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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: MAY 25 1993

In reply refer to: M-93-16

Howard Pearson, M.D.
President
American Academy of Pediatrics
141 Northwest Point Boulevard
P.O. Box 927
Elk Grove Village, Illinois 60009

Recreational boating accidents currently result in the greatest number of transportation fatalities annually after highway accidents. Although the number of fatal recreational boating accidents and fatalities had decreased each year since 1985, the U.S. Coast Guard indicates that in 1991, the number of fatalities from recreational boating accidents increased to 924 from the 865 fatalities reported in 1990. According to the Coast Guard, the fatality rate--the number of fatalities per 100,000 estimated boats--also increased slightly during the same period. Information from the American Red Cross indicates that about 355,000 persons are injured from recreational boating accidents annually and that more than 40 percent of these injuries require medical treatment beyond first aid. The U.S. Coast Guard estimates that in 1991 there were about 20 million recreational boats on the Nation's waterways, with the number increasing steadily each year. Not only has the number of recreational boats increased, but the speed at which many of these recreational boats operate has also increased. Because of the number of fatalities and injuries and because recreational boating activities can be expected to continue to increase, the Safety Board believes that efforts to improve safety are needed in recreational boating. The Safety Board, therefore, initiated a safety study of recreational boating accidents to determine the circumstances of these accidents and the countermeasures needed to prevent or reduce their number and severity.[1]

For the study, the Safety Board reviewed U.S. Coast Guard data on recreational boating accidents that occurred between 1986 and 1991. The Safety

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[1] National Transportation Safety Board. 1993. Recreational boating safety. Safety Study NTSB/SS-93/01. Washington, DC.

Board also asked 18 States to provide copies of their 1991 fatal accident investigation reports, including witness statements, local investigation reports, and written narratives of the accidents. The Safety Board received 407 fatal accident reports, about 52 percent of the 779 fatal boating accidents that occurred nationally in 1991; 478 persons died in these accidents, about 52 percent of the 924 persons who died in boating accidents nationally in 1991.

Of the 478 fatalities that occurred in the accidents, 351 were reported by the States to be the result of drowning and 89 were due to traumatic injuries.[2] Of the 351 persons who drowned, use/nonuse of personal flotation devices (PFDs) was known for 331 persons; 50 (15 percent) of these persons wore PFDs; 281 (85 percent) did not wear PFDs.

A detailed review of the 50 State-reported "drownings" in which the victims were wearing a PFD suggests that cold water exposure (hypothermia) may have been a factor in the cause of death in 23 cases. The review further revealed that in 10 cases, the victims were caught under water; in 4 cases, the victims were probably unconscious; in 1 case, the PFD was ripped off the victim; in 4 cases, the PFDs were not being worn properly; and in 8 cases, the circumstances of the drowning and the role of the PFD were not known or not documented. Thus, in at least 84 percent of the drownings in which the victim was wearing a PFD, there is a reason for the victim drowning that is not attributed to the failure of the PFD.

A review of the 281 State-reported "drownings" in which the victims were not wearing a PFD suggests that in 15 percent of the drownings (43 drownings) there were factors involved that may not have been influenced by the wearing of a PFD. The cause of death in 32 of the 43 drownings was probably exposure to cold water (hypothermia) rather than drowning; in 9 drownings, the victims were caught under water; and in 2 of the drownings, the victims were probably unconscious. Therefore, as many as 238 persons (85 percent of the drownings) may have survived had they been wearing a PFD.

There were 51 children under the age of 12 on board the accident vessels. Fifteen of these 51 children were fatally injured: 2 died from traumatic injuries, 12 drowned, and the cause of death for 1 victim was not known because the body was never recovered. Of the 12 children who drowned, it was documented that 5 were

[2] Subsequent information obtained from the States indicates that for the remaining 38 fatalities, 35 bodies were never recovered and the cause of death could not be accurately determined; 1 fatality was believed to have been caused by a pre-existing medical condition; and 2 fatalities were thought to have been the result of exposure to cold water.

wearing a PFD and 7 were not.[3] Information provided by the officers who responded to the accidents indicates that of the 36 children who survived the accidents, 15 lives were saved because they were wearing a PFD.

The above data raise concern about the adequacy of current requirements regarding the carriage and use of personal flotation devices on recreational boats. The Coast Guard sets minimum safety standards for recreational boats and associated equipment. Personal flotation devices must carry the label of "Coast Guard Approved Equipment," which means that the equipment has been determined to be in compliance with U.S. Coast Guard specifications and regulations relating to performance, construction, and materials. Coast Guard regulations require that PFDs be in good and serviceable condition, of appropriate size for the intended user, and that wearable PFDs be readily accessible.

Recreational boats less than 16 feet in length (including canoes and kayaks of any length) must be equipped with either a Type I, II, III, IV, or V PFD for each person on board. Boats 16 feet and longer must be equipped with either a Type I, II, III, or V PFD for each person on board plus one Type IV PFD. Type V PFDs have use restrictions marked on them that must be observed. In order for a Type V PFD to be counted toward minimum carriage requirements, it must be worn. There are no Federal requirements regarding the wearing of other PFDs. Federal law does not require PFDs on racing shells, rowing skulls, and racing kayaks.

On November 9, 1992, the U.S. Coast Guard published a notice of proposed rulemaking (NPRM) in the Federal Register (57 FR 53410) on recreational boating safety equipment requirements. The Coast Guard proposes to change several Federal requirements and exemptions for carriage of PFDs on recreational vessels. Specifically, the rulemaking would eliminate the Type IV PFD as a primary PFD on recreational vessels less than 16 feet in length. Further, the rulemaking would eliminate Federal preemption of State boating safety laws related to PFD wearing or PFD carriage. Because current PFD carriage regulations allow use of a nonwearable Type IV PFD to meet carriage requirements for vessels under 16 feet in length, a State requirement to wear a PFD is preempted by Federal regulations because it implies a wearable PFD that is in conflict with Federal regulations. Under the rulemaking, a State would no longer be preempted from requiring that PFDs be worn. The proposed rulemaking would also remove the exemption from PFD carriage requirements for racing shells, rowing sculls, canoes and kayaks, sailboards, and personal watercraft. The Safety Board supports the NPRM.

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[3] Of the five children who drowned and were wearing a PFD, three died from exposure to cold water (hypothermia), one was caught under water, and one slipped out of the PFD in cold water.

In 1988, the National Association of State Boating Law Administrators (NASBLA) passed a resolution calling for the mandatory wearing of PFDs by all children less than 12 years of age. Proponents of this resolution believed that requiring children to wear PFDs would eventually result in more adults wearing PFDs. To support this contention, statistics from the Scandinavian countries of Finland, Sweden, and Denmark were cited. In the mid- and late 1970s, the Scandinavian Aquatic Council recommended that all children 12 years old and younger who were participating in Council-sponsored activities and competions wear PFDs. This recommendation became a requirement because of liability concerns and eventually resulted in local jurisdictions, lake associations, and marinas adopting a policy that all children 12 years old and younger were required to wear a PFD. Within the last 5 years, overall boating fatalities have decreased on the Scandinavian lakes, rivers, and bays. The Finnish Bureau of Aquatic Statistics and Lake Shore Patrol attribute this decrease, in part, to the increase in the number of adults now wearing PFDs because of the requirement to do so when they were younger.

Despite the fact that States are preempted from requiring that PFDs be worn on boats less than 16 feet in length, some States have enacted such laws. One of the most typical requirements is that children of certain ages wear PFDs. The age requirements, however, vary from State to State and sometimes are linked to the size of vessel. The lack of age uniformity in the requirements may be confusing to recreational boaters traveling throughout the States with children. More importantly, however, the requirements do not appear to be based on accident data or scientific research. According to the State boating law administrator in Florida, who favors a requirement for 12-year-olds and younger, the age of 6 was arbitrarily chosen by the State legislature, he believed, because it was close to 5, the age at which children are required to wear seatbelts. According to the boating law administrator in North Dakota, the age of 10 was a compromise between those who opposed any requirement and those who favored the age of 12. The NASBLA, on the other hand, supports its resolution to require children 12 years old and younger to wear PFDs by the fact that the age of 12 has repeatedly been linked to operator maturity by the marine community. It also references work by Ballestreri Consulting, Inc., that researched the physiological, emotional, and motor skill changes that occur around the age of 12.[4] The American Academy of Pediatrics (AAP) recommends that "your children should wear life jackets at all times when on or near the water."[5] The AAP embarked on a water safety campaign as a result of the high incidence of drownings among children. A policy statement on drowning is due this summer. The AAP does not, however, define "children" nor does it identify the specific ages at which a child needs to wear a "life jacket."

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[4] Letter dated January 19, 1993, from S. Ballestreri to Safety Board staff.

[5] American Academy of Pediatrics. 1992. Life jackets and life preservers [pamphlet]. TIPP HEO 133. August.

The enactment of laws to require children to wear PFDs has been somewhat successful, in part, the Safety Board believes, because the boating public can readily accept that it is dangerous for children not to wear PFDs. However, the accident data provided by the States forcefully points out that boating without a PFD is dangerous for boaters of all ages. Requiring the use of PFDs for all recreational boaters, therefore, would appear to be the proper course of action for all States to take. The Centers for Disease Control, in an effort to reduce the number of drownings associated with recreational boating, has urged the States to require the wearing of PFDs. The Safety Board recognizes, however, that there would be strong opposition to an across-the-board law, that such a law would be difficult to enforce, and that PFDs may indeed not be necessary at all times, such as in certain areas of large recreational vessels.

Nevertheless, given the number of lives that could have been saved in the accidents examined for the Safety Board study had PFDs been worn, the Board believes that it is incumbent on the States to increase the level of PFD usage. Based on the NPRM issued on November 9, 1992, it is clearly the intent of the Coast Guard to allow States to enact legislation that would require boaters to wear PFDs. Thus, the Coast Guard has recognized the safety benefits that would be derived from revising current regulations that preempt States from requiring the wearing of PFDs. The Safety Board looks forward to the Coast Guard's completion of this rulemaking process.[6] In the interim, the Safety Board believes that the States can begin the legislative process to increase the level of PFD usage. One approach to increase the level of PFD usage is to mandate PFD usage for persons involved in recreational boating activities or situations that are perceived by the boating public to be dangerous, similarly to how the public has accepted that it is dangerous for children not to wear PFDs. Examples include water skiers, operators of personal watercraft, and persons operating in hazardous waters or operating a vessel alone. Of the 351 persons who drowned in the 407 fatal accidents, 338 persons drowned in single-vessel accidents. Of the 338 drownings, 96 victims (28 percent) were alone in their vessel at the time of the accident.

Other factors that States may need to consider include the types and conditions of recreational waters within the States' respective boundaries, such as cold recreational waters (waters with a temperature of 70 °F or less). Fifty-four percent of the accidents for which water temperature was recorded occurred in water temperatures of 70 °F or less. A person entering cold water experiences a sudden cold water shock reflex. This reflex causes a person to immediately gasp for air, which

[6] At the time of this letter, it was anticipated that the final rule was imminent.

can result in water entering the lungs, reduced underwater breath-holding times, and hyperventilation with subsequent confusion and increased muscle tetany.[7]

Consideration should also be given to such factors as the types of recreational activities and the length and size of vessels. The States should study in detail existing accident data to determine where, when, and by whom PFD usage should be required. States need to consider that on certain sizes of vessels and during certain types of recreational activities, PFD usage may not be necessary and that there is a level of risk associated with many sporting activities, including recreational boating. For example, some people jump off their boats in warm waters and swim safely without wearing a PFD.

At a minimum, however, the Safety Board believes that children should be required to wear PFDs. The Safety Board also believes that requiring children to wear PFDs will eventually result in more adults wearing PFDs, as occurred with the use of child safety seats and seatbelts for children.[8] However, given the various age limits that have been enacted by some of the States and apparently the lack of any scientific research to support the age limits chosen, the Safety Board believes that the Coast Guard and the NASBLA, in consultation with the American Academy of Pediatrics, should establish an age at or below which all children should be required by all States to wear PFDs while in recreational boats. The Safety Board further believes that the NASBLA members should then seek legislative action in their respective States that would require the wearing of PFDs, under conditions determined to be appropriate by the State, with a minimum requirement that all children wear PFDs.

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[7] Steinmen, Alan M.; Haywood, John S. 1989. Cold water immersion. In: *Management of* wilderness and environmental emergencies. St. Louis, MO: Mosbey Publishing Company.

[8] According to data from a National Highway Traffic Safety Administration (NHTSA) 19-city survey, seatbelt use has increased from about 16 percent for teenage drivers in 1985 to about 44 percent for teenage drivers in 1991. Also, use of seatbelts by subteens (5- to 12-year-olds) is increasing steadily. The NHTSA suggests that this is likely a function of the fact that many of these persons used child safety seats and seatbelts when they were younger and have developed the habit of buckling up. They may also have been influenced by public education efforts to promote seatbelt use. Further, the "follow the leader" effect has been evident in the child restraint area, where parents use seatbelts to serve as a role model for children who were in child safety seats.

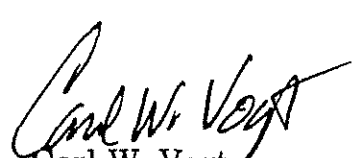
Therefore, as a result of the safety study, the National Transportation Safety Board recommends that the American Academy of Pediatrics:

> Cooperate with the U.S. Coast Guard and the National Association of State Boating Law Administrators in developing a uniform component of standards that establishes an age at or below which all children should be required by all States to wear personal flotation devices while in recreational boats. (Class II, Priority Action) (M-93-16)

Also as a result of the study, the Safety Board issued safety recommendations to the Governors of the 50 States, U.S. Virgin Islands, Puerto Rico; the Mayor of the District of Columbia; the National Association of State Boating Law Administrators; the U.S. Coast Guard; and the U.S. Department of the Army, Corps of Engineers.

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 recommendation in this letter. Please refer to Safety Recommendation M-93-16 in your reply.

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in this recommendation.



By: Carl W. Vogt
Chairman