

# NRRs for Hearing Protectors: A Change is Coming

EPA and most people involved in bringing about the new ratings believe they will reduce hearing loss and improve hearing conservation programs.

BY BRIAN MYERS

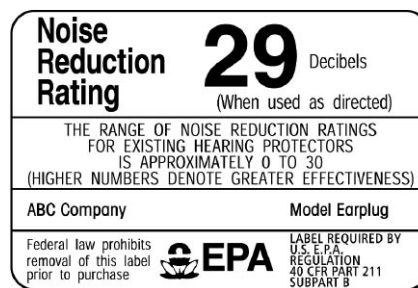
**P**erhaps the most common criterion for specifying hearing protection devices (HPDs), the NRR or Noise Reduction Rating—that bold number on every box of ear plugs—is about to change, hopefully for the better. For years, safety professionals selecting hearing protection have enjoyed the seeming simplicity of a single number that could be used to differentiate products in the purchasing process, a number which every hearing protector was required by law to display on the package.

Actual application of that number in noisy workplaces, though, has proven challenging. OSHA requires subtracting seven from the number and dividing it by two for some applications, but not for others. NIOSH recommends a variable derating based on HPD type. Transformation of the seemingly simple NRR to something useful in practice became “rocket science” as concerns about validity of the labeled values, derating, population statistics and A-weighted versus C-weighted sound levels emerged. The Environmental Protection Agency (EPA) has undertaken a process to revise hearing protector testing and NRR labeling using the latest ANSI standards. While the pros and cons of these NRR changes will have to be determined in practice in the hearing conservation programs across the United States, changes in the tests and NRR labels are a certainty.

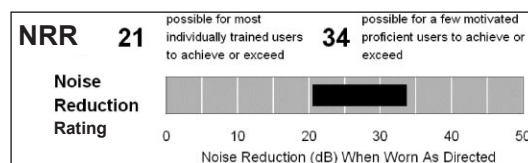
### What Does This Mean to Me?

In the early months of 2009, safety directors and other hearing conservationists may start to receive products labeled with the new NRR from their safety products distributors. The most noticeable change will be in the appearance of the label itself.

**One number becomes two.** The most obvious difference in the label is that what was once a single NRR number has now become a two-number range. The higher number of the new range indicates the amount



Old NRR Label (circa 1980)



New Proposed Label (EPA will likely make small changes to this)

of protection which about one-in-five motivated and highly trained wearers would attain or exceed. The lower number indicates the protection which four-out-of-five individually trained wearers would meet or exceed, and it is this lower value that should be used to calculate employee exposures and will probably be used by OSHA to determine whether protection is adequate.

A range of numbers can provide more information regarding how consistently the hearing protectors provide protection within a group. By subtracting the lower number from the higher one and comparing the difference to the same calculation for other hearing protectors, hearing conservationists can get an idea of the uniformity of protection given by that hearing protector where smaller differences would indicate more consistent performance. In the example label, the range is 13—the difference between the higher number, 34,

and the lower number, 21. You should expect that this protector would give less consistent protection than a protector that had a range of five or 10 but provide a more consistent performance than one with a range of 20. As you might guess, ear muffs will generally have smaller ranges than insertable ear plugs because the protection they provide tends to be more consistent across groups of users.

How will the numbers compare to the current single NRR? The current NRR will likely fall within the range between the upper and lower values, but it will vary by product. Until data are reported using the version of hearing protector test standard that will be required by the EPA—ANSI S12.6-200X, a document that will not be finalized and approved until later this year—the exact numbers are still open to question.

The exit of the single NRR number should bring about a new appreciation that the protection levels of a hearing protector in a group of wearers varies—no single number can adequately describe these changing lev-

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els of protection from one individual to the next. Selecting and specifying a hearing protector might come down to issues that today are sometimes considered secondary but really matter in effective hearing loss prevention programs: comfort, ease of use, demonstrated ability of workers to properly use the chosen HPD, and other, less-quantifiable attributes.

**No 7-dB correction required.** Many hearing conservationists have performed their sound level measurements with A-weighting as required by OSHA. However, when NRRs have been applied to these A-weighted sound levels, a correction factor of 7 dB is subtracted from the old NRR. The new NRR numbers are calculated to be applied directly to the A-weighted sound-level so that no 7-dB adjustment will be required.

**More realistic ratings?** Efforts have been made in the standards development process to get the lab evaluations to better reflect real performance, to reduce the likelihood of a need for derating. EPA representatives have indicated that one of the key reasons to undertake the time-consuming regulatory process is to do a better job of making the labeled attenuation values more reliable, and thus less (or not) subject to after-the-fact derating. It is not yet clear that the new numbers will produce values that can be generally expected to reflect workplace hearing conservation experience. A derating may still be necessary. This determination may be made by the professional community or by OSHA as they begin to plan for application of the new rating method.

**Electronic and other specialized hearing protectors to get an additional label.** If you are interested in hearing protectors that incorporate level-dependent attenuation or electronics for sound transmission or active noise reduction, these products will have an additional graphic (probably a bar as shown in the illustration previous) within the EPA-specified label to specify the level-dependent and/or electronic performance. This additional graphic will be similar to the first, showing a range of two numbers and bar graph, but in this case, the attenuation numbers will denote performance of the device with the electronic or other feature activated. This will be the first standardized comparison of the performance for these types of devices available to hearing conservationists!

### More Effective Hearing Loss Prevention

EPA and most of the other individuals involved in bringing about these changes believe that they will result in improvements in hearing conservation programs and reduction of hearing loss. That is the ultimate purpose for these changes. Whether or not this positive impact is realized will ultimately depend upon the safety directors and hearing conservationists who will use this new system in their product selection processes. The best way to ensure you get the maximum benefit from this new NRR for your program is obviously to learn as much as you can about it, ask questions, and let EPA know your feelings about the change.

For additional information on this new proposed NRR, go to [www.regulations.gov](http://www.regulations.gov), click “advanced docket search” under “More Search Options,” select EPA as the agency, and then OAR-2003-0024 as the docket number. To give any opinion or feeling that you may wish to share with EPA about this proposed label, you may want to participate directly in a public hearing that EPA will hold on the matter sometime in 2008.

### Individual Fit Validation is Still the Only Guarantee

No matter what changes are made to the NRR, users still must recognize it is a population statistic and cannot be used to accurately predict the amount of protection an individual actually attains from using that hearing protector. The only way to gain confidence for each individual’s protection level is to conduct individual fit validation—a test of each person wearing his or her own hearing protector that documents the level he or she receives from that protector. These fit validation systems are beginning to make their way into industrial hearing conservation programs. To learn more about them, please visit [www.e-a-r.com/pdf/hearing\\_cons/0629.pdf](http://www.e-a-r.com/pdf/hearing_cons/0629.pdf). **OHS**

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