THE NOISE ADVISORY COUNCIL CODE OF PRACTICE ON SOUND LEVELS IN DISCOTHEQUES - A WHITE ELEPHANT?

K Dibble

Consultant, The Sound Practice, Rugby

INTRODUCTION

This code, published in April 1986 by HMSO under the auspices of the Department of the Environment, was originally produced for the now defunct Noise Advisory Council by John Bickerdike and his team at Leeds Polytechnic and is based upon an earlier study (1) commissioned by the NAC in 1979. The full title is:-

"Draft Code of Practice on Sound Levels in Discotheques"

This present paper is a revision of an earlier work (2) given at the 1986 IoA autumn conference "Reproduced Sound - 2" and is here updated in an attempt to bring this important development to the attention of a wider cross section of the profession.

SCOPE

The Code is concerned only with the control of noise exposure by persons attending discotheques, whether in purpose built premises, in multi-use buildings or other temporary accommodation, and is intended to be applied whether the entertainment is provided by a permanently installed sound system or by a hired-in mobile operator. Thus, every type of discotheque venue from the opulent elegance of Peter Stringfellow's London Hippodrome operation to a village wedding reception at Cherry Hinton church hall or St Neots youth club hop, comes within the scope of the Code. It does not address the problem of environmental noise control although by its very nature there is bound to be a spin-off in this direction. Also it specifically excludes venues used for live rock music performances, recognising this as an altogether different problem.

STATUS

As is implied by its title the document is intended as a voluntary code of practice and as such does not have the force of law behind it. However specific suggestions are given to local authority officials as to how compulsory compliance can be built into local planning and licensing regulations, thus removing all semblance of voluntary status and rendering its provisions in effect mandatory.

The new Code is therefore to be taken seriously and the object of this paper is to consider the need for such a code in the first instance, to assess its implications and to highlight some of the difficulties likely to arise from enforcement.

CONSULTATION

The word "Draft" in the title is misleading as it implies a consultative status. This is not the case. This document has been in preparation for some time, a first draft having been published in 1982 (3), and any implied

consultation period has long since past. This it would seem is the final document and although wide consultation within the industry is claimed by its author, neither the author of this present paper with many years involvement in this field, nor any of his clients - with several well known national club operators and trade journal publishers among their number, nor any colleague so far approached, have even been aware that such a code was under preparation. Thus begs the question as to who, apart from those members of the Institute of Environmental Health Officers present at its reading (3) - was consulted?

THE EXTENT OF THE PROBLEM

A study of the research which would establish the requirement for such a Code is not convincing. It appears to be founded on inconclusive and contradictory evidence and the justification for basing an effectively mandatory Code of Practice on such evidence must itself be open to question. The introduction states that:-

"...Some sound levels experienced in discotheques and other similar premises are above the level at which noise induced hearing loss is considered to begin..."

and goes on to cite the Bickerdike & Gregory study (1), Fearn & Hanson (4) and the well known work on industrial noise exposure carried out by Burns & Robinson (5) to substantiate the statement.

Whilst the concept of noise induced hearing loss has indeed been amply demonstrated in terms of occupational noise exposure by many researchers over the years, the risks associated with exposure to discotheque or rock music have yet to be satisfactorily proved. Even Bickerdike's own investigation (1), which represents quite the largest study yet undertaken, involving 4166 discotheque attenders in 49 discotheques, is unconvincing. He concludes:-

"...Although the ranges of possible exposure to sound levels in discotheques is large the risk of noise induced hearing loss ... is small. Out of an estimated 6 million regular attenders some 0.025% might be expected to reach the low fence impairment level...at the end of their attendance period."

In its critical overview document "Damage to Hearing arising from Leisure Noise" (6) the Medical Research Council Institute of Hearing Research summarised its findings as follows:-

"No definitive estimates of durations or numbers involved for even the most prevalent leisure-noise sources are available at present. Bickerdike and Gregory's estimate of the numbers regularly exposed to discotheque noise implies that it is an important source of noise exposure. However we have argued that this estimate may be a three-fold to seven-fold overestimate, and conclude that the importance of this noise source is less than they imply."

Lutman (7), in a paper presented to the British Society of Audiology in 1987 concludes:-

"...leisure noise does not constitute a major source of noise-induced hearing loss in the UK, given hearing conservation programmes geared to levels of 90dB(A). Our interpretations would be more certain if we had reliable data on a sufficiently large and representative population sample."

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Rintelmann & Bienvenue in a keynote paper to the AES Symposium on Rock Music & Noise Induced Hearing Loss in 1976 (8) (This document provides references to no less than 38 studies) clearly shows that the five methods used to study the problem up to that time had produced as many different conclusions.

Of the five studies based on DRC (Damage Rick Criteria) principles - the method used in the Bickerdike & Gregory study - all showed that hearing damage was to be expected after subjection to rock music or discotheques, whilst those based on TTS (Temporary Threshold Shift) (13 studies) showed that the assumed relationship between TTS and permanent hearing loss was not reliable and that whilst TTS might not be the most suitable method for the purpose, concluded that caution was nevertheless in order.

Conventional Audiology (5 studies involving a mix of almost 300 professional musicians and regular rock concert or discotheque attendees, some spread over a 7½ year period with the same subjects) showed little or no variation in pure tone air conduction thresholds, whilst a study of 400 normal hearing subjects, 100 rock musicians and 100 rock concert attendees carried out by Fletcher in 1972 (9) using High Frequency Audiometry techniques produced the conclusion:-

"...Knowing the levels and durations of exposure these persons receive in that pastime it is almost unbelievable that no clearly observable losses could be found."

And herein lies the problem. According to DRC principles there ought to be a problem. The fact that this is not substantiated by research is it seems of no matter. So let's bring the bureaucratic might of the nation's licensing and planning departments to bear - we can't have people enjoying themselves, now can we?!

SUMMARY OF THE REQUIREMENTS

The document itself is not logically arranged and is something less than concise. Its main provisions are summarised as follows:-

Venues Open to the Public more than 2 Days per Week

1. The interior layout of the premises and the loudspeaker arrangement to be such that high level music is contained as far as is practicable to the dance floor with reduced volume levels in any lounge, bar or dining areas. There is a specific requirement that at least 25% of the available public area be designated as "Rest Areas" where volume levels will be significantly lower than on the dance floor.
2. No public to be allowed within 2m of any loudspeaker.
3. The volume level measured at the nearest point to any loudspeaker accessible by the public (the MPEL point) not to exceed 100dB LAeq over the duration of the session.
4. Where designated Rest Areas are not provided the maximum music level is reduced to 95dB LAeq.
5. Volume levels within the designated Rest Areas not to exceed 85dB LAeq (5 minutes).

6. Volume levels at the MPEL point to be continuously monitored and a real-time public display provided.
7. Permanent records of the MPEL values to be kept for inspection by the appropriate authority.
8. DJs to be equipped with hearing protection.
9. Warning notices to be displayed around the premises.
10. Literature to be available to highlight the risk of noise induced hearing loss in leisure activities.

Venues Open to the Public 2 Days per Week or Less

1. Layout considerations and volume constraints as already given.
2. The requirement for continuous monitoring of volume levels is waived. Instead, at least 6No dB LAeq (5 minute) measurements to be made during each session. The averaged level during each session not to exceed the 100dB LAeq limit and no single value to exceed 102dB LAeq.
3. The requirement for the public display also waived.
4. The requirements for record keeping, hearing protection and the display of notices as previously given will apply.
5. The Code to apply equally to all venues where discotheque entertainment is provided, including mobile operators.
6. Where mobile operators are employed it is the responsibility of the operator to provide the monitoring equipment and to ensure compliance with the requirements of the Code, and the management's responsibility to keep the necessary records and to ensure that the operator is suitably equipped.

THE IMPLICATIONS

The interior layout and loudspeaker placement considerations are not new and the majority of the specific recommendations made in the Code have been incorporated into many purpose built permanent venues for many years, either for the comfort of patrons, for operational convenience, or to comply with health & safety at work or environmental legislation (Dibble [10]). The main problems will arise where discotheques are operated in general purpose halls where there is no opportunity to influence the acoustical design and layout of the interior, and this will inevitably result in the 95dB LAeq fallback limit being applied in these circumstances.

The Exposure Limits

The dance floor limit of 100dB LAeq is certainly not unreasonable and is in practice only marginally below present typical operating levels in the majority of clubs and select discotheques anyway. Fig 1 shows a typical 96dB(A) discotheque music spectrum and it can be seen that at very low frequencies the 1/3rd octave levels are well up in the 105dB range. Fig 2 shows another example, at 100dB(A) with low frequency peaks in excess of 120dB, the superimposed A-weighting envelope showing how such high 1/3rd octave values can be accommodated within a 100dB(A) SPL measurement. Even in a purpose built venue the pressure waves generated when the low frequency

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1/3rd octave levels approach 110dB can be expected to react upon the building structure and give rise to environmental noise nuisance complaints. Such considerations therefore impose a built-in volume constraint at around the 100dB(A) mark anyway.

Also, the 95dB LAeq fallback limit can not be considered unreasonable in a general purpose building, and again, anything higher would almost certainly run into environmental difficulties, especially in a village hall or similar building.

Amplification Systems

Another limiting factor is the cost of the amplification systems necessary to achieve very high sound levels at an acceptable quality. On average, it costs between £7,500 and £15,000 to provide good quality "disco sound", with its characteristic low frequency emphasis, at 100dB(A) in a moderate capacity venue and would involve something of the order of 2Kw of amplifier power through four fairly large loudspeaker systems. To increase this to 103dB(A) would involve a doubling of the amplifier power and a doubling of the number of loudspeakers used, pushing the cost towards the upper figure. Many of the small mobile operators use only 100 or 200 watts of amplifier power and inefficient loudspeaker systems because that is all they can afford, and such systems are just not capable of generating 100dB(A) without severe overloading of both amplifiers and loudspeakers. Subjectively, a badly distorted 95dB(A) programme from an inadequate amplification system will be adjudged much louder than a clean 105dB(A) programme from a fully engineered rig with adequate headroom capacity, and will be far more distressing to the listener.

Instrumentation, Public Display & Record Keeping

The least expensive integrating SPL meter on the market is the Castle GA203 which costs around £400 or the Cirrus 2.22 at around £570. A calibrator adds a further £130 or so and VAT another £100. Many mobile operators, youth clubs and local community halls spend less than that sum on their total sound system and there is no way that this order of expenditure will be available to purchase the instrumentation required under this Code.

Meeting the other requirements of the Code intended to apply to permanent venues will not be a practicable proposition using such a basic instrument. If compliance is not to become an operational nightmare it will be necessary to install a fully automated system with built-in interface for the real-time public display and a built in printer. The CEL262 Environmental Noise Analyser, which appears to be the least expensive off-the-shelf, self contained equipment which will meet the requirements costs almost £7,000 - which represents between 50% and 100% of the cost of the sound system - and in any event is far too complicated to be used by an inexperienced operator. Other options are to take a standard integrating SPL meter which has a digital interface facility (such as the CEL493) and to hook this up with a suitable printer and display via an interface unit. But even that is going to cost around £4000, will again greatly exceed the actual requirements of the Code and be difficult to operate satisfactorily.

The simple fact is that contrary to the unequivocal statement made in the Code itself, there is no item of equipment available on the market which will satisfactorily meet the requirements of the Code at a reasonable cost and in a form that will facilitate use by untrained operators.

Added to that, it will in all instances be necessary for a permanent venue to employ a consultant to advise on the selection of equipment, to supervise its installation, to set up and commission and to provide staff training in its use. This will be likely to incur at least a further £1000 expenditure. Good news for consultants but not for the operator!

Given that the Code itself acknowledges that the majority of operators already take a responsible approach, and that as has been shown, volume levels in the majority of instances are self governing anyway, one must question the reasonableness of the monitoring requirement of the Code, and it is anticipated that this will be the greatest problem area.

Hearing Protection

In the majority of clubs today the DJ is in effect the Master of Ceremonies, encouraging audience involvement, running, promotions etc, often with technical operators to cue up and change records and to operate the lighting and video systems. Even these operators are often required to be mobile as part of "the act" and are frequently attractive girls in scant clothing. We are talking about show business, and the concept of DJs or their operators wearing ear protection is no more practicable than, say, Barbara Streisand on a Broadway stage!

Enforcement

Dealing with the larger, high profile fashionable venues is a fairly easy matter and these will doubtless fall easy prey. But it is hardly fair, nor is it in the spirit of the Code to compel compliance in that instance whilst all the smaller operators carry on regardless. Such an approach could well lead to accusations of discrimination in favour of the smaller operators.

And who will keep track of the mobile operators? Without a compulsory register and licensing system it is contended that this will be impossible to enforce. Who is going to refuse to license a youth club or local church hall because they cannot afford the instrumentation? And who will go around checking every wedding reception or village hop? The staffing levels at the Environmental Health Dept will need to be doubled just to enforce this one Code! And who will pay?

CONCLUSIONS

There are many possible reasons as to why many researchers have been unable to substantiate the widely held supposition that the enjoyment of rock music in any of its forms must result in impaired hearing, but that is another topic to be left for another occasion. But as Rintlemann & Bienvenue (8) concluded, the research does however suggest that caution may be in order.

Even if it can ultimately be shown that protection from exposure to music played at very high SPLs may be desirable, can it be reasonable having regard to the existing constraints and the generally responsible way in which the industry is operated, to expect all discotheque management, from the Hippodromes to the rural church halls and youth clubs to take on the financial and complex administrative burden being imposed on them by this code? Even the author of the code himself, in a paper to the 89th Environmental Health Congress in 1982 (3) acknowledges that:-

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"The problem is not well enough researched and defined in all its aspects to warrant specific proposals being made...it is considered that specific legislative control is unwarranted...."

Given its certain eventual adoption by many local authorities as an instrument of planning control and condition of licensing it is suggested that the Code will indeed become in effect the "specific legislative control" its author considered unwarranted in 1982.

It is considered that the extent of monitoring and administration by venue management, by operators and by the Authorities, the cost implications, and the often petty restrictions the Code seeks to impose, are far in excess of what is reasonable having regard to the inconclusive evidence upon which the Code is based. When this is coupled with the fact that the hardware necessary to implement the monitoring requirement in a practicable manner is not commercially available, the entire proposal becomes unworkable.

Now that agreement on noise exposure limits at work has finally been reached within the EEC, by January 1990 the 90dB LAeq (8 Hr) exposure limit is required to be legally enforceable in all member states. In the UK, this is to be covered by Part 1 Section 2 of the Health and Safety at Work Act by means of the proposed "Regulations for Prevention of Damage to Hearing from Noise at Work". All venues will be required to operate a management policy to ensure that staff are not exposed to noise above 90dB LAeq (8 hours) and compliance here will in most instances ensure that the public too are not exposed to excessively high levels as they move about such venues. This, it is suggested, will provide the most effective long term solution and will render the Code superfluous.

It is an ill conceived Code which, in relation to the extent of the problem it seeks to address, places unnecessary restriction and unwarranted obligation on a normally responsible industry, and action should be initiated to secure its immediate withdrawal until such time as a properly researched and more practicable solution can be found.

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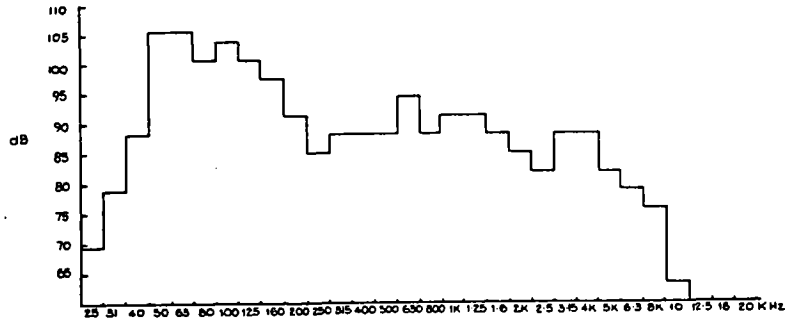

Fig 1 TYPICAL DISCOTHEQUE NOISE SPECTRA AT 96 dB(A)

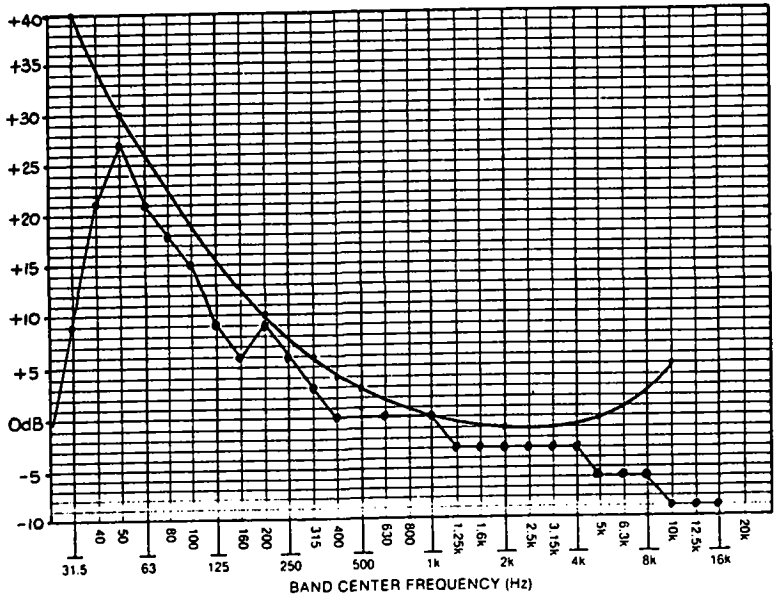

Fig.2 TYPICAL DISCOTHEQUE NOISE SPECTRA Vs 'A' WEIGHTING CURVE