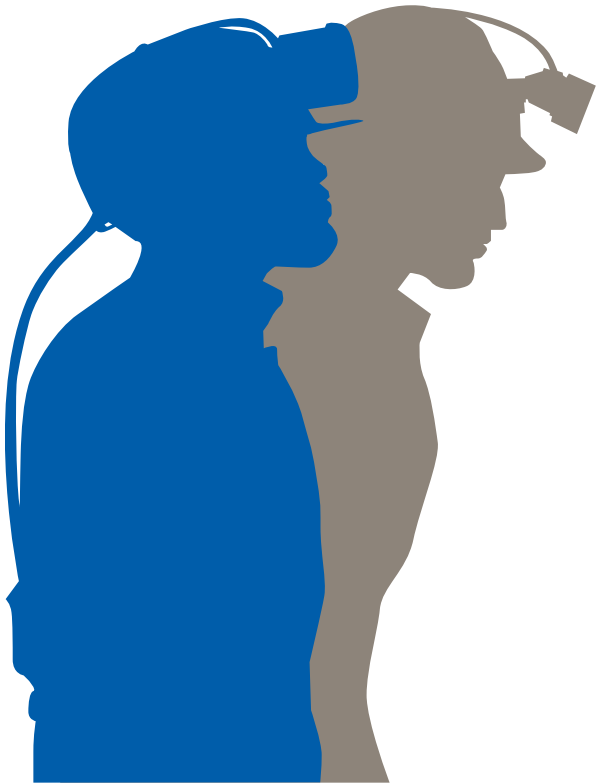


OMSHR

Office of Mine Safety and Health Research



An Overview of OMSHR's History of Refuge Alternatives Research

Dr. RJ Matetic

**Director, Division of Mining
Research Operations**

*Refuge Alternatives Partnership Meeting
February 10, 2015*



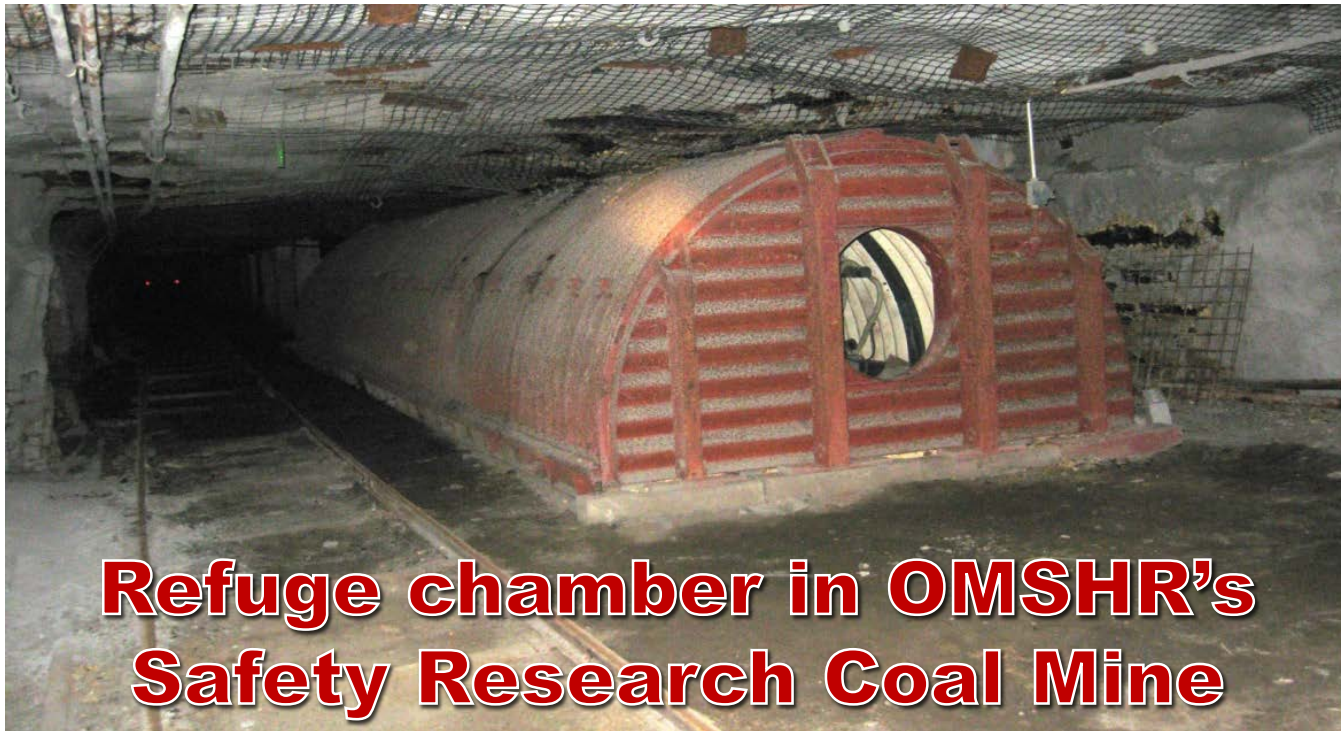
Outline

- Pre-MINER Act BOM refuge alternatives research
- MINER Act introduction
- Post-MINER Act NIOSH refuge alternatives research



The Bureau of Mines funded five major contract efforts between 1970 and 1983

- Addressed mine rescue and survival
- Examined explosion-proof bulkhead design
- Provided guidelines for rescue chambers
- Identified post survival and rescue research needs



In 2006, three mine tragedies occurred and the MINER Act was passed

- January 2: an explosion occurred at Sago Mine
 - 12 miners killed; 1 miner survived
- January 19: a belt fire occurred at Alma Mine
 - 2 miners killed; 10 miners escaped
- May 16: the Mine Improvement and New Emergency Response (MINER) Act was introduced
- May 20: an explosion occurred at Darby Mine
 - 5 miners killed; 1 miner injured
- May 24: Senate unanimously passed the MINER Act
- June 7: House passed the MINER Act by a vote of 381–37
- June 15: President George W. Bush signed the MINER Act into law

The MINER act included two RA-related mandates for NIOSH:

- “NIOSH shall provide for the conduct of research, including field tests, concerning the utility, practicality, survivability, and cost of various refuge alternatives in an underground coal environment”
- “No later than 18 months after the date of enactment of this Act, NIOSH shall prepare and submit to the Secretary of Labor, the Secretary of Health and Human Services, the Committee on Health, Education, Labor, and Pensions of the Senate, and the Committee on Education and the Workforce of the House of Representatives a report concerning the results of the research conducted”
 - Completed December 2007

Since the MINER Act was passed, NIOSH has conducted numerous research activities on refuge alternatives

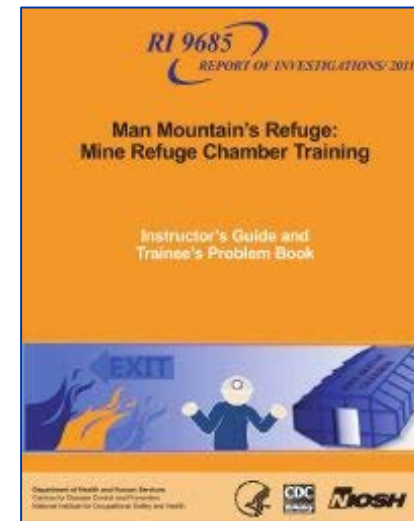
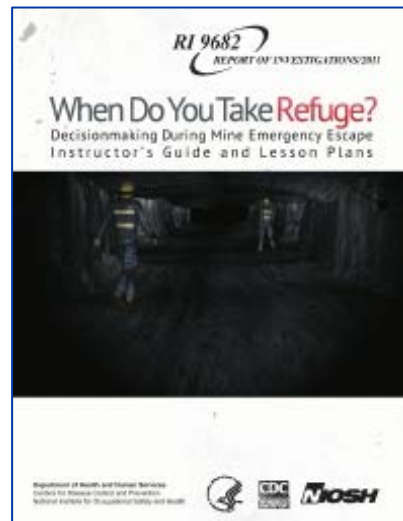
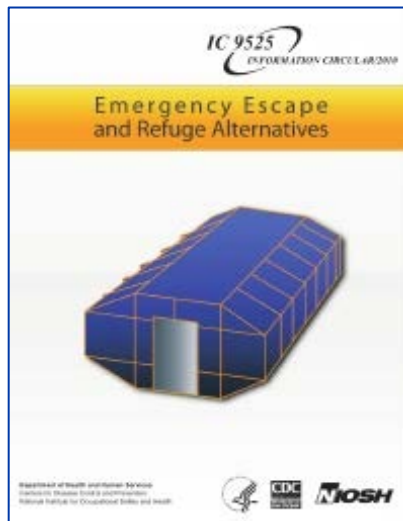
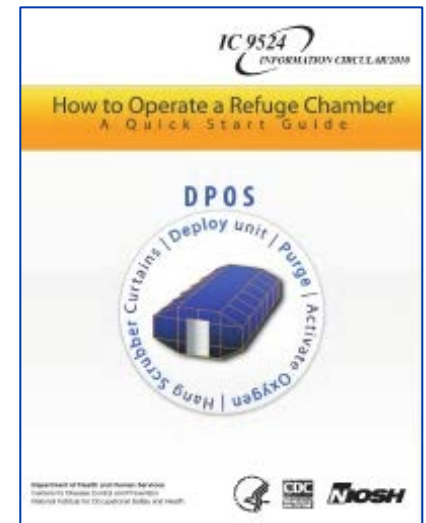
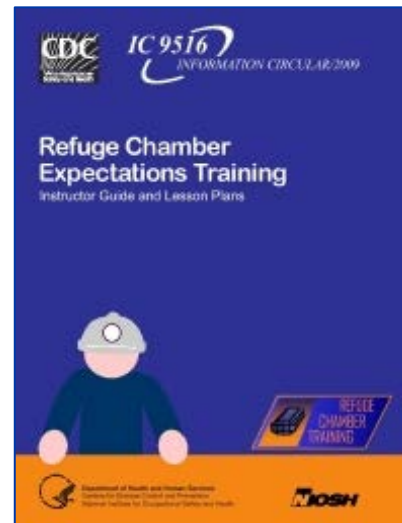
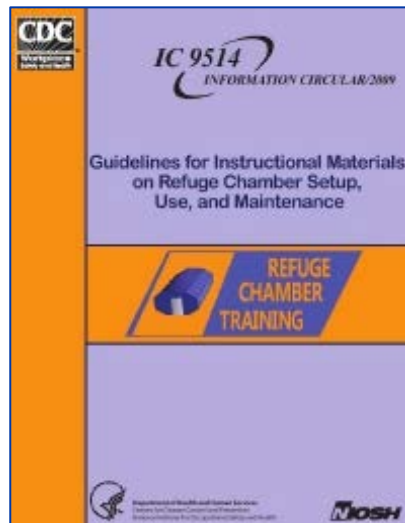
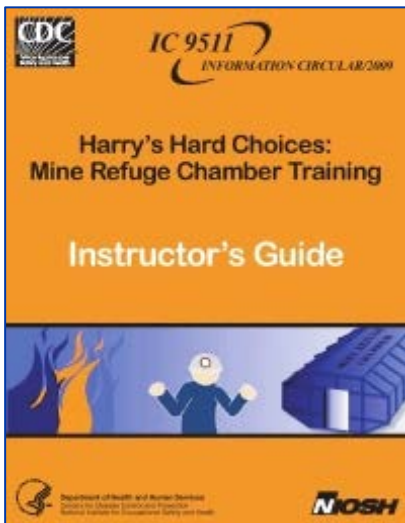
- NIOSH/MSHA Working Group
- Refuge alternatives contract (Foster-Miller)
- Mine curtain survivability system contract (Battelle)
- Explosive forces, debris fields, and anchoring
- Thermal analyses (Raytheon, NASA, O'Donnell, ThermoAnalytics)
- Refuge chamber moving issues
- Best practices world-wide
- Cost estimates
- Location guidance
- Survivability evaluations
- Training issues
- Purging, heat and humidity

Survivability performance evaluations that examined CO₂ scrubbing, O₂ supply, and heat and humidity over 96 hours were conducted on WV-approved chambers at Lake Lynn Laboratory



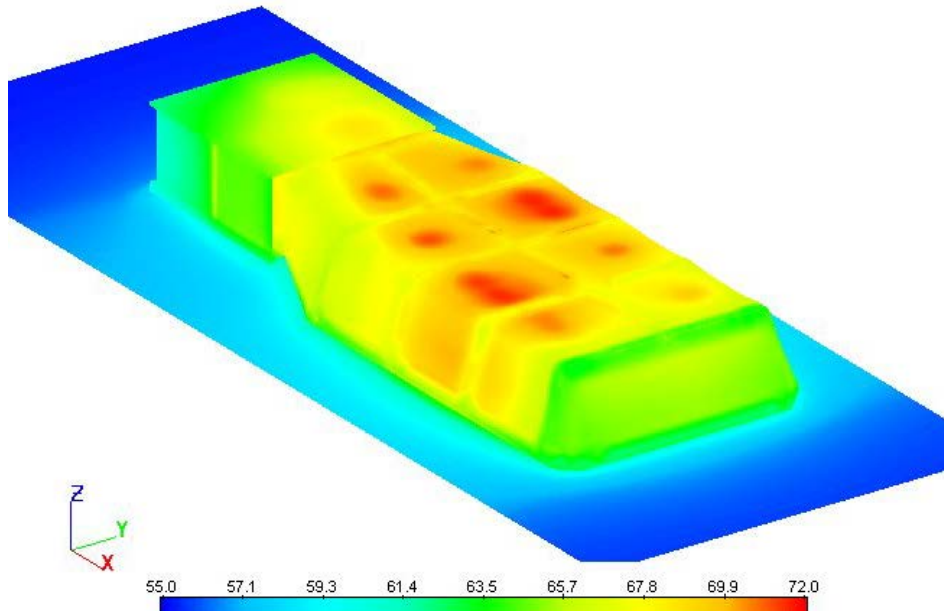
NIOSH has developed extensive refuge alternative training materials

- <http://www.cdc.gov/niosh/mining/topics/RefugeChambers.html>
- <http://www.cdc.gov/niosh/mining/content/refugechambers.html>



NIOSH continues to perform RA-related research

Heat & Humidity



Built-in-place



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Questions?

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