

**FINAL RULE**  
**Flame-Resistant Conveyor**  
**Belt, Fire Prevention and**  
**Detection, and Use of Air**  
**From the Belt Entry**  
**December 31, 2008**

This Power Point was prepared by the office of Coal Mine Safety and Health. It is intended for use by MSHA personnel. This is not a stand-alone document. Please consult the final rule and preamble for compliance information.

# Proposed Rule Public Hearings

- August 19, 2008.....Salt Lake City, UT
- August 21, 2008.....Lexington, KY
- August 26, 2008.....Charleston, WV
- August 28, 2008.....Birmingham, AL

Public Comment Period Ended  
September 8, 2008

# Technical Study Panel

- Section 11 of the MINER Act established the Technical Study Panel to provide an independent scientific and engineering review, and issue a report with recommendations. This final rule is a response to the Panel recommendations.
- The Panel issued its report on December 20, 2007. A copy of the report is available on MSHA's website at <http://www.msha.gov>.

# Technical Study Panel Members

Selected the by Secretary of Labor;

Dr. Jan M. Mutmansky, Penn State Univ.

Dr. Jerry C. Tien, Univ. Missouri-Rolla

Selected by the Secretary of HHS;

Dr Jurgen F. Brune, NIOSH

Dr. Felipe Calizaya, Univ. of Utah

Selected by Majority Leaders of Congress;

Mr. Thomas P. Mucho, Mining Consultancy

Selected by Minority Leaders of Congress;

Dr. James L. Weeks, Evergreen Consulting

# Panel Recommendations

- Recommendation number 1 - Conveyor Belt Flammability Testing and Approval;
- Recommendation number 2 – Other Belt Tests;
- Recommendation number 3 – Improved Fire Resistance Standards for all Underground Coal Mines;
- Recommendation number 4 – Coordinating Belt Testing with Other Countries;
- Recommendation number 5 – Belt entry and conveyor belt maintenance;

# Panel Recommendations

- Recommendation number 6 – Special requirements for the use of belt air;
- Recommendation number 7 – Belt air approval recommendation;
- Recommendation number 8 – Discontinuing point-type heat sensors;
- Recommendation number 9 – Smoke sensors;
- Recommendation number 10 – Use of diesel-discriminating sensors;

# Panel Recommendations

- Recommendation number 11 – Review of AMS records;
- Recommendation number 12 – AMS operator training certification;
- Recommendation number 13 – Minimum and maximum air velocities;
- Recommendation number 14 – Escapeways and leakage;
- Recommendation number 15 – Lifelines;

# Panel Recommendations

- Recommendation number 16 – Point-feeding;
- Recommendation number 17 – Respirable dust;
- Recommendation number 18 – Mine methane;
- Recommendation number 19 – Inspections; and
- Recommendation number 20 – Research.

# Compliance Dates

- 2 Months: (March 2, 2009)
- 48.27(a) ----- Task training for AMS operators
- 75.156(a) ----- AMS operator qualifications
- 75.350(b) ----- Use of air from the belt entry, ventilation plan approval
- 75.1731 ----- Maintenance of belt conveyors and belt entries

# Compliance Dates

- Within 60 days after approval by the district manager in the mine ventilation plan
- 75.350(d)(1)-----monitor point-feed regulator 1,000 feet upwind
- 75.351(e)(1)(iii)--500 foot sensor spacing where air velocity is between 50 and 100 fpm
- 75.351(e)(1)(iv)--additional co sensor if distance between belt drive, tailpiece, and transfer or take-up exceeds 100 feet
- 75,352(g)-----visual and audible signal at point feed regulator

# Compliance Dates

- 3 Months: (March 31, 2009)

- 75.333(c) (4) – Establish airlocks

- 6 Months: (June 30, 2009)

- 75.380(d) (7) --- Standard lifeline tactile signals

- 75.380(f) -----Primary escapeway higher ventilation pressure

- 75.381(c) (5) --- Standard lifeline tactile signals; anthracite mines

- 75.381(e) ----- Primary escapeway higher ventilation pressure; anthracite mines

# Compliance Dates

- 1 Year: (December 31, 2009)
- 75.350(a) (2) --- air velocity 50 fpm minimum (all mines)
- 75.351(e) (2) --- Smoke sensors after Secretary determines available
- 75.1103-4(a) --- Replace point type heat sensors with co sensors
- 75.1108(a) ----- Until December 31, 2009 either Part 18 or Part 14 belt may be used
- 75.1108(b) ----- After December 31, 2009 only Part 14 belt may be placed in service

# Compliance Dates

- 10 Years: (December 31, 2018)
- 75.1108(c) ----- All belts in use must be Part 14 belt

# Major Provisions

- Place in service conveyor belts that are more flame resistant than those currently used by December 31, 2009 (all existing belts must be replaced within 10 years).
- Request District Manager approval in the mine ventilation plan to use air from the belt entry to ventilate working sections.
- Replace point-type heat sensors with carbon monoxide sensors.

# Major Provisions

- Improve belt maintenance by requiring belts to be aligned, damaged rollers to be replaced, and by prohibiting materials in the belt entry if they contribute to a frictional heating hazard.
- Standardize signals on lifelines in escapeways to identify direction of travel to the surface, SCSR storage caches, personnel doors and refuge alternatives.
- Require training of Atmospheric Monitoring System (AMS) operators and make monitoring the AMS a primary responsibility (during an emergency the sole responsibility).

# Major Provisions

- Require the primary escapeway to have a higher ventilating pressure than the belt entry to prevent the primary escapeway from being contaminated by a fire in the belt entry.
- Establish airlocks where high air pressure differentials exist on personnel doors along escapeways to allow safe access to adjacent entries.
- Establish minimum and maximum air velocities in belt entries to assure appropriate fire detection.

# Major Provisions

- Require lower dust levels in belt entries for mines that use air from the belt entry to ventilate a working section if the working section is on a reduced (lower than 1.0 mg/m<sup>3</sup>) dust standard.
- Install smoke sensors in addition to carbon monoxide sensors in mines that use air from the belt entry to ventilate the working section. Smoke sensors would be required one year after approval for use in underground coal mines.

# Summary of Final Rule

- Part 14 requires that conveyor belts in underground coal mines meet the Agency's Belt Evaluation Laboratory Test (BELT).
- Until December 31, 2009 either Part 18 or Part 14 belts may be placed in service, after December 31, 2009 all belts placed in service must be Part 14 belts. After December 31, 2018 all belts must be Part 14 belts.

# Summary of Final Rule

- 48.27(a) requires that miners assigned work tasks as AMS (Atmospheric Monitor System) operators receive training prior to performing new work tasks.

# Summary of Final Rule

- 75.156 requires that miners assigned tasks as Atmospheric Monitoring System (AMS) operators be trained on their duties and responsibilities before they perform these duties and that AMS operators demonstrate proficiency to MSHA inspectors. To assist operators with training programs, MSHA has developed a training guide.

# Summary of Final Rule

- AMS operators are required at mines using an AMS to fulfill the following requirements listed in 75.351(a):  
75.323(d)(1)(ii), 75.340(a)(1)(ii),  
75.340(a)(2)(ii), 75.350(b), 75.350(d), or  
75.362(f) which relate to levels of methane in the return, monitoring underground electrical installations, using air from the belt entry, monitoring point-feed regulators, or using an alternative to on-shift examinations.

# Summary of Final Rule

- 75.333(c) applies to all underground mines and requires an airlock where the air pressure differential between air courses creates a static force exceeding 125 pounds on closed personnel doors along escapeways. Operators have until March 31, 2009 to establish airlocks.

# Summary of Final Rule

- The force in pounds produced by the pressure differential can be computed by multiplying the pressure drop across the door (in inches of water) by the area of the personnel door (in square feet) by a factor of 5.21. An example calculation is provided in the final rule preamble.

# Summary of Final Rule

## Pressure Needed to Produce 125 Pound Force

Door Area	Pressure Differential
4 sq ft	6.0 inches H <sub>2</sub> O
6 sq ft	4.0 inches H <sub>2</sub> O
9 sq ft	2.7 inches H <sub>2</sub> O
10 sq ft	2.4 inches H <sub>2</sub> O
12 sq ft	2.0 inches H <sub>2</sub> O

# Summary of Final Rule

- 75.350 (a) establishes a minimum air velocity of 50 feet per minute in mines that do not use air from the belt entry to ventilate a working section. 75.350 (b) establishes a minimum of 100 feet per minute, and a maximum of 1,000 feet per minute air velocity in mines that use air from the belt entry to ventilate working sections.

# Summary of Final Rule

- 75.350(b) requires that the use of air from a belt entry to ventilate the working section be permitted only when evaluated and approved by the District Manager in the ventilation plan. The mine operator must provide justification that the use of air from the belt entry would afford at least the same measure of protection as where belt haulage entries are not used to ventilate working places.

# Summary of Final Rule

- 75.350(b)(3) requires that where miners on the working section are on a reduced respirable coal mine dust standard below  $1.0 \text{ mg/m}^3$ , the average concentration of respirable dust in the belt entry must be at or below the lowest applicable respirable dust standard on that section.

# Summary of Final Rule

- 75.350(d)(1) requires that point feed regulators be monitored for carbon monoxide or smoke at a point within 50 feet upwind of the point-feed regulator. A second point must be monitored 1,000 feet upwind of the point feed regulator unless a lesser distance is approved in the mine ventilation plan

# Summary of Final Rule

- 75.351(b)(2) requires that an AMS operator's primary duty is to monitor the alert and alarm signals of the AMS and notify appropriate personnel of these signals. In the event of an emergency, the sole responsibility of the AMS operator shall be to respond to the emergency.
- 75.351(q) requires all AMS operators to be trained annually and travel underground to all working sections at least once every 6 months.

# Summary of Final Rule

- 75.351(e)(1) requires that carbon monoxide sensors be installed at intervals not to exceed 1,000 feet along each belt entry. However when air velocities are between 50 and 100 feet per minute spacing of sensors must not exceed 500 feet and in areas where air velocities are less than 50 feet per minute spacing of sensors must not exceed 350 feet

# Summary of Final Rule

- 75.351(e)(2) requires that smoke sensors be installed in areas where air from the belt entry is used to ventilate working sections. It would become effective one year after the Secretary has determined that smoke sensors are available to detect fires in underground coal mines. NIOSH is conducting studies to determine smoke sensor availability.

# Summary of Final Rule

- 75.352(g) requires that the AMS automatically provide both a visual and audible signal in the belt entry at the point-feed regulator location, at affected sections, and at the designated surface location when carbon monoxide concentrations reach the alert level at both point-feed intake sensors or the alarm level at either point-feed intake sensor

# Summary of Final Rule

- 75.371(jj) requires the ventilation plan to contain the locations and approved velocities at those locations where air velocities in the belt entry are above or below the limits set forth in 75.350(a)(2) or 75.350(b)(7) and 75.350(b)(8).
- 75.371(mm) requires the ventilation plan to contain the location of any diesel-discriminating sensor, and additional carbon monoxide or smoke sensors installed in the belt air course.

# Summary of Final Rule

- 75.371(nn) requires the ventilation plan to contain the length of the time delay or any other method used to reduce the number of non-fire related alert and alarm signals from carbon monoxide sensors.
- 75.371(yy) requires the ventilation plan to contain the locations where the pressure differential cannot be maintained from the primary escapeway to the belt entry.

# Summary of Final Rule

- 75.380 (d)(7) and 75.381 (c)(5) establishes new requirements for lifelines in underground bituminous and anthracite coal mines. The rule requires that lifelines in escapeways have tactile signals to identify SCSR caches, personnel doors, and refuge alternatives. The rule requires nationwide standardization of all tactile signals.

## Standardized Lifeline Signals

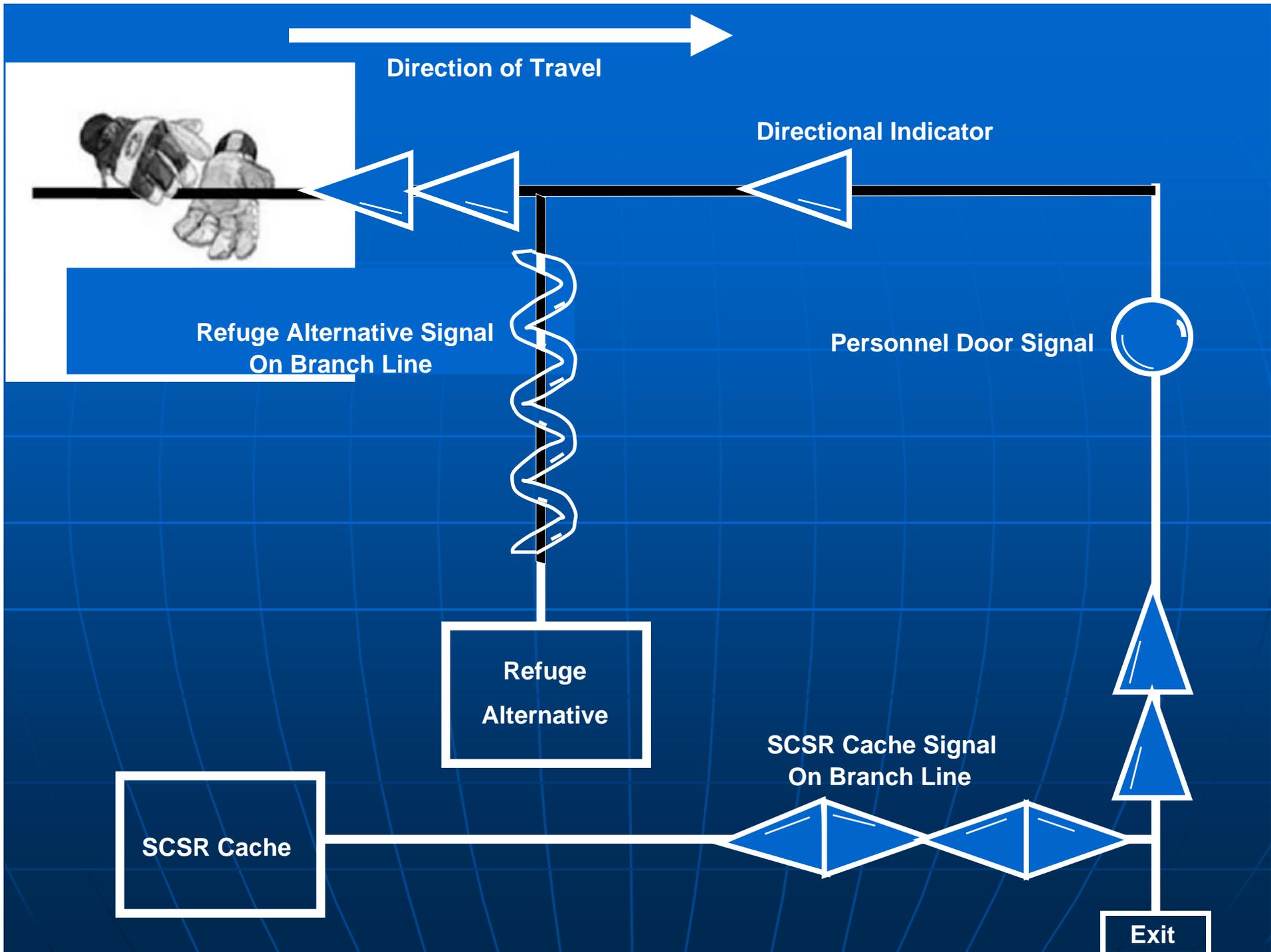
 Directional Indicator

 Branch Line Signal

 SCSR Storage Cache

 Refuge Alternative

 Intersection with Personnel Door  
(Like a tennis ball)



# Summary of Final Rule

- 75.380(f) and 75.381(e) requires that the primary escapeway in all coal mines have a higher ventilation pressure than the belt entry. The operator may submit an alternative in the mine ventilation plan to protect the integrity of the primary escapeway.

# Summary of Final Rule

- 75.1103-4 discontinues the use of point-type heat sensors and requires the use of carbon monoxide sensors for fire detection along belt conveyors in all underground coal mines. All point-type heat sensors, except those used to activate fire-suppression systems, must be replaced with carbon monoxide sensors by December 31, 2009

# Summary of Final Rule

- The final rule supersedes granted petitions for modification that allowed mine operators to use carbon monoxide sensors equivalent to point-type heat sensors. Mines operating under these petitions must comply with the requirements in the final rule. Mines that have installed carbon monoxide sensors in lieu of point-type heat sensors must comply with the final rule.

# Summary of Final Rule

- 75.1103-5 requires that when the carbon monoxide level reaches 10 parts per million above the established ambient level at any sensor location, automatic fire sensor and warning device systems shall provide an effective warning signal at the following locations: (1) At working sections and other work locations where miners may be endangered from a fire in the belt entry and (2) At a manned surface location where personnel have an assigned post of duty.

# Summary of Final Rule

- 75.1103-6 permits point-type heat sensors or automatic fire sensor and warning device systems to be used to actuate deluge-type water systems, foam generator systems, multipurpose dry-powder systems, or other equivalent automatic fire suppression systems.

# Summary of Final Rule

- 75.1103-8 requires automatic fire sensor and warning device systems to be examined at least once each shift when belts are operated as part of a production shift. A functional test of the warning signals shall be made at least once every seven days. Examination and maintenance of such systems shall be by a qualified person.
- A record of the functional test conducted in accordance with paragraph shall be maintained by the operator and kept for a period of one year.
- Sensors shall be calibrated in accordance with the manufacturer's calibration instructions at intervals not to exceed 31 days. A record of the sensor calibrations shall be maintained by the operator and kept for a period of one year.

# Summary of Final Rule

- 75.1103-10 requires that for each conveyor belt flight exceeding 2,000 feet in length, where the average air velocity along the belt haulage entry exceeds 100 feet per minute, an additional cache of the materials specified in 75.1103-9(a) (1), (2), and (3) shall be provided. The additional cache may be stored at the locations specified in 75.1103-9(a), or at some other strategic location readily accessible to the conveyor belt flight.

# Summary of Final Rule

- 75.1108 requires that until December 31, 2009 conveyor belts placed in service in underground coal mines shall be:
  - (1) Approved under Part 14; or
  - (2) Accepted under Part 18.
- Effective December 31, 2009 conveyor belts placed in service in underground coal mines shall be approved under Part 14. If MSHA determines that Part 14 approved belt is not available, the Agency will consider an extension of the effective date.
- Effective December 31, 2018 all conveyor belts used in underground coal mines shall be approved under Part 14.

# Summary of Final Rule

- 75.1731 requires that damaged rollers, or other damaged belt conveyor components, which pose a fire hazard must be immediately repaired or replaced. All other damaged rollers, or other damaged belt conveyor components, must be repaired or replaced.
- Conveyor belts must be properly aligned to prevent the moving belt from rubbing against the structure or components.
- Materials shall not be allowed in the belt conveyor entry where the material may contribute to a frictional heating hazard.
- Splicing of any approved conveyor belt must maintain flame-resistant properties of the belt.

**THANK YOU**

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