8. **Hearing Conservation without Assumptions: Using Daily Microphone-in-Real-Ear Techniques to Verify Safe Exposures for Pot-line Workers in an Aluminum Smelter**

*Ronda Wilkinson, Alcoa Intalco Works, Ferndale, Washington, and Kevin Michael, doseBusters USA, State College, Pennsylvania*

Ten pot line workers at the Alcoa Intalco aluminum smelter were outfitted with the doseBusters USA Exposure Smart Protector (ESP). The ESP measures actual protected exposure: the measurements account for wearing time and quality of fit of the HPD. Using the ESPs, workers were able to limit their protected exposures to safe levels in most cases. Intervention for overexposed individuals resulted in a reduction of protected exposure to a safe level.

9. **Calculation of the Intrinsic Error in Hearing Protector Ratings**

*CDR William J. Murphy, Ph.D., U.S. Public Health Service, National Institute for Occupational Safety and Health, Hearing Loss Prevention Section, Cincinnati, Ohio*

The secondary label of the Noise Reduction Rating (NRR) is required to disclose the mean attenuation and standard deviations for the real ear attenuation at threshold (REAT) measurements. However, the overall error of the NRR has been largely ignored. Using covariant statistics, Monte Carlo simulation and Bootstrap simulation methods, the error in the noise reduction rating has been estimated and applied to several experimental studies.

10. **Hearing Acuity of Undergraduate Music Students**

*Julie Phillips, Greensboro, North Carolina*

Undergraduate music students at the University of North Carolina at Greensboro are exposed to intensity levels for duration that exceed OSHA standards. The hearing of 200 undergraduate music students was assessed in order to determine whether the accumulated exposure to intense sound levels throughout baccalaureate years negatively affects music students' hearing. Students presented noise notches suggesting that continued exposure throughout these years can contribute to hearing loss in this population. Results confirm that a hearing conservation program be implemented at the UNCG School of Music.

11. **Certified Safe Farm: A Description of Hearing Illnesses and Hearing Protection Device Use in a Midwestern Agricultural Population**

*Sara Schneiders, MS, Greg Flamme, Ph.D., Jeff Lange, Ph.D., Kelley Donham, DVM, MS*

Certified Safe Farm (CSF) is an agricultural occupational health research program initiated in 1998 to address the high rate of illnesses and injuries in farmers. This presentation will discuss the impact on the CSF program on the self-reported rate of HPD use among farmers and on the incidence of self-reported hearing illnesses. We will also present data describing on the progression of hearing loss over a 4-year interval. Project supported by NIOSH.

12. **Sound and Carbon Monoxide Exposure in Bars and Restaurants**

*Melissa Teahen and Gregory A. Flamme, The University of Iowa*

Hearing damage risk in social establishments catering to college students has not been extensively examined. Potential risk factors in these environments include exposure to high sound levels and increased levels of carbon monoxide (CO). This study involved measurements sound level and carbon monoxide measurements from local bars and restaurants. Damaging sound levels and low levels of CO were found in most environments.

13. **Real Noise Exposures of the Highway Patrol**

*Randy L. Tubbs, Ph.D. and Chad H. Dowell, M.S., National Institute for Occupational Safety and Health, Division of Surveillance, Hazard Evaluations, and Field Studies, Cincinnati, Ohio*

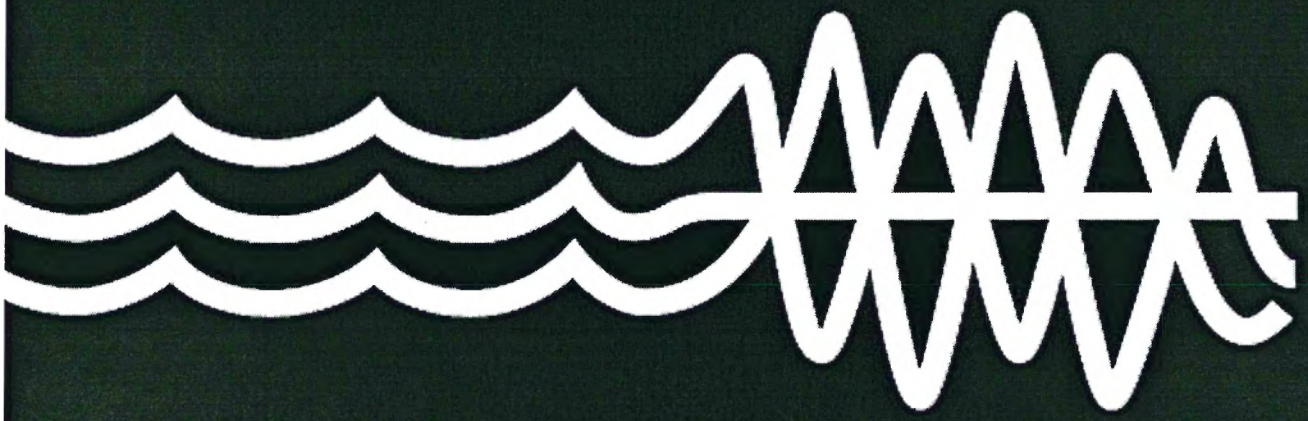
NIOSH received a request for an evaluation from a highway patrol concerned about troopers' noise exposures during patrol. Dosimeter measurements were made on troopers in six different counties over three days. Real-time spectral data were collected from locations along the highways. The noise measurements were well below the OSHA PEL and action level. Only four of 53 samples exceeded the NIOSH REL. Noise measured along the freeway ranged up to 88 dBA. Recommendations on implementation of a hearing conservation program and the use of specialized hearing protection devices have been presented to the highway patrol.

14. **The Prevalence of High Frequency Hearing Loss in Eighth Grade Children and their Attitudes and Knowledge Regarding Noisy Leisure Time Activities**

*Dorie Watkins, Ear, Nose & Throat Associates of the Bay Area, Pinole, California*

Noise-induced hearing loss is a particularly ominous, insidious and invisible disability, especially in children (Bess, 1985; Niskar, 1998). Even before affecting hearing acuity, noise exposure has been reported to result in learning disabilities, delayed reading scores, an inability to complete problem solving tasks and impaired sensori-motor development (Niskar, 1998). Approximately 3,500 eighth grade students were seen for annual pure tone hearing screening, of which 6.5% (N=226) were seen for retesting. During the retest appointment, students were asked to complete a 14-question survey assessing their attitudes toward activities. Twenty-seven percent of the students with confirmed hearing loss upon retest exhibited audiometric configurations consistent with a history of excessive noise exposure. Student responses to the survey suggest that these children do possess some knowledge of the hazardous effects of noise but do not recognize the immediate threat to their hearing health and are not avoiding loud noise or protecting their hearing.

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