Long Term Field Evaluation

Colorado School of Mines

Golden, CO

April 24, 2003

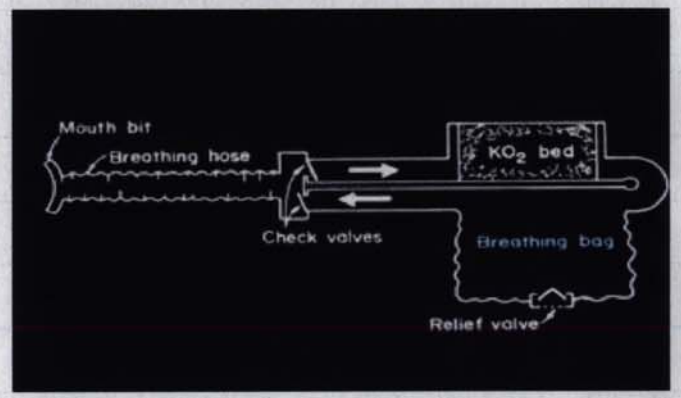
CDC Workplace Safety and Health

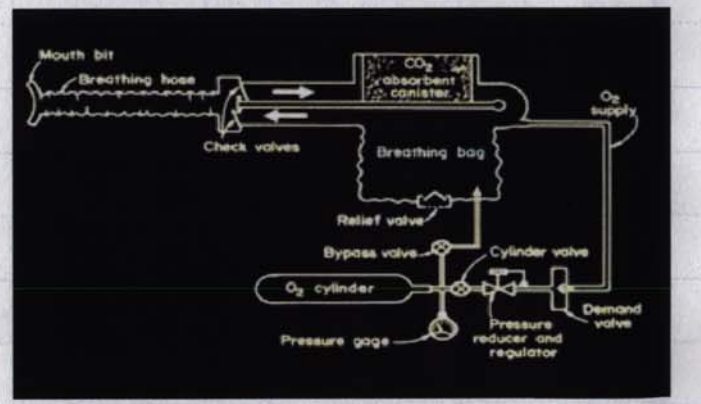
U.S. Department of Labor

Mine Safety and Health Administration

NIOSH

Approved SCSRs and Schematics





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Long Term Field Evaluation

- Joint MSHA/NIOSH project
- Objective
  - Track reliability of field deployed SCSR's
- Method
  - Sample, replace and inspect
  - Measure life support capability
  - Compare to new SCSR's

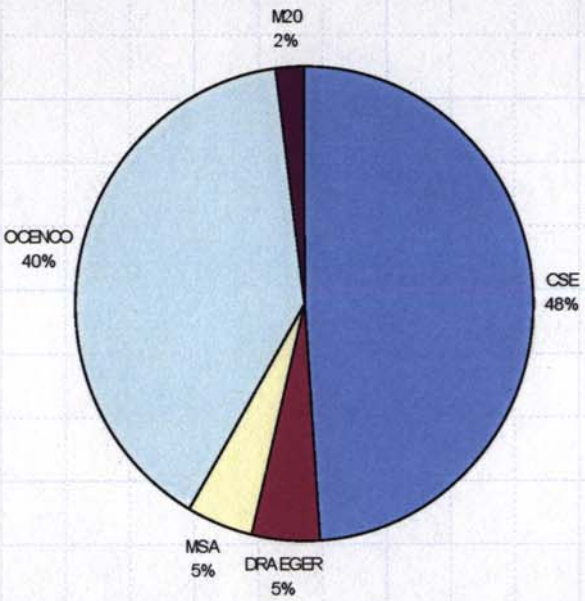
Reliability

- Reliability = Will my SCSR work?
  - Is there quality control at the point of manufacture?
  - How has it been handled?
  - How old is it?
- Reliability = When should an SCSR be removed from service?
  - Are the inspection criteria sound?
  - Are miners well trained?
- Reliability = Will evacuation under oxygen be successful?
  - Are miners well trained and prepared?
  - Do they have confidence?

Reliability Issues LTFE

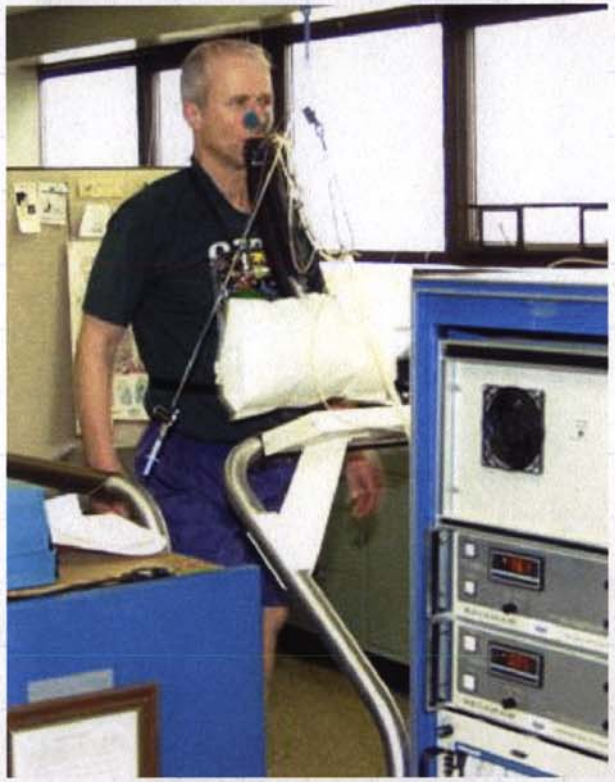
- Issues
  - Critical SCSR problems were missed because too few SCSR's were collected and tested
  - Sometimes LTFE findings are hard to interpret
- Solutions:
  - Expand LTFE from 50 to 200 SCSR's per year
  - Include FSR in LTFE
  - Learn how to compare BMS results to MT#4.

In-Mine Collection



	CSE	DRAEGER	MSA	FSR	OCENCO	M20	Total
2001	94	9	9	70	76	4	262
2002/2003	94	20	20	70	76	20	300

LTFE Testing



FSR Field Evaluation

Reliability Issues
When should an SCSR be removed from service?

- Issues
  - Poor decision making
    - Imperfect information
    - Inattention
  - No unanimity of judgement and action
  - Some confusion about who is accountable for safekeeping, as well as what safekeeping means

- Solutions
  - New QC standard
  - Training
  - Make the units easier to inspect
    - Pass/fail indicators for temperature and mechanical shock.

Decision Making

	As-Approved	Out-of-Compliance
Passes	Keep in Service	Keep in Service
Fails	Remove from Service	Remove from Service

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CSE SR-100

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Draeger OXY K-Plus

Ocenco EBA 6.5

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A training package to teach …

- How to properly conduct daily and 90 day inspection
- How to care for an SCSR
- Criteria for removing an SCSR from service

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Update: Training Modules

- Development
  - Agreement established between NIOSH and MSHA
  - Partnerships include NIOSH, MSHA, BCOA, UMWA, and SCSR Manufacturers
  - CBT being developed by PowerTrain under existing DOL contract funded by NIOSH
- Distribution
  - MSHA personnel will introduce and distribute at individual mines
  - MSHA will emphasize the SCSR modules to increase awareness
  - SCSR modules will be a focus of a new initiative utilizing National Guard Teleconferencing Resources

SR-100 Temperature Sensor

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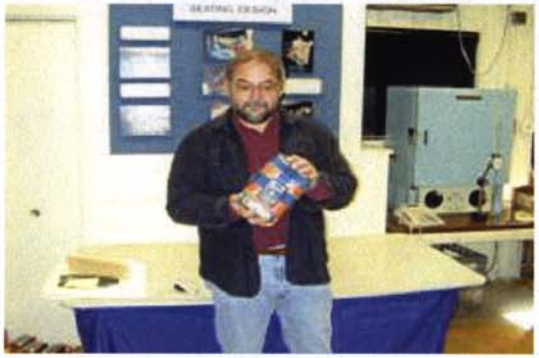
Reliability Issues
Non-Destructive Testing (NDT)

- Issues:
  - We are starting to see SCSR's which will pass daily inspection, but will otherwise be out of compliance.
    - Some SCSR's will show decreased life support capacity.
    - Catastrophic failure

- Solutions:
  - Practical, non-destructive testing (NDT) to sort SCSR's is an emergent technology.
    - Make noise measurements on SCSR's collected as part of the LTFE
    - Collaborative effort with manufacturers.
  - Adjust service life to account for:
    - Multi-shifting
    - Unknown handling history

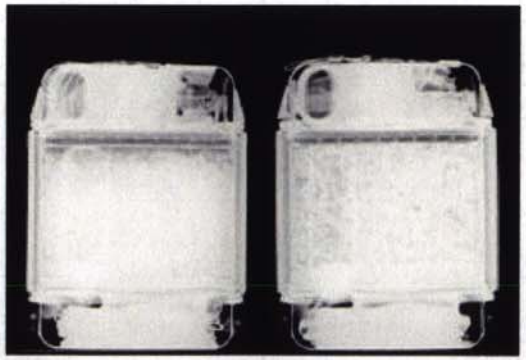
Non-Destructive Testing

Laboratory ND Noise Test



In-Mine ND Noise Test

Draeger AMS



Neutron Radiography

MSA Life Saver 60

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