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.
Triangle For Success

EDUCATION & TRAINING

TECHNICAL SUPPORT

United States Department of Labor

Mine Safety and Health Administration

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$^3$ /% 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$^3$
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

<table>
<thead>
<tr>
<th>TOXICITY</th>
<th>RISK OF EXPOSURE</th>
<th>SAMPLING PRIORITY</th>
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</thead>
<tbody>
<tr>
<td>How dangerous is the substance?</td>
<td>how often, how long</td>
<td></td>
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<tr>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
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<td>Medium</td>
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<tr>
<td>High</td>
<td>High</td>
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GPRA Health Goals

- Government Performance and Results Act

- Reduce silica dust samples exceeding the applicable standard by 5% per year for hazardous occupations
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<thead>
<tr>
<th>SIC CODE</th>
<th>COMMODITY</th>
<th>JOB CODE</th>
<th>JOB</th>
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<td>734</td>
<td>Drill operator rotary air</td>
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<td>734</td>
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<td>Crusher operator</td>
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<td>Laborer bullgang</td>
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<td>18/1</td>
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<td>Bagger</td>
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<td>Construction sand &amp; gravel</td>
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GPRA Goals continued

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