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PLANNING AND INDUSTRIAL NOISE

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Introduction

The principle adopted in the assessment and control of industrial noise in the United Kingdom is to consider each case individually while taking into account local conditions and circumstances. This procedure is different from that used in some other countries where standards are prescribed centrally for various zones of land use. In assessing the effects of industrial noise in the environment it is usual to use the British Standard method of predicting the likelihood of complaints(1). In addition, a planning circular(2) advises local authorities on the setting of noise standards for new developments. Some of the difficulties which have arisen in applying the procedures outlined in these two documents are discussed. There are several methods of controlling noise at the planning stage and the advantages and disadvantages of some of the approaches are examined. A new method of control which arises from powers given to local authorities by the Control of Pollution Act 1974 is described.

Assessment of industrial noise

British Standard BS 4142 describes a method for predicting whether complaints about noise from industry and other fixed installations are likely to occur. The method is based essentially on practical experience. It involves a comparison of the measured noise level, corrected for the duration and character of the noise, with the pre-existing background level or a calculated notional background level. The noise levels are measured outside the building affected by the noise. Where the corrected noise level (CNL) exceeds the background level by 10 dB(A) or more it is suggested that complaints may be expected, while differences of 5 dB(A) are of 'marginal significance'. Where the CNL is more than 10 dB(A) below the background noise level than there is a positive indication that complaints should not arise. This indicates a range of some 20 dB(A) between a noise level at which complaints would be very unlikely to occur and a level at which there would be a considerable likelihood of complaints arising. Clearly, it would hardly ever be reasonable to permit a new development to exceed the latter noise level. Although the former noise level would seem to be the standard to aim for from the environmental point of view it must be remembered that the cost and practical difficulties of achieving such a standard in certain situations may be extremely high.

An amendment to BS 4142 which was issued in 1975 removed the method of predicting a notional background level to an appendix and put greater emphasis on the measurement of the background noise level (specified as L_{90}). Experience with the use of the British Standard had shown that there was a tendency for the prediction method to over predict the background noise level. More recently, an investigation has confirmed this to be so, particularly for industrial areas(3). This investigation also showed that there was a wide

spread in the background noise levels corresponding to each of the area categories in BS 4142 (eg rural, urban). This finding illustrates the weakness of the zoning approach favoured by some other countries. If background noise levels (L_{90}) vary between, say, 40 dB(A) and 60 dB(A) for different urban areas it makes little sense to restrict new industrial sources in urban areas to a single noise level given that community response is related to the difference between the noise level from the source and the background level (L_{90}).

Since the method of rating noise described in the British Standard is based on practical experience it is inevitable that there may be difficulties in applying the method to situations outside those used to derive the Standard. Recently two aspects have given rise to particular difficulty. The first concerns situations in which the background noise level is very low. An external level of 25 dB(A) is not uncommon in some areas at night. If it was decided to restrict noise from new developments to a level just below the existing background level (a not unreasonable restriction in many situations) this could be equivalent to restricting the intrusive noise level in the dwelling to below 15 dB(A). It must be questioned whether such a requirement can be justified since it is well below even the strictest standards quoted for the avoidance of sleep disturbance. An examination of community response to noise in quiet areas may enable a level to be set below which further reductions would not be necessary. A second aspect of the rating of noise from fixed sources which has caused recent difficulties is how to assess noise sources which are present only on certain occasions. While BS 4142 gives a method of correction for a noise source whose output varies during the day or night there appears to be an implicit assumption that the noise occurs regularly from day to day. Certainly all or most of the sources used to validate the British Standard approach were industrial or commercial sources which were present for at least 5 days in a week. Recently there have been attempts to apply BS 4142 to sources such as sports stadia which produce noise on an irregular basis or at most one or two times a week. It is not clear whether the rating method described in BS 4142 can be used directly in such cases or whether there is some trade-off between the noise level produced and the frequency of occurrence of the noise. As with the problem of assessment in situations where there is low background noise the answer may be found by examining information on complaints made to local authorities.

Control of industrial noise

In general, there are two types of planning condition which may be used to control noise from new developments. The first involves the specification of noise levels not to be exceeded at given times while the second involves the specification of the type of activity to be permitted and the construction and layout of buildings within the development. Each type of condition has its advantages and disadvantages.

It is important to realise that setting a maximum noise level at the boundary of a site does not in itself control the noise output from the site. For such a condition to be effective there must be sufficient monitoring of the noise output to ensure that the required noise level is not being exceeded. Where the requirement is for a noise level which is below the existing background level it may be impossible to ensure that the requirement is being

achieved by means of noise monitoring alone. Even when noise monitoring is feasible it must be remembered that noise measurements are subject to errors. The likely size of these errors in a particular situation will need to be evaluated before enforcement action can be taken. The type of condition which specifies boundary noise levels has the advantage that the developer can determine which is the most cost effective way for him to achieve the requirements. This type of condition can give continuing control over noise emission provided that monitoring is carried out on a regular basis.

The second type of condition in which the construction, layout and use of buildings are specified is more akin to the traditional type of planning condition employed in situations where there are no acoustic considerations. It is probably easier to check that this type of condition is being complied with. In setting such a condition a reasonable knowledge of source levels and of noise propagation is required to ensure that the building and layout requirements will achieve the desired noise levels. A disadvantage of this type of condition is that it may be ineffective against certain new sources which do not involve new construction or a change in use or activities. Nevertheless in situations where there is no intention to undertake noise monitoring there is much to be said for adopting this type of condition. In certain cases, particularly with large industrial developments, a dual approach may have considerable advantages. This approach would entail the developer being given boundary noise levels to work to at an early stage. The layout and building constructions proposed by the developer to meet these noise levels would be accepted and incorporated in the planning conditions provided that the local authority was satisfied that the proposals would in fact achieve its requirements.

When setting planning conditions it is useful to be aware of certain aspects of industrial noise sources. It seems that many of the sources which give rise to complaints from local residents are situated outside the main factory buildings(4,5). Furthermore, many sources (eg fans, compressors) are common to a number of different types of industry. Thus, in general, is not feasible to classify different types of industrial and commercial developments into very noisy, moderately noisy, quiet categories and hence to prepare a list of types of development which would be acceptable in a residential area. For example, food storage depots might be thought to generate little noise and in most cases this would be true. However, there have been cases where noise from refrigeration units sited on the roof of such depots have caused complaints.

Noise from sources within buildings will escape from any openings in the structure. Doors which may be left open should, therefore, be placed so that they do not face noise sensitive areas. Attention should be paid to the ventilation requirements of the building. There is little point in specifying walls and roofs with good sound attenuating characteristics if windows which face noise sensitive areas have to be opened to provide for ventilation and cooling in summer.

The Control of Pollution Act 1974 provides local authorities with new powers to control noise from industrial and commercial premises. These powers permit local authorities to set up areas of special control called Noise Abatement Zones (NAZ). Within a NAZ the noise levels at the boundaries of classified

premises will be measured and entered in a public register(6). The major objects are to prevent further increases in the noise emitted from certain types of industrial and commercial development and where appropriate to obtain reductions in existing levels. However, within a NAZ the local authority also has powers to determine acceptable levels of noise at the boundary of new developments which when completed will be of a type which is subject to the noise abatement order. The level of noise so determined should be entered in the noise level register. When the new development is completed the noise level at the noise control boundary may not exceed the registered level without the consent of the local authority. It should be noted that the defence of best practicable means is not available in proceedings taken under this section of the Control of Pollution Act.

In the recent past, the development of industrial estates in which noise producers are segregated from noise sensitive areas has, perhaps, reduced the importance of taking noise into account in planning applications for some developments. However, the present emphasis on the revitalisation of inner city areas will require more careful consideration of noise emission at the planning stage. It is unlikely that within inner cities there will be as much scope for segregation and therefore it will be more important to undertake detailed planning and use available noise control procedures if serious nuisance is to be avoided.

References

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