The Noise Control Partnership

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Due to the inherently dangerous nature of construction work, chronic health hazards such as noise have received little historic attention. In recent years, however, noise exposure and other health hazards have received more emphasis; noise-induced hearing loss is now a priority item on the National Institute for Occupational Safety and Health's (NIOSH) National Occupational Research Agenda. NIOSH estimates that at least 420,000 US construction workers are potentially exposed to hazardous noise (exposure levels above 85 dBA) (NIOSH, 1998). Rates of hearing loss among US construction workers are high, as well: an inventory of 2300 crane operators, carpenters, operating engineers, and electricians found NIHL rates greater than 20% in each trade (study by D. Ohlin, cited in Suter, 1999).

A recent article in the magazine Construction Engineering and Safety illustrates the current US approach to dealing with occupational construction noise (Walker, 2001). The article, which cites statistics from the American Road and Transportation Builders Association, OSHA, the National Safety Council, and the Bureau of Labor Statistics, compares the road construction industry costs associated with 100% use of hearing protection devices (calculated at $36 million/year) to those associated with noise-induced hearing loss claims (calculated at $50 million/year), and comes to the conclusion that it would be $14 million cheaper to provide all road construction workers with HPDs than to pay for NIHL claims. Although this conclusion seems reasonable from a pure cost perspective, and the author is clearly interested in protecting workers, the entire argument is based on the assumption that simply providing workers with HPDs will result in the elimination of NIHL. This is clearly an incorrect assumption. Achieving 100% usage rates for noise-exposed workers would be an ambitious goal for an established and effective HCP in a fixed industry. For the approach described, which depends on HPD use alone - with no mention of the costs associated with training and other HC support functions – in a mobile and highly transient workforce, it is nearly inconceivable.

A recent study demonstrates the difficult prospect of achieving high usage rates in construction workers (Lusk, 1998). This study, which examined 400 operating engineers, carpenters, and pipefitters, found trade-specific usage rates of 18-49%. However, 44-65% of the same workers reported a perceived hearing loss. In other words, as many as 2 of every 3 workers questioned felt they had a hearing loss, but only 50% - at most – used hearing protection regularly. If workers who already suffer from a perceived hearing loss are unwilling to use HPDs, it seems doubtful that younger construction workers will use them. Several recent studies at the University of Washington have included direct observation of HPD use in several trades, and have noted even lower usage rates of 9-15% (Ren, 1999; Whitaker, 2001).

A better strategy for reducing noise exposure, and therefore NIHL rates, is to eliminate or reduce noise exposures wherever possible through the use of noise control methods. Unfortunately, there has been little incentive for the US construction industry to incorporate such methods into their processes. Although regulations exist which require hearing conservation programs and noise control for high noise exposure levels, there has been very little regulatory enforcement of these regulations. For example, in the 18,000 OSHA construction inspections in 1999, only 45 noise- and 19 hearing conservation-related citations were issued (Jeffress, 2000). In addition, while regulations issued by the US EPA Office of Noise Abatement have never been rescinded, there has been no enforcement of these regulations since the office was de-funded in 1982.

Although construction noise exposures have not been thoroughly characterized, existing research provides a useful picture of the biggest sources of noise exposure. Carpenters, laborers, ironworkers, sheet metal workers, and operating engineers are all potentially exposed to high noise. Carpentry and concrete work are associated with high noise levels, as are pneumatic tools and heavy equipment and the construction stages of excavation and erection (Neitzel, 2000; Suter, 1999).

While construction noise controls offer an excellent way to reduce noise exposure level, certain factors must be considered prior to their implementation. Construction contractors typically operate at a relatively slim profit margin of 1-5%, so cheaper controls are more likely to be adopted. The common industry perception of noise controls being extremely costly and complex must be overcome before controls become widely accepted. Controls must be effective; if they don't reduce exposures under actual field conditions, they are a waste of time and resources. Controls must be accepted by workers; if work progress is slowed or interrupted too drastically, workers will reject the controls, and they will not be used. There are a large number of noise sources on any construction site; the worst sources – both in terms of highest noise levels and number of workers exposed – must be addressed. Lastly, there is very little information currently available to contractors regarding construction-specific noise controls.

In an effort to increase the acceptability of noise controls to the construction industry, an effort is underway to create a "one-stop shopping" information source on construction noise controls. This effort is being conducted by a group called the "Construction Noise Control Partnership" (NCP) spearheaded by Scott Schneider, Director of Health and Safety for the Laborers Health and Safety Fund of North America (LHSFNA). The NCP is made up volunteers from a variety of areas, including unions, contractors, regulatory agencies, academic institutions, insurance companies, equipment manufacturers, trade organizations, consulting firms, and professional organizations. Equipment manufacturers and contractors are a critical element in any noise control effort, since the equipment they choose to market and purchase/lease, respectively, determines site noise levels. A recent informal survey of 43 members of the Construction Industry Manufacturers Association shows great promise. The survey indicated that 76% of manufacturers measure the noise levels of their equipment; however, only 45% of these make this information available to the public. Fifty-six percent of those polled indicated that at least one of their products has a hearing protection warning, though only 11% of those labels include a specific decibel level. Most importantly, 63% of those polled see some demand for quieter equipment, and 69% have received requests for the noise level of particular pieces of equipment. These results suggest that manufacturers do have an interest in the noise levels of their equipment, and that they may be receptive to a movement to reduce those levels (Hutchison, 2000).

The NCP is working to promote knowledge and use of noise controls in several of ways. The first is through the development of an equipment-specific noise database. The NCP is developing a protocol for making standardized sound pressure level measurements. With this protocol in place, comparable sound pressure data can be collected on a variety of construction equipment. This data can then be maintained in a searchable public database, allowing contractors to review and select similar equipment based on SPL, in much the same way that HPDs can be compared by NRR. The NCP is also working to develop informational materials and a best practices guide, and to make them available to the industry. The best practices guide will describe typical construction equipment and common noise exposure scenarios, and will list a variety of proven ways (and expected costs) to address these exposure issues through noise controls. The NCP is also partnering with other organizations such as NHCA and the National Institute for Deafness and Communication Disorders to promote noise control and the reduction of noise exposure levels through voluntary and regulatory actions.

There are a number of existing programs from which the NCP can draw ideas and concepts. The existing US EPA Office of Noise Abatement regulations, though not currently enforced, offer a model of noise control which can be adopted and modified by the NCP. One element of the Office of Noise Abatement was a “Buy Quiet” program designed to help governments at all levels select and purchase quiet equipment when possible. This is an excellent concept which should be encouraged and endorsed by the NCP and other organizations.

The German Blue Angel Program offers another model noise control alternative. This program allows manufacturers to voluntarily submit specific equipment for analysis; equipment meeting certain criteria, including sound power levels, are designated as environmentally-friendly. Once the manufacturer and the German Federal Environmental Agency sign a 4-year contract, the equipment can be marketed with the Blue Angel symbol, which is considered a positive sales attribute. This program began certifying low noise construction equipment in 1988, and covers nearly all types of heavy mobile equipment. Nearly 40 manufacturers – 15% of which are non-German – currently market over 200 Blue Angel-designated construction products (Suter, 1999).

The Commission of the European Communities issued a directive in July 2000 which mandates noise labeling for equipment sold in the European Union states. This directive establishes guidelines for the measurement of sound power and labeling of 22 types of construction equipment, and also sets acceptable sound power emission requirements. The directive specifies a two-stage adoption of noise limits: the first stage becomes effective in March 2002, the second in March 2006. The second stage lowers the allowable noise levels by 2-3 dB; this will require changes in, or elimination of, an estimated 50% of equipment currently on the market. All EU-marketed equipment must have a CEC label and carry what is essentially a guarantee on the noise levels produced by the equipment. As part of this directive, a repository of noise level data will be designed and maintained by the Commission (Irmer, V, 2000).

Other sources of noise control information which may be of assistance in the NCP effort are the extensive noise control literature available from Worksafe Western Australia; the “Noise Management Guide” published by the University of New South Wales, Australia; the “Sound Solutions Guide” from the UK Health and Safety Executive; and the “Construction Noise Guide” put out by the Workers Compensation Board of British Columbia.

The nature of construction is such that hearing protection will always be a reality when workers are involved in certain processes. Effective hearing conservation programs, including training, HPDs, and audiometry, are essential to protect and preserve the hearing ability of construction workers. However, until noise control efforts are made an integral part of every hearing conservation program, overexposures and subsequent NIHL will remain a problem. The most effective way to protect workers' hearing is to prevent noise exposure in the first place; this is exactly what the NCP hopes to accomplish.

For additional information, visit the Noise Control Partnership website:
www.lhsfna.org/html/_noise_partnership.html

References

Hutchison, R. Summary of August 8, 2000 Construction Industry Manufacturers Association Product Safety Seminar. Personal communication on November 20, 2000.

Irmer, V. Recent development in European noise legislation concerning construction equipment. Presentation at the National Conference on Noise Control Engineering. Newport Beach, USA. 2000.

Jeffress, C. Speech at National Conference on Preventing Hearing Loss in Construction. Washington, DC, USA. March 30, 2000.

Lusk, S. L., M. J. Kerr, and S. A. Kauffman. Use of hearing protection and perceptions of noise exposure and hearing loss among construction workers. Am Ind Hyg Assoc J, 1998. 59(7): p. 466-70.

National Institute for Occupational Safety and Health. Criteria for a Recommended Standard: Occupational Noise Exposure. DHHS (NIOSH) Publication No. 98-126. Washington, D.C.: Department of Health and Human Services/National Institute for Occupational Safety and Health, June 1998.

Neitzel, R., N. S. Seixas, J. Camp, and M. Yost, An assessment of occupational noise exposures in four construction trades. Am Ind Hyg Assoc J, 1999. 60(6): p. 807-17.

Ren, K. An evaluation of noise exposure in construction electricians. Department of Environmental Health. 1999, University of Washington: Seattle.

Suter, A.H., Construction noise: Exposure, effects, and the potential for remediation. 1999, Alice Suter and Associates: Report for the Occupational Safety and Health Administration: Ashland, OR.

Walker, J. Hearing protection: Bottom-line benefit. Const Eng Saf 2001 1(3): p. 8.

Whitaker, C. Accuracy of construction task recall for epidemiological exposure assessment to noise. Department of Environmental Health. 2001. University of Washington: Seattle.