



MSHA Proximity Detection Update

February 16, 2011

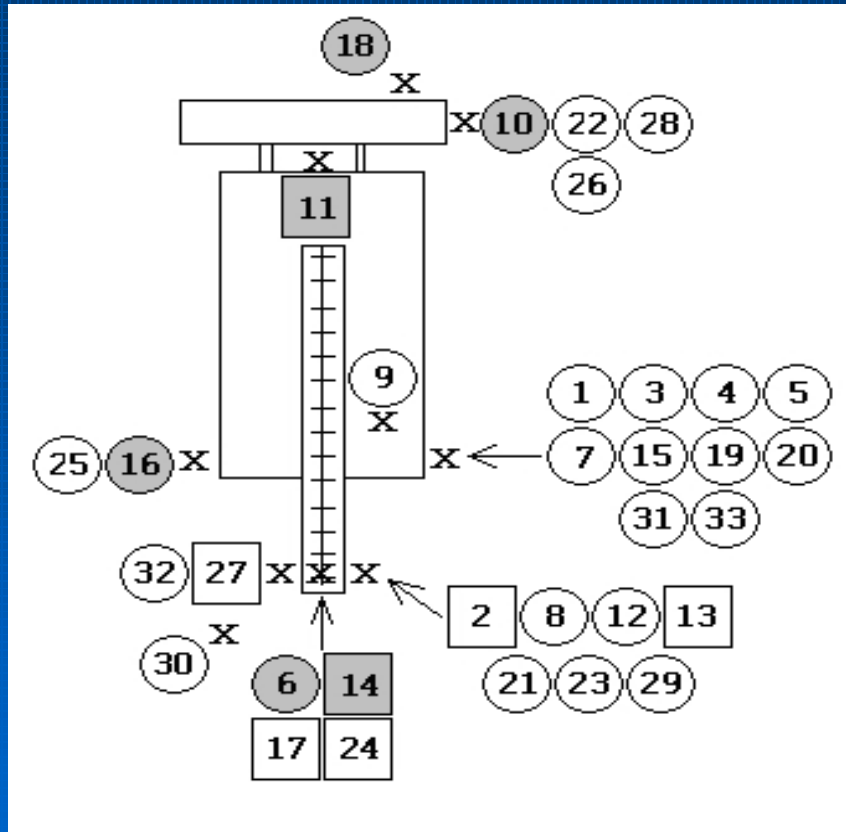


Fatal Accident Data Study – 1984-2010

- Study identified crushing fatalities that could have been prevented by proximity detection:
 - 70 total in CMSH
 - 30 continuous miners
 - 25 shuttle cars or coal haulers
 - 10 scoops
 - 5 mobile bridge conveyors
 - 5 total in MNM



Remote Control Continuous Mining Machine Fatalities



- 33 since 1984
- 28 victims had possession of remote control
- 6 maintenance



Fatal Crushing Accidents (2010)



- Two remote control continuous miner accidents



- Four shuttle car/coal loading machine accidents



2004 Red Zone Awareness Campaign

- MSHA conducted awareness campaign for “staying out of the red zone” in 2004/2005 that included:
 - Analysis of the task of operating remote control continuous mining machines (Job Task Analyses)
 - “Walk and talks” – visiting mining operations
 - Webcast
 - Mass mailings



2004 Red Zone Awareness Campaign

- Zero CM fatalities in 2005 – 2007
- Machinery crushing fatalities are on the increase.
- Raised awareness campaigns have an “expiration date.”



MSHA Approved Proximity Detection Systems

- Nautilus International Coal Buddy System
- Strata Safety Products HazardAvert™ System
- Joy/Matrix Design Group M3-1000 System



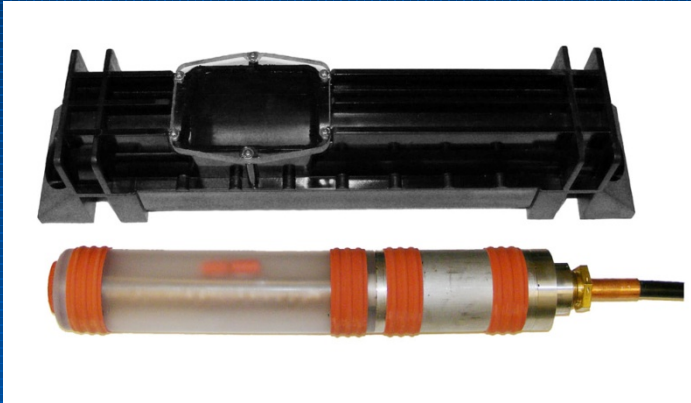
Nautilus International “Coal Buddy System”



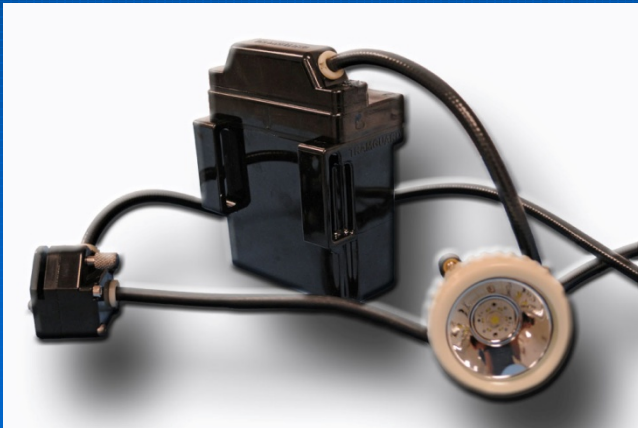
- Three current installations
 - ICG Sentinel
 - Massey (Independence Coal) Cook and Randolph Mines
- One system ordered for Patriot’s Federal #2 Mine
- Massey Energy ordered 30 systems



Strata Safety Products HazardAvert™ System



- Experience with installations at:
 - Consol Jones Fork Mine
 - ICG Viper Mine
 - Peabody Black Beauty Mine
 - Consol Buchanan Mine
- Current focus in South Africa where there are currently eight (8) complete u/g coal mine sections using HazardAvert™
- Currently testing system at Consol Buchanan Mine and Peabody Willow Lake Mine



Joy-Matrix Design Group “Miner Monitor M3-1000”



- MSHA approved in February 2009
- 18 systems installed at Alliance Coal Company Mines including :
 - Riverview
 - Pattiki
 - Dottiki
 - Mettiki
 - Tunnel Ridge



Joy-Matrix Design Group “Miner Monitor M3-1000”

- **Zone Types**

- **Warning Zone**, further away from the machine, provides operator feedback through a series of yellow LED lights mounted on each receiver
- **Shutdown Zone**, closer to the machine, provides operator feedback through red LED lights and disables certain functions such as tram and conveyor swing

- **Operational Modes**

- **Tram Mode** defines a larger, full machine zone accounting for increased machine speed
- **Cutting Mode** defines a smaller, partial machine zone near the bumper accounting for operator positioning away from haulage interaction



Proximity Detection Performance Issues

- Parasitic coupling – signal gets induced on nearby cables distorting field
- Magnetic interference – large metal objects distort field
- Other interference – Variable Frequency Drives
- ❖ *Performance issues appear to have been overcome by several systems*



MSHA, NIOSH, WV MSTTF Visit to South Africa

- Observed:
 - Strata Safety Products Tramguard™ at Sasol Twistdraai Underground Coal Mine
 - SafeMine GPS System at Anglo New Vaal Colliery Surface Coal Mine
 - Becker CAS System at Xstrata Kroondal Underground Chromium Mine
 - Booyco CWS at Anglo Greenside Colliery underground coal mine



South Africa PDS Experience

- Sasol uses on all face equipment including:
 - Continuous mining machines
 - Shuttle cars
 - LHDs (scoops)
 - Roof Bolters
 - Feeder Breakers
- Anglo Coal uses on all face equipment except CMs



Surface Collision Warning Systems

- SafeMine GPS
- AMT RFID and Video System
- Preco Radar System
- Becker CAS System
- Acumine ACASS System
- Strata HazardAvert™



MSHA Rulemaking Activity

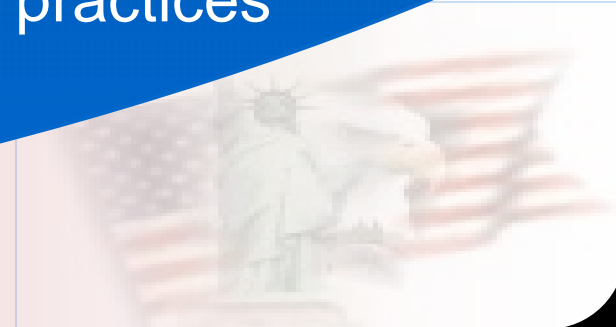
- Published RFI January 31, 2010
 - 14 Responses received
 - Available at www.msha.gov
- Working on Emergency Temporary Standard



Safety Around Shuttle Cars and Scoops in Underground Coal Mines



- MSHA program addresses increase in underground machinery accidents and includes:
 - Training presentations
 - Public service message
 - Best practices



Safety Around Shuttle Cars and Scoops in Underground Coal Mines

- Sticker Design
- Poster
- Talking points and powerpoint for trainers



Safety Around Shuttle Cars and Scoops in Underground Coal Mines

- Safety practices around scoops and shuttle cars for:
 - Miners
 - Mine managers and operators
 - Trainers
- <http://www.msha.gov/focuson/watchout/watchout.asp>



MSHA Webpage Resources

- [Proximity Detection / Collision Warning Single Source Page](#)
- [Remote Control Continuous Mining Machines Single Source Page](#)





Thank you for your attention!

