swimmers; the chances that the PFD will be worn; and the probability that the inflation system will be properly activated. The values assigned for the characteristics of the manufacturer's proposed design would be reviewed by the recognized laboratory. The LSI equation would then be solved for the design. If the LSI of the manufacturer's design equals or exceeds the Coast Guard's assigned LSI value for a Type III inherently buoyant PFD, the manufacturer would submit to the Commandant the calculations, the values assigned to each term, statements justifying those values, and an explanation of any assumptions used in performing the calculation. The Commandant would review the material submitted by the manufacturer. The Commandant may then approve designs determined to validly demonstrate an LSI that is at least equal to the Coast Guard's assigned LSI of a Type III inherently buoyant design. The designs approved under the LSI evaluation method would not be required to meet certain provisions of the construction and performance requirements of § 160.076–23 and approval testing requirements of §160.076-25

One way to increase the LSI of a design is to require that the PFD be worn, and, accordingly, obtain approval for the device as a Type V PFD. For instance, preliminary calculations show that a belt-pack style PFD without conditional approval may have an LSI of 0.35. However, when the same PFD is approved only when worn, the belt-pack style PFD might have an LSI of 0.67. Therefore, manufacturers may designate conditions concerning use to achieve the LSI of a Type III inherently buoyant PFD. Manufacturers are free to fashion other methods that will enable their designs to achieve the required minimum LSI and submit the information for Commandant review.

The Coast Guard anticipates that examples of designs that would be readily approved under the UL requirements as modified by this IFR are: Type I with automatic inflation and indicator (of cylinder seal); Type II with automatic inflation and indicator. Examples of designs that would probably not meet the UL requirements as modified by this IFR but that may be able to be approved under the LSI evaluation are: Type III PFDs with type II performance, but with manual inflation and indicator; Type III yoke style PFDs with automatic inflation and indicator; Type V PFD with type II performance and automatic or manual inflation but without indicator (of cylinder seal); Type V yoke style PFD with type III performance and automatic inflation but without indicator; Type V yoke style PFD with performance type III and with manual inflation, with or without indicator; and Type V belt-pack style PFD with performance type III.

With the LSI evaluation, the Coast Guard will be able to approve unique and novel designs that offer lifesaving potential equal to or greater than that of approved devices, but that otherwise would not be made available to the boating public. These designs may prove to be very comfortable, affordable and popular with the boating public, and thereby increase the number of recreational boaters who wear PFDs. This will result in an increase in lives saved.

Because the designs approved under the LSI evaluation will be new and perhaps novel, the Coast Guard, manufacturers, and the public will not have the same level of experience and knowledge with the designs that they have with devices approved under the UL requirements as modified by this IFR. Therefore, to ensure that only designs that provide a sufficient level of safety to the boating public continue to hold Coast Guard approval, the Commandant will annually review the designs approved under the LSI evaluation. At that time, the devices will be compared to other approved devices and the Coast Guard will evaluate the relative weight and values of the various characteristics that were initially used in the LSI calculation. Recognized laboratories will maintain a ranking of the PFDs approved under this method and submit the information to the Commandant to assist in the annual reviews. If after the review the Coast Guard determines that the device does not provide a minimum level of lifesaving potential as required by §160.076–27, the approval on that design may be terminated or suspended. To retain Coast Guard approval, the PFD design would have to be modified to meet the requirements of § 160.076–27. However, if an approval is terminated or suspended, the manufacturer's inventory of completed PFDs could continue to be sold unless the Coast Guard determines that the design presents a significant hazard to users of those PFDs.

## User Awareness

The biggest problem in reducing the approximately 670 recreational boating drownings annually is that of getting the individual boater to take the preventive measure of wearing a PFD and, in the case of an inflatable PFD, keeping it in a serviceable condition. The approval of inflatables is not intended to make it easier for boaters to satisfy PFD carriage requirements, but rather to encourage boaters to change their current behavior patterns and provide them with a more convenient means to protect themselves from the tragedy of a serious boating accident. In establishing the LSI evaluation and conditional approvals, the Coast Guard hopes to approve new and unique designs that will encourage the wearing of PFDs by a greater number of boaters. This wide range of options should encourage boaters to make informed decisions that could save their lives.

The Coast Guard seeks to develop an incentive system to get both boaters and manufacturers more involved in preventing drowning. As mentioned above, manufacturers will be able to obtain conditional approvals for PFDs which might otherwise fail to meet some of the more stringent requirements. The practical effect for boaters purchasing PFDs with conditional approvals which, for example, are approved only when worn, is that boaters will be given the option of buying a less expensive PFD. The manufacturer will be responsible for clearly communicating the boater's responsibility for compliance with the approval conditions or, if the boater fails to comply with the conditions, the need to provide an additional PFD, without conditional approval, to meet the carriage requirements.

Since boaters appear to prefer unconditionally approved PFDs, this system will encourage manufacturers to develop innovative ways to increase the lifesaving potential of PFDs without relying on conditional approval.

Also, conditional approval used in this way will raise the awareness of boaters as to what they can do to contribute to improving boating safety, and will give them more freedom of choice.

## PFD Information Pamphlet

Title 33 CFR 181, subpart G requires that an information pamphlet be provided with each PFD sold or offered for sale for use on recreational boats. UL standard 1180 does not yet contain pamphlet requirements for inflatable PFDs. However, UL has reserved a section and plans to add the pamphlet requirements at a later date. When an industry standard is available for such pamphlets the Coast Guard will review it and, if appropriate, propose it for incorporation in the Coast Guard rules. Section 160.076–35 established by this IFR requires inflatable PFD manufacturers to provide information pamphlets that have been submitted to and approved by the Commandant. The purpose of the information pamphlet is