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**Personal Flotation Devices in Recreational
Boating**

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UNITED STATES COAST GUARD

Office of Boating Safety – 2 August 2004 Report on

MS701: FORUM – Personal Flotation Devices in Recreational Boating

As the Administrator of the National Recreational Boating Safety (RBS) Program, the mission of the U. S. Coast Guard’s Office of Boating Safety (Office) is to “minimize the loss of life, personal injury, property damage, and environmental impact associated with the use of recreational boats, through preventive means, in order to maximize safe use and enjoyment of U. S. waterways by the public.” To fulfill this mission, the Office has established the following goals: 1) Improve the demonstrated knowledge, skills, abilities, and behaviors of boaters; 2) Improve the safety of boats and their associated equipment; 3) Improve the physical and operational boating environment; and 4) Improve intermodal and interagency cooperation, coordination, and assistance.

In measurable terms, the outcome goals of the National RBS Program relate to specific reductions in the number of recreational boating fatalities, injuries, property damage and accidents. Each year, the Office collects boating accident reports from each of the States and Territories and analyzes and publishes reports, information and statistics on these marine casualties. This generates the baseline with which future year statistics are compared and measurements made to evaluate success in achieving the desired outcomes.

In 2002, the Office began utilizing the Coast Guard’s Risk-Based Decision Making (RBDM) Guidelines. These Guidelines provide an effective tool for determining where the highest potential risks exist, in terms of frequency of occurrence and potential level of damage. Organized in a block matrix, those issues that were rated as having both the highest frequency of occurrence and highest potential level of damage (fatalities, etc.) then become primary areas for us to focus our efforts toward resolving.

When the Office applied the RBDM Guidelines to the National RBS Program data, it became apparent that the key issues to address were the primary cause of death (drowning) and the primary cause of accidents (operator error). It was further determined that the most effective methods for resolving these causes were the enhanced wearing of personal flotation devices (PFDs) and enhanced recreational vessel operator proficiency. A significant increase in the wearing of PFDs would result in a significant reduction in recreational boating fatalities; and a significant increase in operator proficiency would result in a reduction in recreational boating accidents, which would thus result in a reduction in fatalities, injuries, property damage, and environmental impact.

The wearing of PFDs by all recreational vessel occupants was clearly determined to be the most effective resolution for reducing recreational boating fatalities, as proven through the statistics and their analysis. However, to measure this, the Office first had to determine how many and which recreational boating participants typically wore PFDs during their boating activity. Then, it had to compare this data to the accident analysis data.

To determine the level of current wearing of PFDs by boating participants, the Office began providing grant funds to a recipient (JSI Research & Training Institute, Inc.) in 1998 to observe boating activity in 30 States and collect on-site data of how many of the participants were wearing their PFDs when they were observed, and to categorize their findings according to type of recreational vessel, general size of the vessel, and general age of the person observed. That study has been replicated each year, and the results through 2003 are available (See <http://www.uscgboating.org/stats.htm>). The following is a summary of the six years of data captured by the JSI studies:

- 1) Adult wear rates are generally relatively low with a few exceptions – personal watercraft (PWCs), kayaks, and day-sailors.

- 2) Adult wear rates have remained stable (and low) over these six years.
- 3) Wear rates on PWCs for both adults and children are almost universal, which is clearly a reflection of legal mandates and boater common sense.
- 4) Children's wear rates are relatively high, particularly for younger children under six years of age.
- 5) Children's wear rates have increased about 10% over this six-year period.
- 6) The analysis of State law data from 1998-2002 revealed that parents and children respond to legal mandates for children's PFD use above and beyond what they would normally do for all age categories not covered by legal mandates.
- 7) Adults increase their use of PFDs under conditions that seemingly increase their risks (e.g. boating in small boats, rough water, strong current, cold water and cold air temperatures).

Overall, the JSI studies indicate that 22.4% of all collective age groups of boating participants wore their PFDs when they were observed in 2003. Further, this figure appears to have remained relatively stable during the six-year study period. Of particular note, due to the high number of reported fatalities involving the following types of recreational vessels and the age of the victims, is the low 2003 PFD wear rate for adults age 18 and over who used:

1) runabouts/speedboats - 4.5%, 2) skiffs/utility boats – 10.8%, and 3) canoes – 28.8%.

Reviewing the accident analysis data, the Office queried its Boating Accident Report Database (BARD) System and determined that reported recreational boating fatalities were primarily due to drowning. Drowning statistics were then compiled and categorized according to frequency, length of vessel, type of vessel, and whether a PFD was worn by the victim. The analysis was done separately on the 2003 accident statistics and then for a five-year period, from 1999-2003 collectively. In 2003, of the 703 total fatalities that were recorded in BARD, 481

drownings occurred, and 416 drowning victims were not wearing a PFD. Of the 416 drowning victims not wearing a PFD, 176 were on boats less than 16 feet in length; and 294 were on boats less than 21 feet in length. (NOTE: 54 of the 416 drowning victims that were not wearing a PFD were on boats of unreported length.) Comparable results were also determined in the five-year analysis.

Considering type of vessel, the 2003 statistics indicated that 223 of the 416 drowning victims not wearing a PFD were using an open motorboat, 50 were using a rowboat, 49 were using a canoe/kayak, and 37 were using a cabin motorboat. Ten of the 416 victims were using a PWC. Comparable results were also determined in the five-year analysis.

The Coast Guard continues to seek input from the National Boating Safety Advisory Council, through public workshops, and in communications with a myriad of boating partners to identify optional methods for effectively enhancing PFD wear by recreational boating participants. Identified methods include both voluntary and mandatory strategies.

In addition, the Coast Guard also recognizes that PFD wear is crucial and has endeavored to enhance wear through technology. To this end, we have implemented new product regulations and standards over the years. The changes in PFD standards were prompted by studies that quantify the relationship between PFD wear, physical effectiveness, and reliability, where they show wearability to be the weak link in the overall lifesaving potential of PFDs. Wearability is a very complex characteristic of PFDs and is influenced by factors such as comfort, environment, activity, attractiveness, utility, affordability, user perceptions and paradigms, among others.

Over thirty years ago, the Coast Guard began approving what are now called flotation aids, buoyancy aids, or Type III PFDs in addition to traditional life preservers in an effort to provide more wearable PFD options to boaters. Later, after extensive field studies, the Coast Guard implemented standards in cooperation with the PFD industry and Underwriters Laboratories, Inc.

for approval of hybrid and then inflatable PFDs. Hybrid and inflatable PFDs are believed to offer the highest overall lifesaving potential of all PFDs, but also cost more than most others. While lower cost units are being developed, the materials and hardware, production requirements, maintenance, and owner's manual will always require that these PFDs cost more.

Inflatable PFDs offer designers the most flexibility ever available to create more wearable and/or effective PFDs. While inflatable technology is not extremely new, providing it in a highly reliable form is new. Meeting the reliability needs that the public expects requires that inflatable PFDs be operationally reliable. The advent of indicating inflators is new and will allow unrestricted approval of more inflatable PFDs because of their link to improved operational reliability.

While inflatable PFDs are a significant advancement in design and comfort, PFD wear is dependent on many other factors, with "desirability" perhaps best characterizing what motivates people to wear them. The early studies showed that while users rate inflatable PFDs as more comfortable, they wore their inherently buoyant PFDs more often. Understanding this seeming paradox is important in increasing the wear rate of PFDs.

In conclusion, the USCG Office of Boating Safety is committed to fulfill its responsibility of enhancing boating safety and enjoyment. We will continue to focus our efforts on enhancing the wearing of PFDs by boating participants, particularly those participants most at risk. Working with the National Boating Safety Advisory Council, the many partners in boating safety, and the boating community, we continue to seek input on methods to accomplish this endeavor and our mission.

(PowerPoint slides with statistical information to follow.)

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