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DEVELOPMENTS IN THE CONTROL OF NOISE AND VIBRATION FROM CONSTRUCTION SITES IN THE UK

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1. INTRODUCTION

Complaints to local authorities about noise and vibration from construction sites in the UK have risen slightly over the last 19 years. Improved local authority reporting and better information on how and who to complain to, mean these figures can be regarded as an indication of the generally successful control of noise and vibration from construction sites. In comparison, complaints about neighbour noise have risen significantly over the same period.

In the UK, the Control of Pollution Act 1974 and the Environmental Protection Act 1990 provide local authorities with powers to take action in respect of noise from construction sites. These powers are generally thought to provide appropriate controls. British Standard 5228 'Noise Control on Construction and Open Sites' gives local authorities and others a method to predict noise from sites and ways to control this noise.

A number of changes have been recently proposed to BS 5228 including the extension of its scope to include vibration, the provision of more accurate ways to estimate sound power and pressure levels, soft ground attenuation, and improved barrier attenuations.

It is anticipated that this will continue to provide a framework and methods which will meet local community and operator requirements.

2. THE SCALE OF THE PROBLEM IN THE UK

In a survey carried out for the Wilson Committee in 1960, nearly a quarter of the complaints about industrial noise that were received (from a sample

of local authorities), related to noise from construction or demolition work. As a result noise from construction sites in the UK was systematically approached in the Wilson Committee's report[1] in 1962.

Common complaints about construction sites often include a number of factors including noise and vibration, dust, odour, fume, access denial, mud, light pollution and damage to the local environment.

Clearly some issues are objectively easier to control than others. Noise and vibration measurement and control is reasonably well established. Figures from the CIEH[2] show an overall increase in complaints about noise to local authorities over the last 19 years (Figure 1). However for construction noise, the increase from 2153 complaints in 1975 to 6435 in 1993/94 is a slightly smaller percentage rise than that for 'industrial noise' of 12634 complaints to 43737 over the same period. In both cases the increase is substantially less than that of the 'neighbour noise' increase from 6325 to 131153 complaints.

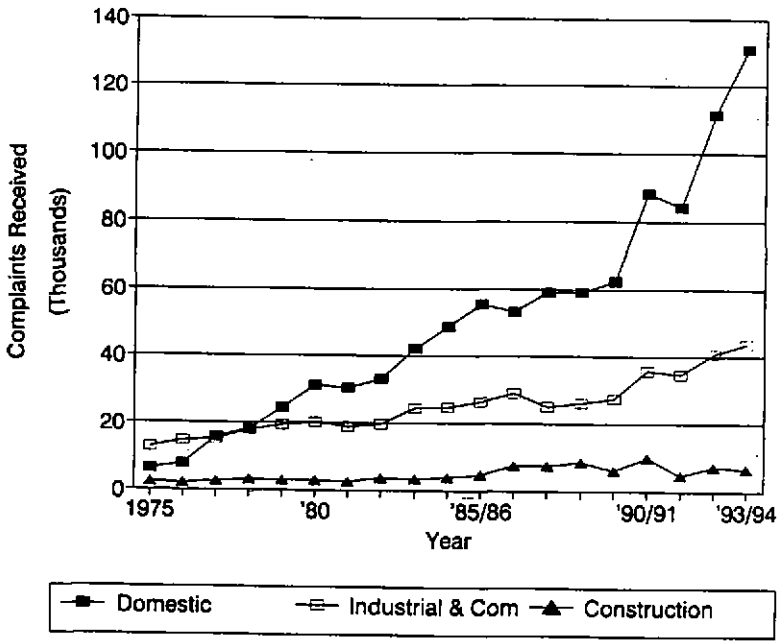

Figure 1: Complaints received by local authorities about noise

3. THE UK FRAMEWORK OF CONTROL OF NOISE FROM CONSTRUCTION SITES

Legislative control of noise from construction sites is provided by two Acts, the Control of Pollution Act and the Environmental Protection Act.

The Control of Pollution Act 1974[3] (COPA) has been largely replaced by the Environmental Protection Act 1990 (EPA), however certain parts relating to the control of construction site noise remain.

Section 60 of COPA gives local authorities the power to specify the way in which construction, demolition and similar works must be carried out so as to minimise noise. Requirements may prohibit the operation of certain plant or machinery, specify hours of operation or specify permitted noise levels from particular types of machinery. Control may be exercised through the issue of a notice on a person who is going to carry out works, or on the site operators or others who have control over operations.

Section 61 of COPA allows a site operator to apply to the local authority, prior to work starting, for approval of certain works or processes (usually detailing the works and noise control measures) on the site.

Section 71 of COPA empowers the Secretary of State to prepare, approve and issue codes of practice giving guidance on appropriate methods of minimising noise. British Standard 5228 'Noise Control on construction and open sites' Parts 1,3 and 4 are approved Codes of Practice under Section 71 of COPA.

The Environmental Protection Act 1990[4] (EPA) defines Statutory Nuisances. Section 82 of the Act allows an individual aggrieved by the existence of a nuisance to complain direct to a magistrates court.

4. THE EXISTING BRITISH STANDARD 5228

British Standard 5228 'Noise Control on Construction and Open Sites' is a comprehensive document, offering recommendations for basic methods of noise control, procedures for the establishment of effective liaison between interested parties, and guidance on the prediction and measurement of noise and assessing its impact on those exposed to it.

Part 1 of the standard is intended as a document capable of being used alone, detailing methods of control of site noise and a prediction method, in addition to a summary of legislation, for the majority of construction site activities. Part 2 details applicable legislation. Part 3 deals with particular issues inherent in surface (opencast) coal extraction, such as specific legislation and controls applying to coal extraction. Part 4 of the standard deals specifically with noise and vibration from piling activities.

The calculation method in BS 5228 is based on plant sound power or pressure levels obtained from tables or measurement. The prediction of levels assumes hemispherical spreading, and a simple screening correction may be applied. Account may also be taken of the effect of mobile plant, and plant which operates intermittently.

There is limited evidence to suggest that this method provides an overestimate of the noise exposure provided by sites. Over short propagation distances this is believed to be mainly due to the inaccuracies of the sound power and pressure levels given in the standard. At longer distances soft ground attenuation becomes more important and provides greater variation. Where there is significant screening the barrier attenuation provided is a potential source of further variation. Despite these apparent drawbacks, an unpublished Noise Council survey of Codes of Practice in 1994 showed virtually all respondents working in the field are aware of BS 5228, and that the majority sometimes or always use it.

5. THE PROPOSED CHANGES TO BS 5228

All parts of British Standard 5228 (with the exception of part 4) are currently undergoing revision.

There are two major proposed changes to the Standard. The first is the proposal to include vibration. This brings the Standard into line with current legislation and the 1992 revision of BS 5228 Part 4. The second is to provide a new Part 5 applicable to surface mineral extraction (excluding coal).

Other proposed revisions to the Standard reflect new legislation brought into force since 1984. This legislation includes the Noise at Work Regulations 1989, the Environmental Protection Act 1990 and legislation implementing European Community Directives relating to Construction Equipment.

Various definitions have been clarified, including that of noise-sensitive premises and open sites. The concepts of 'Best Practicable Means' (BPM) referenced in the Control of Pollution Act, 'Best Available Techniques Not Entailing Excessive Cost' (BATNEEC) referenced in the Environmental Protection Act are introduced. The disturbing effects of vibration on individuals, buildings and structures and sensitive installations are discussed and site vibration descriptors given. There is also some description of the control of vibration at source.

A number of technical revisions are also proposed. These include the option of taking account of soft ground attenuation and an improved barrier correction in noise propagation, and better sourcing of noise levels of plant. The three sources of data recommended are, direct measurement of the same plant or process operating in the same mode as that required for the site, use of the manufacturers maximum permitted sound power levels of the plant (under EC Regulations), or use of provided (in the standard) sound power levels or sound pressure levels.

New data is also provided for plant on opencast coal sites.

The new part of the Standard is intended to form a Code of Practice for noise and vibration control applicable to surface mineral extraction (excluding coal), and draws together guidance from various sources, including MPG 11[9] and other Department of the Environment advice. The UK coal industry has undergone substantial changes over recent years and the standard describes the revised legislative position.

6. CONCLUSIONS

The current UK control framework of prediction and local control using BS 5228, the Control of Pollution Act and Environmental Protection Act works well. However the data within the standard must be upgraded periodically to provide accurate prediction. There is scope to broaden the application of the standard to other processes, such as that suggested by the Batho Committee[10] to cover oil and gas sites.

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