

comment considers the ability to determine cylinder charge status as part of the self-inspection criteria to be an unreasonable requirement.

The Coast Guard disagrees. As stated above, affordable, disposable inflators have been made that accomplish this task, making such a requirement reasonable. Additionally, reusable inflators have been demonstrated which should be available in the near future.

Another issue raised by this PFD manufacturer was that the inflatable PFD standard should not attempt to anticipate unlikely misuse, such as reinstallation of a spent cylinder, in the self-inspection requirements.

The Coast Guard notes that according to the PFD studies cited previously, users may have frequently reinstalled spent cylinders. The Coast Guard agrees that because of the limited number of systems available at this time which are capable of indicating the reinstallation of a spent cylinder, the standards should not require that all systems have such a capability. Only unconditionally approved PFDs (Type I, II, and III) must be capable of indicating this common misuse whether intentional or unintentional. Therefore, on these PFDs which do not have conditional approval, boaters will get the extra assurance of inflators that minimize possible misuse.

Three comments from PFD manufacturers suggested that available inflation mechanisms which indicate the activation of automatic or manual inflation systems by the presence or absence of a pin or clip, or a port window subject to a change in color are sufficient to indicate that the cylinder has been spent.

The two independent inflatable PFD studies mentioned above have shown the need for better human factors design in these systems. Under this IFR, the Coast Guard is adopting standards for systems that utilize user-installed pins or clips as a lower performing indicating system. The Coast Guard will continue to review new systems as they become available and, when appropriate, adopt upgraded standards as more designs become available that improve the chances of correct status determination of inflation system readiness.

These same PFD manufacturers stated that self-inspection issues are best addressed in user manuals or labels on the inflatable PFD rather than through standards on PFD designs. The Coast Guard disagrees. While instructions and labels can help, they are a poor substitute for designs of emergency equipment that take human nature into account. Systems designed with good human factors have indicators that most

users understand instinctively and aid in proper rearming and operation of PFD inflation systems, thereby enhancing the PFD's lifesaving potential.

PFDs Approved Only When Worn.

In a discussion of the public's expected acceptance of inflatable PFDs, the November 9, 1993 ANPRM discussed industry's experience in marketing hybrid PFDs. The ANPRM stated that the hybrid PFD's lack of wide usage by the public may be due to the fact that hybrid PFDs do not count toward the satisfaction of carriage requirements unless they are worn. PFDs with such "conditional approval" are labelled "approved only when worn". This requirement was intended to ensure that these PFDs are properly maintained. The ANPRM suggested that if the inflation systems of inflatable PFDs were required to have indicating devices to show if the inflation system requires servicing or re-arming, the Coast Guard would consider not requiring inflatable PFDs to be worn. The ANPRM further suggested that an inflatable PFD which lacks an indicating device could be labelled as a Type V PFD and be approved only when worn, to increase the likelihood that such inflatable PFDs are maintained in a serviceable condition.

Nearly all of the PFD manufacturers and the boat owners association were opposed to an "approved only when worn" requirement for inflatable PFDs, because requiring constant wear would be a deterrent to buyers. Another comment from a PFD manufacturer stated that an "approved only when worn" criterion does not ensure that boaters will inspect their PFDs as was implied in the discussion of this issue in the ANPRM.

The Coast Guard agrees that boaters were discouraged from buying those hybrid PFDs which are "required to be worn," and that such a requirement only indirectly helps to encourage boaters to inspect their PFDs. Further, fewer sales of highly wearable inflatable PFDs will frustrate the Coast Guard's goal of increasing the total number of people wearing PFDs. Moreover, as discussed above, there have been many improvements to inflatable PFD designs. Therefore, the standards adopted by this IFR provide for approval of inflatable Type I, II, and III PFDs without conditions on their approval.

However, the Coast Guard notes that several factors contributed to the negative reaction to conditional approval of hybrid PFDs. For instance, the hybrid PFD designs were hot, bulky, and expensive. It is the Coast Guard's

position that conditional approval can play a valuable role in the approval of unique and novel inflatable PFD designs which are much more cool, comfortable and less expensive than the hybrid designs. This role is discussed below under "*PFD lifesaving potential evaluation*" in the discussion of rules section.

A comment from the boat manufacturer stated that regulations need to be adopted requiring PFDs to be worn whenever an engine is in use, rather than the current requirement for PFDs to be on board.

The Coast Guard, in a future rulemaking, may consider a requirement for boaters to wear a PFD whenever the engine is running for specific PFD designs on a case-by-case basis during approval, and will consider the desirability of wider application of such a restriction in the future.

Another comment from a PFD manufacturer argued in favor of rules requiring individuals to wear a PFD, and allowing for the use of non-approved devices, including inflatables.

The Coast Guard is not adopting this suggestion. While Coast Guard regulations do not prohibit the carriage and use of non-approved PFDs, carrying such devices does not count toward meeting the carriage requirements. The quality and performance of PFDs that do not meet any specified standards is uncertain. The Coast Guard's position continues to be that in order to achieve the minimum acceptable level of safety and meet operational needs, only Coast Guard-approved devices, which must meet specified safety criteria, should be counted toward carriage requirements. A poorly manufactured device could fail to provide needed assistance, or a poorly designed device could actually perform such that the user is worse off than having no PFD.

Inflatable PFD Types

The ANPRM also stated that approval of Type I and II, as well as Type V inflatable PFDs with conditions on their use or that are intended for use in specific activities, will provide more choices suitable for a variety of different boating activities.

One comment from a PFD manufacturer stated that the Coast Guard should allow for approval of several inflatable PFD types rated at different levels of performance. The comment suggested that the highest performance inflatable PFD provide 35 pounds (150 N) of buoyancy, have dual chambers, an automatic, self-inspecting inflation system, and a high strength harness and lifting becket. The lowest performance inflatable PFD, according