

## The Partial Cab: A New Noise Engineering Control for Surface Drill Rigs

### Objective

The National Institute for Occupational Safety and Health (NIOSH), in partnership with stakeholders in the mining and surface drilling industries, conducted research to develop engineering control technologies that reduce workplace noise exposure. The result of this research partnership is the development of a partial cab.

### Background

Noise-induced hearing loss (NIHL) continues to be an occupational health problem in the U.S. mining industry. Hearing loss data suggest that by age 50, nearly 90% of coal miners have a hearing impairment. This compares to 10% for a general population of nonexposed males. Previous studies showed that operators of noncab surface drill rigs are overexposed to noise. These rigs are used in various surface drilling industries, including mining and construction. Many surface rigs do not have full cabs as a result of the original equipment manufacturer design or the prohibitive cost of aftermarket products.

### Approach

Engineering controls are the most desirable among the hierarchy of controls to lower noise exposure and prevent NIHL. NIOSH researchers determined that a noise control to protect the operator at the rig's control panel would be effective based on the organization of work practices and typical worker behaviors. As a result, researchers developed the partial cab (Figure 1). This engineering control design

addressed stakeholders' needs associated with cost, transport, and worker usage. Field tests found the partial cab effective in reducing noise exposure at the rig's control panel, a typical location for a drill rig operator (Figure 2). In one case, sound levels at the control panel were reduced from 104 to 96 dB(A). Coupled with continued use of personal protective



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 the field, the sound level at the operator's station without the partial cab was over 100 dB(A) during hammer drilling. The partial cab reduced the sound levels by 5–9 dB(A).

equipment such as hearing protection devices, the partial cab can help reduce noise exposures below the NIOSH recommended exposure limit (85 dB(A)) during a typical workday.

### **Partial Cab Communication Suite**

A communication suite (DHHS (NIOSH) Publication No. 2007–147c) was assembled with multiple information components to help surface drilling operators understand the benefit of this noise control technology, as well as how to construct the par-

tial cab. The suite is packaged on a CD to be viewed on a standard computer and includes video, graphic, and instructive components. For example, a viewer of the CD can watch a video that highlights the benefits of the partial cab in real work scenarios, view CAD drawings of the partial cab design, and then print out information on construction materials and design details. The CD also provides background information on NIHL and hearing protection devices to increase knowledge about this occupational health concern. This information can be coupled with an accompanying training checklist to help promote the partial cab's importance to workers using the technology.

### **For More Information**

The Partial Cab Communication Suite is available through NIOSH at <http://www.cdc.gov/niosh/mining/pubs> or through the National Ground Water Association at <http://www.ngwa.org>

For more information on partial cabs for reducing noise exposure, contact David S. Yantek, NIOSH Pittsburgh Research Laboratory, P.O. Box 18070, Pittsburgh PA 15236–0070; phone: (412) 386–4498; e-mail: [DYantek@cdc.gov](mailto:DYantek@cdc.gov).

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