Industry Perspective on Seals and Sealed Areas

MSHA Mine Academy
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National Mining Association Work Group

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Sealing and Sealed Area

- Current Seal Standards
  - Mitchell Barrett Seal – 30CFR75.335(a)(1)
  - Alternative Seals – 20 psi requirement 30CFR75.335(a)(2)
  - P.I.B. Seals – 50 psi recommend and evaluated through Technical Support, but approved through MSHA Districts
  - Seal Standards Required by MINER Act

Mitchell Barrett Seal – 30CFR75.335(a)(1)

- Only approved seal design by regulations
- Only industry wide approved seal since the release of the P.I.B. of July 19, 2006.
- These seals are labor intensive construction requiring material handling and hitching
- Seal does not perform well in areas of higher convergence – Higher leakage possible, potential for spontaneous combustion

Alternative Seals – 20 psi requirement 30CFR75.335(a)(2)

- Most seals currently in-place in U.S. Coal Mines are designed to this performance standard.

P.I.B. Seals – 50 psi approved through Technical Support

- Engineering designed approved through Technical Support as compared to in mine testing of the 20 psi seals.
- Site / Mine specific approvals, resulting in an extended time process for approval and construction
- PE Certification

Seal Standards Required by MINER Act

The following items that may impact the future design requirements:

- Testing of Seals from Sago - ??? Results
- Mining Standards from other countries - ???
- Report from NIOSH - ??? Results

New seal Regulations required by Dec. 15th , 2007

Industry Dilemma

- Unknown standards for alternative seals
- Regulatory Stability for Mine Planning / Sealing is Needed
- Risk analysis of sealing verses ventilating inactive areas
- Determine the effectiveness of existing seals

Unknown standards for alternative seals

- Construction
  - Will current alternative seals built today per the current P.I.B., be adequate for future requirements?
  - Will construction standard be based on a performance model?
    - No explosive atmosphere mixture
    - Explosive atmosphere mixture potential
      - Monitoring and Inerting Program for Sealed Areas
      - Explosive Atmosphere Potential for Sealed Areas, no monitoring or inerting plan
  - Will construction be based on a prescriptive model?
  - Will standard allow for practical construction?

Unknown standards for alternative seals

- Monitoring
  - Location of Monitoring Points
  - Distance from Seals into the Gob
  - Acceptable Monitoring Device (s)
  - Acceptable Monitoring Frequency and Subsequent Actions
  - When sampling should occur (out gassing?)
  - Trending

Unknown standards for alternative seals

- Artificial Inerting
  - Infrastructure issues
    - Borehole (Access to surface, increase number of holes?)
    - Piping Network
    - Availability of Inert Gases
  - Inherent problems produced by inertization devices such as a Tomlinson Boiler or Jet Engine
    - CO in Gob, Nitrogen in Gob may mask or create concerns
    - Surface Noise
    - Deterioration of mine roof and floor around Seals (leakage)
  - Ability to accomplish in a large gob on a long-term basis
  - Active area air quality issues

Regulatory Stability for Mine Planning / Sealing is Needed

- Definitive Seal Design that allows for no additional actions once installed
- Seal Standard with:
  - Clear Approval System
  - Performance Criteria
  - Cost Effective Construction Design to allow sealing in lieu of ventilating old works
  - Design Considerations – Initial panel starts, etc.
  - Timeliness / Ease of construction
  - Definition between Gob Isolation Seals and District Seals
    - Allow for Convergence (strength of material)
    - Short-term use of seals

The End