

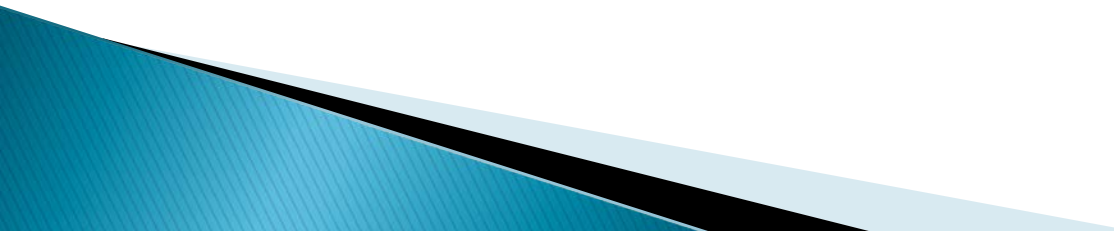
# MINE EMERGENCY RESPONSE

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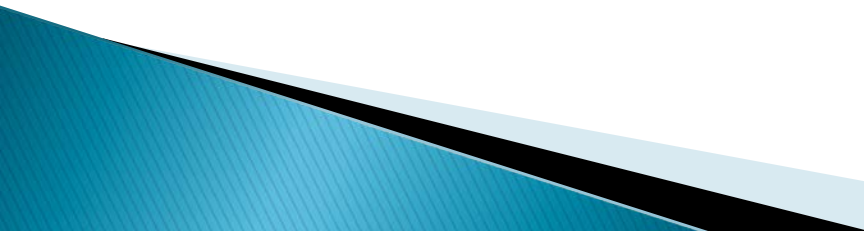
# Atmospheric Monitoring Systems

- Improved “Survivable” AMS Systems
  - Better sensors, including continuous gas detection and ventilation monitoring (velocity, direction, etc.)
  - Long duration battery operation
  - Tube bundle systems

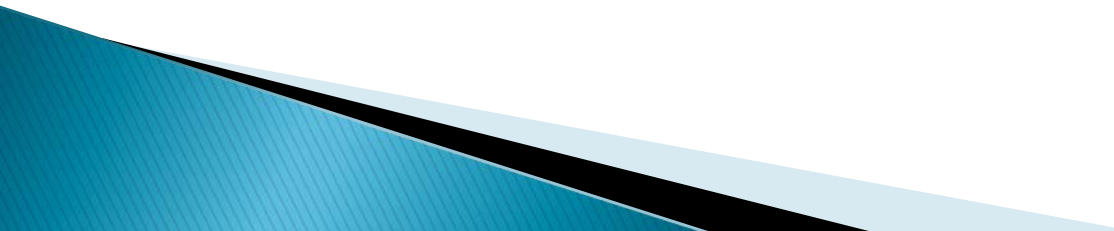
# Breathable Air

- Next generation SCSRs that meet both MINER Act and CCER requirements
  - Advanced SCBA quick refill systems
  - Low-profile SCBA for use in low or medium height mines
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# Communications and Tracking

- “Survivable” systems
  - Methods to evaluate current systems
  - Determine optimal characteristics
    - Coverage
    - Quality of Service
    - Tracking Accuracy
  - Determine minimum performance recommendations and needed improvements
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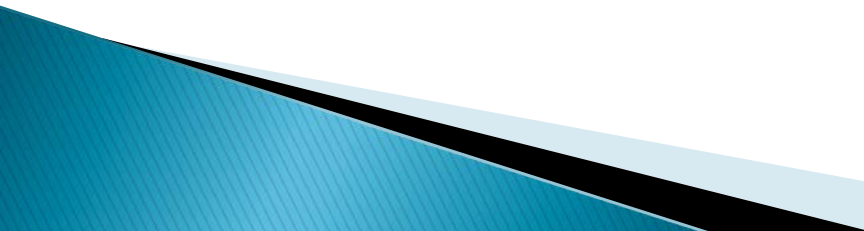
# Mine Rescue Training

- Determine necessary skill set and associated training
  - Improved MERD exercises
  - Use of new technology
  - Command Center training
  - Responsible Person training
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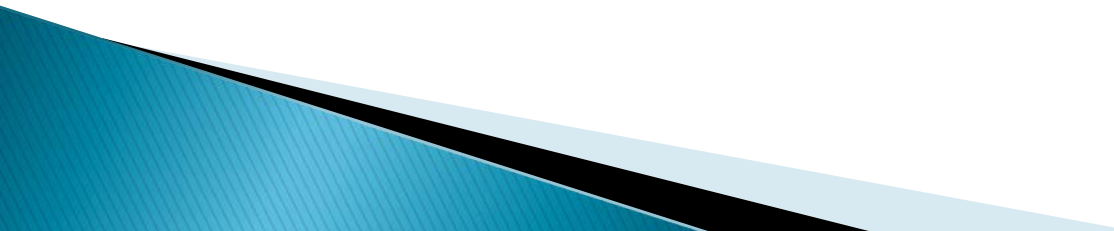
# Mine Seals

- Options for remote mine seals
- Evaluation of current/future seal designs
  - Seal materials
  - Surrounding strata
  - Water drainage systems
  - Non-conventional materials
    - Cementitious foam
    - Polyurethane

# Mine Rescue Equipment

- Permissible IR or Thermal Imagers
  - Improved mine rescue communications systems
  - Improved seismic systems for detection and location (portable)
  - Thumpers to be used with seismic systems
  - Permissible Mine Rescue and Explorer Robots
    - Repeater or fiber optic systems for long distances
    - Improved sensors, cameras, lighting
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# Mine Rescue – Human Factors

- Human–Robot interaction
  - Health and Psychological Issues
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# Refuge Alternatives

- Evaluate Alternatives to Refuge Chambers
- Human Subject Testing