Fit Testing for Hearing Protection

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Plan of Action

1. Discuss Hearing Conservation Program Requirements
2. Discuss Types of Hearing Protection Devices
3. Discuss Noise Reduction Ratings (NRR)
4. Discuss the Concept of Fit Testing and Verification
5. Discuss Different Fit Testing Systems Available
6. Discuss Integration of Fit Testing
Hearing Conservation Program: Hearing Protection Device Requirements

- HPD are provided at no cost for employees exposed to 85dB or greater.
- Employees shall be given a variety of HPD to choose from.
- Employer shall provide training on use & care of HPD.
- Employer shall ensure proper fit and supervise the correct use of HPD.

- Employer shall evaluate HPD attenuation for the specific environment in which the protector will be used.
- HPD must attenuate below 90 dB/85dB for an STS.
- HPD must be reevaluated if noise levels have changed.
Types of Hearing Protection Devices

- Earplugs
  - Foam
  - Soft Silicon (Flanged)

- Earmuffs

- Custom Earplugs
Key Barriers in HPD Use

- Comfort*
- Ergonomics
- Motivation*
- Environment (temperature)
- Communication Needs

- Wearing Time
- Lack of Training*
- Unknown Level of Protection*
Does this Earplug Fit Properly?

How much protection is this worker receiving?

Is it enough?

If you think you can answer these questions just by looking, think again!
Can I Trust the NRR?

In a word, NO!

The Noise Reduction Rating (NRR) value is accurate...

...in a laboratory under ideal conditions.

Do your workers work in a laboratory?
The NRR does not reflect real-world working conditions which significantly influence how much real protection your workers actually receive.
But I Can Derate the NRR by 50%

Think again! Studies show that many workers obtain less than 5 decibels of real-world hearing protection...and that’s way less than 50%.

Less than 5 dB!!!

Cutting the NRR in half guarantees nothing...and OSHA cannot require it.

Derating the NRR by any amount does not tell you if the worker is achieving sufficient protection where it counts...

IN THE REAL WORLD

Study conducted by Michael & Associates, Inc.
What about the 7dB Correction Factor?

- Unprotected dBA – (NRR-7dB) = Protected dBA
- Used to account for the de-emphasis of low-frequency energy from the A-weighting scale.
- Again, NOT real world!
Who is Better Protected?

Are You Sure?!
So How Can We Determine a HPD Level of Protection?

MAY WE RECOMMEND....

Fit Testing!!!!
Fit Testing In The News

- In a Best Practice Bulletin issued by an alliance between the National Hearing Conservation Association (NHCA) and OSHA, “ear plug fit testing was endorsed as a recommended best practice in reducing occupational hearing loss as well as a metric to assess a hearing conservation program's overall effectiveness.”

“the best hearing protector is the one that is worn properly whenever exposed to hazardous noise”
What is the GOAL of Fit Testing?

**GOAL:**
To provide an individual with feedback on whether they are properly wearing a HPD

AND

that it offers sufficient protection for the condition in which it is to be used.
How Do We Obtain Our Goal?

By Measuring the:

Personal Attenuation Rating (PAR)

The difference between the earplug-in measure and the earplug-out measure is the amount of hearing protection the worker receives.
How is the PAR Measured?

- **Objective Field Microphone-in-the-Ear (F-MIRE) Measures**
  - Involves a dual-microphone measurement of a test signal.

- **Subjective Real-Ear Attenuation at Threshold (REAT) Measurement**

- **Loudness Balance Technologies**
  - Involves an employee's response to sound stimuli.
How Do I Apply the PAR?

TWA-PAR = EPL

Expected Protection Level

The Level of Noise in Which the Employee is Working
**Fit Testing Systems**

- E-A-R-Fit Validation System - 3M
- FitCheck System - Michael & Associates
- INTEGRAfit - Workplace INTEGRA
- VeriPro - Howard Leight
E-A-R Fit Validation System
www.e-a-rfit.com

• **Objective**
• **ONLY** used with E-A-R line of insert hearing protectors
• Each protector has a port (or hole) that runs through the center.
• A dual microphone is used: one end of the mic is inserted into the hole of the protector and measures ear canal sound levels; the other end of the mic measures ambient sound levels.
• Employee sits in front of a small speaker.
E-A-R Fit Validation System
• Subjective
• Used with any brand of insert hearing protector
• Employee wears special headphones and takes a hearing test, listening to 250 to 3000 Hz 1/3-octave band filtered noise, with and without protectors in place.
• Software assigns employee a Personal Attenuation Rating (PAR) and generates a report.
• Subjective
• Used with any brand of insert hearing protector.
• Employee wears special headphones and takes a hearing test, listening to a 500 Hz tone only, with and without protectors in place.
• Software assigns employee a Personal Attenuation Rating (PAR) and generates a report.
• iPad App Version as well as Audiometer integrated unit.
INTEGRAfit® Quantitative Fit-Testing for Earplugs
—Audiometer & Apple® iPad® Versions
VeriPRO
www.howardleight.com

• Subjective
• Used with any brand of insert hearing protector.
• Employee wears special headphones and “balances” the loudness of a tone in one ear against a tone in the opposite ear at a known level.
• Balance is done with and without hearing protectors in place.
VeriPRO Earplug Field Verification Software
Factors to Consider in Fit Testing

WHO

WHAT

WHEN

WHERE

HOW
Do you have an adequate assortment of hearing protectors?
Who’s Going to do Fit Testing?

Health (OHNS)?
Vendor trained?
CAOHC trained?
Safety?
What approach will be used when conducting Fit-Tests?

Proactive approach?

Reactive approach?
Proactive Approach

- As part of annual hearing test
- As an independent event
As Part of Annual Hearing Test

- Lengthens time to do hearing tests
- May have to reschedule difficult-to-fit employees
As an Independent Event

- Establish Fit-test schedule
- May have to reschedule difficult-to-fit employees
Reactive Approach

Fit-test on an as needed basis
• When there are changes in hearing
• Based on employee concerns/complaints
Counseling

• What do you say to the employee after the fit-test?
• Generic vs. specific information
Monitoring

- Are employees wearing the HPDs for which they were fit-tested?
- How do you track this information?
- How often should fit-testing be re-conducted?
- What are acceptable re-test outcomes?
After all is said and done...

Fit test systems are tools to help achieve better employee fit of HPDs and to help better educate employees on HPD use.
The Bottom-line...

No matter which test method is used, individual fit testing has the potential to serve several POSITIVE purposes in hearing conservation programs!
Positive Purposes

- Can be a valuable training tool
- Can be used as a train-the-trainer tool
- Can assist with OSHA required audiometric follow-up procedures
- Can provide documentation of adequacy and training
- Can be used to assess the overall effectiveness of your HCP
- Can aid in the appropriate selection of HPD for new hires
- Can enable the ability to match the employee’s HP attenuation to their noise exposure level
And As A Result...

Research suggests that employees involved in the fitting process & receive positive feedback are more likely to have a positive attitude about using and wearing HPD correctly and consistently.

EQUALS:
Reduction of Noise-Induced Hearing Loss!!!