

tool with 29,000 subjects, a virtual museum exhibit with eight fun, interactive activities and simulations, and a Teacher's Resource Guide filled with activities, instructions and hearing health information. These resources can be applied in industrial, military or public educational hearing loss prevention efforts.

### **Evidence for Loud Music Dependency Disorder**

*Dr. Mary Florentine, Matthews Distinguished Professor, Northeastern University, Boston, MA*

*Dr. Linda Welsh, Psychotherapist, Brown University, Providence, RI*

Why do some individuals continue listening to loud music despite knowledge of potential hearing loss? Is it possible that they may have a dependency-like disorder underlying excessive listening to loud music as suggested by Florentine et al. (*Ear and Hearing* 19, 420-428, 1998)? This talk (1) presents the conceptual framework for the existence of a new dependency disorder, (2) reviews data suggesting the presence of such a disorder, and (3) presents a case study of an individual whose music-listening behaviors meet clinical criteria for a behavioral dependency disorder as defined by an adapted version of the American Psychiatric Association's Criterion for Substance Dependence (1994). This case study appears to confirm the existence of a true dependency on loud music. If Loud Music Dependency Disorder is confirmed to exist in a significant number of individuals, programs for the prevention of noise-induced hearing loss may need to be modified.

### **Effect of Training Modality on Earplug Attenuation**

*Antony R. Joseph, Au.D., Ph.D., U.S. Navy, FPO AP*

*Mark R. Stephenson, Ph.D., NIOSH Taft Laboratories, Cincinnati, OH*

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The effect of group versus individual hearing loss prevention (HLP) training on the attenuation performance of hearing protection devices (HPDs) was investigated. A subject-fit methodology, which gives naïve listeners access only to the instructions printed on the HPD product label, was used to determine real-ear attenuation at threshold (REAT) at third-octave noise bands between 125-8000 Hz. REAT measurements were augmented by use of the HLP Attitude-Belief survey, a self-assessment tool developed by the National Institute for Occupational Safety and Health. Participants were randomly assigned to one of four experimental groups, consisting of 25 listeners each. A short multimedia program was presented to listeners, with half randomly assigned to individual training and the other half assigned to group training. Results showed training to have a significant effect, for two types of HPDs (formable and premolded) on real-ear attenuation and attitude, but, importantly, there was no difference between group and individual training.

## **SATURDAY, FEBRUARY 18**

### **Considerations for Active Noise Control in Ducts Using Splitting Vanes for Multiple Duct Channels**

*Jeremy M. Slagley, U.S. Air Force, Morgantown, WV*

Active noise control (ANC) is particularly useful in hard-walled ducts in low frequency regions for canceling plane waves. The frequency region of plane waves that can be controlled increases as the cross-sectional dimensions of the ducts decrease. One method to reduce the inner dimensions of a large duct is to insert axial splitting vanes down the length of the duct to separate the inner space into smaller channels. A commercially-available ANC system was used to reduce random noise in a large 18 inch round duct having four different diameter (6, 8, 12, and 16 inch) round ducts inserted as axial splitting vanes. Insertion loss (IL) at frequencies above the large duct plane wave region ( $\geq 315$  Hz) increased by an average of 3-4 dB with 12 and 16 inch inserts as the large duct inner dimensions decreased. This research may make ANC more applicable particularly for HVAC systems inside buildings, or exhaust stacks contributing to environmental noise.

### **Do Earphones for Music Reproduction Provide Hearing Protection?**

*John G. Casali, Ph.D., CPE, Auditory Systems Laboratory, Dept. of Industrial & Systems Engineering, Virginia Tech, Blacksburg, VA*

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*Virginia Tech, Blacksburg, VA*

*Scott Grinker, Shure, Inc. Niles, Illinois*

Earphones that are designed for listening to music consist of in-ear devices (such as "ear buds," "ear pods," and other inserts), on-the-ear devices (lightweight headsets), and devices that encircle the ear (muff-style headsets). Both passive and active noise reduction (ANR) strategies are used. Depending upon the noise environment, the wearer of a music headphone may be in need of hearing protection, such as is the case with a disc jockey in a dance club. This research examined 8 commonly-available music earphones from 4 manufacturers to determine attenuation afforded. The devices were tested using standardized REAT (real-ear attenuation at threshold, per ANSI S3.19-1974) and MIRE (microphone in real-ear, per ANSI S12.42-1995) procedures. Ten subjects underwent both REAT and MIRE attenuation tests and also provided comfort preference rankings. The results indicated that certain music earphones *do* provide significant protection, while others offer little or no protection. Noise Reduction Ratings (NRRs) computed from the spectral data ranged from 25 to -7. For the sample, passive, insert-type devices generally provided higher attenuation than the ANR devices. There were also substantial attenuation as well as comfort differences between flanged and foam eartips. The research also offers a comparison of data emanating from REAT and MIRE protocols for a common set of products.

### **Attitudes Towards Noise and the Use of Hearing Protection in Young Adults in Sweden and the USA**

*Alice E. Holmes, Ph.D., University of Florida, Gainesville, FL*

*Stephen E. Widén, Göteborg University, University of Trollhättan/Uddevalla, Sweden*

*Soly I. Erlandsson, Göteborg University, University of Trollhättan/Uddevalla, Sweden*

Differences between Swedish (N=179) and American (N=203) young adults (17 to 21 years) regarding attitudes toward noise, hearing protection use and reported tinnitus and hearing loss were investigated. Multivariate logistic regression analysis was used to examine if attitudes, gender and nationality can explain hearing protection use. Results indicate that attitudes can predict hearing protection use to some extent. Large differences were found between Sweden and USA regarding attitudes towards noisy environments and actual hearing protection use. The Swedish sample had significantly greater use of hearing protection than the USA young adults. Likewise the USA subjects were indicated more positive attitudes towards noise than the Swedish subjects. Reported prevalence of hearing loss and tinnitus in the subjects will also be presented.

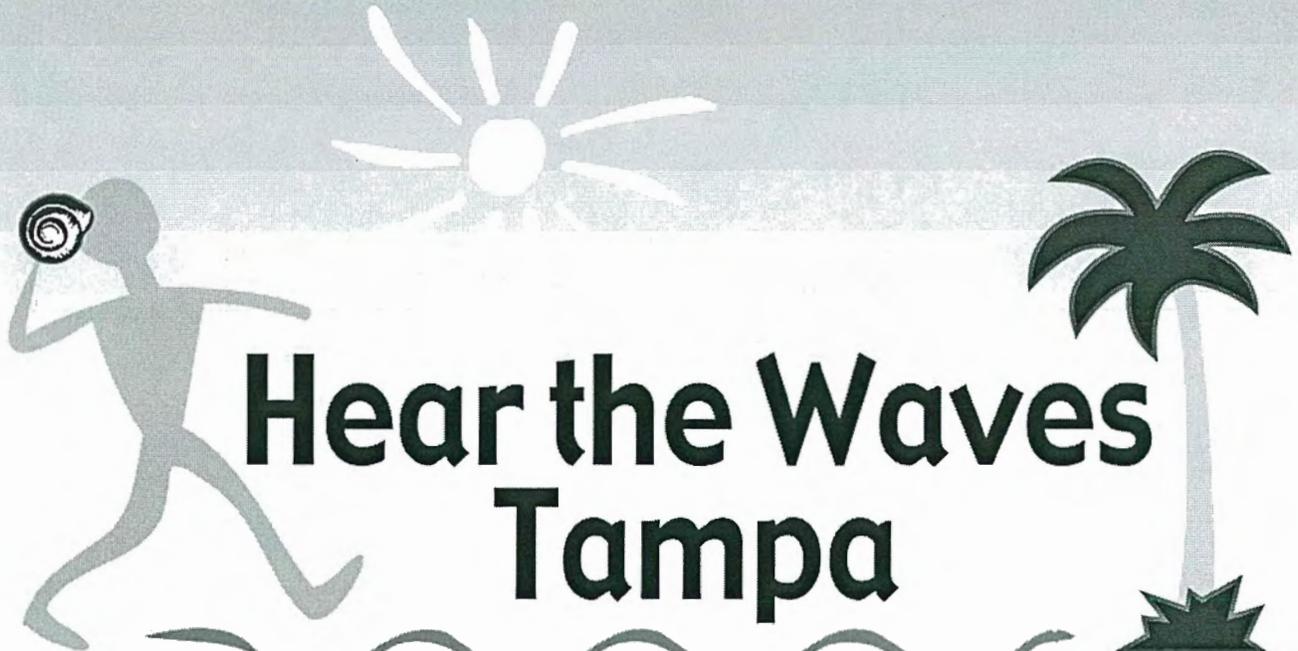
### **Recordable Hearing Loss in the US: 2004**

*Lee D. Hager, Hearing Loss Prevention Consultant, Sonomax Hearing Healthcare, Inc., Portland, MI*

While OSHA's revised criteria for recordable hearing loss as reflected in the revision of 29CFR1910 came into effect in 2003, a unique location for recording hearing loss was not placed on OSHA's recordkeeping form (Form 300) until January 2004. Because of this change, national incidence and prevalence analysis of occupational hearing loss is available for the first time for 2004. Analysis of Bureau of Labor Statistics data indicates about 28,400 recorded hearing losses in 2004, constituting about 11% of the total illnesses recorded, with manufacturing and transportation accounting for the majority of the hearing losses recorded.

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