



JOY MINING MACHINERY
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Office of Standards, Regulations and Variances
Mine Safety and Health Administration
1100 Wilson Boulevard
Room 2352
Arlington, Virginia 22209

To be presented at the Public Hearing of MSHA's Proposed Rule for High Voltage Continuous Mining Machines, November 30, 2004 at the Radisson Hotel, Morgantown, WV.

Good Morning,

Mr. Chairman, members of the proposed rule committee and all interested parties, I am presenting this information on behalf of Joy Mining Machinery to address the recent Proposed Rule that was published in the Federal Register on July 16, 2004 concerning High Voltage Continuous Mining Machines. Comments by interested parties were requested and since Joy is the world's largest producer of underground mining machinery, and a current supplier of high voltage continuous miners, we have a great interest in this area of discussion. Joy has been actively involved in designing, manufacturing and commissioning high voltage mining equipment throughout the world. To date we have produced 59 high voltage continuous mining machines operating in 3 different countries that require some different form of approval or certification for the equipment.

The first discussion point raised an invitation to comment on reorganizing the regulations differently than that proposed. We would recommend that MSHA consider creating a primary section of regulations that address the requirements common to all equipment designed for voltages in excess of 1000 volts. We would also recommend subsections based on the different types of equipment (ie: longwall, continuous miners, haulage, drills, etc.) that would contain only the extra regulations specific to that type of equipment.

We have reviewed both the Part 18 and Part 75 proposed rules and have the following comments to make on both sections. Although the Part 18 proposed rules directly affect us as a manufacturer, we have encountered problems with our customers trying to understand and meet the requirements listed in the current petitions and subsequently included in the proposed rules. Therefore we will respond to parts of the Part 75 proposed rule that we have encountered that are keeping the equipment from being used to its full potential.

Our review of the Part 18 requirements resulted in minimal changes that we feel are needed. We understand that the current proposed rule is a derivative of the high voltage longwall regulations, but would comment on the proposed rule under Part 18 paragraph 54(a) requiring separate compartments, barriers or partitions of low and medium voltage circuits from those with high voltage circuits. On a continuous mining machine, there are a number of small enclosures that may house high voltage components, unlike a longwall shearer that typically only uses one main controller. We would ask that MSHA include the ability to consider the enclosure's cover as the "barrier" and allow cover interlocks to be used to de-energize the entire controller on the removal of the cover from the enclosure. Locating high-voltage and lower voltage

components together in an enclosure does not, in itself, increase the risk of exposure to energized high-voltage conductors or parts. It is not the location of components that is the risk, but rather the access to potentially energized high-voltage components. Barriers, partitions, or the enclosure itself can prevent access. This would allow existing designs of controllers that include various voltage circuits to be housed in a convenient enclosure and still prevent the exposure of persons to high voltage energized conductors or parts. Part 18 paragraph 54(b) needs to better clarify that barriers or partitions need not be interlocked if the enclosure cover is interlocked.

Part 18 paragraph 54(e) and Part 75 paragraph 54(c) describes additional circuitry that must be added for continuous miners that are designed with an ungrounded, 3-phase power circuit. We do not see these requirements of additional circuitry as adding any level of safety to the machine, when in fact it reduces the safety of the personnel who must work on the machine. We would recommend that this paragraph be deleted. Having an ungrounded power transformer secondary circuit onboard continuous miners is not a safety issue as evidenced by the successful and safe use of these circuits on continuous miners for over thirty years. In fact, it could be argued that grounding a transformer secondary circuit increases the risk of electrical shock by exposing maintenance personnel to a greater number of potential shock points when fault finding or testing. Additionally, there is no requirement for the grounding of power transformer secondary circuits in the current high voltage shearing machine regulations.

As a current manufacturer of high voltage continuous miners, we do not have issues with the other requirements defined in the Part 18 section of the Proposed Rule. The enclosure design and testing, minimum creepage and clearance design distances and control voltage transformers grounding requirements have always been part of the design and were incorporated on the original high voltage machine placed in service during 1997.

Reviewing the proposed rules of Part 75, we wish to highlight areas that have a direct impact on the ease of use and coal miner acceptance of operating the high voltage continuous miner. From research recently conducted, it becomes more imperative that our fleet of continuous mining machinery in the United States be upgraded to high voltage input to take advantage of technological advancements now available. In just a few minutes I will be introducing you to an expert in the electrical power distribution field of underground mining who has some exciting details to reveal on his research with high voltage mining machines. His conclusions will, I anticipate, move our country in the direction of utilizing high voltage mining equipment and benefit from the many advantages offered such as lower cost energy and higher productivity.

Our major concern that we wish to comment on deals with the issue of the installation and handling of the high voltage trailing cable along with the use of high voltage gloves; all of which seem to hamper operator acceptance of the machinery. Part 75 paragraphs 827, 828 and 833 address the trailing cable and glove issues. It is the content of these paragraphs and their potential impact which cause us to ask MSHA to reconsider the overall concept of just exactly what we as an industry are trying to achieve and what impact it will play on the coal miner who must adhere to these final requirements.

Our overall comment is that this high voltage trailing cable should be treated the same as any other trailing cable used on underground face equipment. Information provided to this committee from other experts concerning the improvements in design of the high voltage trailing cable over that of the medium and low voltage trailing cables describe the extra features that contribute to an overall safer power system. Couple this enhanced cable design with the numerous additions of safety features such as the proposed look ahead circuits, reduced tolerances of electrical potential and daily inspections being mandated by this proposed rule results in the safest trailing cable system found underground. Bulky, cumbersome to use high voltage rubber gloves designed for work on bare high voltage circuits are probably not the best possible protective device to use when handling this special trailing cable. Our involvement over the past 7 years with operators of continuous miners has shown that these gloves become a hindrance to the safe operation of the equipment. The machine operator cannot easily relocate the trailing cable when needed, or perform many of the other tasks that he or she must do while wearing these unmanageable gloves. We

recommend MSHA consider mandating the use of work gloves in good condition, and recommending supplemental items such as mitts, hooks, tongs or slings be available for use by the operator. Our data being presented today will conclude without a doubt that using work gloves to handle the high voltage trailing cable is the best possible solution to offer the underground coal miner to perform his or her job.

Along the same thought process, the high voltage trailing cable should also be treated as existing medium and low voltage trailing cables as it routes from the power center to the continuous miner. This cable complete with all of it's enhanced design and protective circuitry must be permitted to be placed on the mine floor or hung, if preferred, from the rib along the entryway. Movement in this entryway should permit foot and maintenance vehicular traffic, just as the medium and low voltage trailing cables.

The goal for the United States Coal Industry is the introduction of high voltage continuous miners that incorporate enhanced design and safety features and do not negatively impact the productivity of the coal miner. Our country must not hinder productivity by limiting the use of new technology, especially at a time of increasing global demand for power generation. Rather, we need to insure our country benefits from being the leader in coal production, miner productivity and safety. Thank you for your time allowing our company to comment on this important subject and for the consideration of our opinions on this Proposed Rule.

Now, it is my privilege to introduce to you Dr. Thomas Novak, Department Head of Mining & Minerals Engineering at Virginia Polytechnic Institute and State University. Dr Novak's expertise is in mine electrical systems and he has conducted numerous research projects dealing with underground power systems. Dr. Novak, well-known and highly regarded throughout the mining industry, has held positions at the University of Alabama, Penn State University, U.S. Bureau of Mines - Pittsburgh Research Center and Republic Steel Corporation - Northern Coal Mines Division. He has published many articles and presented numerous papers detailing underground mine power systems and has been an expert consultant on many legal proceedings.

Joy contacted Dr. Novak to investigate his desire to conduct research of the safety aspect of high voltage trailing cables compared to cables used on medium and low voltage machines. This topic has been discussed throughout the industry beginning with the introduction of the first high voltage continuous miner. Various opinions on the level of safety gained were given, but substantial research and analysis were not available to support the opinions. At least it was not available until now. The research and resultant factual data have now been completed and I desire to make it available to the mining industry today at this hearing. Mr. Chairman, it is my pleasure to now pass the podium to Dr. Novak to present his research on the "Safety Analysis of Trailing Cables Used on High Voltage Continuous Miners".

Thank you,



Mr. David Thomas
Certification Engineer
Joy Mining Machinery