EMERGENCY COMMUNICATION AND TRACKING SYSTEMS

MSHA TECHNOLOGY EVALUATION

MSHA Activities To Address Communication and Tracking Issues

- Investigate Mine Site Technologies PED and TRACKER systems

- Evaluate available new technology
  - Received more than 80 proposals
  - Requested proposals through www.msha.gov
  - Reviewing proposals to determine which to pursue further

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Mine Site PED and TRACKER Investigation

- Investigate PED installations at:
  - Peabody Air Quality and Twentymile Mines
  - Consol Blacksville and Robinson Run Mines
  - BHP San Juan Mine (only surface-installed antenna in the US)
- Travel to Australia to investigate TRACKER installation

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Pros and Cons of PED

- Pros:
  - Can send evacuation instructions to miners in early stages of fire
  - Can be retrofit for Koehler, NLT and MSA cap lamps
  - System can be deployed in emergency by arranging surface loop antenna

- Cons:
  - Underground antenna could be compromised in fire or explosion
  - Reports of some areas where signals can't be received (shadow zones)
  - Can interfere with existing mine systems
  - Communications limited to one-way
  - No confirmation that message has been received

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PROS AND CONS OF TRACKER

- Pro: Can provide last known location of miner before loss of power

- Cons:
  - Cannot provide precise location of personnel
  - System will become non-operational upon loss of power

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System Evaluation Criteria

- System capability – precise tracking and 2-way voice and text preferred
- Survivability in a fire or explosion
  - Focusing on completely wireless communication
- Current availability
  - Available or near term available hardware vs. conceptual
- Capability of complying with MSHA requirements

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Field Testing Evaluation Goals

- Determine how well signals propagate (maximum distance between nodes)
- Determine how much overburden systems can penetrate if capable of through-the-earth communication
- Determine mine coverage area (i.e. are there blind spots and why?)
- Explore interference issues
- Determine accuracy of tracking features

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Current Technologies Under Evaluation

- Wireless node-based systems using IEEE 802.11 protocol
- Wireless node-based systems using IEEE 802.15.4 protocol
- Ultra-Wide Band Communications and Tracking
- Low frequency, narrow band through-the-earth (TTE)

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