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HEARING CONSERVATION AND NOISE CONTROL IN INDUSTRY ORGANIZED AND PERFORMED BY THE ACCIDENT BRANCH OF THE AUSTRIAN SOCIAL SECURITY BOARD

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In Austria, as in many other European countries, special insurance against the consequences of industrial accidents and occupational diseases comes within the scope of statutory social security. The main responsibilities of the accident insurance institutions, which are the competent organizations, are:-

a) prevention of industrial accidents and occupational diseases
b) therapeutic treatment
c) compensation in respect of industrial accidents and occupational diseases.

In Austria, the occupational diseases are scheduled, and noise-induced hearing impairment ranks, along with silicosis, industrial skin diseases and infectious diseases of hospital staff, among the most-commonly occurring of these. Our institution, the Allgemeine Unfallversicherungsanstalt, is the social security branch for all employed persons except those in agriculture, forestry or on the railways.

We began organizing technical and medical measures to abate industrial noise in 1962. The medical aspects include periodical checking of the auditory status of work people, the making of recommendations regarding hearing protection devices, and the assessment of fitness for work under noise exposure. Technical activities include noise measurements and the preparation of expert appraisals on measures for noise abatement in workshops.

Audiometric investigations and technical measurements are carried out for industry free of charge. Serial audiometry is conducted on site in the factories, using vehicles specially constructed for the purpose. The object of these examinations is the quick recording of many employees: after exploring the medical history and occupational anamnesis, testing is confined to checking the pure-tone air-conduction audiogram at frequencies from 128 to 8192 Hz, supplemented by bone-conduction if necessary. Naturally it is not feasible in this mass examination to test each employee after a prolonged interval away from work, but this is not necessary for serial examinations of a purely screening character. The results of serial examinations are classified by a method that we have developed, which selects appropriate cases for referral to an otologist for further examination. The results of the serial examinations, as well as the medical data, are fed into a computer, the following data being coded:-

name, sex, date of birth;

factory, date of examination, examiner;

kind of occupation; noise level;

medical anamnesis (ear affections, head injuries, acute noise exposure etc.);

length of exposure, military service;

type of hearing protection, length of time used;

audiogram (air-conduction, bone-conduction if necessary);

result of speech audiometry (experts' opinions);

otological disgnosis.

In order to perform a rapid classification of large numbers of audiograms we have evolved threshold templates relating tolerable hearing losses to age and length of exposure to noise. These thresholds are computer-processed and serve to eliminate all cases requiring no further action. If the curve of an audiogram shows an inconspicuous course and does not surpass the appropriate template, the case is classified Ø by the computer. Other cases, including all those with bone-conduction curves, are scrutinized by our medical adviser. To facilitate visual assessment, the computer draws the audiogram curves by means of a plotter, and prints out all the important anamnestic data.

Before adopting our threshold templates, their applicability was checked in the light of hundreds of cases. No faults have been discovered by subsequent checks.

During the period November 1962 to October 1969, we conducted 88,491 examinations in our vehicles and an advanced hearing loss due to noise was found in 5% of cases. A medical check was necessary in order to clarify the hearing status in 10% of cases. 1% of all persons examined received compensation in respect of loss of earning capacity when this amounted to 20% or more and when the hearing loss was, in the specialists' opinion, caused by industrial noise. The assessment of loss of earning capacity is carried out in conformity with the recommendations of Boenninghaus and RÖser (1958).

We have also developed a standardized procedure for the objective investigations. At each factory visited the noise levels, in dB(A), dB(B), dB(C) and LIN, are measured in all noisy departments. If the dB(A) value exceeds 80, we measure the sound pressure level in octave bands. This analysis furnishes a general view of noise conditions in the whole factory and facilitates a schematic assessment of the hearing loss risks at particular working places. To assess the admissibility of noise stress, we use the principles of the CHABA Report by Kryter et al (K.D. Kryter, W.D. Ward, J.D.Miller and D.E. Eldredge, "Hazardous Exposures to Intermittent and Steady-State Noise", J.acoust. Soc. Amer. 1966, 39, 451-464) which, in our experience, best takes account of all the noise configurations occurring in the factories. The permissible duration of noise exposure is obtained from the tables in the CHABA Report. All these particulars are communicated to the factory in a report which includes diagrams of the measurements. The results of noise measurement are also processed by computer. For each factory we have the following data:-

name and type of factory
designation of measurement points
characterization of the noise
type of machine or device
type of measuring instrument
overall noise level
sound pressure level in octave bands from 31.5 to 31500 Hz

) for each measuring point

Routine noise measurements and serial audiometry are repeated at intervals of 4 to 6 years and the results of these periodical measurements are likewise processed by computer.

An adivsory service to industry, provided by specialized engineers of our institution, also comes within the scope of technical noise abatement. This activity is manifold, ranging from short consultations on the spot to the elaboration of expert appraisals on safety measures. Up to now 203 such memoranda have been prepared.

In addition to the Management, both the Factory Inspectorate and the Works Council are informed of the results of medical examinations and technical measurements in order that they may cooperate in the enforcement of safety measures within the scope of their statutory functions.

To accomplish these tasks, the staff of our Department for Occupational Diseases and their Prevention consists currently of 21 people: 4 engineers, 3 measurement technicians, 6 audiometricians, 8 administrative staff and assistants; add to this 1 medical and 1 technical consultant respectively. A further enlargement of the Department is envisaged within the next few years. From our experience, it is of the utmost importance to tackle all problems by team work. Industrial noise abatement is an intricate problem and its success certainly depends on a well-functioning organization that mobilizes all the appropriate forces inside and outside the factories.

We hope that we have succeeded by our method in promoting industrial noise abatement in Austria. At any rate, encouraging progress has been obtained since 1962.