Noise Exposure Assessment – A New ISO Standard

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1. INTRODUCTION

It is universally accepted that the hazard of occupational noise induced hearing loss has to be assessed measuring the noise exposure of the exposed person and not just by measuring the noise level the person is exposed to. This is because hearing loss from occupational noise is the result of long-term (years?) exposure to noise. Therefore there is a need for the assessment of this long-term exposure.

There is no lack of documents that describes the procedures for this kind of measurements. In Canada the Canadian Standard Association has produced the standard CSA Z107.56 (R1999) Procedures for the Measurement of Occupational Noise Exposure. Although it is under revision, the eventual modifications are not expected to be substantial. In the United States, the American National Standard Institution has produced the standard ANSI S12.19-1996 Measurement of Occupational Noise Exposure. The International Organization for Standardization, ISO, has two standards related to this subject. One is the ISO 1999:1990 Acoustics – Determination of occupational noise exposure and estimation of noise-induced hearing loss. It does not provide to many details with regard to the measurement itself.

The only specific standard among the ISO documents is the ISO 9612:1997: "Acoustics -- Guidelines for the measurement and assessment of exposure to noise in a working environment". New developments in the field of noise exposure measurement techniques have made the ISO 9612:1997 obsolete, to the point that it was decided to write a new standard rather than review the old one. To that effect, the ISO/TC 43/SC 1, "Noise" has requested that WG 53 (Working Group 53) be responsible for preparing the new document. (There are two Canadian members in the WG: Tim Kelsall of Hatch Association and this author). The WG held its first meeting in January 2004, where the basics of the standard where discussed. Substantial

progress was achieved at a second meeting in June. A new meeting is planed for September, when the first draft is expected to be finished. (Because of the deadline for submitting this summary, the results of the September meeting are not included).

2. THE NEW DRAFT

The complete name for the new document is: ISO/WD2 9612 Acoustics – "Measurement and calculation of occupational noise exposure – Engineering method". (WD = Working Draft). Some of the sections will be described in the following paragraphs.

2.1 Sect 1:Scope

The purpose of the standard is to provide a method for the measurement of the noise exposure in the workplace. It is explicitly stated that the following issues are beyond the scope of the document: environment noise levels (noise maps), masking of communication, infrasound and ultrasound, extra-auditory effects as well as estimation of the noise exposure when hearing protectors are worn.

The standard does not deal with measurements required for noise reduction either.

2.2 Sect 6: Instrumentation

The standard recognizes the use of handheld sound level meters as well as dosimeters (called in the document "personal sound level meters". A table included in the document provides guidance on when each of those instruments is the best choice for the task.

2.3 Sect 7: Identifying equal noise exposure groups or a noise exposed worker.

This is a process aimed at reducing the number of required measurements. By grouping the workers on the basis of their exposures, there will be no need of measuring each one of them. This, by the way, is a common Industrial Hygiene technique, used for exposures to other hazardous substances chemical of physical.

Two approaches are recommended: one based on the tasks being performed and the second by the function. The second is especially useful when a worker performs the same task at different locations (e.g., maintenance operators).

2.4 Sect 8: Description of representative working day

This is a task necessary when characterizing a noise exposure situation of a worker in the entity under measurement. The standard includes a specific procedure for the overview and understanding of all the different tasks

that may influence the noise exposure. This has to be done in consultation with the worker in question and his supervisor.

There are provisions for a short-term evaluation to ascertain that the description of the measurement period is representative. However, another evaluation, under the heading of "long-term" requires that the measurements be repeated in another occasion(s) to confirm the previous findings.

2.5 Sect 10: Measurements

Probably the most useful section of the document provides guidance on how the measurement should be performed. It specifies that the result of the test should be presented as L_{eq}, L_{EX} and L_{Cpeak}.

Several sampling strategies are included and a table presents a selection of the strategies that can be used and the one that are recommended. Details are also included regarding how the instrument should be used, calibration procedures for the same, number and duration of the measurements, etc.

2.5 Sect 11: Evaluation of the uncertainty

For the last couple of years, it has been a requirement for each new standard to evaluate the uncertainty. This is to eliminate the rule of tumb presently used, stating that measurement results are true within +/- 2 dBA.

3.0 CONCLUSION

As mentioned above, the work is still in progress and there are many issues to be dealt with, trying to get consensus within the Working Group. We hope that most of the problem areas will be cleared at the September meeting and that by the CAA 2005, we will have a finished ISO standard.

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