



*Innovative Field Practices in Hearing Conservation  
Three Companies Share Strategies and Re-define Success*

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## Introduction

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“We’ve got twenty-five years of audiometric data that shows what we’re doing in our Hearing Conservation Program doesn’t really work,” I was recently told by the safety manager at a large company who administered a totally compliant OSHA-standard Hearing Conservation Program. I couldn’t believe my ears. Here was a situation in which everything had been in place for over two decades: noise monitoring, audiometric testing, hearing protectors, annual training, and recordkeeping. But the number of recordable hearing losses continued climbing steadily.

The manager’s sentiment is one echoed in many noisy companies, both large and small. Employers invest the time and money to administer a compliant Hearing Conservation Program, with the expectation that providing earplugs should stop hearing loss. But the expectations are dashed when recordable hearing losses continue to occur, and claims for noise-induced hearing loss continue unabated — or worse yet, climb higher.

How does a safety manager take hearing conservation to the next level, from a Hearing Loss *Documentation* program to a Hearing Loss *Prevention* program? Safety and industrial hygiene professionals at three companies discussed with us how they changed their practices to make their Hearing Conservation Program a preventive force in their company’s safety strategy.

## Company 1 — California Manufacturer

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By all appearances, this manufacturer with 120 employees was doing everything right. Employees watched a motivational training video in groups prior to their annual audiometric testing. The video contained all the required elements: the effects of noise on hearing, the purpose and use of hearing protectors, and the purpose and procedures of audiometric testing. “But,” lamented the contracted audiologist, “we walked onto the production floor an hour later, and noticed the same ‘trained’ workers with earplugs barely inside their ears. Those earplugs were doing nothing more than looking good — they were not functional at all. We had to try a different approach.”

The safety manager pulled the plug on the annual hearing conservation video shown to groups of noise-exposed workers (“we would have employees tossing paper clips during our group sessions,” he said), and replaced the group training with a one-on-one review of each employee’s audiogram, and fit testing of hearing protectors. The results were embarrassing and enlightening. “We had workers who had participated in years of group training, and yet were unable to properly fit their foam earplugs — it had never been required of them. We even had managers who failed our proper-fit check.” The new one-on-one training format required every worker to demonstrate a proper fit — no exceptions.

Studies repeatedly confirm the advantage of one-on-one training and personal feedback in preventing hearing loss. For noise-exposed workers, that training is most effective when offered in conjunction with audiometric testing. Lower rates of hearing loss have been documented among employees who receive a copy and explanation of their audiometric results, compared to their co-workers who received no feedback. One research study has documented an average 14 dB increase in the measured protection of earplugs when workers received just two or three minutes of one-on-one training in proper earplug fitting. Another study found significantly better fit and attenuation of earplugs when training was administered individually rather than in groups.

### Company 1 — Continued

In research performed by the Howard Leight Acoustical Laboratory, we visited eight different locations to test 104 workers. Locations and workers were not pre-screened. Workers were asked to use the earplug they typically wear, inserting it in a normal manner. They received no training or coaching as part of the test. Using VeriPRO™, Howard Leight's new earplug fit testing technology, we were able to determine the initial attenuation of each employee. The results below show that the distribution of earplug fit follows a predictable one-tailed bell curve. The majority of workers achieved attenuation within  $\pm 5$  dB of the published attenuation, regardless of the model of earplug used. But nearly one-third of the workers achieved attenuation more than 5 dB lower than the labeled NRR. Armed with these individual measurements, a safety manager can target these low performers who are at risk for noise-induced hearing loss.

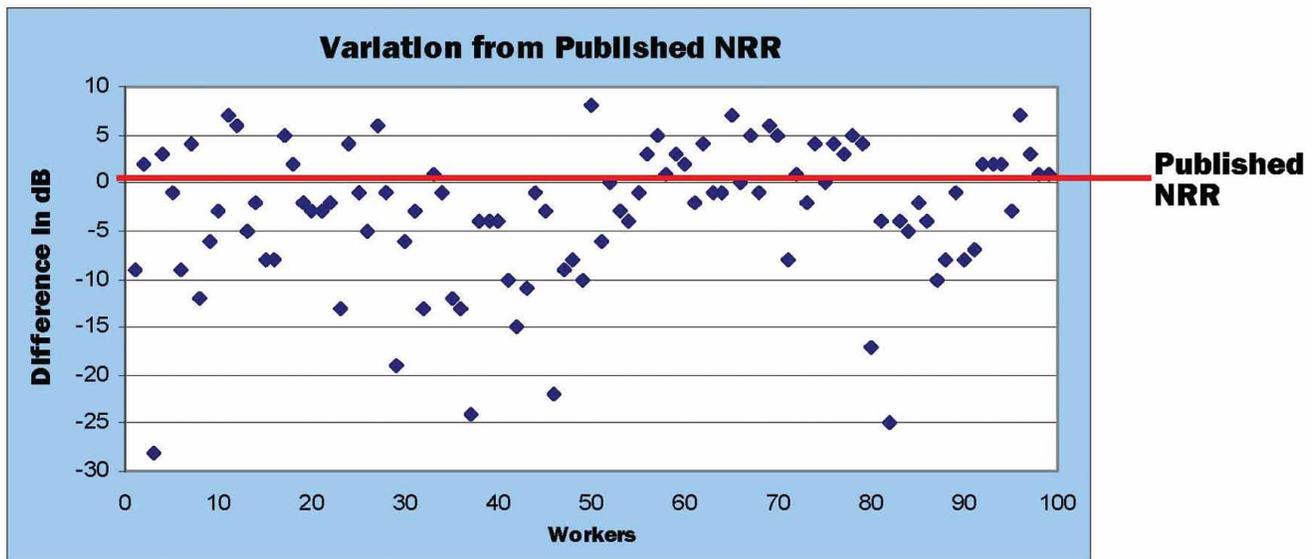


Figure 1. Variation of Published NRR (Howard Leight Acoustical Laboratory, San Diego, CA)

This scattergram shows the danger in using de-rating policies like the oft-misapplied 50% de-rating by OSHA. If we were to summarily assume that all earplugs only achieve 50% of the published NRR in the field, then clearly 2/3 of the workers are seriously overprotected, since they are achieving much higher protection than 50%.

While measuring the attenuation of an earplug is useful, the most valuable contribution of field verification systems will likely be in employee training. Fit testing of earplugs provides immediate feedback — users will know right away whether their fit is good or bad, and can make immediate adjustments.

And study after study confirm that the best predictor of whether a worker will achieve good protection from an earplug is one-on-one training, not group hearing conservation training.

#### TRAINING TIPS:

- Use one-on-one training to focus on proper fit.
- Document whether each employee can demonstrate a proper fit.
- Make sure every supervisor knows how to properly fit the hearing protectors, and how to visually check for proper fit in workers.

## Company 2 — Aerospace Manufacturer

When the safety manager of an aerospace manufacturer reviewed his Hearing Conservation training materials, something didn't sit quite right: the examples of noisy equipment described were all occupational. He knew his workers were exposed to hazardous noise at work, but he also knew they had some very high non-occupational exposures. "We adjusted our training to focus more on *off-the-job* hearing protection. For workers in our region, we call them 'the big three' — power tools, chainsaws, and firearms." By using workplace training to focus on non-occupational hearing protection, managers were bridging the gap for workers to carry over their hearing conservation practices from job to home.

"We also encouraged — not just allowed, but encouraged — our workers to take their hearing protectors home." And years after that take-home policy was initiated, there have been zero concerns or complaints about employees abusing the free earplugs.

Workers who comply with all hearing protection requirements at the workplace may revel in noisy recreational activities off-the-job. And since OSHA-required audiometric testing does not differentiate between occupational and non-occupational noise-induced hearing loss, employers may be stuck with the responsibility for those off-the-job hearing losses when they show up in future audiometric testing.

Our ears do not operate on a time clock: a 95 dB exposure at work is just as hazardous as a 95 dB exposure listening to loud music in the car, running power tools in the garage, or operating the lawnmower or edger in the yard. Unlike work, there are no posted warning signs for these non-occupational exposures. But the need for protection is just as critical to good hearing, whether on-the-job or off.

### TRAINING TIPS:

- Encourage workers to use their hearing protectors for off-the-job exposures.
- Employees should be familiar with the rule of thumb for identifying hazardous noise: if you must shout to be understood by someone standing an arm's length away, then that background noise is probably hazardous (85 dB).
- During safety fairs and in-house health clinics, include Hearing Conservation training and perform earplug fit testing with VeriPRO™ to demonstrate proper use of HPDs.



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## Company 3 — Metal Fabrication Shop

Hearing Conservation procedures had been in place at one metal fabrication shop since the 1980s. “That was kind of the problem,” said the safety manager. “We were in a Hearing Conservation rut. We were going through the motions without seeing any success, or even knowing how to define success in our program.” When managers stepped back to assess the program, they realized success could only be defined one way for them: 0% recordable hearing losses.

Their first step was to revisit their noise control options. A Hearing Conservation program for noise-exposed workers is *not* the first line of defense against hazardous noise; eliminating noise hazards at its source is the only sure method of preventing workplace hearing loss. Complete noise control is sometimes not feasible, but many engineering solutions are very cost-effective when compared with the ongoing expense of recordable hearing losses.

By contacting vendors and equipment suppliers to explore updated noise control features, the fabrication shop was able to significantly reduce noise levels, thus requiring fewer employees to be monitored in the Hearing Conservation program. While noise control solutions vary significantly for each work process, successful reduction of noise often involves a combination of “Buy Quiet” policies, retrofitting existing machinery, erecting protection barriers to block noise, or isolating noisy equipment to a protected area.

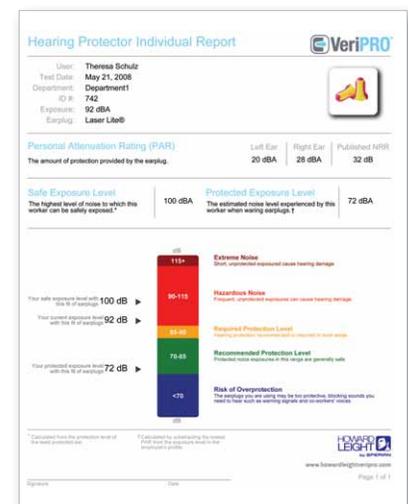
To reach their goal of 0% recordable hearing losses, shop management chose another solution for the remaining noise-exposed employees: fit testing of hearing protectors. Workers were given a specialized hearing test while wearing their earplugs, then repeated the test without the earplugs. The difference between the two hearing tests essentially indicated how much protection was achieved by the user in real-world usage (for a description of Howard Leight’s VeriPRO™ fit testing system, go to <http://www.howardleight.com/veripro>).

Fit testing of hearing protectors makes the common estimation method (the Noise Reduction Rating) mostly obsolete. The NRR is a laboratory evaluation method used to estimate noise protection, but it is a poor estimator of a hearing protector’s performance on individual users. Fit testing now allows safety managers to measure — not just estimate — the amount of protection a particular worker attains with his/her hearing protectors. Not all workers will achieve an adequate fit with all earplugs, and fit testing is the best available tool to measure those differences. One facility places color-coded stickers on the hardhats of workers who have “certified” proper attenuation with their earplugs.

For these companies, success in hearing conservation was not simply defined as implementing an OSHA-compliant program. Instead, success has been defined as preventing noise-induced hearing loss, both on and off the job. Thinking out of the box, and with the commitment of management, these companies have taken hearing conservation to a new level of worker safety.

### TRAINING TIPS:

- **Do not assume the noise is insurmountable: reconsider engineering solutions to reduce the number of exposed workers.**
- **For noise-exposed workers, use fit testing to ensure adequate real-world protection is being achieved.**



Howard Leight’s VeriPRO technology measures real-world attenuation of unmodified earplugs and can be used as a means to improve individual employee training and enhance the overall effectiveness of hearing conservation programs.

Sperian Hearing Protection, LLC, recommends all users of its products undergo thorough training and that all warnings and instructions provided with the products be thoroughly read and understood prior to use. It is necessary to assess hazards in the work environment and to match the appropriate personal protective equipment to particular hazards that may exist. At a minimum, a complete and thorough hazard assessment must be conducted to properly identify the appropriate personal protective equipment to be used in a particular work environment.

**▲ FAILURE TO READ AND FOLLOW ALL PRODUCT WARNINGS AND INSTRUCTIONS AND TO PROPERLY PERFORM A HAZARD ASSESSMENT MAY RESULT IN SERIOUS PERSONAL INJURY, ILLNESS OR DEATH.**

For further information on VeriPRO or other Hearing Conservation topics, contact Howard Leight VeriPRO Technical Support at: 877/VERIPRO.

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