### Noise Exposure and Hearing Conservation Programs in Selected Industries in Washington State

*William Daniell, M.D., MPH, Department of Environmental and Occupational Health, University of Washington, Seattle, Washington along with Susan Swan, Janice Camp, Mary McDaniel, Martin Cohen, Robert Leo*

We evaluated hearing conservation programs (HCPs) at 76 worksites in eight industries with high rates of hearing loss claims, to characterize the current risk for hearing loss. At each site, we interviewed the HCP coordinator (n=76) and a sample of employees (n=1,557); measured full-shift average noise exposures (n=984); made single-blind observations of hearing protector use (n=602, in five industries); and reviewed existing audiograms.

In each industry, 25% to 94% of monitored employees were overexposed (full-shift average >85 dBA). In general, HCPs were more complete in industries where overexposure was more common, and significantly less complete where overexposure occurred less often. In three industries, only half of observed employees used hearing protection when exposed. Higher levels of management HCP effort were associated with higher employee awareness and effort.

There is still substantial risk for hearing loss in noisy industries, particularly in industries where a limited fraction of employees is typically overexposed.

### Working Impaired in Dangerous Settings: What Workers Tell Us About Their Communication and Hearing Needs

*Robert Randolph, NIOSH, Pittsburgh, Pennsylvania*

This presentation will review the results of a study using a series of focus group discussions with hearing impaired construction workers and miners as well as interviews with their supervisors. These workers and their supervisors have the closest, most detailed view of the particular communication and hearing challenges hearing-impaired employees face in their workplace. Their views can help focus problem-solving efforts and identify issues that might otherwise have been missed.

### Sound Localization Wearing Level-Dependent HPD (Combat Arms Earplug)

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Soldiers in today's combat environment need hearing protection that is responsive to their communication needs. Current hearing protective devices are effective but are not conducive to verbal communication. A possible solution to the problem is the use of level dependent hearing protection, which allows verbal communication in relatively normal ambient noise levels and provides protection specifically against impulse noise. The U.S. Army recently approved the use of the combat arms earplug (CAE), which is an expanded French version of the level dependent earplug, developed at the French-German Institute. The combat arms earplug has two sides, one (yellow) is the level dependent earplug and the other (green) is the traditional triple-flange earplug. The purpose of this project was to determine the effects of CAE on the soldier's ability to localize sound sources in various listening conditions. The participants were seated in the center of an array of 37 loudspeakers distributed over three circular rings. Three groups of 12 listeners each were used as participants. Group one used the yellow side of the combat arms earplug, group two used the green side of the earplug and group three used the EAR foam plug. Within each group there were four listening conditions: open ears in quiet and noise and protected ears in quiet and noise. Participants were asked to localize various speech and environmental stimuli. Data comparison for all three earplugs has not revealed any significant differences in soldier performance although the yellow (level dependent) earplug resulted in slightly better performance than two others.

### Evaluation of Level-Dependent Hearing Protection Devices for Use with Impulsive Noises

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

As a part of a NIOSH Health Hazard Evaluation of law-enforcement personnel, the attenuation of several types of earplugs and earmuffs was measured in response to impulse noise produced by small-arms gunfire. The protectors were measured on a mannequin built by the Institute de Saint Louis for increased acoustic isolation of flanking pathways to the microphone. The earplugs demonstrated a range of peak reduction between 10 and 28 dB while the earmuffs ranged from 25 to 33 dB peak sound pressure level. The slopes of the peak reduction with peak level for most earplugs exhibited a slope of 0.2 dB/dB while earmuffs tended to have a slope of 0.5 dB/dB. Finally, the risk of hearing loss was estimated with the Auditory Hazard Assessment Algorithm for Humans (AHAAH model) and demonstrated a range of Auditory Hazard Units from 450 to 10 for impulses recorded underneath hearing protectors. AHUs could be reliably be predicted for small-arms fire from the peak level reduction.

### STS Recordability Panel

*Moderator: Nancy N. Green, AuD, Industrial Audiologist, Jacksonville, Florida*

*Panelists: George Cook, Workplace Group, Greensboro, North Carolina, Lynda Glaspey, OSHA Region 10, Seattle, Washington, Cathy Padolewski Cole, Sherwin –Williams Co., Cleveland, Ohio, Claude Revels, JM Family Enterprises, Deerfield Beach, Florida, Carolyn Tolley, ASI Health Services, Dallas, Texas*

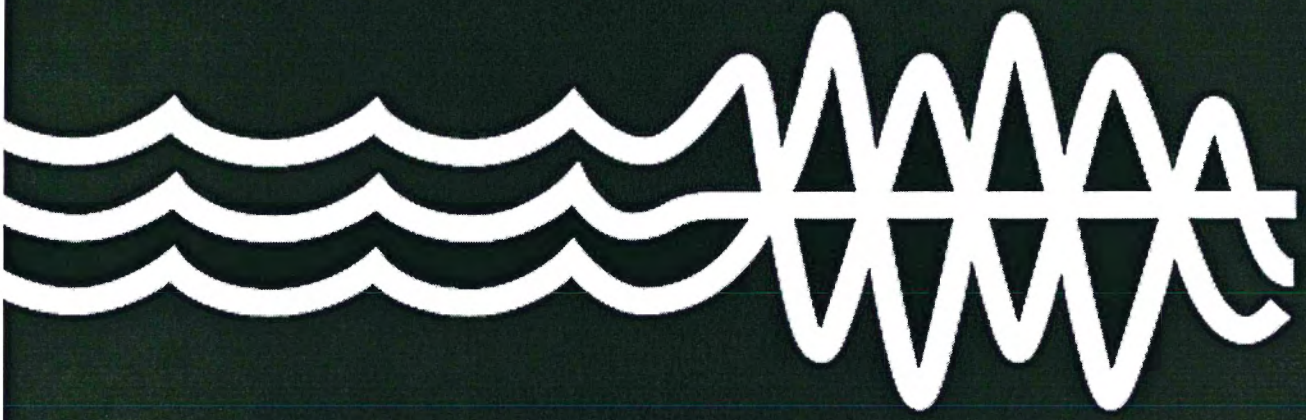
This panel discussion will present information on both the expected and unexpected effects that the recent revision of the OSHA Recordkeeping rule (Part 1904) has had on the provision of hearing conservation services and worker's compensation in the U.S. Panelists will present information from varying points of view including the audiometric service provider, safety director, industrial hygienist, the employer, hearing conservation program consultant, worker's compensation administrator, and OSHA. Each panelist will report on what their experiences have been over the past year, both good and bad, and how procedures/practices have been changed to reflect the new recordability criteria for noise-induced hearing loss.

### Recommended Criteria for Removing Employees from a Hearing Conservation Program

*Dennis P. Driscoll, P.E., Associates in Acoustics, Inc., and Laurie L. Wells, FAAA, Associates in Acoustics, Inc.*

Due principally to recent changes in the Occupational Safety and Health Administration's (OSHA's) occupational injury and illness

# Sail the Sound



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## 29th Annual NHCA Hearing Conservation Conference

February 19-21, 2004
Hilton Seattle Airport
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NHCA