



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: October 3, 1986

In reply refer to: M-86-115

Mr. Anthony J. Galio
 Administrator
 National Oceanic and Atmospheric Administration
 Washington, D.C. 20230

About 1611 P.s.t. on February 8, 1986, the MERRY JANE, a 65-foot charter passenger vessel, was returning to Bodega Bay, California, after a sportfishing trip when it was overtaken by large waves. As the first large wave passed under the MERRY JANE's port quarter, the vessel was suddenly raised and its bow swung to the left forcing the vessel to become broadside to the waves. The vessel was heeled to starboard and nearly capsized. The sudden large heel caused two passengers on the bow, one passenger on the flying bridge, and one crewmember near the stern to be thrown overboard. A few seconds later the same large wave broke over the vessel's port side, flooded the after deck, and washed 14 of the 48 passengers overboard. After the vessel righted, it was struck again by another large wave which again heeled the vessel severely and also broke over the vessel. The operator succeeded in turning the vessel to the left in order to head into the seas. Once headed into the seas, the MERRY JANE encountered one more large wave and one more passenger was thrown overboard. Of the 19 persons thrown into the water, 10 persons were rescued and 9 persons died. The MERRY JANE sustained only minor damage. 1/

During the afternoon of February 8, 1986, a photographer on Bodega Head was taking photographs of the landscape. His approximate position was latitude 38°18'00" north and longitude 123°03'35" west. The photographer took one photograph of the MERRY JANE as it approached the passage between Bodega Head and Bodega Rock about 1610 and took another photograph when he observed the MERRY JANE being heeled over about 1611. The photographer voluntarily brought his undeveloped film to the Coast Guard station and donated it for use in the study of the accident.

From the time the vessel passed buoy R "12" until the accident, the operator was steering from the flying bridge. He was not using his compass but was steering as needed to head the vessel toward the center of the passage between Bodega Head and Bodega Rock. Measurements taken from a photograph of the MERRY JANE immediately before the accident place the vessel in about 24 feet of water approximately 430 yards, 250° from the center of Bodega Rock on a heading of about 013°, which puts the vessel on a heading toward the entrance jetties. It appears that the vessel was set approximately 150 to 200 yards to the right of its intended track through the middle of the passage.

1/ For more detailed information read Marine Accident Report—"Near Capsizing of the Charter Passenger Vessel MERRY JANE, Bodega Bay, California, February 8, 1986" (NTSB/MAR-86/11).

The operator apparently failed to recognize early after passing buoy R "12" that there was a current acting on his vessel and that it was necessary to steer significantly to the left to compensate for it in order to navigate through the center of the passage. Instead, he apparently kept the vessel headed for the center of the passage between Bodega Head and Bodega Rock. While heading for the center of the passage, it is probable that the operator unconsciously steered progressively more to the left as his vessel was set to the right, and that he did not recognize that the vessel was being set or the extent of the set. This allowed the vessel to enter relatively shallow water where swells would increase in height and could become hazardous. If he had been observing his compass, however, it would have indicated that he was steering about 30° to the left of the general axis of the passage. However, a 30° departure from his original heading at buoy R "12" should have been apparent to an operator familiar with the area even if he did not refer to his compass.

Measurements taken from the second photograph of the MERRY JANE while it was heeled to starboard indicate that the vessel traveled about 285 feet from its position in the first photograph, and it was estimated to be about 150 yards southeast of the center of the deeper portion of the passage. At the time of the second photograph, a large wave estimated to be 15 feet high had the MERRY JANE heeled about 66° to starboard. This was the first of several increasing swells encountered by the MERRY JANE during its approach to Bodega Bay. The breaking portion of the wave shown in the photograph is limited to a length along the crest about three to four times the length of the MERRY JANE, and it does not extend to the center of the passage where the water is deeper. The enlarged breaking portion of this wave could have been the result of the interaction of two wave patterns. However, it is more probable that the breaking portion of the wave was the result of a large wave from about 240° encountering shoaling inside the 30-foot contour in the narrow area about 400 to 500 yards and 250° from the center of Bodega Rock. Measurements from the two photographs of the MERRY JANE disclosed that the same wave appears in both photographs. In the first photograph the wave is moving from about 240° and is about a ship length astern of the MERRY JANE.

The vessel's heading and location were both significant factors contributing to the broaching and near capsizing. The heading of about 013° allowed the overtaking swell to strike the vessel broad on the quarter. The MERRY JANE probably would not have broached if it had been heading about 045°, which would have been possible if it had been navigating close to the center of the deeper portion of the passage. The operator did not see the swell approaching from astern probably because he was looking ahead as he piloted the vessel. Also, the swell probably was not discernable until it swept into the shoaling water and increased further in height and steepness. However, several of the passengers saw the wave, which the operator could have detected if he had looked astern frequently as is prudent when approaching an inlet with a following sea. Even if the operator had seen the oncoming swells, there probably was little he could have done due to his location. Any change of course to the right to present a stern aspect to the swell was not possible since, in the vessel's location, it would have meant heading toward the shoal water near Bodega Rock. Thus, the area that the MERRY JANE was traversing was not only undesirable due to the potential for breaking waves, it limited the options for maneuvering. Also, had the vessel lost power in this area, it probably would have been driven aground on the shoals near Bodega Rock.

Small passenger vessels like the MERRY JANE customarily operate with small magnetic compasses that are not suitable to taking bearings for precise navigation. Nor is it reasonable to expect that an operator who is steering his vessel and navigating by visually observing landmarks would be able to do any chart plotting. However, by using

radar and occasionally observing his compass, a vessel operator could maintain a track along the deeper portion of the area between Bodega Head and Bodega Rock on a course of about 045°. The use of a fathometer could aid an operator to stay beyond the 30-foot depth curve around Bodega Rock where the deeper water would greatly reduce the possibility of waves breaking. Also, the refraction of waves between Bodega Head and Bodega Rock causes waves to travel in a northeasterly direction, thus a vessel proceeding along a track of about 045° would benefit from having most waves approach from almost directly astern.

The "U.S. Coast Pilot" warns that the waves, especially combers, can be dangerous to small vessels, such as skiffs, navigating between the Bodega Head and the Bodega Rock. This accident demonstrates that even a vessel as large as the MERRY JANE can be imperiled if large waves occur unexpectedly, particularly if the operator fails to keep his vessel in the deeper portion of the passage. Testimony from operators of small passenger vessels like the MERRY JANE indicate that vessels routinely navigate between Bodega Head and Bodega Rock unless breakers extend significantly into the passage. While estimates of how much of the passage must remain free of breaking waves for safe passage is not well established, it appears that most local users consider it relatively safe as long as most of the 300 yards of water between the 12-foot depth contour lines on either side of the passage is free of breaking waves. This type of local knowledge is not published, and in this case it is difficult to define just when the passage starts to become dangerous.

The Safety Board believes that there should be a precautionary note on the navigation chart and in the "U.S. Coast Pilot" pertaining to Bodega Bay to advise mariners navigating the passage between Bodega Head and Bodega Rock to keep to that portion of the passage where the water is deeper and to stay on the deeper side of the 30-foot depth contour northwest and southwest of Bodega Rock. Also, the precautionary note should inform mariners that the passage between Bodega Head and Bodega Rock can become unsafe whenever breakers reduce the width of the passage, and that when this occurs, mariners entering Bodega Bay from the sea should consider entering Bodega Bay south of buoy BW "BA."

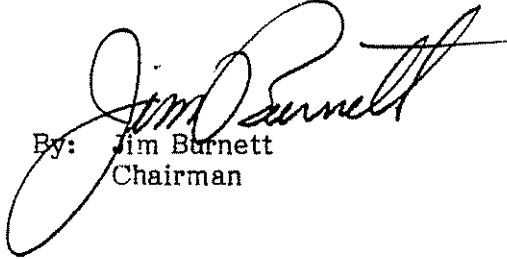
As a result of its investigation, the National Transportation Safety Board recommends that the National Oceanic and Atmospheric Administration:

Place a precautionary note on the navigation chart for Bodega Bay, California, and in the "U.S. Coast Pilot" to advise mariners that the safest part of the passage between Bodega Head and Bodega Rock is along the deeper part of the passage; that large breaking waves can occur inside the 30-foot depth contour line northwest and southwest of Bodega Rock; that the passage can become unsafe whenever breakers reduce the width of the passage; and that when the width of the passage is reduced by breakers, mariners entering Bodega Bay from the sea should consider passing south of buoy BW "BA" located about 0.7 mile southeast of Bodega Rock. (Class II, Priority Action) (M-86-115)

Also as a result of its investigation, the Safety Board issued Safety Recommendations M-86-113 and -114 to the U.S. Coast Guard.

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 actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendations in this letter. Please refer to Safety Recommendation M-86-115 in your reply.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER and NALL, Members, concurred in this recommendation.


By: Jim Burnett
Chairman