



National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: October 22, 1990

In reply refer to: M-90-67 through -69

Admiral Frank B. Kelso II
Chief of Naval Operations
Navy Department
Washington, D.C. 20350-2000

On June 14, 1989, the U.S. tug BARCONA was under way from Long Beach, California, in San Pedro Channel with two empty deck barges in tandem tow astern, bound for Santa Catalina Island. The U.S. Navy nuclear attack submarine USS HOUSTON was operating submerged in the same area. At 0430, the HOUSTON prepared to come to periscope depth in order to obtain a navigation fix from a navigation satellite. The operating crew of the submarine did not detect the presence of the BARCONA's tow prior to reaching periscope depth. The submarine came to periscope depth close to the BARCONA and its tow, and an antenna that had been raised to obtain the navigational fix snagged the BARCONA's towline. When the submarine crew realized that they were perilously close to surface vessels, they executed an emergency dive at full power. The force of the diving submarine pulled the stern of the tug down and caused the tug to flood through open exterior main deck doors, and the tug sank. Two of the three crewmen were able to escape from the sinking tug and were later rescued. One crewman, however, remains missing and is presumed dead.¹

The established periscope depth procedures on board the HOUSTON required the use of the under-ice sonar in the active mode. This sonar was mounted on the front of the HOUSTON's sail and was directed ahead of the submarine. The under-ice sonar was a short range, high resolution sonar. However, it was not operational at the time of the accident and thus, could not be used. According to the leading first class sonarman on the HOUSTON, had the under-ice sonar been operational and had it been used in the active mode during the procedures to ascend to periscope depth just before the accident, the BARCONA and its tow would have been detected. He further said that there was an "80-percent probability" that the sonar would also have detected the towing cable.

¹For more detailed information, read Marine Accident Report--"Sinking of the U.S. Tug BARCONA by the U.S. Navy Nuclear Attack Submarine USS HOUSTON (SSN 713), San Pedro Channel, Near Santa Catalina Island, California," June 14, 1989 (NTSB/MAR-90/05).

In the Safety Board's view, the fact that the active sonar device normally used during the ascent to periscope depth was out of service did not relieve the navigation watch of the responsibility of using the other active sonar equipment that was available and operational. The established periscope depth procedures instruct the officer of the deck (OOD) to "always consider the use of additional available support systems, including full and optimum use of active and passive sensors and of fire control analysis capabilities." Although this instruction does not specifically require the OOD to use active sonar, it allows the OOD to do so. Since it is normal practice aboard U.S. Navy submarines not to use the main sonar array in the active mode, OODs would not typically do so without first obtaining the permission of the commanding officer (CO). However, junior OODs might hesitate to suggest such a course of action to the CO for fear that such a suggestion would expose them to criticism. Since it was the practice on board the HOUSTON to utilize the under-ice sonar in the active mode when coming to periscope depth and since the under-ice sonar was not operational, the normal periscope depth procedures could not be followed. The Safety Board concludes that the CO should have provided specific guidance to the OODs on what procedures should be followed, insofar as practical, to provide at least the same level of surveillance preparatory to periscope depth operations as would have been provided by a fully operational under-ice sonar. The Board recognizes that there are times, even in peacetime, when operational commitments require a submarine to remain undetected and prohibit the use of active sonar during an evolution to bring the submarine to periscope depth. Naval training exercises and intelligence gathering operations may be examples of instances in which the use of active sonar is inappropriate. As far as the Safety Board could determine, the HOUSTON was not engaged in any naval training exercise, nor was it engaged in any known military operation. There was no need for the HOUSTON to maintain secrecy concerning its presence in the area. The HOUSTON was operating in U.S. coastal waters close to one of the busiest ports in the Nation. Even though the submarine was operating away from the main shipping lanes to the entrance to the Los Angeles-Long Beach port facilities, it should have been assumed that there would be a large volume of local traffic in the area, and extra caution should have been taken to make sure that it was safe to come to periscope depth. Therefore, the use of active sonar would not have compromised the operational commitments of the HOUSTON and should have been used as a final check that there were no vessels in the immediate area prior to ascent to periscope depth.

The OOD who was on duty on the HOUSTON at the time of the accident had gotten only about 2 hours sleep before assuming the navigation watch at 0011 on June 14. This officer had been sharing underway OOD watches with one other individual on a 6-hours-on, 6-hours-off duty rotation since the HOUSTON left San Diego on June 12. He stated that he had gotten only 2 to 3 hours sleep the night before the HOUSTON departed from San Diego and that he had not had a "good night's sleep" for about 10 days before the accident. The Safety Board concludes that the OOD was fatigued when he assumed the navigation watch. However, the barges in the BARCONA's tow were not detected before the HOUSTON reached periscope depth because passive sonar was not capable of detecting them. Thus, the Safety Board concludes that the fatigued condition of the OOD did not contribute to the HOUSTON's failure to

detect the presence of the BARCONA's tow before the submarine arrived at periscope depth. However, the OOD's ability to conduct a proper navigation watch may have been diminished by his fatigue. Despite the fog conditions, it remains a possibility that the BARCONA's towing lights were visible to the OOD and that because of his fatigue, he failed to recognize the significance of the light configuration. Since the submarine was about 1,000 feet from the towline when the OOD first sighted the BARCONA, it is possible that, had he seen and recognized the significance of the masthead towing light display, he could have taken emergency action to avoid the towline.

The Navy's operational instructions require an oncoming watchstander to report to his senior in the watch organization and request relief if he is not able to stand an "alert, effective watch" because of exhaustion. These instructions further specify that the offgoing watchstander must "assure himself that his relief is physically capable of assuming the watch" before relinquishing the watch to him. Instructions such as these are not effective in preventing fatigued officers from assuming a navigation watch. The oncoming watchstander is disinclined to report himself as unfit to stand watch owing to exhaustion because he fears being regarded by his shipmates, who are exposed to the same grueling routine as he and may be just as tired, as one who shirks his responsibility. Moreover, since someone else would have to stand the watch in his absence, he would be viewed as adding to the workload of others. It is difficult for a watchstander who is being relieved to assess the physical and mental condition of his relief. Thus, there is no way that he can comply with the requirement that he "assure himself" that his relief is fit to stand the watch.

Considering the number and types of activities that had to be completed by the submarine crew before surfacing, the Safety Board concludes there was no undue delay on the part of the HOUSTON in ascending to the surface and returning to the location of the accident. As soon as the submarine was free floating on the surface and able to do so, the HOUSTON contacted Coast Guard authorities by radio and reported the accident. Even though the radio contact took place about 2 hours after the accident, the Safety Board concludes that it could not reasonably have been made earlier. However, the HOUSTON had reported the incident to Naval authorities an hour earlier, and these authorities should have reported the incident to local Coast Guard search and rescue forces. Such a report would not have altered the outcome of this accident, but under different circumstances, earlier notification to search and rescue forces could have been crucial.

Therefore, the National Transportation Safety Board recommends that the U.S. Navy:

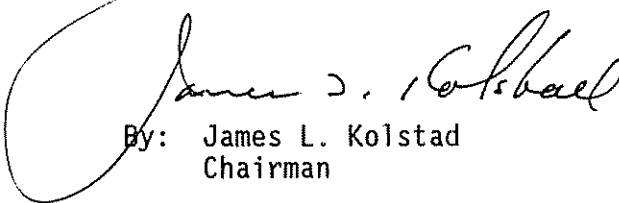
Require that sonar gear be used in the active mode on all submarines operating in U.S. coastal waters that are known to have high volumes of commercial and recreational traffic before ascending to periscope depth, except when such usage conflicts with national security considerations. (Class II, Priority Action) (M-90-67)

Amend U.S. Navy operational instructions to submarine crews to require adequate rest periods for officers of the deck before they stand underway watches, except when such a requirement conflicts with national security considerations. (Class II, Priority Action) (M-90-68)

Review and amend, as appropriate, U.S. Navy procedures to require shoreside Naval commands to notify local Coast Guard search and rescue authorities whenever a Naval vessel reports involvement in an accident with another vessel in U.S. coastal waters. (Class II, Priority Action) (M-90-69)

Also, the Safety Board issued Safety Recommendations M-90-70 through -72 to Connolly Pacific Company; M-90-73 through -75 to the American Waterway Operators; and M-90-76 and -77 to the U.S. Coast Guard.

KOLSTAD, Chairman, COUGHLIN, Vice Chairman, and LAUBER, BURNETT, and HART, Members, concurred in these recommendations.



By: James L. Kolstad
Chairman