educating boaters about the relationship of good judgment and decision-making to boating safety. (M-99-18)

Also, the Safety Board issued Safety Recommendations M-99-2 through 16 to the U.S. Coast Guard, M-99-17 to the Governors of the 50 States, M-99-19 to the U.S. Coast Guard Auxiliary, M-99-20 to the U.S. Power Squadrons, M-99-21 to the National Safe Boating Council, and M-99-22 to the Boat Owners Association of the United States.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility “to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations” (Public Law 93-633). The Safety Board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you within 90 days regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation M-99-18 in your reply. If you need additional information, you may call (202) 314-6457.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.

By: Jim Hall
Chairman