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A SURVEY OF LOCAL AUTHORITY NOISE MEASUREMENTS

B F Berry

Acoustics Branch, Division of Radiation Science & Acoustics,
National Physical Laboratory, Teddington, TW11 OLW, UK

1. INTRODUCTION

In pursuance of various statutory obligations, the scientific and technical staff of local authorities undertake a variety of measurements of environmental noise. Some aspects of the specifications of equipment and techniques to be used in these measurements are rather vague and imprecise. In particular, there is large variation in the specification of requirements for instrument calibration.

A typical example is that of the regulations governing Noise Abatement Zones (1). In a schedule memorandum to the regulations, covering measurement and calculation of noise levels, the specifications require only that "the measurements should be carried out by competent staff", that "the acoustic performance of the measuring equipment must conform to the relevant standards" and that the calibration of the measuring equipment "must be maintained".

Similarly, in connection with Section 60 of the Control of Pollution Act 1974, which deals with noise from construction sites, there is an approved Code of Practice, BS 5228 (2). Part 1 of this Code has an Appendix on Noise Monitoring which simply advises, "Every precaution should be taken before use to ensure that the instruments are accurately calibrated...".

Where measurements of traffic noise are made under the Noise Insulation Regulations 1975, the requirements are more clearly stated. Thus in the memorandum "Calculation of Road Traffic Noise" (3), there is an Appendix on "Calibration of equipment". This contains the following paragraph.

> (b) System Calibration
>
> To ensure overall measurement precision, within twelve months immediately prior to the measurement the overall system should have been directly compared with an independent reference system. This comparison is most easily effected by using both to measure and analyse the same noise sample. Likewise, the output level of the acoustic calibrator referred to in paragaraph 2(a) should also have been checked by direct comparison with an independent reference device.

Few, if any, of the local authorities which equip themselves for such measurements have the facilities for undertaking fundamental calibration of their instruments and, other than acceptance of the manufacturers' assurance, there is no independent check or certification of compliance. There is therefore no guarantee of the accuracy achieved in the measurements.

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A minimum requirement could be introduced into the regulations, requiring each authority to check regularly the calibration of its instruments, using a device which generates a known sound pressure level and which has itself been calibrated against a reference standard. The requirement might specify that the calibration against a reference standard should be made by a laboratory officially recognised for the purpose. A scheme for so accrediting calibration laboratories is operated by the Department of Trade & Industry through the British Calibration Service (4). By this means, the calibration of instruments all over the UK could be traced back ultimately to the national reference standard for acoustical measurements.

In order to assess the impact of any possible new regulation, it was decided that a survey of current practice on instrument calibration was needed. However, it was seen to be important to set such practices in their overall context, so the survey was designed to gather information on:

- manpower resources
- equipment and facilities
- the extent and nature of noise measurement activities.

The opportunity was also taken to acquire up-to-date information on Noise Abatement Zones.

2. METHODS

2.1 Questionnaire development and distribution

A series of structured interviews was conducted with officials from ten authorities distributed over the UK. The interviews were based on a preliminary questionnaire, and the experience of the interviews was used to refine the questionnaire into its postal form. This was then submitted to the Survey Control Unit of the Department of the Environment for approval. As a pilot test of the postal questionnaire, it was sent to an initial sample of ten authorities. Following analysis of the eight replies obtained from this sample, some minor changes were made.

The main mailing, to a one-in-three sample of all local authorities, a total of 165, was made in mid-November 1985.

2.2 The questionnaire

The questionnaire began with a series of general questions about the area for which the local authority was responsible, eg population, land area, types of industry. On manpower resources, information was requested on number of staff, the percentage of their time spent on noise work, and on their qualifications. Respondents were asked whether staff who undertook noise measurements for statutory purposes, such as the Control of Pollution Act, were encouraged to take specialist training courses and to specify whic courses. They were also asked if there should be a minimum qualification f such staff and to suggest what that should be.

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In the section on equipment and resources, the respondents were called upon to supply a complete list of their noise measuring equipment. They were then asked whether they operated loaning or pooling arrangements with other parties and whether they ever hired equipment. An estimate of expenditure on new equipment in the last three financial years was also sought and details of any computer hardware and software used for noise work were requested.

In respect of noise measuring equipment, such as sound level meters and calibrators, respondents were asked whether written records were kept of equipment usage, maintenance/repair and of recalibration by the manufacturer or specialist laboratory. For those items of equipment which were regularly recalibrated, they were asked to give a description of that equipment, the normal interval between calibration, the date of the most recent calibration certificate, and the name of the laboratory which carried out the calibration. An estimate of the annual expenditure on instrument recalibration was then requested and, where the policy of the authority was to send equipment for regular recalibration, respondents were called upon to describe their main reasons for doing this.

The section on noise measurement activities began with a request to select one of the following as being the area in which the majority of their noise measurements had been made during the past 2 or 3 years:

- Nuisance assessment (Control of Pollution Act)
- Planning Evaluations
- Compensation Eligibility (eg Noise Insulation Regulations)
- Licensing Applications
- Health and Safety.

Respondents were then asked which one of the relevant sections (58 to 67) of the Control of Pollution Act had given rise to the most measurement activity and to identify the class of noise source which had been most frequently the subject of noise measurements.

For each of the relevant sections of the Control of Pollution Act, and for the following areas of work - Planning evaluations, Compensation, Licensing Applications and Health and Safety, respondents were asked to give an estimate of the number of cases investigated in each of the last 2 years and the percentage of these requiring noise measurements. They were then asked to look back over the past 5 years and report whether the Authority had been involved in any litigation, eg a prosecution under Section 58 of the Control of Pollution Act, where questions of noise measurement accuracy or instrument calibration had played a significant role. If the Authority had been so involved, details of the case were sought. This section concluded by asking whether they considered existing legislation provided sufficient powers to deal with noise problems and, if not, to state what additional powers were required.

Where an authority had a Noise Abatement Zone there was an additional section to be completed. This asked how many orders designating NAZ's had been confirmed, whether all measurements had been completed, and whether

they had been recorded in the Noise Level Register. Attention was then drawn to the paragraph in the Control of Noise (Measurement and Registers) Regulations 1976 which states that:

> "the overall acoustic performance must be checked before and after each measurement using high-quality calibration equipment with a calibration level known to within ± 0.5 dB(A)".

Respondents were asked to state whether the results of such checks were noted in the Register, and also by which method the accuracy of the calibration equipment itself was determined.

3. PRELIMINARY OBSERVATIONS

By early January 1986, only 70 completed questionnaires had been returned and reminders were sent to the remaining 95 authorities. At the time of writing (mid-February 1986), 75% of the questionnaires have been returned completed.

On the central issue of instrument calibration, the indications are that 50% of the local authorities surveyed have a policy of sending equipment on a regular basis to the manufacturer or to a specialist laboratory for recalibration. The most common reason for such a policy was to ensure that the accuracy of results could be supported in legal proceedings.

As well as providing a valuable picture of current manpower resources, instrumentation and activities, it is already clear that the survey is producing useful information on broader aspects of the subject of local authorities and noise. For instance, a number of interesting suggestions have been put forward in response to the question of what additional powers are required to deal with noise problems. Also, details are emerging of the current status of the practical implementation of Noise Abatement Zones.

It is expected that results of the analysis of all the returned questionnaires will be available for discussion at the Spring Conference and a full report will follow in due course.

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