Mine Emergency Communication: Options, Issues, & Futures

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Communication Reality

WV SB 247 and the Miner Act did not revoke the laws of physics

WV §56-4 drafted with all the laws in mind
Wireless – miner not connected by wire

Two-way communications to each miner in at least two separate airways

Tracking each miner in relation to known points prior and in escapeways after

Operators submit Communication/Tracking Plan by July 31, 2007

- Understand needs and thought through risks
- Survive accident or be quickly repairable
- Communication center operator needs red-hat card
Few Spectrum Options

Practical options are limited by physics and existing uses
Through The Earth (TTE)

Limitations:
- Interference Sources
- Antenna Size
- Knowledge Base
- Safety Understandings
- Bandwidth Limitations
- No Market Base
Medium Frequency (MF)

Limitations:
- Knowledge Base
- Bandwidth Limitations
- Limited Market Base
- Unknown Susceptibility
Wi-Fi Mesh Nodes

Limitations:

• Knowledge Base
• Safety Understandings
• Limited Range
• Susceptible to explosion
Leaky Feeder VHF

Limitations:
• Bandwidth Limitations
• Limited Range
• Susceptible to explosion
Leaky Feeder UHF

Limitations:
- Bandwidth Limitations
- Susceptible to explosion
Leaky Feeder Coverage Enhancement

Note: Coverage includes implementation of coverage extension approaches
Next Generation...Redundancy

What happens if 2000 feet of all entries lost?
Evolving NIOSH Approach

- Phase 1 – Non-Redundant Wireless* Coverage
- Phase 2 – Bi-Directional Communication Pathway Redundancy
- Phase 3 – Redundant radio coverage systems (one hardened) and coverage enhancements

* Wireless definition as in WV 56-4
WV Path Forward

• WV functionality approvals underway
• Continued NIOSH study group interaction
• MHSA IS approval process continues
• WV Communication Plan submittals
• Installation dates subject to manufacturers receiving all needed MSHA approvals