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The potential impact of light emitting diode lighting on reducing mining injuries during operation and maintenance of lighting systems

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Abstract

Research by the US National Institute for Occupational Safety and Health (NIOSH) indicates that light emitting diodes (LEDs) can be used to enhance safety by improving a minerâ€™s ability to see mining hazards and reducing glare. This paper investigates if LEDs provide another benefit by reducing miner exposure to hazards during maintenance and operation of LED lighting. LEDs could provide useful lives up to 50 times longer than incandescent lighting commonly used in mining and could enable design changes to reduce certain hazards. The mining accident records compiled by the Mine Safety and Health Administration (MSHA) were examined to determine the extent and nature of

accidents involving the maintenance and operation of mine luminaries. A total of 140 relevant accident records were found for the years 2002â€“2006. These incidents resulted in 3668Â days lost from work with an additional 925Â days of restricted activity. The injury narratives were studied to determine if the implementation of LED-based luminaries could reduce injury severity and frequency. The greatest near-term potential impacts appear to be related to reducing maintenance and cap lamp redesign. Longer term (5Â years), low-power and lightweight auxiliary LED lighting for surface mines could also have potential impact for improving safety.

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Keywords

Illumination; Light emitting diode; Safety; Mining

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