Cananea Copper Mine: is it safe for workers?

Ingrid X. Zubieta, MPH
UCLA – Labor Occupational Safety and Health Program
Outline

- Background
- Methods
- Results
- Walk-through Inspection
- Mexican Response
- Conclusions
- Recommendations
Background

- Open-pit copper mine in northern Mexico owned by Grupo Mexico
- 1200 miners + 300 contractors. Miners went on strike in July 2007
- OHS volunteer team organized by Maquiladora Health and Safety Support Network (MHSSN) in October 2007
Background

- Operations at Cananea Mine
- Concentrator – Crushing process
- QUEBALIX – Extract copper from low-grade ore (Crusher - Conveyor belt - Lixiviate)
- ESDE – Copper coated plates (Solvent Extraction by Electrolytic Deposition)
Methods

- IH questionnaire
- Health survey/Lung function test (Spirometry)
- 68 miners interviewed in two days
- Walk-through inspection
## Results

**Based on IH interviews**

### Exposures

<table>
<thead>
<tr>
<th>Chemical Hazards</th>
<th>Silica - 32%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Solvents - 24%</td>
</tr>
<tr>
<td></td>
<td>Diesel fumes - 22%</td>
</tr>
<tr>
<td>Physical Hazards</td>
<td>Noise - 90%</td>
</tr>
<tr>
<td></td>
<td>Vibration - 78%</td>
</tr>
<tr>
<td>Safety Hazards</td>
<td>Falls - 94%</td>
</tr>
<tr>
<td></td>
<td>Machine operation - 73%</td>
</tr>
<tr>
<td></td>
<td>Machine guarding - 62%</td>
</tr>
</tbody>
</table>
Results

Based on IH interviews

- **PPE**
  - Inadequate respirators,
  - Ear plugs

- **Air and Noise monitoring**
  - Seldom, no changes

- **Medical surveillance**
  - Physical exam at hiring
  - No pulmonary or audiometric test

- **Accidents**
  - From broken fingers to one fatality
Results

- Lack of Training Programs

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing Conservation</td>
<td>98%</td>
</tr>
<tr>
<td>Respiratory Protection</td>
<td>82%</td>
</tr>
<tr>
<td>Machine Guarding</td>
<td>77%</td>
</tr>
<tr>
<td>Electrical Safety</td>
<td>70%</td>
</tr>
<tr>
<td>Hazard Communication</td>
<td>58%</td>
</tr>
</tbody>
</table>

Workers reporting NO training in these specific areas
Results

Based on Health Survey

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Estimate of workers with respiratory symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sputum production</td>
<td>10%</td>
</tr>
<tr>
<td>Coughing</td>
<td>12%</td>
</tr>
<tr>
<td>Wheezing</td>
<td>12%</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>46%</td>
</tr>
</tbody>
</table>
Walk-through Inspection

- Four areas visited
  - Mine
  - Concentrator
  - Quebalix
  - ESDE

- Main observations
  - Chemical hazards
  - Electrical hazards
  - Safety hazards
  - Physical hazards
  - Poor housekeeping
Walk-through Inspection

Based on bulk sample (accumulated dust)

- 23% quartz silica
- 51% of the dust $\rightarrow$ respirable range
- 75% of the dust $\rightarrow$ thoracic range

What does it means?

- Workers are exposed at least to $1.2\text{mg/m}^3$ respirable silica
- Mexican Permissible Exposure Limit $0.1\text{mg/m}^3$
Job Hazards
Job Hazards
Job Hazards
Job Hazards
Job Hazards
Mexican Response

- STPS did a walk-through inspection
  April 2007 → **72 required corrective actions**

- OHS team released a report
  November 2007

- STPS said the report is not valid

- STPS did a second walk-through inspection
  January 2008 → **200 required corrective actions**

- “Nada de Gravedad”

Secretariat of Labor and Social Security = STPS Spanish-language
Conclusions

- Grupo Mexico has **failed to provide** a safe and healthful workplace for the miners, **to comply** with health and safety Mexican regulations.

- Serious health and safety hazards that require immediate and long-term corrections to guarantee basic workers’ health and safety rights.

- The **safety program** has not resulted in effective hazard corrections, accident investigations, and worker training.
Recommendations

- A massive clean-up operation to eliminate the most immediate hazards to workers’ health and safety.
- Grupo Mexico must initiate a comprehensive health and safety remediation plan for the facility.
- Grupo Mexico should initiate a comprehensive medical surveillance program.
- Mexican government must ensure that workers at the Cananea mine are protected against all regulated hazards.
SOUTHERN COPPER MEXICANA DE CANANEAL

GERENCIA DE MINA

BIENVENIDOS

SE ENCUENTRA USTED EN LA MINA MAS GRANDE
Y SEGURA QUE TIENE MEXICO

DEPARTAMENTO DE SEGURIDAD E HIGIENE