Refuge Alternative Partnership "Wrap-Up"

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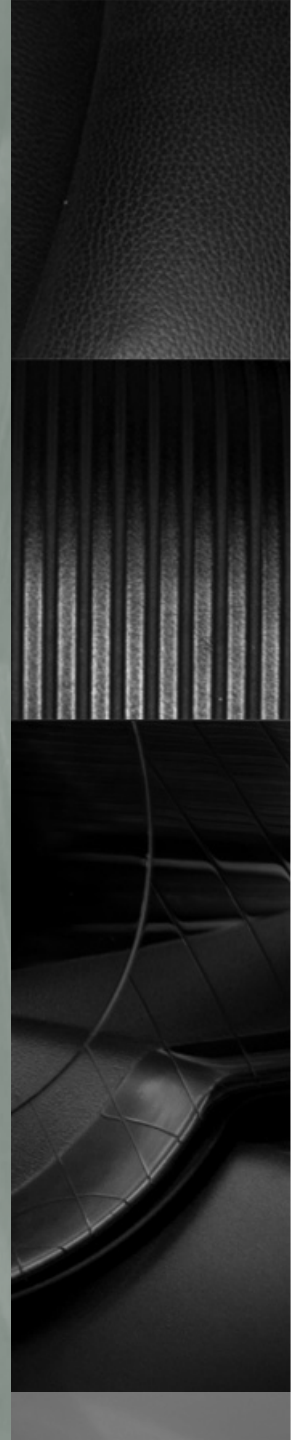

Development of Refuge Alternatives

- Significant advancement for underground coal
  - Began with boards and brattice
  - Limited products available from the international market
  - Lack of purpose built permissible equipment
  - Limited defined requirements
  - Technology drawn from Department of Defense, NASA, medical community, international mining, and many others
  - Efforts from States, Labor, Mine Operators, Manufacturers, Academia
- Escape remains the preferred option
  - Refuges, SCSRs, Escapeways, Communication, Training – all work together

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Partnership Contributions

- Shared Experiences
- Guide NIOSH Research – Industry Needs
  - Training – Decision Making
  - Temperature and Humidity – occupancy rating and cooling
  - Purging
  - Built in Place development
  - Communications
  - Validation and Verification of requirements - test methods

Approved Refuge Alternative Components

- **Breathable Air** 51
- **Air Monitoring** 35
- **Harmful Gas Removal** 75
- **Structural** 22

  Includes portable steel and inflatables; built in place
- **Permissible Air Conditioning**

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Recent Technical Assistance

- Increased use of portable refuges in Metal/NonMetal mining
  - Coal regulations serve as guidelines
  - Typically no need for permissible equipment
- Need for refuges in Anthracite coal mines
  - Challenging mine layout
  - Surface rights

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Where Are The Issues?

- Citations under 75.1506, 2019 to present
  - Non-MSHA approved components; none since 2019
  - Location; within 1,000 feet of the working face
  - Housekeeping; keep area around refuge clear
  - Signage; directional signs and at refuge
  - Removal from service; examinations
- Also, 75.1600-3; Communications at Refuge

Looking to the Future

- 2022/2023 Refit of scrubbing chemicals/food/water
- Mine Operators should know expiration dates
- Coordinate with refuge manufacturer
- DOT regulations regarding transporting cylinders

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QUESTIONS?

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