

were no longer required to wear hearing protection.

**Lessons Learned:** Listen to employees. Effective engineering controls can be from employees who want a more comfortable work environment.

#### **CS-122-03**

##### **WITHDRAWN – Implementing HPD Fit-testing into a Hearing Conservation Program**

S. Henderson, Chevron Phillips Chemical Company, LP, Old Ocean, TX.

#### **CS-122-04**

##### **Does Handedness or Order of Test Effect Earplug Fit Results?**

T. Schulz, Honeywell Safety Products, Fredericktown, PA; R. Allomong, ConAgra Foods, Archbold, OH.

**Situation/Problem:** Hearing protection is a critical part of any successful hearing conservation program. Methods to individually fit-test hearing protectors will be discussed.

The gold standard for measuring the fit of earplugs is Real Ear Attenuation at Threshold (REAT) method of hearing protector measurement.

The result of REAT testing when one individual is tested is called Personal Attenuation Rating (PAR). Subjects test one ear at a time. Are order biases present when one ear is always tested first?

**Resolution:** Several data sets from various populations using the loudness balance test method will be analyzed to determine if ear bias is present. Additionally several experienced users data over multiple fits will be analyzed to determine if ear bias may be individually biased vs a method bias.

**Results:** Pilot results show possible ear bias for small groups of data, however as the population grows the ear bias disappears.

**Lessons Learned:** Personal Attenuation Ratings (PARs) must, by definition, be subjective in order to be compared to the goal standard of REAT. Individual measures of fit over time vary and the largest factor in that variability is, in fact, the fit of the earplug itself.

#### **SR-122-05**

##### **Evaluation of Exposure to Noise and Hearing Loss among Dentists in Yazd**

N. Tahmaseby, Yazd University, Yazd, Islamic Republic of Iran.

**Objective:** Noise is one physical agent which is disturbing for most people. These are many researches in industrial settings which show noise is one of the most important workplace exposures. A disturbing noise is a noise intervenes with conversation and communication, and may cause pain, injury or hearing loss.

**Methods:** This is a cohort study in 25 dentists with 3–15 years employment duration (case) and 28 dental students in 10<sup>th</sup> university term or higher (control).

**Results:** Noise level in dentistry equipment was lower than permissible level. 16% (4 persons) from dentists and 60/7% (11 persons) from students suffered from hearing loss in right ear and 4% (1 person) from dentists and 53/6% (15 persons) from students suffered from hearing loss in left ear.

#### **CS-122-06**

##### **Cicada Invasion! Noise Study of Brood XIX**

M. Bogard, Vanderbilt University, Nashville, TN.

**Situation/Problem:** The great Southern brood of cicadas (Brood XIX) invaded the Middle Tennessee area in the spring of 2011. Millions of insects collectively began their mating calls and generated enough noise to warrant noise testing.

**Resolution:** Area noise dosimetry was conducted for 3 days in 3 locations around Vanderbilt University to measure noise levels.

**Results:** Noise results approached the OSHA action level for Hearing Conservation for short periods of time, but time-weighted averages were below regulatory action levels.

**Lessons Learned:** For a six week period every 13 years, a significant amount of noise will be generated by Brood XIX in Middle Tennessee, but not enough to mandate the need for hearing protection.

#### **SR-122-07**

##### **Peak Noise Exposure during Concrete Grinding in Confined Areas**

F. Akbar-Khanzadeh, S. Milz, A. Ames, C. Wagner, J. Laughlin, University of Toledo Health Science Campus, Toledo, OH.

**Objective:** This study examined the levels of peak noise exposure during concrete grinding and complemented our previous study that assessed time-weighted-average (TWA) noise exposure for the same type of operation.

**Methods:** Minute-average peak noise levels were measured by a personal noise dosimeter (Spark 705+, Larsen Davis) while concrete grinding was performed in a confined area (an indoor field laboratory) using a variety of grinder types and dust control methods. The total grinding time was 1715 minutes covering 44 grinding scenarios.

**Results:** Overall minute-average peak noise exposure (dBC) during grinding was  $113 \pm 5$  (mean  $\pm$  SD) ranging from 104 -153. Noise exposure was different for 5 main dust control methods: (1)  $119 \pm 10$  during conventional (no dust control) grinding, (2)  $115 \pm 5$  during wet-grinding, (3)  $113 \pm 4$  when using a Shop-vac, (4)  $111 \pm 3$  when using local exhaust ventilation (LEV) - high-efficiency air filter (HEPA) within a tank (LEV-HEPA-tank), and (5)  $109 \pm 6$  when using LEV-HEPA-cyclone. Noise exposure (dBC) was also different for 3 sizes of grinding-cups (diamond blades) as follow: (1)  $115 \pm 5$  when using 6 inch (15 cm) diameter grinding-cup, (2)  $112 \pm 5$  when using 5 inch (12.5 cm), and (3)  $111 \pm 5$  when using 4 inch (10 cm).

**Conclusions:** The results of this study indicated that the levels of approximately 0.8% of samples exceeded U.S. Occupational Safety and Health Administration (OSHA) criterion of 140 dBC peak noise. The highest level of peak noise was generated when using conventional method and 6 inch grinding cup. It is recommended that the grinding operators should be monitored for peak noise level and protected accordingly.

#### **SR-122-08**

##### **Evaluation of Noise Exposure among Brazilian Headphone/headset Professional Users**

W. Iramina, S. Eston, University of Sao Paulo - Brazil, Sao Paulo, Brazil; J. Felicio, City Hall (Prefeitura), Jundiai, Brazil; M. Da Silva, Doulos Ambiental, Sao Paulo, Brazil. Electronic technologies have been improving the communication systems in many ways allowing sound devices to become better,

cheaper and widely used. In the professional field, millions of workers use headsets and headphones in order to keep in contact to costumers and other workers. Besides its professional use headsets are very popular among young people who use them for their mobile devices and video games. Although communication systems are much better nowadays, the sound pressure levels inside the headsets or headphones have become a huge concern because there are no well-established criteria associated to general workers. The standards for prevention of hearing losses are addressed to environmental noise which is measured outside auricular pavilion. The technology applied to measure sound levels inside the auricular pavilion is complex and there are still few devices available in the market. The available standards ISO 11904 parts 1 and 2 are very precise and efficient but their application is difficult. This study aims to discuss what parameters are necessary to evaluate the noise generated by headphones in workplaces and also to contribute to develop a measuring procedure. It is based on some experiences carried out by a Brazilian Telephone Company's engineer and on some attempts made to evaluate accurately the headphone users' exposure to noise in workplaces. Brazil has no standard concerning the evaluation of workers using headphones. Measurements using experimental devices (artificial ear) compared to third part researches have shown that several methods may become applicable and the results may suggest that there is a risk of hearing loss among Brazilian headphone/headset professional users. Considering their limitations and the lessons learned in the past, this study tries to contribute to establishing a Brazilian standard complying with ISO standards as well as for the development of new methods.

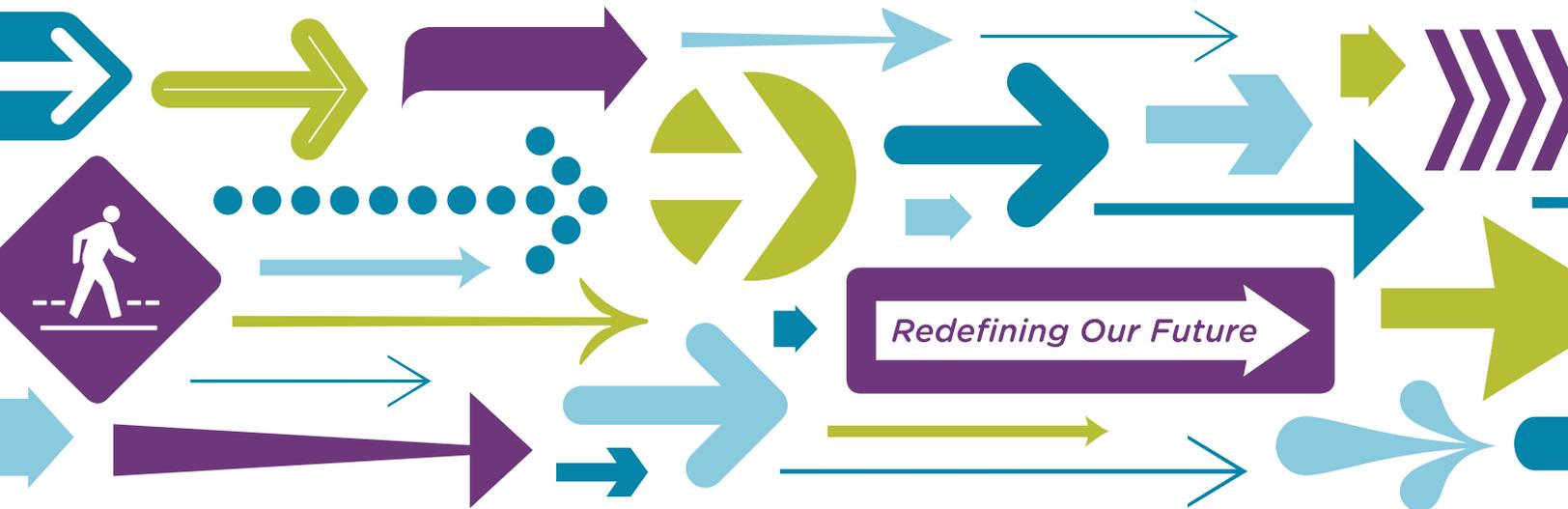
#### **SR-122-09**

##### **Noise Exposure Assessment in a Dental School**

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