

WMEA November 18, 2015 – Ft. Worth, Tx

Group Discussion Notes: Group #1

Jason Shaw –Prairie Mines & Royalty – Estevan, Sask

Chris Berndt – Falkirk Mine – Underwood, ND

Ken Kary – North American Coal, Liberty Fuels – DeKalb, MS.

Brian Harris – Line Power – Bristol, Va

Mike Easley – Flanders Electric – White Oak, Tx

Steve Jeans – Luminant Mining – Tatum, Tx

Mike Wilton – Westmoreland - Prairie Mine – Warburg, AB

Allen Colbert – Sabine Mining Co. – Hallsville, Tx.

Rob Marnell – Drives & Controls Services, Inc (DCS) – Casper, Wy.

Safety:

Mike Easley – Flanders Electric discussed the hazards of using dated Oil Circuit Breakers instead of the newer Vacuum type interrupter style breakers. The replacement parts availability of this older style equipment is limited, and the application of an updated style unit enhances system protection.

Rob Marnell (DCS) discussed the application of the Oil Circuit Breaker in strip mining equipment for large ac motor starters (i.e. 3000 hp – 6600 vac synchronous motors on MG Sets). These units were fully rated for the starting load, and short circuit interrupting current, but would frequently fail, rupturing the oil tanks and catching fire. Failure investigation found that while the units were fully rated electrically for the application, they were subject to a duty cycle time constraint. These units typically had a 15 second duty cycle to allow the gasses generated by opening the unit on a load to dissipate from the oil. It was found that if the unit failed to mechanically latch, the operator could push the close button repeatedly, filling the oil with conductive gasses, resulting in a violent failure.

Ken Kary – North American Coal – discussed an incident he experienced in which a power conductor in a trail cable rabbit box was draped over the ground conductor, the insulation on the cables tracked over to ground. The tracking ran about two feet up the power cable to ground. The problem was resolved by “Fanning Out” the conductors so that they did not overlap and make contact.

Steve Jeans – Luminant Mining spoke of an incident in which an Oil Circuit Breaker was found “Frozen” in the closed position. The unit was tripped, but failed to open the main contacts.

Rob Marnell – DCS spoke of an incident at a mine site in which an electrician came in contact with a 480 volt Motor Control Center Feeder Cable Connection. The electrician was in the process of running a cable through the bottom access doors, when it was discovered that the incoming phase connections were terminated in that compartment. The MCC was modified to seal this area of the enclosure and mark it with an “Energized 480 Volt” sign. The electrician was taken to the hospital for evaluation as a precaution, evaluated and released.

Our group discussed the separation of conductors carrying different levels of voltage, as well as communication cable. Jason Shaw - Prairie Mines discussed the restrictions in Canada, which are much more stringent than here in the US. In Canada, they use separate cable trays, alternate cable runs, and barriers to separate the different voltage ratings. This may be an enlightening topic for presentation in a future meeting.

Ken Kary talked about separating 23kv cable from 480 vac cable. Allen Colbert from Sabine Mine talked about a standoff type cable support which separates the cables of different voltages as they cross over each other.

We discussed an incident at one of the mine sites in which a large excavator was being restarted after an extended outage, the operator struck a contractor pick up with the machine bucket. The investigation found a variety of problems leading up to the incident, reinforcing the concept that the cause of an accident is usually a series of small incidents, which if interrupted, can help prevent accidents. The mine site changed their Standard Operation Plan to account for these variables.

Rob Marnell – DCS noted that with what he knows about the control systems on mining equipment, he makes sure to park outside the swing radius of any machine.

Our group discussed the differences between the US and Canada in the requirements for testing electrical hot gloves. This could also be incorporated in a future presentation topic.

Brian Harris – Line Power discussed the magnetic pulse closing equipment utilized on their contactors and breakers. He agreed to expound on this topic during the presentation of the group discussion presentations on Thursday.

Steve Jeans – Luminant discussed their requirement for Arc Flash Protective Clothing while exposed to various levels of arc flash exposure. Their mine site is using the Class 4 protective clothing when exposed to 23 kv switching operations.

Our group discussed motor brake systems, some of the advantages and disadvantages to the different types of disc and caliper style brakes being applied to replace the original drum style units. Rob Marnell – DCS discussed a recent boom lowering experience in which new caliper

style brakes were installed to increase the motion braking capability for the boom lower and raise process. In the initial brake test, the motion pulled through the brakes at about 40% power. After several days delay, the brakes were able to hold full motion power by adding additional caliper units.

Jason Shaw – Prairie Mine discussed a proximity sensor he has applied to brakes to determine if they have mechanically opened, before allowing the motion control to rotate the motors. It does not rely on brake air pressure, it looks for the brake pads to actually be in the released position.

Jason Shaw – Prairie Mine also spoke of his new Pegasus data recording system which captures PLC data at 10 samples per second. This stored data can be used as a “Forensic Investigation” tool to analyze machine operation if a problem occurs.

We discussed testing electrical “Hot Sticks”, does anyone here test the grounding sticks usually stored in rabbit boxes to “Fuzz” the cable after de-energization? J-Hooks?

We discussed a recent accident at a mine site in which an electrician was operating a three phase spring loaded knife disconnect switch. The handle slipped out of his hand in mid operation, flying back and hitting him in the mouth.

Ken Kary – North American Coal – asked our group if anyone was testing substation relays with primary injection, and is anyone sending them out to a test facility for testing? Any input would be appreciated. Most of our group were not testing, apparently in Canada, they are tested on site every three years using an outside contractor.

Ken Kary – North American Coal – noted that their Insurance Carrier was suggesting a list of tests that they felt would assist the mine site with their equipment upkeep.

Jason Shaw – Prairie Mine discussed an innovation they have installed. They have installed “Fire Eyes” devices to monitor UV and Infrared emissions from areas in addition to heat and smoke detecting. These devices have an analog output which can be monitored at a selected detection level by a PLC subroutine. The systems are sensitive enough to detect a flashover on a piece of DC Rotating Equipment. They recently found a broken DC Generator Commutator Riser by the arcing detected by this system.

Brian Harris – Line Power asked if anyone had ideas to boost our attendance. It was suggested that since the vendors see a lot more of the different mining locations than the miners, maybe a bounty could be offered to any vendor bringing a new miner to the meetings. (WMEA Jacket) gift card to take the wife to dinner, free babysitting, or lawn service by WEMA board members)

Future Locations:

Fairbanks, Alaska (Usibelli Coal – Healy, Alaska - would be a great place to visit)

Cabo San Lucas, Mexico

