

WMEA Group Discussion Notes – Albuquerque, NM November, 2013 Group #2

Rob Marnell – Drives & Controls Services, Inc – Casper, Wyoming - Group Leader

Chet Steele – Trapper Mine – Craig, Colorado

Tiffany Shaw – Luminant Mining – Longview Texas

Jim Flynn – Consolidated Mine Service – Longview Texas

Tyler Klassen – Littelfuse Startco – Staskatoon, Saskatchewan

Mike Wilton – Sherritt Coal – Warburg, Alberta

Gus Nasrallah – Electroswitch – Weymouth, Ma

Mike Foley – Eaton – Citizen of the Earth

Safety

Rob Marnell from Drives & Controls Services, Inc shared an exchange with MSHA in which one of their inspectors wanted to relay the details of an accident at one of his local mines. The injured miner had shut off a circuit breaker feeding a starter for a ventilation fan, to service the magnetic starter. As he disassembled the starter, an arc flash occurred injuring the miner. The miner had apparently tripped the wrong breaker for the feed to the starter, and had not tested for zero voltage before beginning work.

The message learned from this incident is to include testing for zero voltage as part of the lock out and tag out process.

Tiffany Shaw – Luminant Mining shared the application of a device by Grace Industries which indicates an energized circuit to persons approaching the device.

Voltage detection devices were discussed including the pencil type voltage detector (i.e. Fluke flashing light with beeper) Proper use in testing known live source, then your circuit, then the known live source again to prove the device works.

Also available is the Tic Tracer voltage detector with two voltage ranges to 1500 vac and 122,000 vac.

Chet Steele – Trapper Mine discussed a project at his mine site in which cable trays on a dragline were opened for several weeks as selected cables were replaced. The cable trays were covered with planks to prevent personnel from walking on open cable trays, and to prevent slip and fall hazards. The project went well, the extra time up front to install the protective planking paid off.

Rob Marnell – Drives & Controls Services discussed an accident at a mine in which a miner was operating a hydraulic track pin tool which broke under load. A piece of the puller device struck the miner in the head, causing extensive injuries. After two months, the miner is still not back to work.

He also related an incident in which mechanics had set up a hydraulic cylinder held in place by chains to push a bushing out, the mechanics were operating the hydraulic pump from a remote location on the machine for their safety, but had not barricaded the area to prevent other crafts (electrical service engineers) from entering the area.

Tiffany Shaw – Luminant Mining noted that they have experienced several injuries from getting on and off equipment, and uneven ground conditions at the work sites. An aging workforce was seen to be one of the factors which contributed to the problem. Broken ankles and sprained hips were encountered. A miner working on a trailer stepped backwards from his work area and fell about six feet breaking his leg in three places.

Chet Steele said that Trapper Mine has installed lighting on the dragline shoes near the boarding ladder to assist during night shifts. He also stressed the importance of waiting for the machine to stop swinging before getting on or off the shoe. Some of the other types of machines at his mine site have electrical boarding ladders which move into position very fast, making it important to insure the area is clear before operation the device.

Mike Wilton – Sherritt Coal discussed dragline shoe stairs installed on the machines at his mine.

Several modifications to machines were discussed which make getting on and off easier including:

- Hydraulic stairs mounted on dragline shoes which raise and lower for access

- Steps built into the dragline shoe to replace vertical ladders.

Jim Flynn – Consolidated Mine Service discussed hand injuries caused by cutting tools. Utility knife accidents are common in the mining industry, several customers have implemented the use of safety gloves, and spring retracting blades to decrease the exposure. The gloves are difficult to use when close, precise cutting is required.

Chet Steele – Trapper Mine shared a tip on penciling high voltage cable leads. His crew is using a grinder with an abrasive flapper wheel to pencil the leads. He indicated that it make a lot of dust, so that a respirator was required, and dusted the shop area, but did a real nice job on the cable.

Jim Flynn – Consolidated Mine Service – in response to the presentation on how cable jacket was coated with lead, then cured, and the lead stripped off. Jim was curious as to what type of exposure to lead we might have from any left over residual without knowing it.

Chet Steele – Trapper Mine – Jim Flynn – Consolidated Mine Service – Mike Wilton – Sherritt Coal discussed methods for making electrical trail cable splices. Soldering or welding the phase connections, using butt splices or cable connectors, completing the cable splice by repairing the outer jacket.

Jim Flynn – Consolidated Mine Service discussed having the outer jacket mold coated with Teflon to allow for easier removal after the jacket repair is vulcanized.

Mike Foley – Eaton discussed safety from the standpoint of a sales representative team driving long distances to visit mine sites. His team attends MSHA training to enter the mine sites. Defensive Driving Safety Classes are held regularly, in an on line format. After the presentation is viewed, the participants are required to pass an on line test to receive credit for attending.

Mike Wilton – Sherritt Coal discussed a common practice at his mine site on the dragline fleet to manually trip the drag slack rope protection circuit to disable the machines in order to enter the drag and hoist drum area. There was an incident at their mine site in which a miner re-enabled the trip circuit, and the machine restarted before he was clear of the mechanical hazards.

The mine realized that they were using this slack rope trip circuit as a lock out means, and changed the procedure to specifically require lock out and tag out before entering this area. The system was also updated to require a control reset to be initiated before the machine could be moved any time the slack rope switch was activated.

New Innovations and Technology

Gus Nasrallah – Electroswitch talked about the open mike topic in which one of the mines discussed MSHA inspector activities at their mine site. He suggested that the inspector may be trying to design and apply electrical equipment, rather than perform electrical inspections of engineered systems.

DCS has just finished installing a digital drive upgrade to the DC Control on the Peabody Coal, Lee Ranch 1570 machine. The upgrade features Allen Bradley Control Logix PLC equipment and Siemens 6RA80 digital drives standardizing on one drive size to reduce required spare parts inventory.

Jim Flynn – Consolidated Mine Service – Discussed that while splicing trail cable, he has had the outer jacket mold coated with Teflon to allow for easier removal after the jacket repair is vulcanized.

DCS and Flanders Electric has two AC Control Draglines running, and a third under construction at this time. They are applying their production recording system “AccuWeigh” to both AC and DC machine control systems.

Chet Steele – Trapper Mine spoke of an incident in which he and his electrical staff were able to set up a digital recorder on one of their machines, take a recording of key parameters in one of the control systems, send the recording file via email to an electrical service group for analysis of a system operational problem. Tiffany Shaw – Luminant Mining suggested that while this sounded like a good idea, the service group would probably charge him an outrageous fee for this service. Rob Marnell – Drives & Controls Services assured Chet that this would not happen.

DCS is now designing operator HMI screen systems using the Ignition system which allows for graphical operator interface with controls, and an aggressive historian function to store machine operational data.

Tiffany Shaw – Luminant Mining spoke of a system by Emerson Process Management her mine is using which allows wireless remote sensing for bearing temperature and oil flow sensing. The bearing temperature monitor RTD units are installed in the grease zerk fitting with NPT threads into the bearing grease cavity, and have an auxiliary zerk fitting which allows the bearing to be greased with the RTD unit in place. The WirelessHART system at 2.4 ghz performs well in their coal barn conveyor applications, as well as on strip mining machinery with historically limited wireless signal strength.

Jim Flynn – Consolidated Mine Service discussed some of the differences in trail cable jacket materials. He feels that the rubber jackets are better suited to cable repair processes than the newer TPU jackets, which do not take to vulcanization as well as the rubber.

Mike Wilton – Sherritt Coal described a video camera monitor system installed on his dragline fleet that allows the operator to pan around different areas of the machine to view operation and to help keep track of other miners on board the machines. The system is well received by the operators. The system uses wired, military grade cameras with the ability to pan from the remote monitoring location.

Gus Nasrallah – Electroswitch discussed the application of a circuit breaker open/close operator with a time delay. The close (or open) command is initiated, and a time delay started to allow the miner to walk away from the unit to a safe distance before the timer times out and closes (or opens) the unit.

Rob Marnell – Drives & Controls Services described a similar application in a PLC control which allows a dragline machine operator to initiate a time delayed mg set start sequence, which allows time for the operator to walk to a safe distance before the mg sets are started. By applying this automatic start sequence in the PLC control, the mine was able to avoid the costs of moving the mg set start/stop control panel to a remote location.

Problems and Solutions

Jim Flynn – Consolidated Mine Service discussed the addition of a dead man switch to the trail cable reel handling equipment. If the operator were to try to move into a hazardous area, machine motion is disabled.

Tyler Klassen – Littelfuse Startco discussed a protection system for a substation which monitors arc activity a transformer unprotected low voltage throat area between the secondary bushings and the down stream breaker. A fault in this area is difficult to protect against as there is usually no means of opening the primary of the transformer. There is usually just a manually operated air disconnect switch on the transformer primary.

Future Meetings Topics

Chet Steele – Trapper Mine is interested in a DC motor/generator commutator profile analysis presentation.

Tiffany Shaw – Luminant Mining felt that a presentation by Flanders Electric on MG Set Bearing Operation and Maintenance would be useful.

Tiffany Shaw – Luminant Mining also felt that a presentation on wireless communication would be a good idea.

Gus Nasrallah – Electroswitch suggested inviting MSHA and OSHA to attend the meetings.

Future Locations

Salt Lake City

Canada