

# **Management of Health Risks in Mining in the US**

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# **What is Risk Management?**

**Process of identifying particular hazards, understanding their likelihood (risk), their consequences; and taking steps to control risk.**

# Risk Management

- **MSHA's Triangle of Success**
  - **Enforcement, Compliance Assistance**  
(Compliance Assistance is offered before a regulation becomes effective.)
  - **Education and Training, Compliance Assistance**
  - **Technical support, Compliance Assistance**

**All parts of Triangle are tools to manage risk in mining operations.**

**EDUCATION & TRAINING**  
Compliance Assistance

**Triangle  
For  
Success**

**TECHNICAL SUPPORT**  
Compliance Assistance



Compliance Assistance  
**ENFORCEMENT**

# Enabling Congressional Acts

- Occupational Safety and Health Administration Act, 1969
- Mine Safety and Health Administration Act, 1977

# The MSHA Act

- Provided for notice and comment rulemaking to implement the Act
- National Institute for Occupational Safety and Health to carry out research

# MSHA's Mission Statement

- administer the Federal Mine Safety and Health Act of 1977 (Mine Act)
- enforce compliance with mandatory safety and health standards as a means to eliminate fatal accidents;
- reduce the frequency and severity of nonfatal accidents;
- minimize health hazards;
- and promote improved safety and health conditions in the Nation's mines.
- at all mining and mineral processing operations in the United States, regardless of size, number of employees, commodity mined, or method of extraction.

# Mine Act (Continued)

- **Must use best available evidence as basis for regulation to prevent material impairment of health**
  - **Even if miner exposed over working lifetime**



- **Cannot use rulemaking to decrease existing protection of miners**
- **Operators cannot petition MSHA for modification of a health rule**

# Reporting Requirements

- Mine operators must
  - immediately notify MSHA of accidents
  - investigate accidents
  - file reports of accidents, occupational injuries and illnesses.

# Hierarchy of Controls

- **Engineering controls**
- **Administrative controls**
- **When these controls are exhausted, personal protective equipment is required until additional controls can be installed.**

# Feasibility

- To require use of a control, it must reduce exposure and be feasible
  - Economically feasible
  - Technologically feasible

# Major areas of health concerns in Mining

- Dust (silica) ACGIH limit based on formula:  
TLV=10 mg/m<sup>3</sup> /% Respirable Quartz +2
- Noise 90 dBA limit, 85 dBA action level,  
updated rule in 1999
- Diesel Particulate Matter, new rule 2001  
interim limit 400 µ/m<sup>3</sup>

# **Threshold limit values (TLVs) for Chemical Substances in Workroom Air Adopted by the ACGIH for 1973**

- Published by American Conference of  
Governmental Industrial Hygienists**
- Incorporated by reference into MSHA  
health standards for metal and nonmetal  
mines.**

# Maximum Risk Miner

- Sample the one expected to have the greatest exposure of all of the miners in the area.



# PRIORITY

<b>TOXICITY</b> How dangerous is the substance?	<b>RISK OF EXPOSURE</b> how often, how long	<b>SAMPLING PRIORITY</b>
Low	Low	Low
Low	High	Medium
High	Low	Medium
High	High	High



# **GPRA Health Goals**

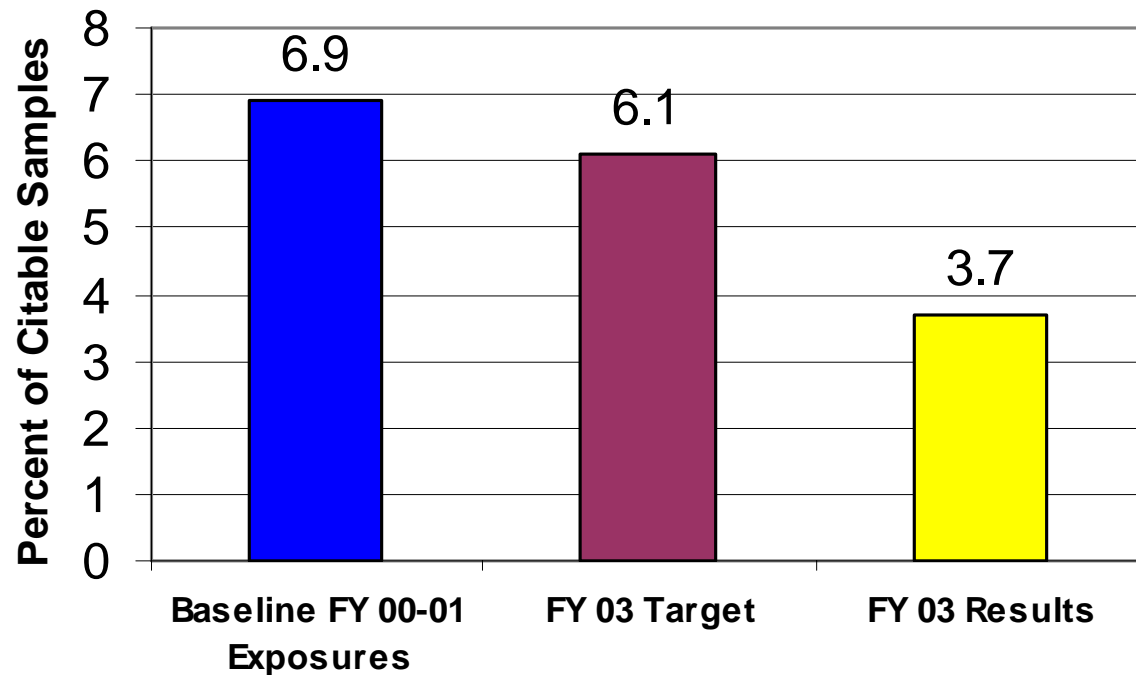
- **Government Performance and Results Act**
- **Reduce silica dust samples exceeding the applicable standard by 5% per year for hazardous occupations**

<b>SIC CODE</b>	<b>COMMODITY</b>	<b>JOB CODE</b>	<b>JOB</b>	<b>#SAMPLES/ #CITEABLE</b>
14110	Dimensional stone (NEC)	734	Drill operator rotary air	24/ 7
14111	Dimensional granite	734	Drill operator rotary air	31/ 5
14115	Dimensional stone slate	399	Dimension stone cutter	52/ 7
14220	Limestone crushed & broken	079	Crusher operator	681/ 31
14220	Limestone crushed & broken	616	Laborer bullgang	161/ 2
14290	Crushed stone (NEC)	079	Crusher operator	99/ 2
14292	Sandstone crushed & broken	079	Crusher operator	46/ 10
14292	Sandstone crushed & broken	616	Laborer bullgang	18/1
14292	Sandstone crushed & broken	879	Bagger	18/ 1
14420	Construction sand & gravel	079	Crusher operator	670/ 46
14420	Construction sand & gravel	613	Clean-up man	118/ 18
14420	Construction sand & gravel	616	Laborer bullgang	195/ 12
14420	Construction sand & gravel	879	Bagger	72/ 7

# GPRA Goals continued

- Reduce the percentage of Noise Exposures above the citation level by 10%

**FY 2003 Evaluation of Metal/Nonmetal  
Noise Exposures**



# Health Goals exceeded in FY 2003

- 310 of 8482 noise samples were over the limit (6.4%, target was 8.6%)
- 129 of 2017 silica samples were over the limit (3.7%, target was 6.1%)

