## Successes in Research to Practice from the NIOSH Office of Mine Safety and Health Research

<table>
<thead>
<tr>
<th>Continuous mining machine noise controls</th>
<th>Coal Dust Explosibility Meter</th>
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<tbody>
<tr>
<td>Dual-sprocket chain reduces hazardous noise from underground coal continuous mining machines by 3 dB(A)</td>
<td>Coal Dust Explosibility Meter warns of explosive concentrations of coal dust in the mine atmosphere</td>
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<tr>
<td>Joy Mining Machinery put into production in 2008</td>
<td>Eliminates delays in obtaining analysis from remote laboratories</td>
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<td>Now installed on 30% of US continuous mining machines</td>
<td>Developed and commercialized through partnerships with H&amp;P Prototyping, Geneva College Center for Technology Development, and Sensidyne, Inc.</td>
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<tr>
<td>Dual-sprocket urethane-coated chain reduces noise by additional 4 dB(A).</td>
<td>Field studies showed 97% agreement with MSHA lab analysis</td>
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<tr>
<td>Manufacturing partner (Joy Mining Machinery) taking orders for coated chain</td>
<td>Over 200 now in use in mines</td>
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### Drilling machine noise controls

- Drill bit isolator developed to reduce hazardous noise from roof bolting machines used in underground coal
- Developed with input from manufacturing partners Kennametal Inc. and Corry Rubber
- Achieved 3-5 dB(A) reductions in mine tests
- Durable and does not interfere with normal operation
- Manufacturers taking orders and first deliveries are now in mines

### Personal Dust Monitor

- Personal Dust Monitor warns of coal dust that causes black lung
- Input from stakeholders guided design – integrated into cap lamp battery
- Performance meets or exceeds that of slower standard gravimetric samplers and delivers warning in real time
- Approved by MSHA and commercialized
- 200 units now in use in mines

### In-mine gas nitrogen generating system

- In-mine gas nitrogen generating system renders inert potentially explosive methane accumulations behind mine seals
- NIOSH contract with On Site Gas Systems to develop an inerting system
- Developed new pressure swing adsorption bed design for high nitrogen output from smaller generating plant
- Completed design extracts nitrogen from mine atmosphere and injects behind seals to displace oxygen and reduce explosion risk
- Now commercially available to the mining industry

### Communication systems

- Communication systems needed to improve chances of surviving mine emergencies
- Stakeholder input solicited to identify candidate technologies, followed by competitive contracts to multiple partners
- Primary solutions include L3 Communications wireless mesh and Becker Mining Systems leaky feeder communications system
- Secondary backup solutions include Lockheed Martin Through the Earth system and Kutta Technologies Medium Frequency system

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