Proceedings of the Institute of Acoustics

BS 4142:1990 - The sequel, towards 1994

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1. INTRODUCTION

At the 1991 Autumn Conference [1] I described the processes involved in the revision of BS 4142 which had culminated in the publication of the Second Edition at the end of 1990 [2]. The paper also listed a number of questions raised about the Standard which arose from the April 1991 seminar organised by BSI to introduce the document. The answers to those questions, provided by a sub-group of the relevant BSI Technical Committee, EPC 1/3 "Industrial and Residential Noise", were subsequently printed in the Bulletin of the Institute of Acoustics in January 1992 [3]. At that time it was hoped that a new edition would be produced within about 12 months in which the points raised at the seminar would be taken into account. As was to be expected, given the substantial changes made in the 1990 edition, further correspondence requesting clarification has been received by BSI and by NPL. In addition a number of questions have recurred at conferences and meetings. Further comments have been elicited in the course of the NPL data-sheet study [4].

In December 1992, at a meeting of EPC 1/3, a key item on the agenda was the consideration of future plans for the Standard. A decision was made to form a Working Group to produce a new edition. The aim was to work on minor amendments and clarifications, with no major technical changes being made. Such changes would require the lengthy process of a Draft for Public Comment. The initial target was an agreed text within six months. This paper reports on the status of progress by the Working Group and considers the likely next steps. Although work on the new document is well advanced, it has not yet been presented to the full EPC 1/3 committee. Because of this it is not possible in this written version of the conference paper to give the actual re-wording of various clauses, but examples will be given in my presentation.

2. THE WORKING GROUP

I acted as Chairman of the group and the other members are listed below, together with the organisation they represent on EPC 1/3,

Nicole Porter	(NPL/DTI)
John Seller	(Society of Environmental Engineers)
Ken Collins	(Institute of Acoustics)
Peter Talbot	(British Scrap Federation)
David Fleming	(Association of Noise Consultants)
David Trevor-Jones	(British Occupational Hygiene Society)
Ian Flindell	(ISVR)
John Sargent	(BRE)

The group first met in January 1993 and at this first meeting we worked systematically through each clause of the 1990 edition to produce a "worklist" of points requiring clarification or modification. The work of redrafting was shared out across the group, with each member being responsible for a specific part of the document. After three meetings the first composite new document was available for discussion, and it has been discussed in great detail in three further meetings. In this paper I will attempt to convey the main ways in which changes have been introduced.

3. PLANNED MODIFICATIONS

For the purposes of this paper the various planned changes will be discussed clause by clause, using the headings of the existing Standard.

Foreword

The wording has been changed to emphasise the subjective nature of response to noise and to stress that the likelihood of complaint is dependent on many factors, but that BS 4142 only deals with the amount by which the rating level exceeds the background noise level. It is stressed that BS 4142 is only part of a complete noise assessment.

Scope

The present edition states that the method is not applicable where the background noise level is very low, " i.e. below an A-weighted sound pressure level of 30 dB". This restriction has been the source of much comment, in particular from Environmental Health Officers

in rural areas. Many situations were quoted where specific noise levels were well in excess of low background noise levels, but the Standard could not be applied. The Working Group felt that the Standard could reasonably be used in such situations, but should not be used when both the background and specific noise levels were low. The Scope has therefore been re-worded. In addition the actual assigning of numerical values considered to be very low is in a NOTE.

In view of the frequent requests to rule on whether or not a particular type of noise situation was within the scope of BS 4142, the Working Group considered adding a list of specific exclusions, e.g. transportation noise, but eventually decided against this.

Definitions

In general an attempt has been made to ensure complete consistency with Part 1 of ISO 1996, now dual-numbered as BS 7445 [5].

Because a noise complying with the definition of "steady noise" could still contain significant fluctuations, it was decided to remove the definition, and to discourage the use of Time-weighting 'S'. The requirement for use of Time-weighting 'F' for background noise level is now brought forward from its place in the present edition to become part of the definition of background noise level.

The order in which the definitions appear has been changed to clarify meaning, thus Reference time interval is now defined before Specific Noise Level.

Measuring Equipment

For the measurement of Specific Noise Level, the possibility of visually averaging the indication on a sound level meter is "downgraded" to a NOTE, and it is emphasised that this is only an approximation. Where such an approximation is used it must be reported under Clause 9. In addition there is no mention of Time-weighting 'S'. The existing NOTE 2 which refers to an approximation to the background noise level is deleted.

Calibration

At present the Standard requires that where measurements are made over a prolonged period the calibration be verified at least twice daily. It is now proposed that checks be made "before and after measurement and at each change of measurement position".

The Standard currently requires that compliance tests on the measuring equipment shall be carried out at least every two years by a NAMAS accredited calibration laboratory. It was noted that BS 7445 puts the onus for extensive recalibration and verification on "authorities responsible for the use of the results". It is proposed to reword this clause in line with BS 7445 together with a NOTE which points out that the level of accuracy involved in

application of the Standard in a particular case should be considered in deciding how detailed any verification tests should be. Requirements for tests at the highest level of accuracy are given in the NOTE, and the new BS7580 [6] is referred to. Where tests to a lower level of accuracy are used they must be reported.

These clauses in fact form part of a new clause 4 "Measurement Practice" which brings together information on measurement positions, precautions against interferences and weather conditions, which are currently distributed in various parts of the existing Standard. In doing this the opportunity has been taken to clarify guidance on distance from facades and also to remove the reference to a 3°C temperature limit.

Determination of Specific Noise Level

A number of changes are proposed here to clarify the use of the Standard. The Working Group recognised that the measurement of specific noise level in the presence of fluctuating residual noise presented difficulties. In the existing Standard the guidance about measuring "when the residual noise level has subsided to typically low or mean minimum values" is somewhat hidden away in clause 5.4.4 (b). This guidance is now brought forward to the beginning of this part of the document.

For the purpose of correcting for the influence of residual noise on the specific noise level, the Working Group are considering recommending that an additional measurement be made of residual noise level in terms of L_{Aeq}. The procedure to be followed in correcting the measured specific noise level would then depend on this value of the residual noise level. Details of the method have yet to be finalised.

Clause 5.5 Measurement time interval has a number of sub-clauses dealing with various possible situations. To aid clarification, diagrams are to be inserted in the text to illustrate the choice of measurement time interval.

Background Noise Level

Very minor editorial changes have been made, thus it was noticed that the term "background noise" rather than "background noise level" had been used in a number of places in the 1990 edition.

The NOTE to Clause 6.1.2 referring to "at least 5 minutes" has been deleted.

Determination of rating level
It was realised that the way in which the present clause 7.1 immediately calls up clause 7.2 showed the need for minor re-ordering of the text. The term "acoustic features" is used rather than "characteristics".

Assessing the noise for complaint purposes
Minor changes have been made to emphasise that the likelihood of complaints increases as the difference between the rating level and the background noise level increases. Also in order to remove any possible confusion caused by the words "a difference below 5 dB", these have been changed to, "a difference less than +5 dB".

Appendix A. Examples
Here additional notes have been added before each example to indicate the particular aspects of the Standard being dealt with in each case. An additional example has been added to illustrate a situation where measurements have to be made closer to a specific noise source, with readings being corrected for distance.

4. NEXT STEPS

We anticipate that the final text will be discussed by the main EPC 1/3 committee in December so that approval to proceed to publication should be given this year. Publication of the new edition would then be early in 1994. But the process will not of course stop at that point. A number of research projects relevant to the long-term future of BS 4142 are in progress [7]. These will be monitored closely and we plan to produce a more extensive revision in three to four year's time.

5. ACKNOWLEDGMENTS

Development of a Standard such as BS 4142 is very much a team effort and I gladly acknowledge the work done by the members of the Working Group. Several members have also provided comments on a draft version of this paper.

6. REFERENCES

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3. N D Porter, 1992. *Industrial and residential noise - questions asked at the BSI Symposium on BS 4142.* Acoustics Bulletin, January / February 1992, 11-13.

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5. British Standards Institution 1991. *Description and measurement of environmental noise. Part 1. Guide to quantities and procedures.* BS 7445.

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