EAR PROTECTION IN THE FACTORY ENVIRONMENT

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Introduction

The Factory Inspectorate has for many years advised industry on the need to take action to prevent occupational hearing loss [1], but in recent years the amount of effort devoted to this problem has been rapidly increasing. Each of the 11 Divisions of the Factory Inspectorate is equiped with sound level meters, and when noise is considered excessive some action to protect the worker's hearing is recommended.

The first advice given is always to seek some way of removing or reducing the hazard by reducing the worker's exposure to high noise levels wherever this is practical. Nevertheless it often has to be accepted that, in the present state of engineering practice, there are situations in which hazard to the worker's hearing can only be immediately removed by the provision and use of effective ear protectors.

Selecting suitable protectors

The methods used for measuring the attenuation given have already been described at this meeting, and the results of these tests may be used for selecting protectors which can provide enough attenuation to protect against the offending noise. There is, however, little published information available to guide the hygienist or safety officer as to how the attenuation under test conditions compares with the protection actually given in industrial conditions. A particular problem is that most published tests seem to have been conducted on clean-shaven male wearers with short hair, while in practice the protectors are likely to be used by people with beards or long hair, and by women who may tend to have smaller heads than men. There appears to be scope for further investigation into the protection actually afforded to industrial workers, and possibly for the development of test procedures which will take into account the wide variety of people who will use the protectors.

Correct selection of protectors involves more than just choosing a protector which will provide enough attenuation, if people are to wear the protectors they must be suitable for the conditions under which they are to be used. This involves considering the ambient temperature, the frequency with which the protecors may need to be removed and replaced, and the other safety equipment (helmet, goggles, or respirator) which may need to be worn at the same time. Decisions of this kind are best made from practical trials on the factory floor, and not, as sometimes happens, by people sitting in cool quiet offices.

Another aspect of suitability which must be considered is the effect which the protectors will have on the ability to communicate. This problem is sometimes exaggerated by workers, but circumstances do exist in which it becomes a serious matter, for example where people are subjected to frequent short bursts of noise between which they need to be able to hear orders or warnings.

Apart from the Gundefender, which has already been described at this meeting, ear muffs with manually openable valves, or ear muffs containing a peak-limited electronic transmission system are available and may sometimes be suitable for overcoming this problem. At present these protectors are rarely used in factories, but there seems to be considerable scope for the future development and use of these more sophisticated types of protector. Of course the solution to communication difficulties may lie not just in the use of special protectors, but also in the re-arrangement of work to avoid over-reliance on audible warnings.

In order to be accepted a protector must be comfortable as well as an efficient attenuator of noise. The hygienist can easily eliminate some uncomfortable types by simple inspection and by by popularity tests among the workers who must ultimately use them. However, the Factory Inspectorate also recommends that, wherever possible, some account should be taken of individual preferences, and that each user should be allowed a personal choice among different types of protector. For example where ear plugs provide adequate attenuation the worker can be allowed a choice between plugs or lightweight ear muffs.

Training and promotion programmes

Even when the best types of protector have been provided people will often be found reluctant to use them, especially when protectors are first introduced into a traditionally noisy industry. This aspect of ear protection is all too often sadly neglected in industry, but it has been clear ever since the days of the earliest recommendations by experts that people should use ear protectors [2][3] that the mere provision of suitable protectors is not enough, and that the protectors will not be used unless there is also an effective training and promotional programme.

There are many techniques which may, according to local circumstances be used for encouraging people to use protectors, examples include lectures, posters, demonstrations, leaflets, and film shows. In the experience of the Factory Inspectorate an important factor in all successful programmes is the personal example of all members of management, and the education of management should be regarded as being equally important as that of the workers.

An interesting and practical way of increasing the acceptability of protectors, which has been applied in the U.S.A., is to use ear muffs containing headphones linked by radio to the factory public address system so that the user can receive music or messages [4]. This system presents no great technical difficulties, although naturally it is rather more costly than normal systems of protection, and it may be that where other methods fail it could usefully be applied in this country.

It is important that promotional programmes should not be allowed to fade away after an initial burst of enthusiasm, but should be regarded as a permanent part of the factory procedure as long as conditions remain noisy enough for ear protectors to be needed. The effect of the programme should be regularly checked by counting the number of people who are not using their protectors, and if any significant number are found this should be regarded as evidence of the inadequacy of the programme.

References

1. Annual Report of the Chief Inspector of Factories and Workshops. 1908, p207.
2. B. Ramazzini. Diseases of Workers. First published 1713, trans. 1964 Hafner Publishing Co.
3. T. Barr. Trans. Phil. Soc. of Glasgow. 1886, p223.
4. The Engineer. 30 April 1970, p9.