HUMAN PERFORMANCE ASPECTS OF NEW DRAFT EUROPEAN STAND\RDS FOR LIFEJACKETS AND PERSONAL FLOTATION DEVICES

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ℵ i efforts to ıp g lfej and other dε ri to aid flotation started during the Second World V and included the pioneer studies of Macintosh and Pask Most countries, and some nt r organisations (such as IMO), have adopted their own detailed performance standards, many of which have led to demonstrabler r ı ‹ of fatal immersion v For some years, np to reach ; on an International Standard under the auspices of ISO have struggled with reconciliation between strongly held and opposing views wever the EEC Council Directive recently published[2] forced the countries of the EEC and, by association those of EFTA to develop and agree a set of standards which will be legally binding within Europe from 1993 onwards.

In a period of less than six months, a working group of experts from many of the member states of the EEC and EFTA v ∃ to produce draft standards which would satisfy all requirements for lifejackets and ĉ i (personal flotation devices) excepting for those circumstances in which IMO ı ∃ it are ε and those in which FAA or CAA legislation is effective. These encompass many offshore workers tl ıŗ ∃ t work on or ı x water in other circumstances, and the ever-increasing number of leisure u in po x ; ı i craft. This paper discusses some aspects of these standards, and considers what developments the may a to in th ıture.

STANDARDS

It was agreed that no single standard could satisfy the needs of every user. ∃ f(i ere ıt ones have sı i·‹d ii ‹ ı as draft European Standards[3]. Although these ㅋ sed by the buoy ; ε provided, there are many other differences between them, and various national terminologies are free c use whatever descriptors are most appropriate. There is no intention that performance is directly dependent on t a lone, rathe that buoyancies are an easily s r:ł l· means f ːl: s fi tion. Minimum levels for ılı have been set at 275 50 100 and 50 N, which are intended to cover, respectively, offshore use when counter bı i; e x r l ∃ ır ie d, al offshore use, inshore use in relatively l wafers, d circumstances where the user is a swimmer and help is immediately to hand

The aim with tl : three hi ;h le is x ffi ːi‹ ːcy l i ł a way that an incapacitated ıı i; k ith h ıi ıı l a of the rı te s c in; the : rescue alive. After much discussion, it was agreed that a measurement of freeboard between mouth and water surface would be included, although the height set as a minimum, 80 mm, is clearly not that hi ł i: l i d. Tł i: was because of a number of reports that such measurements can be difficult to achieve reliably in test houses[4], so making it possible that d ːk \ l l be f ı On the other ıı tests of self-righting have been retained in the w highest buoyancy categories, and using a less stringent test for the 100 N standard too. These latter considerations have been made more important as the result of recent publications[5,6] which have highlighted the possible adverse interactions between buoyant devices and air trapped within immersion suits, w :h ʒ t‹ ɔy

Counter to these tendencies to produce large, high performance lifejackets was the experience of the Nordic [7], which indicated that the cheaper, pl ıı a all more ‹ the lifejacket, the more likely it was to be worn and used, and ı: the greater the reduction in immersion casualties. There are also situations in which the use of ighl› ɔy ‹ ɔ ı ır ıy prevent escape from a capsized dinghy or other vessel, so it v agreed that even those buoyancy aids with relatively little l o y ːy ‹ not ɔe : :d from a and that other devices should be made more attractive to the wearer

Another area of controversy has been the requirement for display of retro-reflective tape. In the past it had been argued successfully that the great majority of u: would not be likely to be immersed during darkness or poor visibility, and that the additional cost of such tape would :r the prospective purchaser, but a ıg amo of retro-reflective tape will be required for all devices from the 100 N standard upwards. Lights and other location aids are the subject of a separate document (which also provides standards for multi-chamber buoyancy systems, safety harness and line compatibility, splash screens, and industrial protection)[3] The standards l: prescribe serie

of minimum buoyancy levels for devices for children, when appropriate, although it has been agreed that evidence as to what is necessary is sadly lacking. Finally, great attention has been paid to the labelling of lifejackets and buoyancy aids, in order to ensure that no matter who uses them, they can be well informed about their use and limitations.

DISCUSSION

Although it is many years since the pioneering work of Macintosh and Pask[1], remarkably little scientific work had been carried out until the recent studies suggesting that there may be problems when lifejackets are worn in conjunction with immersion protective garments[5,6]. At present, there is no simple performance test which can be carried out with good reproducibility in all test houses, to ascertain whether or not a suit and jacket combination is safe. Efforts to do so are to be encouraged and any resulting test should be included in future revisions to these Standards.

Another area in which there has been very little work is that of the buoyancy and other performance indicators for devices for children. As body proportions and density of children of different ages are quite unlike those of adults, it could be suggested that the current guessed extrapolations are erroneous, but in the absence of any good evidence, it is not possible to set different values. Work on this is urgently required.

Labelling of many other safety items is now being carried out using pictograms and other clear non-verbal means. The CEN Working Group has been unable to devise clear pictograms which are suitable for indicating the subtle differences between the different performance standards, but would like to be able to use some. Further work and the input of ergonomics research would be valuable.

If the whole of Europe is to adopt and *enforce* these standards – one of the provisions of the directive' is that it will be illegal to produce or sell items which do not comply with them – then there is also a need to base more international standards, such as those which ISO must eventually produce, on them. This does present an unusually difficult situation, in that previously, ISO has been in advance of CEN, and it has been easy for CEN to adopt an existing ISO standard. With regard to lifejackets, the process must be reversed, which could cause conflicts with non-CEN nations. However, it is hoped that the latter may see in these draft European standards very close parallels to their existing national ones, and that compromise may be reached.

Finally, it would be only logical if the existing international standards maintained by the IMO, and the FAA and CAA, could be incorporated in some way too. Those responsible for the European Standards believe that they have created good standards which will result in major safety improvements, and will be beneficial to both users and manufacturers. It would be even better if the world could move away from the many dozens of often conflicting national standards to a simple, functional and universal system.

REFERENCES

1. Macintosh, R. R. and Pask, E. A., The testing of lifejackets. Brit. J. Indust. Med. 14:168–176, 1957.
2. Council of the European Economic Community, Council Directive of 21 December 1989 on the approximation of the laws of the Member States relating to personal protective equipment. Official 3. of the Eur. Communities No L 399, 18–38, 1989.
3. CEN TC162, Draft European Standards on Lifejackets and Buoyancy Aids, Documents CEN TC162 N29–N33, CEN, Brussels, 1989.
4. Mayer, A. and Barlier, A., Gilets de sauvetage pour l'industrie: bilan des essais. INRS Cahiers de Notes Documentaires No 109,501–517,1982.
5. Herrmann, R., Do we survive with survival suits? J. Roy. Nav. Med. Serv. 74: 147–152,1988.
6. Robert Gordon's Institute of Technology, In-water performance assessment of lifejacket and immersion suit combinations, OTI 88 538, HMSO, London, 1988.
7. Lindquist, Å., More comfortable buoyancy equipment results in fewer drowning accidents, Konsumentverket, Vällingby, Sweden, 1989.

ABBREVIATIONS

CAA – Civil Aviation Authority; CEN – European Standards Committee (EEC); EEC – European Economic Community; EFTA – European Free Trade Association; FAA – Federal Aviation Authority (USA); IMO – International Maritime Organisation; ISO – International Standards Organisation.