U.S. Department of Labor
MSHA
Mine Safety & Health Administration

MSHA Silica Initiative: What You Can Do To Be Involved

Jennifer Van Wey, CIH

Dusty Environments

What can we do differently to protect these miners?

Respirable Crystalline Silica – at MNM Mines

Current MSHA Standards limit exposures to crystalline silica in respirable dust.

Overexposure to crystalline silica can result in some miners developing silicosis, an irreversible but preventable lung disease, which ultimately may be fatal.

Silica Enforcement Initiative Overview

MSHA is implementing a Silica Enforcement Initiative to protect Coal and Metal and Nonmetal (MNM) miners' health by limiting their exposures to respirable crystalline silica.

This initiative has four components:

1. Inspections
2. Sampling
3. Compliance Assistance
4. Miners' Rights

Inspections

At Coal and MNM mines:

MSHA will conduct spot inspections for silica at coal and MNM mines in accordance with section 103(i) of the Mine Act.

- At mines with repeated overexposures to silica, mines may be inspected every 15-days at irregular intervals.

- MSHA will require for overexposures over 100 micrograms per cubic meter (existing PEL):

  - For MNM mines, abatement within a period of time. For overexposures not abated, MSHA will issue a 104(b) withdrawal order.

Section 103(i) of the Mine Act

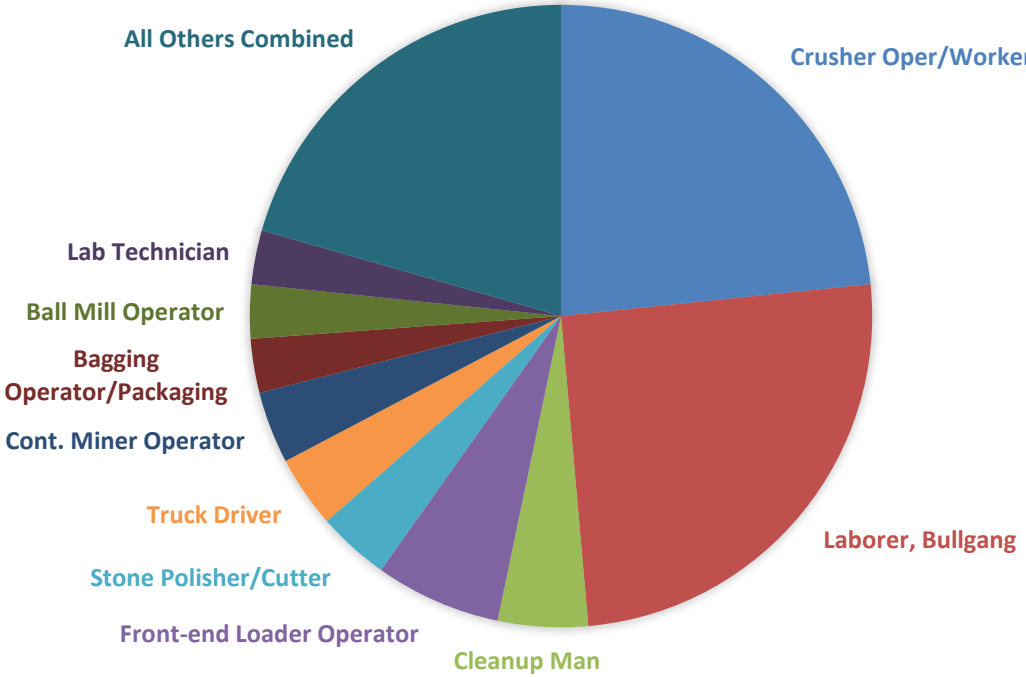
(i) Whenever the Secretary finds that a coal or other mine… or that there exists in such mine some other especially hazardous condition…he shall provide a minimum of one spot inspection by his authorized representative of all or part of such mine every 15 working days at irregular intervals.

Sampling

MSHA will collect respirable dust samples from occupations known to have a high-risk of exposures to silica.

Commonly Overexposed Occupations

JOBS OVEREXPOSED TO RESPIRABLE CRYSTALLINE SILICA >1% QUARTZ
DATA ON PREVIOUS FIVE YEARS (VACAVILLE AND DENVER DISTRICTS)



All Others Category:

Belt Crew
Bobcat Operator
Building Repair/Maint.
Bulldozer Operator
Blaster, Powder Gang
Complete Load-Haul-Dump
Dry Screen Plant Operator
Drill Oper., Jackleg/Stoper
Drill Operator, Rotary
Electrician
Kiln/Dryer Operator
Mechanic
Oiler, Greaser
Sampler, Dust
Shuttle Car Operator (Electric)
Utility Man

This initiative has four components:

1. Inspections
2. Sampling
3. Compliance Assistance
4. Miners' Rights

Compliance Assistance

- MSHA will work with stakeholders including mine operators, industry, and labor.
- MSHA will share additional information through stakeholder calls and to MSHA grantees.
- All information will be posted on the Agency's website.
- MSHA will distribute materials related to this initiative and provide compliance assistance through Educational Field and Small Mine Services staff.

Miners Rights

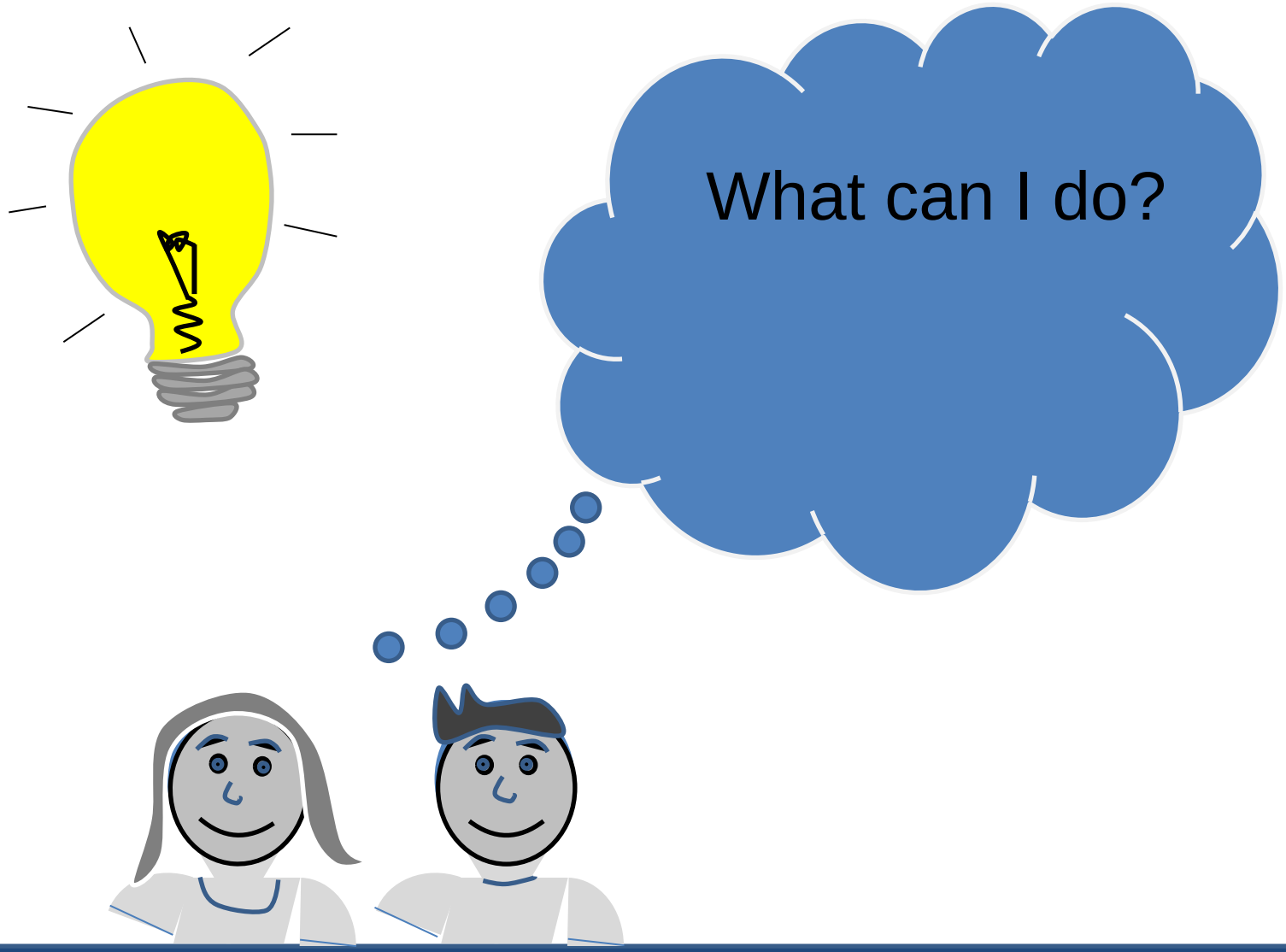
- MSHA will reinvigorate efforts to educate miners about their rights to make hazardous condition complaints and their protections against retaliation and discrimination.

Miners Voice

- MSHA will ensure that miners are aware of their right to:

  - Accompany an MSHA inspector.
  - Obtain an immediate MSHA inspection if they believe safety or health hazards exists.
  - Identify hazardous conditions and refuse unsafe work without fear of retaliation and discrimination.
  - Additional information will be posted on the MSHA's website.
  - Compliance assistance materials will be provided through the Educational Field and Small Mine Services staff.

How Can You Get Involved?



How You Can Get Involved:

- Inspect areas of your mine
  - Document existing controls
  - Recognize deficiencies in existing controls and work towards improvement
- Sample occupations likely exposed to silica
  - Follow up on sampling results until the exposure is reduced
- Educate Miners
  - Talk about silica hazards regularly and communicate efforts towards reducing exposure
  - Allow an open dialog that facilitates input from miners
- Utilize MSHA resources
  - Msha.gov
- NIOSH
  - Dust Control Handbook for Industrial Minerals Mining and Processing
  - CDC - Mining Publications - NIOSH

Control Dust: Excerpt From NIOSH Dust Control Handbook

Five Areas that typically product dust that must be controlled:

1. Transfer Points of conveying systems, where material falls while being transferred to another piece of equipment (e.g., the discharge of one belt conveyor to another belt conveyor, storage bin, or bucket elevator).
2. Processes such as crushing, drying, screening, mixing, blending, bag loading, and truck or rail car loading.

Control Dust: Excerpt From NIOSH Dust Control Handbook

3. Operations involving the displacement of air (e.g., bag filling, palletizing, or pneumatic filling of silos.

4. Outdoor areas where potential dust sources are uncontrolled such as core or blast hole drilling.

5. Haul roads, stockpiles, and miscellaneous unpaved areas.

Our Goal:

Miners are able to work their entire life in a mine and not incur any adverse health effects as a result of exposure to health hazards.

So, lets remember…

Exposures to Toxic Contaminants

- Miners are exposed to silica and numerous other health hazards
- Hazardous substances can enter the body through inhalation, ingestion, and/or skin absorption
- Typically, hazardous substances do not cause occupational diseases or disorders immediately
  - Many years of exposure are often necessary before the disease manifests itself.
- Relating an occupational disease to an occupational exposure is often very difficult

Health Effects from Exposure

- Not all miners exposed to the same concentrations of a hazardous substance will incur the disease or same degree of discomfort or irritation

- Occupational exposures may aggravate a miner's pre-existing medical condition.

- A miner's personal habits (e.g. smoking tobacco or drinking alcohol) may influence the effect of a substance on the miner.

You've probably heard this before…

When an overexposure occurs…

You must implement feasible control measures

How to avoid a health citation in the first place…

(before the overexposure by MSHA occurs)

Know what the standard is/says & Know what the limits are

56/57.5001(a)/56/57.5005

The TLV's listed in the American Conference of Governmental Industrial Hygienists in the 1973 edition of the Conference's publication, entitled "TLV's Threshold Limit Values for Chemical Substances in Workroom Air Adopted by ACGIH for 1973," pages 1-54 are incorporated by reference.

Threshold Limit Values (TLV's)

TLV's refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect.

1973 American Conference of Governmental Industrial Hygienists (ACGIH)

The Metal/NonMetal mining industry standard 56/57.5001 is based on the 1973 TLV formula for calculating crystalline silica:

$$\frac{10\ mg/m^3}{\%\ respirable\ quartz + 2}$$

The formula is designed to limit exposures to 0.1 mg/m³ (100 µg/m³) of silica.

Again remember…

Because of wide variation in individual susceptibility, a small percentage of workers may experience discomfort from some substances at concentrations at or below the threshold limit.

Also Recall:

The health effect depends on the concentration and duration of exposure

A short exposure to a high concentration may be as dangerous as a long exposure to a low concentration.

- Prompt remediation is important; some effects/exposures are cumulative

Implement/Modify Controls

- You've already surveyed what hazards exist
- You know what you have, where you have it and how much
- Now it's time to implement controls while continuing to monitor existing levels

Controls

The types of controls you choose will depend on the contaminants present.

For example: controls are more effective if you can **control it at its source**.

(This is also more cost effective than controlling contaminants after they become airborne)

More About Controls…

- Dust Collection Systems (LEV)
- Water
  - Spray system/dust suppression
  - Water truck
  - Wet drilling
- Enclosures
- Housekeeping
- PPE

Use of Respirators

As a last resort or while repairs are being made.

- Respirator fit tests are crucial.
  - A respirator not maintained and properly fit tested and worn is just as good as not having one at all.

Discussion and Questions

Methods to submit comments once posted:

1. Federal E-Rulemaking Portal: http://www.regulations.gov. Follow the on-line instructions for submitting comments.
2. Email: zzMSHA-comments@dol.gov.
3. Mail: MSHA, Office of Standards, Regulations, and Variances, 201 12th Street South, Suite 4E401, Arlington, Virginia 22202-5452.
4. Hand Delivery or Courier: 201 12th Street South, Suite 4E401, Arlington, Virginia, between 9:00 a.m. and 5:00 p.m. Monday through Friday, except Federal holidays. Sign in at the receptionist's desk on the 4th Floor East, Suite 4E401.
5. Fax: 202-693-9441.