

THE ONTARIO HYDRO NOISE CONTROL AND HEARING CONSERVATION PROGRAM*

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SUMMARY

The need to protect workers' hearing prompted Ontario Hydro Management to set up a Noise Control and Hearing Conservation program in 1984. Some elements of the program (e.g., use of hearing protectors, noise control measures, and hearing tests) have been already in place since the early 70s. However, there was an identified need for a comprehensive package in which requirements and responsibilities would be listed. This paper lists and explains the basic elements of the Program.

RESUME

La direction d'Ontario Hydro a mis en place en 1984, le Programme de Contrôle du Bruit et de la Protection de l'Audition. Quelques éléments du Programme (par exemple, l'usage des protecteurs auditifs, des mesures techniques de contrôle du bruit, des examens audiométriques, etc...) étaient déjà en place au début des années 70. Il a été nécessaire, cependant, de développer un programme global identifiant les besoins et les responsabilités des parties intéressées. Le présent travail énumère et explique les éléments fondamentaux de notre Programme.

1.0 INTRODUCTION

Ontario Hydro has for many years had in place elements of a hearing conservation program. Hearing protectors have been used in many locations, and hearing tests have been performed in some generating stations since 1970. Noise measurements were conducted on equipment and in areas, and warning signs were posted where appropriate.

However, no consistent effort on hearing conservation was made throughout the Corporation until the beginning of 1980. Responsibilities were not clearly defined, records were not always maintained, and training programs for workers and management were not in place.

To overcome these problems a corporate Hearing Conservation and Noise Control Program was developed in 1984. It was signed by the President so that the Program has the value of an internal law. It applies to all employees as well as to contractors and their workers while they are on Ontario Hydro premises.

The Program is worded in general terms. It explains what has to be done, but provides little detail on how to achieve the goals. Each branch within the Corporation had to prepare its own program, following the corporate document. Branch programs contain more details to meet their individual needs. The basic strategy for the Program is to ensure a consistent but decentralized approach. Line management has the entire responsibility for the application of the program. When necessary, line management has to develop its own code of practice and/or procedures to facilitate program needs.

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The entire text of the Program can be provided on request. Some significant aspects are discussed in more detail in the rest of this paper.

2.0 PROGRAM CONTENT

2.1 Definitions

The following two basic definitions have been specifically included in the Program to ensure uniformity in the interpretations.

Noise is considered as such, when its instantaneous level exceeds 80 dBA (continuous) or 135 dBA (peak). Noise levels lower than 80 dBA may cause health effects. However, because they do not affect people's hearing they are not taken into consideration.

Noise exposed worker (NEW) is a person who:

- a) has a noise exposure (L_{eq}) exceeding 85 dBA for more than 60 days/year (continuous noise); or
- b) is exposed to more than 10 impulses/day, with levels higher than 135 dBA peak, for more than 60 days/year; or
- c) is exposed to any number of impulses with levels higher than 140 dBA peak, for more than 60 days/year.

Noise exposed workers are subject to a special treatment as will be explained below.

2.2 Program Elements

2.2.1 Hazard Identification

The first element in the program consists of monitoring all workplaces where noise levels are suspected to exceed 80 dBA. This is done using sound level meters. Measurement procedures are extracted from the corresponding CSA Standard (1). Results are recorded and kept for future reference.

At all locations where the noise levels exceed 85 dBA:

- a) Warning signs are posted,
- b) use of hearing protectors is required, and
- c) a noise exposure assessment is performed on workers.

2.2.2 Hazard (Noise Exposure) Assessment

Noise exposure measurements are usually performed during a whole shift for four consecutive days, on statistically significant samples of workers that belong to the same trade. Guidelines in the CSA Standard on noise exposure measurements (2) are followed for this determination.

The result of the exposure survey is the mean noise exposure of the trade (L_{trade}) at the 95% confidence level and the standard deviation of their individuals' weekly exposures. With those data the percent of workers with noise exposure in excess of 85 dBA is calculated. If this exceeds 5%, then the entire trade is declared to be noise exposed (all workers in this trade become NEWs).

Noise exposure of all NEWs is regularly monitored. In addition, they are included in the Health Surveillance Program which assesses the occurrence of occupational noise induced hearing loss, and advises management and employees when significant hearing loss has occurred. Details of all NEWs are contained in the corporate NEW Registry.

2.2.3 Noise Exposure Control

When a noise hazard to the workers has been identified, line management must establish and document a noise exposure control program. Its objective is to reduce noise levels present in the workplace and/or noise exposure levels of workers.

First priority is given to engineering noise controls. They have to be applied to new as well as to existing facilities or equipment after a cost-effectiveness study has been performed by line management.

If engineering controls cannot be implemented, or, if after their implementation the noise exposure levels are still too high, then formal administrative/operating controls are required. They include studies of work procedures, scheduling, etc.

Studies on noise exposure controls, implemented or otherwise, have to be documented for future reference.

2.2.4 Training and Motivation

Noise Exposed Workers must be aware of the contents of the Noise Control Program. They must receive periodic training involving discussion of noise hazards, control measures, use and care of hearing protectors, and hearing tests. This is done through 1-2 hour training sessions and through health and safety meetings.

2.2.5 Health Surveillance Program

All Noise Exposed Workers, as well as all workers that were NEWs but are now working in conditions such that they do not fulfil the NEW status, are included in the Health Surveillance Program. They are all included in the NEW Registry, that is kept centrally in Head Office. Each workplace also keeps a list of its own NEWs.

All Noise Exposed Workers undergo biannual hearing test, performed in most cases by Ontario Hydro nurses. Audiometers and audiometric booths are tested annually for compliance with the CSA Standard requirements (3). The audiometric test includes an examination of the outer ear and a discussion of the results as compared to the previous audiogram. If appropriate, it includes a discussion of selection, use and care of hearing protectors.

Results of the test are sent to Head Office, where they are kept in confidential medical files. Results that show hearing losses higher than 25 dB in either ear are reviewed by a team composed of the Program Supervisor (an M. D.), the head nurse and an industrial hygienist. The objective of the review is to determine if the hearing loss is noise induced, and, if so, whether a Workers' Compensation Board claim (WCB) should be registered on behalf of the person. If a clinical follow-up is required, the worker is referred to his M. D. or to a specialist.

2.2.6 Program Assessment

Each branch is responsible for assessing the effectiveness of its noise program. The Health and Safety Division, on behalf of the executive office, is to assess the effectiveness of the Corporate program.

3.0 PRESENT STATUS OF PROGRAM

The program was instituted in 1984. At the present time the status is as follows:

- a) **Hazard identification:** Noise measurements have been performed throughout the Corporation. Noisy areas are posted and hearing protector use is enforced.
- b) **Hazard assessment:** Noise exposure assessments have been performed on all suspected noise exposed trades. Results have been documented and data of NEWs are entered into the Noise Exposed Workers' Registry.
- c) **Noise exposure controls:** Use of approved hearing protectors is enforced throughout the Corporation. Training is done using training modules developed in-house. Engineering noise controls are in the process of being implemented, depending on the priority and cost. The Hearing Surveillance Program is in force. Audiometric tests are performed at 16 different locations. The only exceptions are workers in the Regions Branch. Because of distances between locations and the small number of employees at work locations, the task of performing hearing tests is more complex. Presently, audiometric tests are performed by a contractor, but the assessment and counselling is still done by Hydro nurses.
- d) **Engineering controls:** The Engineering Analysis Group (Design and Construction Branch) is a four engineers strong unit that deals specifically with engineering noise control in the Corporation. They are dealing with three types of situations:
 - i) New Plants, where noise is controlled in the design stage,
 - ii) rehabilitation or life extension of existing plants, where noise controls are included in the projects, and
 - iii) noise control of specific equipment/work area.

As a part of the noise control effort, noise characteristics of new equipment that is purchased is specified. To do so, it is necessary to determine the impact of the new equipment on the noise exposure of the workers. The noise exposure of the workers that has to operate the new equipment should not exceed 85 dBA.

The costs of the engineering noise control is quite high, because of the size and costs of the individual projects. Typical costs range between \$1 - 3 million for a new plant, 10 - 15 million for a rehabilitation and 10 - 200 thousand for a local noise control.

4.0 FUTURE TASKS

The issue that is presently being examined is that of how to assess the effectiveness of the Hearing Conservation Programs at different locations and throughout the whole Corporation. Ontario Hydro intends to apply methods and criteria that are now under development by the ANSI S12.12 ground (4). Other performance criteria involving sound level and noise exposure levels are also being considered.

Noise control in the design stages, as opposed to corrective actions taken in the past, is being considered now. A special group in the Design and Construction Branch is involved in examining blue prints of new constructions and in making recommendations for the purchase of new equipment.

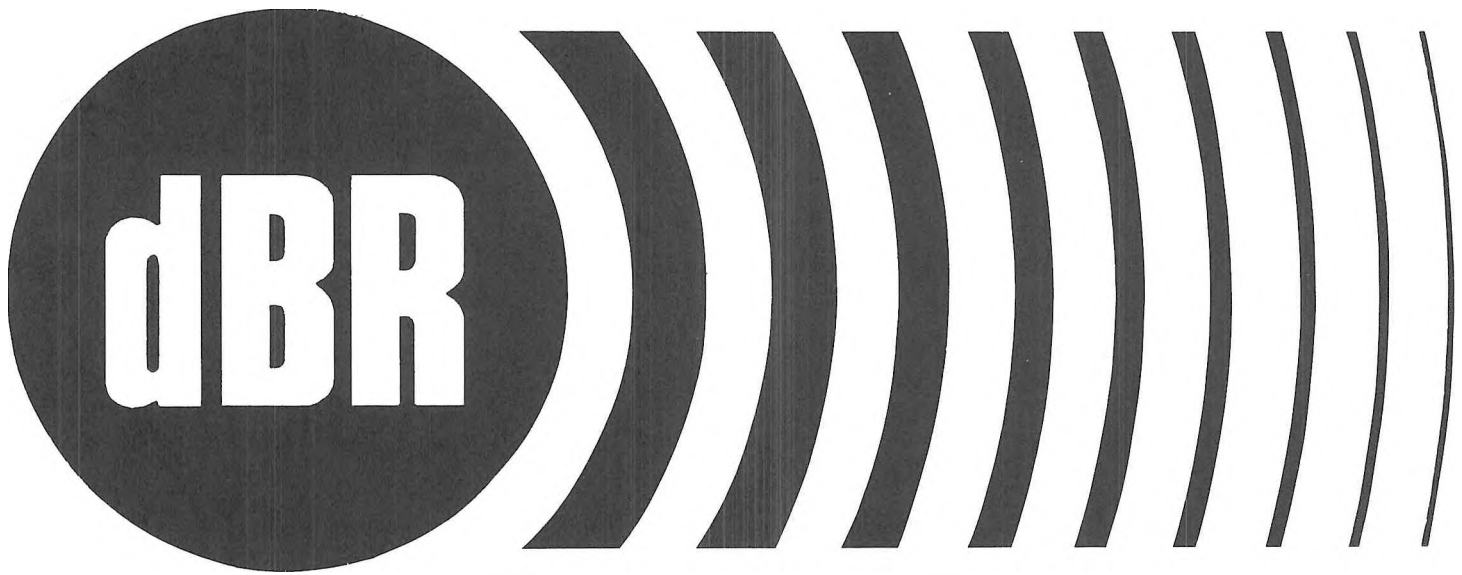
Finally, our Industrial Hygiene Section is involved in assessing new hearing protectors. Since there is a continuous flow of new devices on the market, there is a need for their evaluation. This is especially important with the new breed of non-linear hearing protectors that is now available.

5.0 ACKNOWLEDGEMENTS

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6.0 REFERENCES

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