



National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: October 22, 1990

In reply refer to: N-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).

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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

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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 outgoing 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)

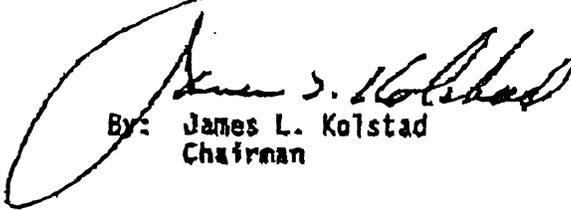
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Amend U.S. Navy operational instructions to submarine crews to require adequate rest periods for officers of the deck before they stand underway watches, except when such a requirement conflicts with national security considerations. (Class II, Priority 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 -76 to the American Waterway Operators; and M-90-75 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



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, DC 20250-7000

IN REPLY REFER TO
Ser 02B/00583056
19 Nov 90

Mr. James L. Kolstad, Chairman
National Transportation Safety Board (NTSB)
Washington, DC 20594

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M-20-67
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Dear Mr. Kolstad,

Thank you for your recent letter with safety recommendations concerning the marine accident involving the U.S. Tug BARCONA and the USS HOUSTON (SSN 713) on 14 June 1989.

The Navy has conducted a thorough review of the findings of your letter as well as the 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). Comments with respect to both of these documents as well as the three safety recommendations you have made are provided in the enclosure to this letter.

The United States Navy is firmly committed to the safe operation of its ships and aircraft throughout the world. We thank you for your assistance in this endeavor.

Sincerely,


R. G. JONES, JR.
Rear Admiral, U.S. Navy
Deputy Assistant Chief
of Naval Operations
(Undersea Warfare)

Enclosure

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U.S. NAVY RESOLUTION OF NTSB SAFETY RECOMMENDATIONS

1. Safety Recommendation #M-90-67: The U.S. Navy should "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."

Background:

As stated in the NTSB report, 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."

The HOUSTON normally had two active sonars available, the under-ice sonar (AN/BQS-15) and the search sonar (AN/BQQ-5). The Commanding Officer stated that the HOUSTON normally used the under-ice sonar when coming to periscope depth but, that on the day of the accident, the under-ice sonar was inoperative. The leading first class sonarman onboard the HOUSTON, who was also the senior sonar repair technician on the submarine, stated that he tested the under-ice sonar before the HOUSTON sailed from San Diego on 12 June 1989, and that it operated satisfactorily at that time; however, when he tested the under-ice sonar again after the submarine submerged for the first time since getting underway, the device did not operate properly. The under-ice sonar could not be repaired while the submarine was underway.

The under-ice sonar is a short-range, high-resolution sonar; the search sonar is a long-range, relatively low-resolution sonar. As stated in the NTSB report, using the search sonar in the active mode interferes with the reception of sound by passive sonar. In addition, search sonar active emissions can be detected at very long ranges, revealing the presence of the HOUSTON to other military vessels well outside of U.S. territorial waters.

Prior to coming to periscope depth, HOUSTON did not hold BARCONA as a sonar contact passively. However, HOUSTON gained BARCONA passively while proceeding to periscope depth. The most probable cause of this phenomenon was the presence of a thermal layer which reduced the probability of detection by passive or active sonar below periscope depth.

U.S. Navy Resolution: Current Navy procedures call for submarines to consider the use of all available sensors when coming to periscope depth which includes the use of under-ice sonar. The use of various active sensors, which make a submarine highly detectable, is not appropriately subject to dictation in specified circumstances but is properly determined by the OOD given the tactical situation. In this particular case, since the

under-ice sonar was not functioning, a careful passive search was appropriate and was conducted prior to coming to periscope depth. Use of the search sonar would not have been of assistance. No change in periscope depth procedures is deemed necessary.

2. Safety Recommendation #M-90-68: The U.S. Navy should "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".

Background:

The NTSB letter and report indicate that OOD fatigue was not responsible for HOUSTON's failure to detect BARCONA and her tow prior to arriving at periscope depth but states that:

"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 (towing) light configuration."

The evidence in the NTSB report more strongly suggests that weather conditions and the geometry of the collision with the tow made it impossible to determine that BARCONA was towing. At the time of the collision, it was early morning twilight, the moon had set and visibility was less than 1/2 mile due to fog. It is important to note that the BARCONA tow consisted of a 132-foot barge and a 160-foot barge, which trailed the BARCONA by 1000 and 1600 feet, respectively. These two barges being towed were connected by a 600-foot submerged "under rider" cable which would have been impossible for an approaching ship of any type to see.

The collision occurred when HOUSTON hit this "under rider" while passing between these two trailing barges perpendicular to their line of travel. HOUSTON was approximately 200 feet aft of the lead barge at the time of the collision. If a height of 30 feet is assumed for the lead barge, due to being masked by the lead barge, the towing light on the mast of the BARCONA would have had to be over 150 feet in height to be seen by the HOUSTON. Since BARCONA was only 73.1 feet in length, her mast head light was much less than 150 feet high and thus impossible to see.

Finally, prior to the accident the OOD made three rapid 360 degree sweeps and one slow 360 degree sweep with the periscope. During the collision the OOD and CDO made independent search sweeps with the periscope prior to descending from periscope depth. Neither the OOD nor the CDO (an officer not identified as fatigued) saw the BARCONA or her towing lights. Both saw only two "contacts", the two trailing barges on either beam.

Navy Resolution:

The evidence in the NTSB report indicates that it was unlikely that fatigue inhibited the HOUSTON OOD from recognizing BARCONA in tow. Even if the reduced visibility conditions would have allowed the OOD to see BARCONA's towing lights, the submerged tow line and the masking effect of the lead barge made it impossible for HOUSTON to see these lights from periscope depth. In addition, the CDO, a more experienced officer, who was not fatigued, was unable to see any evidence that a towing situation existed. The evidence collected by NTSB does not indicate that an additional procedure requiring additional rest for OOD's before they stand watch is required or would have changed the outcome in this accident.

3. Safety Recommendation #N-90-62: The U.S. Navy should "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".

Background:

The report states that the HOUSTON returned to periscope depth as soon as possible and sent the following message to the U.S. Navy authorities:

"At 141143Z while at periscope depth, ship struck what is believed to be a submerged cable or trawl. Conducted emergency deep to a depth of 200 feet to clear object. Returned to periscope depth in same vicinity at 141235Z. Sighted barge possibly adrift. Visibility less than one mile. Surfacing to conduct search for any vessels in distress and inspect for damage. No personnel injuries."

The Naval authorities did not report the incident to the Coast Guard at this time since there was no indication of damage other than possibly a cut cable. Further, a review of subsequent message traffic indicates that even if the Naval authorities had notified the Coast Guard, a Coast Guard search would probably not have been initiated based on available information.

When HOUSTON surfaced and was better able to assess the situation, the following message was sent by radiotelephone:

"Long Beach Coast Guard, this is USS HOUSTON, surfaced submarine. We have had a collision with a submerged tow cable or an apparent tow cable. We are on the surface with only minor damage to own ship. We have spotted what appears to be a barge adrift. Visibility is less than one mile. My posit (i.e., position) is 33 degrees 32.1 minutes, 118 degrees 20.7 minutes."

The Coast Guard Group Long Beach radio operator asked whether the HOUSTON wanted Coast Guard assistance. The radio operator on board the HOUSTON replied:

"LONG BEACH Coast Guard, USS HOUSTON. We do not require assistance. We desire to know if you have had reports of any distressed vessel in this area."

The Coast Guard responded that it had received no report of any vessel in distress. Based on this additional information, the Coast Guard did not initiate a search. Only later when a privately owned pleasure craft, MY WAY, reported that a tug had been sunk, that two crew members from the tug were on board a drifting barge, and that one crew member from the tug was missing, did the Coast Guard initiate a search.

U.S. Navy Resolution:

The NTSB report indicates that there was insufficient initial evidence that a Coast Guard search was required when HOUSTON notified Navy authorities. This finding is substantiated by the fact that the Coast Guard chose not to initiate a search even after HOUSTON surfaced and provided all available information via radiotelephone from the scene. Only when a second independent source reported that a crew member was missing due to the accident, did the Coast Guard initiate a search of the area. The evidence collected by NTSB does not indicate that an additional procedure requiring shoreside Naval commands to notify local Coast Guard search and rescue authorities whenever a Naval vessel reports involvement in an accident with another vessel is required or would have changed the outcome in this accident.

APR 29 1991

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

Dear Admiral Kelso:

The National Transportation Safety Board has reviewed the November 19, 1990, letter signed by Rear Admiral R.G. Jones, Jr., in response to Safety Recommendations M-90-67 through -69. These safety recommendations resulted from the Safety Board's investigation of the June 14, 1989, marine accident involving the U.S. tug BARCONA and the U.S. Navy submarine USS HOUSTON off the coast of Long Beach, California.

Safety Recommendation M-90-67 asked the U.S. Navy to 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. The November 19 letter responds that no change in periscope procedures is deemed necessary. The Safety Board understands that to avoid detection during certain tactical situations it would not be appropriate for submarines to routinely use their search sonar in the active mode before surfacing. However, in light of the HOUSTON's mission and location at the time of this accident, it appears unlikely that the vessel's detection would have compromised its security. Moreover, the accident demonstrated that a passive search was not sufficient to ensure safe navigation of the submarine, since the passive sonar search did not reveal the two barges that the BARCONA towed. Finally, the Safety Board disagrees that the HOUSTON's search sonar in the active mode probably would not have located the barges to avoid the accident. Therefore, the Safety Board disagrees with the Navy's response to Safety Recommendation M-90-67, and it has been classified as "Closed--Unacceptable Action."

Safety Recommendation M-90-68 asked that the U.S. Navy amend its operational instructions to submarine crews to require adequate rest periods for officers of the deck (OOD) before they stand underway watches, except when such a requirement conflicts with national security considerations. We disagree with the Navy's view that evidence in the Safety Board's report suggests "the geometry of the collision with the tow made it impossible to determine that the BARCONA was towing." When the HOUSTON reached periscope depth and the periscope was clear of the water, the OOD executed three rapid 360-degree visual sweeps to check for surface contacts close to the submarine. On the second rapid sweep, he sighted the red sidelight of a vessel off the port side of the submarine. He evaluated this contact as a fishing vessel under way and not engaged in fishing operations. The Safety Board believes that the vessel was the BARCONA. Therefore, the Navy's contention that the BARCONA's towing lights would have been masked by the lead barge and, consequently, impossible to be seen by the HOUSTON is not valid.

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With respect to the Navy's statement that, in addition to the OOD, the command duty officer (CDO) (not identified as fatigued) made independent search sweeps with the periscope before descending from periscope depth and did not see the BARCONA or her towing lights, the Safety Board's investigation determined that the CDO did not make these sweeps until after he heard the sound of something dragging across the sail or the hull of the submarine. At that position, the CDO probably would have been unable to see the BARCONA's towing lights because the lead barge would have masked the periscope's vision. Thus, we find no relevance in the Navy's conclusion concerning the inability of the CDO, who was not fatigued, to see the BARCONA's towing lights.

The Safety Board continues to believe that the OOD's ability to conduct a proper navigation watch may have been diminished by his fatigue and because of his fatigue he failed to recognize the significance of the BARCONA's towing light configuration. Because the Navy disagrees with the Safety Board on this issue, Safety Recommendation M-90-68 has been classified as "Closed--Unacceptable Action."

Safety Recommendation M-90-69 suggested that the Navy review and amend, as appropriate, U.S. Navy procedures to require shoreside Naval commands to notify local U.S. Coast Guard search and rescue authorities whenever a Naval vessel reports involvement in an accident with another vessel in U.S. coastal waters. The Safety Board does not agree with the Navy's opinion that because the Coast Guard did not take immediate action to investigate this accident, the Navy should not require its Naval commands to make such reports to the Coast Guard as soon as possible after an accident has occurred. Consequently, Safety Recommendation M-90-69 has been classified as "Closed--Unacceptable Action."

It is regrettable that the Department of the Navy does not plan to act positively on any of the three safety recommendations suggested by the Safety Board. The recommendations were made, not with the intent of compromising the Navy's important and strategic mission, but rather, to ensure the safe and legitimate use of U.S. coastal waters by all who sail upon them.

Sincerely,

Original Signed By
James I. Kolstad

James I. Kolstad
Chairman

Recommendation Report

Wednesday, July 07, 1998
ADDRESSEE: U.S. NAVY

Log Number **M-0365**
Issue Date **10/22/90** **NYA CATALINA ISLAND CA** **8/14/89**

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 PRISCOPE 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 PRISCOPE DEPTH. THE SUBMARINE CAME TO PRISCOPE 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.

Recommendation # **M-80-087** Overall Status **CUA** Priority **CLASS II**

THE NTSB 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.

U.S. NAVY CLOSED - UNACCEPTABLE ACTION 4/29/91

Recommendation # **M-80-088** Overall Status **CUA** Priority **CLASS II**

THE NTSB RECOMMENDS THAT THE U.S. NAVY: 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.

U.S. NAVY CLOSED - UNACCEPTABLE ACTION 4/29/91

Recommendation # **M-80-069** Overall Status **CUA** Priority **CLASS II**

THE NTSB RECOMMENDS THAT THE U.S. NAVY: 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.

U.S. NAVY CLOSED - UNACCEPTABLE ACTION 4/29/91

Enclosure 39. Video and Photographic Surveillance of External
Damage on GREENEVILLE (SSN 772) classified and
not releasable under Exemption b-1.

Enclosure (59)