



Approval and Certification Center

MSHA –Technical Support

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From the Center Chief's Desk

Our Center was rocked by a severe explosion at the start of our workday, September 15, 2010. We were testing an explosion-proof electrical box in our X/P gallery, and the product failed catastrophically during the eighth ignition test that morning. The blast could be felt a half mile away. Significant damage occurred to our electrical testing building. We encourage you to read a summary of the event inside this issue.

In this edition, we also provide updates on the following topics: our machine audit program, communications and tracking equipment approvals and activities, and a recently held diesel engine approval process meeting with engine manufacturers and other stakeholders. We hope you find these articles to be interesting and useful.

Although the event in September shook our buildings, grounds, and courageous employees who were conducting tests that day, the blast reminded us of why we are here. A&CC employees would much rather have these equipment failures occur inside our testing gallery than in a coal mine. The explosion reinforced our reasons for working here: for the safety and health of our most precious resource, the U.S. miner.

Best wishes for a healthy, happy, and safe 2011,

John

John P. Faini

Electrical Safety Division Explosion Gallery

The explosive power of methane was startlingly exhibited recently at the A&CC. During testing of an explosion-proof enclosure, an unexpected violent ignition in the test gallery occurred. The explosion was heard and felt at buildings over a half mile away, and the A&CC Building 3 was damaged. The doors to the pump house and the doors exiting onto the test pad were bent, and glass panels were shattered. Some large glass shards traveled twenty feet. The explosive forces cracked and broke welds in the test gallery. This pressure disturbance appears likely to have been generated by a very fast flame front within the gallery, possibly traveling at supersonic speed as it exited the gallery vent opening. Such a pressure wave is commonly characteristic of a detonation, which is not typical of the more controlled explosions typically experienced in the gallery.



Windows damaged from the explosion.

The A&CC is making repairs and improvements to reduce the risk of a similar occurrence. In the interim, some electrical explosion testing is being carried out at the A&CC diesel laboratory. Because of the explosion, the MSHA testing schedule has been somewhat delayed. We appreciate the patience of all those affected.

Please contact Ken Porter at 304.547.2030 or porter.kenneth@dol.gov with any questions.

Communications and Tracking Update

As of December 30, 2010, the Electrical Safety Division (ESD) had 42 approval applications for communications and tracking technology in-house. Since the beginning of 2006, 178 new or revised approvals for communications and tracking products have been issued. Significant approvals issued recently include the Argon ST, Inc. Mine Communicator and the Becker VHF/UHF Portable Radio.

We have observed 80 tests or demonstrations of 36 different communications and/or tracking systems at various mine sites. We have met with representatives from 76 communications and tracking system companies. To date, we have had discussions with various vendors regarding 198 different proposals for development of mine communications and tracking systems.

Mine operators have been installing post-accident communications and tracking systems in outby areas as specified in their Emergency Response Plans (ERPs) for some time. Several communications and tracking system manufacturers have incorporated wireless components into their designs for use on working sections or other areas where wires and cables may be vulnerable or problematic. Now that numerous wireless components have been approved by MSHA, many mine operators have extended their communications and tracking systems to their working sections.

Even though more and more mines have operational communications and tracking systems, manufacturers continue to make changes and improvements. Manufacturers hope to use their systems to provide the backbone for atmospheric monitoring and ventilation control sensors and equipment. These additional features may enhance mines' safety systems.

For more information on the A&CC's communication and tracking efforts, visit: <http://www.msha.gov/techsupp/commoandtracking.asp> or contact Dave Chirdon at 304.547.2026 or chirdon.david@dol.gov.

Diesel Workshop

On November 15, 2010, A&CC's Mechanical and Engineering Safety Division (M&ESD) conducted a workshop for diesel engine manufacturers. The purpose of this meeting was to help engine and power package builders get their applications through the approval process in a timely manner. M&ESD investigators provided an overview of the MSHA approval process, discussed specific requirements and updates, and provided helpful tips to expedite the MSHA approval process.

Formal presentations were given by Lois Carr of the Center Operations Division and Rich Skrabak of M&ESD. Lois discussed the administrative procedures involved with the submission, tracking, and issuing of approvals. Rich covered the technical requirements of applications as specified in 30 CFR Part 7, Subpart E. Rich also discussed the detailed data and documentation (engine specifications, fuel rating, test results, drawings, etc.) that should be included in an application to aid investigators and advance the approval process.

In addition to Lois and Rich, several A&CC engineers, technicians, and managers were on hand to explain and discuss various issues and answer questions about the diesel engine approval process.

Attendees were given an opportunity to provide feedback and recommendations for process improvements to the diesel engine approval program. The workshop gave all diesel engine stakeholders a chance to get together to address as many questions as possible. Industry attendees included representatives from Mitsubishi, EVAPAR, FPT, Arch Coal, Mac's Mining

Repair, Cummins, Sandvik, Caterpillar, Kubota, Deutz, Volvo, MTU Detroit Diesel, Bucyrus, Dry Systems Technologies, and Cooling Systems Tech.

Overall feedback from the workshop attendees was positive, and the group indicated they would like to have similar meetings and forums in the future. Questions and comments regarding the Diesel Workshop and/or the diesel engine approval process can be directed to Rich Skrabak at 304.547.2053 or skrabak.richard@dol.gov.



Conducting a machine audit on a roof bolter.

Machine Audit Update

In 2009, the Quality Assurance and Materials Testing Division (QA&MTD) introduced a new emphasis on auditing approved permissible mining equipment. This program has been very successful in the mining community. We are now receiving regular requests to perform audits from manufacturers, re-builders, coal operators, and MSHA enforcement districts.

During the past year, MSHA frequently encountered several issues of concern. The first involved improper installation of permissible mine pumps. The MSHA approval of these pumps requires specific trailing cable sizes and lengths. 30 Code of Federal Regulations (30 CFR), Part 18.35(a) (2) also states that "Cords with sizes 14 to 10 (AWG) conductors shall be constructed with heavy jackets, the diameters of which are given in Table 6 in Appendix I." We recommend that the pump approval holder be contacted for cable information before installation in the coal mine.

MSHA also noted that manufacturers, repair shops, and mine operators should check that all unused lead entrances on explosion-proof enclosures are plugged and tack welded. This issue was repeatedly observed on explosion-proof electric motors. Motor connection boxes typically have two lead entrances, and the second is often out of sight because of its location.

A third problem that MSHA discovered is the intermingling of machine electrical and hydraulic circuits. 30 CFR, Part 18.36 (b) requires that cables between machine components shall be "(2) protected from mechanical damage by position, flame resistant hose conduit, metal tubing, or troughs (flexible or threaded rigid metal conduit will not be acceptable), (3) isolated from hydraulic lines...". Regular inspection of such areas and corrective actions will prevent problems.

Please contact Jim Erlinger at 304.547.2306 or erlinger.james@dol.gov for more information or questions and to request a machine audit.

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