



# **Stakeholder Meeting**

## **October 4, 2016**

**U.S. Department of Labor**  
**Mine Safety & Health Administration**

# Mining Deaths



January - September 2016

22 deaths / 8 in Coal - 14 in MNM

January - September 2015

24 deaths / 9 in Coal - 15 in MNM

Deaths in September 2016 - 4

Deadliest month in MNM - October

# Agenda

10:00am – Pat Silvey	Welcome and Introduction of Assistant Secretary Main
10:05am – Joe Main	Opening Remarks
10:15am – Larry Trainor	Review of MNM Fatalities Review of MNM Serious Accidents
Neal Merrifield	MNM Fatality Prevention Action Plan
10:30am – Marcus Smith	Review of Coal Fatalities Review of Coal Serious Accidents
Tim Watkins	Coal Fatality Prevention Action Plan
10:45am	Questions and Answers
11:00am	MNM & Coal Breakout Sessions



# Metal and Nonmetal Mine Safety & Health Fatal Accidents 2016

January through September

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202-693-9644



# Metal and Nonmetal Fatalals in 2016

- Surface Mines – 14
- Underground Mine – 0
- Classifications
  - Powered Haulage – 3
  - Machinery – 3
  - Inundation – 2
  - Slip or Fall of Person – 2
  - Falling Material – 1
  - Blasting and Breaking Agents – 1
  - Electrical – 1
  - Fall of Highwall – 1



# Metal and Nonmetal Fatalities in 2016

- Company Employees – 10
- Contractors – 4



# Metal and Nonmetal Fatalals in 2016

- Mississippi – 2
- Texas – 2
- Utah – 1
- Iowa – 1
- Arkansas – 1
- Alabama – 1
- Arizona – 1
- Kentucky – 1
- Tennessee – 1
- North Carolina – 1
- Virginia – 1
- Nevada – 1



# Metal and Nonmetal Fatalals in 2016

- Limestone – 4
- Sand & Gravel – 4
- Cement – 2
- Copper Ore – 1
- Titanium – 1
- Granite – 1
- Magnesite – 1



# Metal and Nonmetal Fatalals in 2016

- Truck Operator – 3
- Hydraulic Excavator Operator – 2
- Maintenance – 2
- Leadman/Contractor – 1
- Drill Operator – 1
- Mine Superintendent – 1
- Dozer Operator – 1
- Hydromet EW Operator – 1
- Contractor – 1
- Leadman – 1



On February 26, 2016, a contract truck driver delivering multiple sections of polyurethane pipe was struck by a section of pipe during the unloading process. A forklift removed two sections of pipe from the passenger side of the truck, and then left the area with the two sections. While the forklift was away, a single, unsecured section of pipe rolled off on the driver's side of the truck and struck the victim. Each section of pipe was approximately 50' long and weighed approximately 1,750 pounds. Miners began first aid but the driver was unresponsive. He was transported to the local hospital and later died.



On March 8, 2016, a 54-year old miner with 5 years of mining experience was killed at a surface sand mine. The miner backed his haul truck over a dump site and the driver was found at the bottom of the embankment, 60 feet below the dump point. The victim was found unresponsive and partially submerged in water. CPR was attempted, but the victim was not able to be resuscitated.



On Tuesday, March 22, 2016, a leadman was struck and killed by flyrock during blasting operations. The victim was over 1,000 feet from the blast site and was waiting in his truck to prevent others from accessing the blast site.



On April 9, 2016, a 25-year old plant operator with 4 years of mining experience was fatally injured at a surface copper ore mine. He was found unresponsive, kneeling with his face against a stainless steel flange that was connected to a high-density polyethylene pipe. The medical examiner ruled the cause of death as probable electrocution.



On April 11, 2016, a 61-year old contract dozer operator with 18 years of mining experience was fatally injured at a surface titanium ore mine. The victim had been using a dozer to perform maintenance on the haul road into the pit. The victim either fell or stepped onto the left-side dozer track as the machine started moving backwards down a slope. He was found laying approximately 30 feet in front of the dozer's stopping point.



On May 10, 2016, a 46-year old maintenance man with 6 years of experience was fatally injured at a cement plant. The victim went to the top of the slurry tank to start the rake system. He fell 50 feet through a 3-foot by 4-foot opening in the walkway into the empty slurry tank below.



On June 3, 2016, a 24-year old haul truck operator, with 9 months of experience, and a 56-year old hydraulic excavator operator, with 6 years of experience, were killed at a sand and gravel operation. The two miners were working in a pit next to an abandoned roadway embankment, which partially bound an old pit. Waste clay and sand had been placed in the old pit for reclamation purposes. The embankment failed and the waste clay and sand engulfed both miners.



On June 27, 2016, a 61-year old Mine Superintendent, with 24 years of experience, was killed at a limestone quarry. The victim was building a ramp to the lower bench and was positioning his haul truck to dump a load of material near the edge of a highwall and rolled backwards over the 90 foot highwall.



On July 25, 2016, a 59 year old Excavator Operator, with 17 years of experience, was killed at a limestone quarry. Prior to the accident, the victim was loading shot rock into haul trucks. While waiting for the haul trucks to return, the victim was separating out over sized rocks when the cab of his excavator was struck by falling material from the highwall.



On August 9, 2016, a 33 year old Leadman Contractor, with 4 years of experience, was killed at a cement plant loadout. The victim was attempting to replace the lift cable pulleys on the barge loadout chute, when the anchor point for the temporary rigging separated from the loadout chute and it unexpectedly fell. The falling loadout chute caused the lift cables to tighten and the lift cables pinned the victim to the loadout chute causing fatal injuries.



On September 8, 2016, a 58-year old Haul Truck Operator with 23 years of experience was killed at a granite mine. The victim was operating a Caterpillar 773E haul truck and was returning to the pit to be loaded with shot rock. The truck veered from the right side of the haul road to the left and traveled over the berm at the top of the highwall. The truck landed upside down approximately 150 feet below. The victim was found outside the haul truck.



On September 21, 2016, a 52 year old contract Drill Operator contractor, with 27 years of experience, was killed at a limestone mine. The victim was performing maintenance on a truck-mounted rotary drill when a wrench he was using broken free piercing his abdomen. As the victim attempted to climb down an adjacent step ladder, he was observed falling to the ground and striking his head on a breakaway wrench which was laying on the ground. The victim was transported to a hospital and underwent surgery. He died later that day as a result of his injuries.



On September 15, 2016, a 60 year old Mechanic, with 28 years of experience, was fatally injured at a Magnesite facility. The victim was working on a front end loader. The miner had completed his assigned tasks and was dismounting the machine when he fell knocking him unconscious for several minutes. The victim was revived and transported to a local hospital however his condition worsened and was placed on life support systems before he passed away on September 26, 2016.



# Best Practices

- Use either two hands and one foot, or one hand and two feet when mounting and dismounting equipment.
- Do not place yourself in a position that will expose you to hazards while performing a task.
- Always wear a seat belt when operating a haul truck or mobile equipment.
- Consult and follow the manufacturer's recommended safe work procedures for the maintenance task.
- Look, Listen and Evaluate your highwall and pit conditions daily, especially after each rain, freeze, or thaw.
- Utilize ground control methods, such as berms and dumping short to maintain distance from a drop off.
- Make sure that embankments containing ponds of water, tailings, processing waste, or other fluids are designed and constructed to be stable, and that mining operations are kept a safe distance away.
- Protect openings near travelways by installing railings, barriers, or covers.
- Set the parking brake and lower the bull dozer blade to the ground before dismounting equipment.
- Thoroughly examine the work area before beginning the job.
- Establish and discuss safe work procedures before beginning work.



# MNM Milestones in 2015

- 17 Fataals
- No fataals from August 3<sup>rd</sup> through December 15<sup>th</sup>  
– 133 Days
- 133 is longest stretch of days in MNM mining history without a single death. Previous stretch was 82 days (Oct 19, 2009 to Jan 9, 2010)
- First time in recorded history with no MNM mining deaths in the deadliest month of October.



# MNM Monthly Alerts since Aug. 3, 2015 with Co-Sponsors

- Workplace Exams August 2015
- Seasonal Safety October 2015
- Confined Space November 2015
- Go Home for the Holidays December 2015
- Lock-Tag-Try January 2016
- Machinery & Equipment February 2016
- Pipe Safety March 2016
- April is one of the Deadliest Months April 2016
- Warehouse Safety May 2016
- Trespasser-related Fatalities June 2016
- Explosives Safety July 2016
- Drill Entanglements August 2016
- Water Hazards September 2016
- Seat Belts October 2016



# MNM Future Initiatives

- Nov 2016 - Workplace Exams (w/ Colorado Div. of Reclamation, Mining & Safety)
- TBD - TBA (w/ AZ Rock Products Assn.)
- TBD - Be Alert (w/ NSSGA)



# MNMM Fatal Reduction Tools

- Increased Enforcement
- Education and Outreach
  - Accident and Fatal Information, Root Causes
  - Best Practices
- Quarterly, National conference calls with Mine Safety trainers
- Continue what works
  - Focus Inspections
  - Walk and talks
  - Near Miss alerts
  - Month Initiatives



# Coal Mine Safety & Health Fatal Accidents 2016

January through September

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# Coal Fatalities

- Surface Mines – 0
- Underground Mines – 8
  - Surface of an Underground Mine – 2 of 8
- Classifications
  - Powered Haulage – 3
  - Machinery – 2
  - Fall of Rib – 2
  - Ignition/Explosion of Gas -1



# Coal Fatalities by State

- West Virginia – 4
- Kentucky - 2
- Pennsylvania – 1
- Illinois - 1



# Coal Fatalities by Occupation

- Continuous Mining Machine Operator – 3
- Belt Foreman – 1
- Maintenance Foreman – 1
- Shuttle Car Operator - 1
- Contract Laborer – 1
- Motorman– 1



Fatal No. 1. - On January 4, 2016, a 53-year-old belt foreman received fatal injuries when he became entangled in a moving underground belt. The victim was preparing to change out a hold up roller when he was caught by the moving belt and roller.



# Best Practices

- Never perform work on a moving conveyor belt.
- Ensure that power is off with a visual disconnect before any work is performed.
- Use your own lock and tag to lock out and tag the visual disconnect.
- Ensure that machinery is blocked against motion before performing maintenance or repairs.



Fatal No.2. - On January 16, 2016, a 31-year-old continuous mining machine operator was fatally injured when a section of coal/rock rib pinned him to the mine floor.



# Best Practices

- Train all miners and supervisors to conduct thorough examinations of the roof, face, and ribs where persons will be working and traveling. Correct all hazardous conditions before allowing persons to work or travel in such areas.
- Be aware of potential hazards at all times when working or traveling near ribs. Take additional safety precautions when mining heights increase to prevent development of rib hazards.
- Avoid areas of close clearance between ribs and equipment.
- Know and follow the approved roof control plan and provide additional support when roof or rib fractures, or other abnormalities are detected. Remember, the approved roof control plan only contains minimum requirements.



# Best Practices, Cont'd

- Install rib bolts with adequate surface coverage hardware on cycle and in a consistent pattern for the best protection against rib falls. In addition to rib bolts and mesh, setting post on 4 foot centers along questionable rib lines will provide additional protection against rib rolls.
- Be alert for changing conditions, especially after activities that could cause roof disturbance. Report abnormal roof or rib conditions to mine management.
- Adequately support or scale any loose roof or rib material from a safe location. Use a bar of suitable length and design when scaling.
- Danger off hazardous areas until appropriate corrective measures can be taken.



Fatal No.3. - On January 19, 2016, a 36-year-old continuous mining machine operator was fatally injured between the mining machine and the coal rib.



# Best Practices

- Avoid “RED ZONE” areas when operating or working near a remote controlled continuous mining machine. Ensure all personnel; including the equipment operator is outside the machine turning radius before starting or moving the equipment. STAY OUT of RED ZONES.
- Maintain a safe distance from any moving equipment. Position the conveyor boom away from the operator or other miners working in the area or when moving the machine.
- Perform the manufacturer’s required or recommended pre-operation examinations each shift to ensure the proximity detection system is in proper working order. This will verify that the shutdown zones are sufficient to stop the machine before it could contact a miner.
- Always ensure continuous mining machine pump motors are disabled before handling trailing cables and never defeat machine safety controls.



Fatal No.4. - On March 25, 2016, a 48-year-old continuous mining machine operator was fatally injured when a section of rib fell and pinned him against the haulage equipment.



# Best Practices

- Be aware of potential hazards at all times when working or traveling near mine ribs, especially when conditions exist that could cause roof or rib disturbance. Take additional safety precautions in these conditions and when mining heights increase.
- Do not stand between ribs and remote-controlled face equipment.
- Know and follow all provisions of the approved roof control plan. Recognize that this plan has minimum requirements and additional measures must be taken as mining conditions warrant.
- Train all miners to conduct thorough examinations of the roof, face, and ribs where miners will be working or traveling. Correct all hazardous conditions before allowing miners in such areas.
- Continuously watch for changing conditions and conduct more frequent examinations when abnormal conditions are present.



# Best Practices, Cont'd.

- Pay particular attention to deteriorating roof and rib conditions when working in, or traveling through, older areas of the mine. Provide additional training for specialized work, such as outby construction, emphasizing best practices for each specific task.
- Perform a site-specific risk assessment for underground construction projects since unusual hazards may be encountered. Identify and correct hazardous conditions related to falls of the roof, face, and ribs.
- Install rib bolts on cycle and in a consistent pattern for the best protection against rib falls.
- Provide additional support when fractures or other abnormalities are detected and use appropriate standing support beneath overhanging brows if they cannot be taken down or adequately bolted.
- Adequately scale any loose rib material from a safe location with a bar of suitable length.
- Historically, rib related accidents occur in areas where the mining height exceeds 7 feet and the cover is more than 700 feet. In such areas, make frequent examinations and take proactive measures to assure adequate, effective rib support is installed and maintained.



Fatal No. 5 - On June 6, 2016, a 34-year-old contract laborer with 7 years of mining experience was fatally injured when a diesel-powered front-end loader fell on him. Working together, another miner and the victim lowered the bucket and put downward hydraulic pressure on the bucket to raise the middle of the loader. Both miners then crawled under the loader. The hydraulic pressure released, allowing the loader to lower, pinning both miners. A mine examiner, who was nearby, lowered the bucket again to raise the loader off the miners. One miner was freed and assisted in removing the unresponsive victim from under the loader. Cardiopulmonary resuscitation (CPR) was performed, but the victim could not be revived.



# Best Practices

- Do not work under a suspended load.
- Never depend on hydraulics to support a load. Use the manufacturer's recommendations to lift and block equipment against hazardous motion BEFORE starting any repairs.
- DO NOT proceed with repairs until all safety concerns are adequately resolved, especially if potential hazards or prescribed procedures are unclear.
- Conduct examinations, from safe locations, to identify hydraulic leaks and assure repairs are conducted in accordance with the manufacturer's recommendations. Verify the release of, or fully control, all stored energy before initiating repairs.
- Treat the suspended load as unblocked until blocks or jack stands are in place, fully supporting the weight, and equipment stability has been verified.
- Establish and discuss safe work procedures before beginning work. Identify and control all hazards associated with the work to be performed to ensure miners are protected. Use the proper tools and equipment for the job.
- Train all miners in the health and safety aspects and safe work procedures related to their assigned tasks.



Fatal No. 6 - On Monday, May 16, 2016, at approximately 4:00 a.m., a 50-year-old motorman, with over 14 years mining experience, was fatally injured when the diesel locomotive he was operating crashed through a closed air lock door. The diesel locomotive was pulling six drop deck cars.



# Best Practices

- Communicate your position and intended movements to other locomotive operators and other miners that may be in the area.
- Always look in the direction of equipment movement and ensure travelways are clear.
- Exercise caution in low clearance work areas and maintain adequate clearance for equipment.
- Keep all body parts within the operator's compartment while the equipment is in motion.
- Maintain control of equipment so that it can be safely stopped.
- Assure dead-man controls are fail-safe and maintain brakes and dynamic retarding controls.



Fatal No. 7 - On Friday July 29, 2016, a 58-year-old miner with 40 years of mining experience sustained fatal injuries when an ignition occurred in the shaft he and another miner were working above. Two miners were welding threaded blocks to secure guarding around the drive-shaft between a motor and dewatering pump. Methane ignited within the shaft, and the victim was in the direct line of the ignition force. On August 4, 2016, the victim died from the injuries received during the accident.



# Best Practices

- Do not weld, cut, or solder with an arc or flame where methane is detected in excess of 1% by volume. Provide supplemental ventilation in work areas where methane may be encountered.
- Conduct proper examinations for methane immediately before and periodically during welding, cutting, or soldering, especially in areas likely to contain methane. Perform examinations with properly calibrated methane detectors that are capable of detecting concentrations greater than 5%.
- Ensure smoldering metal or sparks from welding, cutting, or soldering do not result in the ignition of combustible materials or methane. Install non-combustible barriers below welding, cutting, or soldering operations in or over a shaft.
- Provide adequate training on the characteristics of mine gases and in the use of handheld gas detectors, including the use of extendable probes or pumps.
- Always use non-sparking tools when working where there is a potential for flammable or explosive methane concentrations and, when practicable, utilize options which do not involve welding or cutting when working near these areas.



Fatal No. 8 - On Friday September 23, 2016, a 46-year-old miner was fatally injured in a vehicle accident that occurred along a portion of a mine's access/haul road. The victim (passenger) and a coworker (driver) were traveling down an inclined portion of the road when the driver apparently lost control of the pickup truck, causing it to strike the road berm and roll over in the roadway.



# Best Practices

- Always wear a seat belt when operating mobile equipment, including personal trucks and automobiles.
- Operate vehicles and equipment at safe speeds, maintain control at all times, and adjust speed for the prevailing conditions (road grade, visibility, inclement weather, etc).
- Avoid using hand-held cell phones or texting while operating any mobile equipment.
- Ensure that traffic rules, speed limits, and warning signs are posted in visible locations along the roadway. Ensure the rules are obeyed.
- Ensure that access roads on mine property used by miners in personal vehicles are maintained and are free of hazards.
- Provide proper training to all employees on roadway hazards.
- Maintain steering and braking systems in good repair and adjustment.



# Serious Accidents



A roof bolter was attempting to drill a hole in the roof when his arm and hand became intertwined with the drill steel causing severe injuries to his right arm and hand.

## Best Practices

- Never touch or hold a rotating drilling tool, wrench, or bolt.
- Ensure that proper drill feed and rotation pressures are being used. Pressures should be only as high as necessary to efficiently drill the roof.
- Ensure that emergency shut-off switches (panic bars) are properly working.



A miner attempted to start a 400 horsepower, 460 VAC pump motor (435 full load amperes) when two phases short-circuited causing an electrical arc. The heat from the arc escaped the starter enclosure and caused second-degree burns. The short circuit occurred because the high amperage of the motor caused the phase connections to the circuit breaker to loosen over time.



## Best Practices

- Ensure electrical circuits and switches are safely designed and installed.
- Perform complete and thorough electrical examinations.
- Properly maintain electrical circuits to ensure continued safe operation.

# Coal Initiatives

## Compliance Assistance Program

- Began in May 2016
- To date:
  - 1,720 separate mine visits
  - Spoke to 23,759 miners
  - Contributed 17,383 hours

## Stop and Take a Breath – Initiative

- August 29, 2016 to September 30, 2016
  - 958 separate mine visits
  - Spoke to 21,206 miners
  - Contributed 3,613 hours



# Coal Initiatives

## Combining Both Initiatives

- 2,678 separate mine visits
- Spoken with 44,965 miners
- Contributed approximately 21,000 hours

## Upcoming Initiatives

- Continuing the Compliance Assistance Program next Quarter
  - Increasing from 32 to 37 participants
- Assisting MNM
  - 40 Inspectors/Specialist
  - 2 weeks



# Breakout Session: MNM

## AGENDA

- Seat Belt alert for October with AEM
- Overview
- October deadliest month
  - Walk and talks with EFSMS and Coal Inspectors
  - Hazard alerts
- Contractor Fatalities
- Falls of persons contributing factors
- Truck driver fatalities





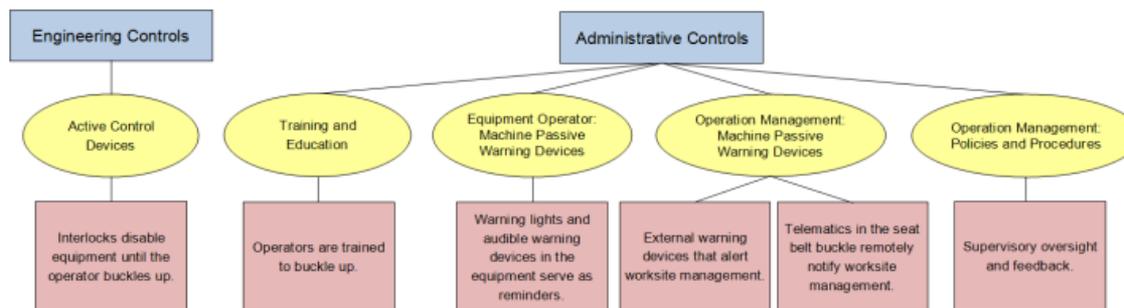
# MSHA & AEM Safety Alert – Seat Belt Use on Mobile Equipment

## MSHA Safety Alert -- Seat Belt Use on Mobile Equipment

A review of mining fatalities from 2010 to 2015 showed that each year about three miners fatally injured in a mobile equipment accident were not properly wearing their seat belt.

Each year, miners' lives could be saved if they simply buckled their seat belt while operating mobile equipment. The Mine Safety and Health Administration (MSHA) and the Association of Equipment Manufacturers (AEM) are working together through their alliance to increase seat belt usage among equipment operators to help achieve the objective of "ZERO INJURY, ZERO HARM."

The challenge is to reach that percentage of operators who do not faithfully wear a seat belt, and buckle up each and every time they get behind the wheel. The components of an effective seat belt policy at your site can include a variety of engineering and administrative controls, as outlined below.



### Points to Consider:

- In the automotive industry, regulations and their enforcement have caused a marked increase in seat belt use. According to the National Safety Council, the national average of seat belt use is at 88%, and seat belt use is 11% higher in states with primary enforcement laws than in states with secondary enforcement only.<sup>1</sup>
- Commercial airline passengers are unlikely to forget to buckle up given the industry's standards for pre-flight instruction with a review of printed information, lights throughout the cabin to indicate that seatbelts should be fastened, announcements when they must be fastened, and consistent staff and management follow up.
- Consider all the stakeholders that contribute to seat belt usage at your site: Original Equipment Manufacturers and dealers, rule makers and regulatory agencies, mine operators, and the equipment operators themselves.

**Establishing and enforcing a clear seat belt policy at your site that incorporates the best practices of both engineering and administrative controls is a key factor in your efforts to achieve higher levels of seat belt usage on mobile equipment.**



# Breakout Session: Coal

## AGENDA

- Overview
- Requirements for Refuge Alternative Certifications
- Built in Place shelters/Refuge Alternatives
- Voice Communications/Breathing Devices
- Mine Rescue Teams



# Refuge Alternative Structural Component Approvals - 2018

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# Refuge Alternative Structural Components

March 2, 2009 Final Rule established approval requirements for structural components in 30 CFR §7.505

Breathable air, air monitoring, and harmful gas removal components were grandfathered until December 31, 2013

30 CFR §75.1506 allows state-approved units to remain in service until December 31, 2018 or until replaced

After December 2018, all pre-fabricated refuge alternatives must meet part 7 requirements



# Refuge Alternative Structural Components

For MSHA part 7 approval consideration, manufacturers must conduct testing, provide results and submit design criteria

Constructed 15 psi stoppings (Built-In-Place) are approved by the District Manager and are not MSHA part 7 approved



# Mine Operators Should Expect:

Likely decrease in maximum occupancy rating due to

- Floor space and volume requirements
- Maximum occupancy derating in order to maintain apparent internal air temperature at or below 95°F

Possible decrease in maximum mine air temperature rating

Modification of the refuge alternative to comply with 2018 requirements

Replacement of components, supplies, and provisions



# Refuge Alternatives Deratings:

## Space and Volume Only - Examples

Manufacturer Product	Occupancy		
	Pre 2018	Post-2018	Percent decrease
1 A	18	17	6%
1 B	16	9	44%
1 C	10	10	0%
2 A	16	9	44%
2 B	20	10	50%
2 C	22	7	68%
3 A	20	9	55%
3 B	28	13	54%
3 C	8	2	75%



# Effect of Derating Refuge Alternatives:

Mine Operators may need to provide additional refuge capacity to accommodate all persons who routinely work in the area and “Hot Seat” shift changes



# Refuge Alternatives Retrofits:

- Refuge alternatives will likely need to be brought outside to complete retrofits
- Tents may need to be replaced in order to
  - Meet the puncture and tear resistance requirement
  - Increase airlock size to accommodate an injured miner on a stretcher
  - Meet floor space and volume per person requirements



# Refuge Alternatives Retrofits:

- Steel containers may require modification to:
  - Accommodate a larger sized tent
  - Provide ability to conduct preshift examinations without entering the structure
- Replacement of components, supplies, and provisions
- Refuge alternatives will be out-of-service during retrofits



# Mine Operator Responsibilities:

- Mine operators must have MSHA part 7 approved refuge alternatives in service after December 31, 2018
- Mine operators must provide training to miners



# NIOSH Partnership Meeting

- October 19, 2016
- Pittsburgh Research Center, South Park, PA
- Details on NIOSH research and additional information on the effects of MSHA Approval Requirements



# For Additional Information

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# BUILT IN PLACE SHELTERS (BIPs)

15 PSI REFUGE ALTERNATIVES (RAs)



# BUILT IN PLACE (15PSI RAs)

- On December 31, 2018, refuge alternative structural components for pre-fabricated units must be approved under part 7.
- Structural components consisting of 15 psi stoppings used with Built-in-Place refuge alternatives are not affected by this compliance date.
  - These already must receive approval from the District, with Tech Support design review if necessary.



# BUILT IN PLACE (15PSI RAs)

- 19 BIPs in underground coal mines
  - District 9 – 15 BIPs at 3 mines (Longwall mining)
  - District 10 – 4 BIPs at 2 mines (Continuous mining)
- Located in outby areas
- Borehole from the surface and either blowers or compressors to supply breathable air
- Blowers and compressors will supply roughly 300-500 cfm of air
- Harmful Gas Removal and Air Monitoring components
- Doors (Micon, Cosby and Custom Engineering) used with 15psi stoppings approved in Emergency Response Plan (ERP)



# X-cut 16 redundant blowers



# X-cut 16 generator



# View of x-cut 16 RA stopping



# View inside x-cut 16 RA livable space



# X-cut 47 outside location



# Valving for breathable air



# Compressor for x-cut 47



# View inside of x-cut 47 RA livable space



View of airlines coming up from underground,  
note kennedy stopping for airlock



# Sound mufflers off of airline



View of buried airline coming from compressor located on surface, airline is buried for a cross-cut until it reaches the livable space of RA.



View of airline coming out of roof from surface and flanked by two pieces of steel to protect pipe from stopping debris in case of flying debris from block stopping.





Three red circular lights mounted on the top edge of the trailer.

CAUTION

HONDA STAR 8000 HONDA

HONDA'S STAR ENGINES GX Series

4



# Coal Breakout: Voice Communications/ Breathing Devices



# Number of Coal Mine Rescue Teams

2012			2016				
STATE	COMPANY TEAMS	STATE TEAMS	STATE	COMPANY TEAMS	Change in Company Teams	STATE TEAMS	Change in State Teams
Alabama	8	2	Alabama	4	-4	2	0
Arkansas	2		Arkansas	2	0		0
Colorado	12		Colorado	10	-2		0
Illinois	15		Illinois	12	-3		0
Indiana	3		Indiana	2	-1	2	2
Kentucky	26	12	Kentucky	13	-13	7	-5
Maryland	2		Maryland	2	0		0
Montana	1		Montana	2	1		0
New Mexico	5		New Mexico	3	-2		0
Ohio	9		Ohio	9	0	1	1
Oklahoma	1		Oklahoma	2	1		0
Pennsylvania	19		Pennsylvania	10	-9	4	4
Tennessee	2		Tennessee	0	-2	2	2
Texas	4		Texas	0	-4		0
Utah	20		Utah	10	-10		0
Virginia	14		Virginia	9	-5	1	1
West Virginia	42	4	West Virginia	33	-9	6	2
Wyoming	16		Wyoming	3	-13		0
<b>TOTALS</b>	<b>201</b>	<b>18</b>	<b>TOTALS</b>	<b>126</b>	<b>-75</b>	<b>25</b>	<b>7</b>
	<b>219</b>			<b>151</b>			

