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Blast Area Security: Flyrock Safety

Objective

The NIOSH Office of Mine Safety and Health has released communication products about flyrock safety in the form of informational brochures, flashcards, and toolbox talk materials. Both the mining and construction industries are targeted with these helpful communication tools. These new products can be used as refresher training for employees and as introductory safety materials for onsite visitors.

Background

Every blast is associated with the fragmentation, and sometimes the projection, of rocks. Flyrock and blast area security dominate blasting-related accidents in surface mining. From 1978 to 2004, 311 people were killed or injured by flyrock at surface mining operations. Poor blast area security was often to blame. Flyrock is any debris that lands outside the designated blasting area. It can vary in mass from marble-sized to car-sized and can be incredibly dangerous and potentially fatal. Flyrock can be the result of an overloaded blast hole, the presence of underground voids, insufficient burden, or an inadequately sized blast area. Proper planning by the blaster is necessary prior to a blast to prevent or minimize the occurrence of flyrock.

Forty percent of blasting injuries and fatalities in mining occur when people are within the blast area. Since blasted material is expected to fall within the blast area, good blast area security is essential to ensure the safety of site personnel. Figure 1 illustrates the importance of securing the blast area. Prior to a blast at a surface limestone mine, an equipment operator used his pickup truck to guard a road leading to the blast site. During the blast, a stone was projected through the truck's windshield, killing him. Preblast planning is essential for determining blast area security since each plan has to be site-specific. Following a blast, the blaster should walk the blast area to determine if the designated area was large enough and to see if changes should be made to the next shot to improve site safety.

Figure 1.—Example of flyrock damage to a vehicle at a worksite.

Approach

The products described here were developed for use in short safety training sessions such as start-of-shift safety talks at the worksite. The information can be presented in 15-minute segments. The training can be tailored to any work setting by substituting appropriate examples and by discussing the individual teaching points in relation to the worksite.

Specific lessons include:

- Toolbox Talks
  - *What Is Flyrock?* – Defines flyrock and its characteristics
  - *Recognize Blast Area & Signals:* Explains and identifies the different warnings and signals used in blast areas
  - *Clear the Blast Area:* Identifies the blast area and clearing procedures
  - *Protect Yourself:* Explains how to prepare oneself for each unique blast
- *Visitor's Hazard Alert:* This pamphlet was made especially for patrons visiting a blast area. It explains how the blasting will be done at that particular mine and what signals to listen for.
- *Worker's Hazard Alert:* This brochure is more detailed than the simplified visitor's pamphlet. It explains flyrock in detail, how to protect oneself from it, and what a typical shot scene is like, and gives other reminders to think about while on location.

The lessons are in multiple communication formats and informational pamphlets. There are separate units focusing on the same topics (Figure 2). The pamphlet and flashcards are color-coded into matching sets that relate to the same lesson. This information can be tailored to multiple audiences, including both mining and construction.

For More Information

The Blast Area Security–Flyrock Safety communication products are available at: **www.cdc.gov/niosh/mining/pubs**. For additional information on flyrock safety, contact Marcia L. Harris, NIOSH Pittsburgh Research Laboratory, P.O. Box 18070, Pittsburgh, PA 15236–0070; phone: (412) 386–5780; e-mail: MHarris@cdc.gov.

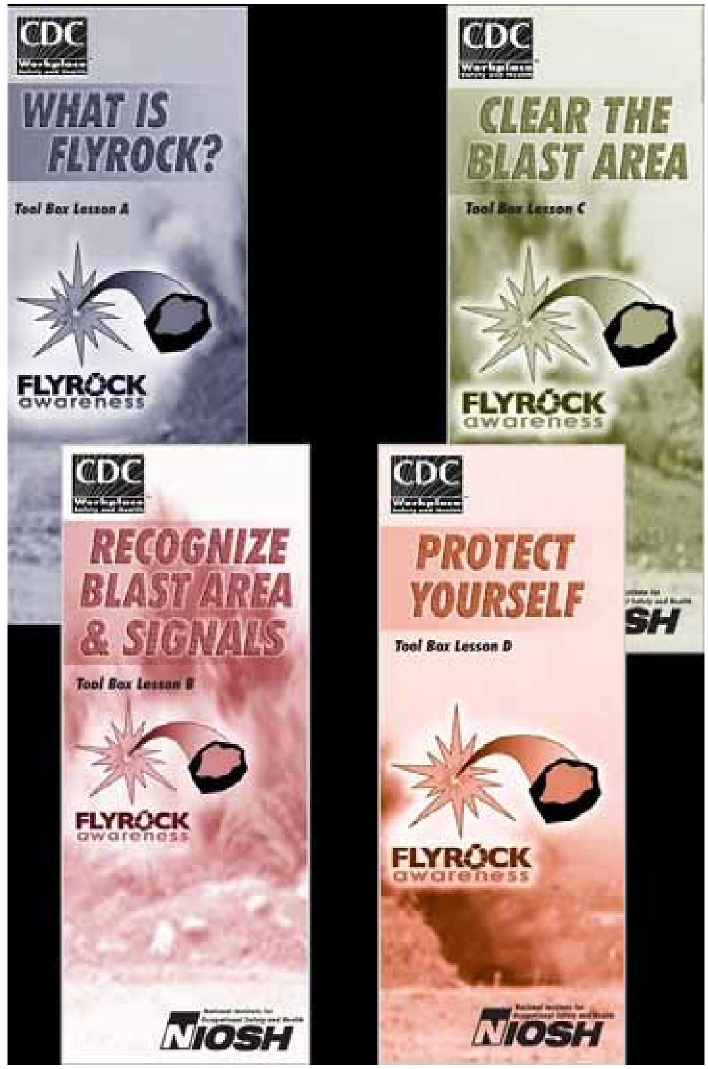

Figure 2.—NIOSH communication products on flyrock safety.

To receive other information about occupational safety and health topics, call **1–800–35–NIOSH** (1–800–356–4674), or visit the NIOSH Web site at **www.cdc.gov/niosh**

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