Working Smart

NIOSH develops technology and products that address exposure to noise at the work site.

By Dana C. Reinke, Ph.D., and David K. Ingram

Researchers at the National Institute for Occupational Safety and Health partnered with the water well industry to develop engineering control technologies and training products to address noise exposure at the job site.

Noise-induced hearing loss continues to be a problem in the well drilling industry. Research conducted by NIOSH found that air rotary drill rigs produce sound levels more than 90 dB(A) over the course of an eight-hour workday. Sounds levels above 90 dB(A), identified during hammer drilling and the hammering of casing, exposes workers to levels that can damage hearing. A typical air rotary drill rig provides no barrier, for noise and dust protection, between the drill's control panel and the drill stem.

The development of a partial cab is the clearest example of NIOSH's research partnership with the water well industry. NIOSH researchers determined that an engineering noise control to protect the operator at the rig's control panel would be effective, based on typical work site conditions. Many surface rigs do not have full cabs as a result of the original equipment manufacturer design or the high cost of aftermarket products.

Developed as a partial cab, the NIOSH engineering noise control design addressed stakeholders' needs associated with cost, transport, and worker usage (Figure 1). Field tests found the partial cab effective in reducing sound levels at the rig's control panel, a typical location for a drill rig operator. Sound levels at the control panel were reduced from 104 to 96 dB(A) (Figure 2). Coupled with continued use of personal protective equipment, such as hearing protection devices, the partial cab can help to reduce noise exposure.

NIOSH researchers created a CD with information about noise exposure and the partial cab. Most important to well drilling companies is information on how to construct and attach the partial cab to drill rigs. The CD can be viewed on a standard computer and includes a video of the partial cab in use on a work site. Computer-aided design drawings are included on the CD and provide detail of the cab design as well as information on construction materials and design details.

Additionally, the CD provides background information on noise-induced hearing loss and hearing protection devices to increase knowledge about this occupational health concern. This information can be viewed by all company employees to help promote the partial cab's importance to workers using the cab.

Figure 1. The partial cab is retrofitted to the air rotary drill rig with a steel frame. The cab slides on a heavy duty linear rail that supports the weight of the cab, allows for easy operation, and resists wear.

Figure 2. In field tests, the partial cab reduced the sound level at the operator control panel from 104 to 96 dB(A). Coupled with continued use of personal protective equipment, such as hearing protection devices, the partial cab can help reduce noise exposure.

More information on the partial cab noise control technology can be downloaded from *www.cdc.gov/niosh/mining*.

NIOSH researchers also examined the health and safety training needs of workers in the ground water industry. It was quickly realized that most workers learn health and safety on the job and do not attend any sort of formal training. In addition, there is not a lot of time for daily "tailgate talks" or "shop talks" on health and safety issues. As a small business industry, the owner is often operating a drill rig along with his other employees. In general, new employees learn the job in an apprentice style system. As a result, workers and owners have few opportunities to access uniform health and safety information based upon the job — an outdoor work environment with daily change in work sites.

With this information, NIOSH researchers developed two products that deliver health and safety information to fit into the daily work of well drillers. Both are information circulars and are available through download at *www.cdc.gov/niosh/mining* and the NGWA Web site at *www.ngwa.org/publication/publications.cfm*. These circulars are:

- *Water Well Safety Bits*. This booklet provides information in a "quick bites" style. It is presented in a magazine format and can be left on

Figure 3. This NIOSH magazine-style booklet talks about preventing hearing loss, electrical safety, and training young workers in the water well industry.

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a break table or attached to a bulletin board. As one well driller joked, it could also be used as a "bathroom reader." Topics covered included noise-induced hearing loss, electrical safety, and training younger workers (Figure 3).

- *Noise Exposure and Overheard Power Line Safety*. This is an information packet that can be brought to the work site and reviewed during downtimes in the workday. The five double-sided documents are laminated to withstand the mud, water, and weather found at a typical well drilling site. As five separate documents, they can be rotated through the workforce with placement on various rigs, viewed in various combinations, or as one complete set. Topics covered include noise-induced hearing loss and electrical safety (Figures 4 and 5).

Developed with an appreciation of industry practices, the design of the partial cab and the delivery methods of the health and safety materials represent NIOSH's efforts to translate research findings into results employed in the workplace.

Figure 4. Laminated materials cover both electrical safety and hearing loss prevention. The five documents can be viewed separately or attached to a metal ring and flipped through.

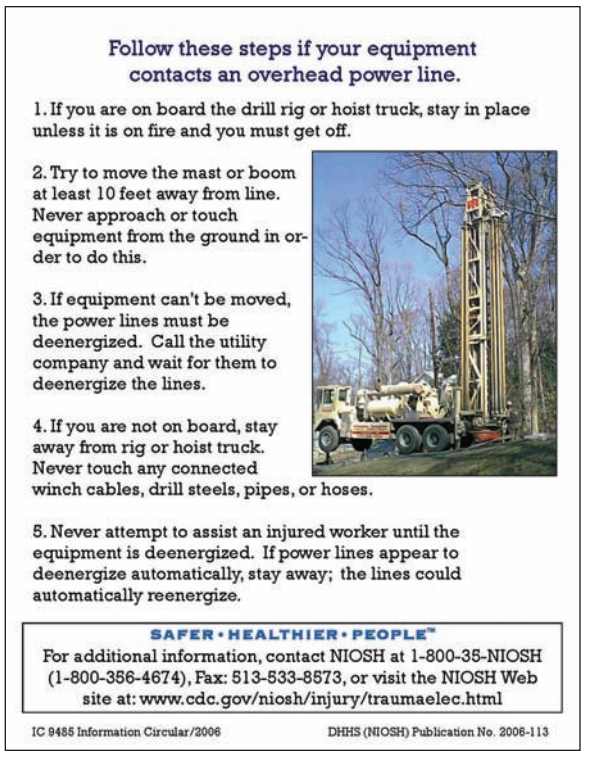

Figure 5. The double-sided laminated sheets provide information that can be used to help train workers. This particular sheet describes what to do if drilling equipment comes in contact with a power line.