Heroes

and

Reasoned and Reasonable Partnerships

MDEC 2003

Lew Wade
Associate Director, Mining
NIOSH

Outline Of Today's Presentation

- Charge to the Conference
- About NIOSH
- About Successful Partnerships
- About Existing NIOSH Partnerships
- About Future Partnerships
- Closing Comments

A Charge to the Conference

- Diesels are critical to the short and middle-term economic viability of the mining industry.
- Current and future regulations will require ever “cleaner” diesel systems.
- While the mining community has much to celebrate concerning the improvement of its health and safety record, long term health issues are still a concern.

A Charge to the Conference

- Therefore: given the above it is critical that we all work together (in partnership, based on enlightened self-interest) to address the problems so we can develop clean diesel systems for operation in our mines.

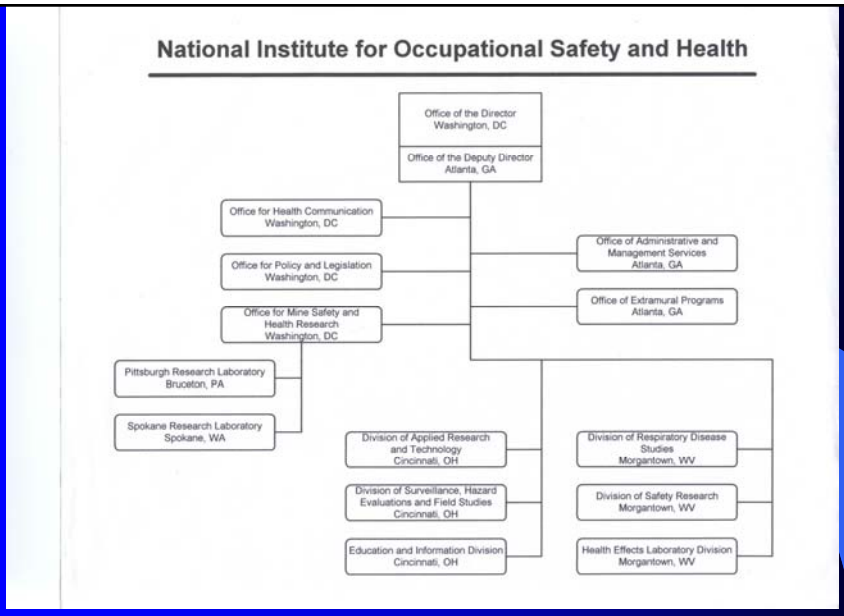
About NIOSH

NIOSH

- Vision: Delivering on the Nation's promise: safety and health at work for all people through research and prevention.

Office of Mine Safety and Health

- Mission: Provide national and world leadership to prevent mining work-related illness, injury, and death by gathering information, conducting scientific research and demonstrations, and translating the knowledge gained into products and services.



National Personal Protection Technology Laboratory

Bruceton, PA

About Successful Partnership

DEEP

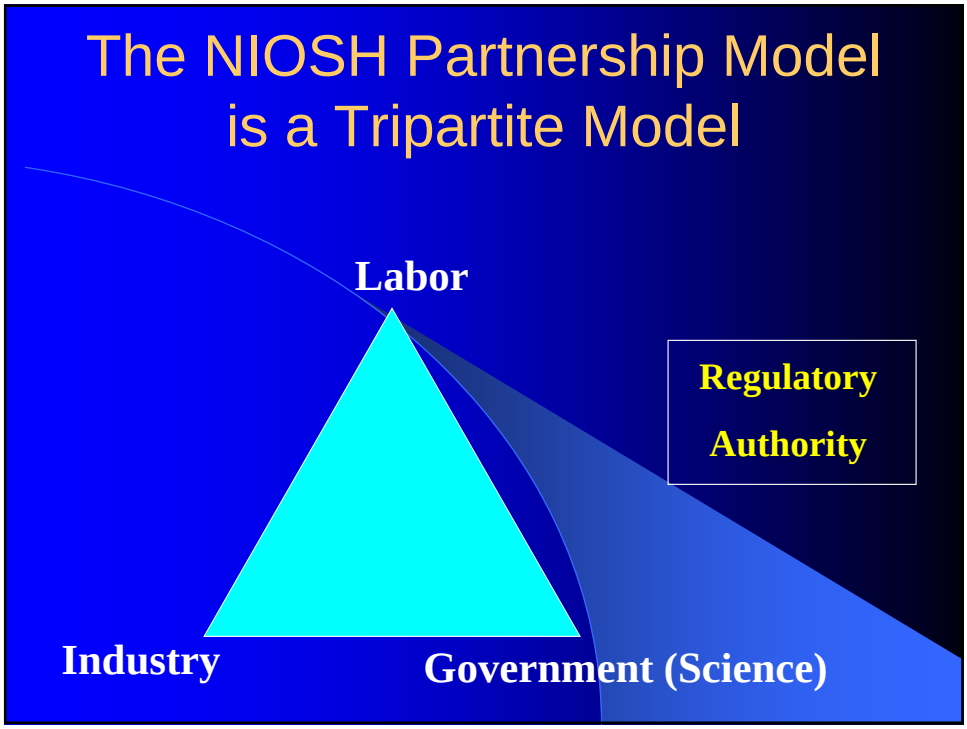
- A research consortium aimed at reducing exposure to diesel exhaust in underground mining
- Formed in 1997
- Participants include industry, labor, research organizations, regulatory organizations, public organizations, equipment manufacturers

Recent Accomplishments

- Sampling for Diesel Particulate Matter (10/2001)
- Evaluation of Biodiesel Fuel (11/2001)
- Diesel Emission Control Strategies (11/2001)
- Statistical Comparison of DPM Sampling Methods (11/2001)
- Sampling Methods Comparison at a High Sulfide Ore Mine (11/2001)
- Diesel Engine Maintenance (11/2001)
- Impact of Low-Emission Diesel Engines on Underground Mine Air Quality (5/2002)

About NIOSH Partnerships

The NIOSH Partnership Model is a Tripartite Model



Diesel Coal Partnership

- To protect the health of miners by reducing their exposure to diesel particulate matter and gaseous emissions
- 1999
- Partners
  - United Mine Workers of America
  - Bituminous Coal Operators Association
  - NIOSH

Major Projects - Testing at Deer Creek in February 2002

- Effects of filtration systems using disposable filters on contribution of the vehicles to the concentrations of DPM in the mine
  - Achievable limits
  - Exhaust leaks through water level limit hole

Testing at Deer Creek in February 2002

- DPM emissions were measured at both the tailpipe and ambient.

Testing at Deer Creek in February 2002

- DPM conc. were measured using :
  - Filter samples for NIOSH 5040 carbon analysis
  - Elemental carbon using PAS 2000
- Concentrations of CO, NO, NO_2, O_2 in mine air were measured using ECOM AC

Testing at Deer Creek in February 2002 - Findings

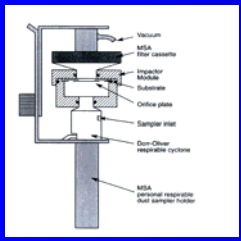
- The maximum fueling rate for the CAT 3306 PCNA engine as set by authorized Caterpillar service was found to be excessively high and resulted in an engine PM emissions significantly higher than that obtained by MSHA during sea level certification tests.
- The PM emissions from Skinnerized vehicles were lower than those obtained during MSHA certification.
- Filter element life for the engine set to MSHA specifications was found to be only 2 to 3 hours.

Emerging Partnership

Metal and Nonmetal Diesel

Background on The Partnership

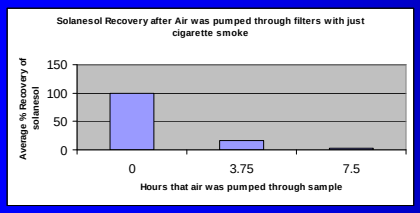
Size Selective Sampler



Bureau of Mines (BOM) (now NIOSH) developed an size selective sampler to prevent mine ore dust from collecting onto the filter.

NIOSH & MSHA worked with SKC, Inc. to perfect a DPM cassette based on the BOM sampler. It excludes mineral dust while allowing DPM reach the collection filter.

Environmental Tobacco Smoke (ETS)



Upon industry request, NIOSH investigated the possibility of using solanesol as a marker to determine the presence and quantification of ETS.

NIOSH determined that solanesol could not be used as a marker but ETS was still a potential interference to DPM

31 Mine Study

- NIOSH reviewed the MSHA/Industry 31 Mine study and provided comments and recommendations for better interpretation of the data.
- Elemental Carbon (EC) was determined to be a better analyte for determining TC.
- This contributed to a settlement between MSHA, industry, and labor.

The Emerging Partnership

- The specific goal of the partnership is to identify technically and economically feasible control, using existing and available technology, that can be retrofitted onto existing diesel powered equipment to meet MSHA's interim and final standards.
- Partners:
  - United Steel Workers of America.
  - National Mining Association.
  - National Stone, Sand and Gravel Association.
  - NIOSH.
  - Possibly others.

Isozone Testing

- Allows for fully-controlled underground testing.
- Minimum length of test drift is 1,000 ft (330 meters).
- The test drift is physically isolated from other parts of the mine.
- The test drift is no larger than 300 ft^2 (12.7 liters).
- The size of the engines and the ventilation volume will be controlled and matched.

Closing Comments

Charge to Partners

- Industry
- Labor
- Government (Science)
- Regulators

Industry

Make your experiences and sites available

Labor

Aggressively support the work of the partnership

Government (Science)

Timely, defendable and focused results

Regulators

Listen and be flexible

We must never forget it's about the health and safety of the mine worker