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NIOSH

Comments to DOL

**COMMENTS OF THE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
ON THE
MINE SAFETY AND HEALTH ADMINISTRATION
PROPOSED RULE ON
AUTOMATIC EMERGENCY-PARKING BRAKES FOR RUBBER-TIRED,
SELF-PROPELLED ELECTRIC FACE EQUIPMENT**

BY R.A. LEMEN

30 CFR Part 75

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
National Institute for Occupational Safety and Health**

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The National Institute for Occupational Safety and Health (NIOSH) commends the Mine Safety and Health Administration (MSHA) for proposing a regulation that supports MSHA's primary directive of protecting the health and safety of the miner.

NIOSH's primary concern is with the 30 CFR 75.523(b)(3) requirement that, "the emergency parking brakes shall safely bring the equipment, when fully loaded, to a complete stop on the maximum grade on which it is operated." Parking brakes that would safely bring a traveling 15.8-ton shuttle car with a 10-ton payload on a 17% downhill grade, to a complete stop, may cause injury to the operator if the same braking effort were applied to an empty shuttle car on a level grade [Cummins et al. 1973]. As MSHA indicates on page 651A of the March 1, 1980, Federal Register, "...sudden, unexpected stops can cause injury to the equipment operator".

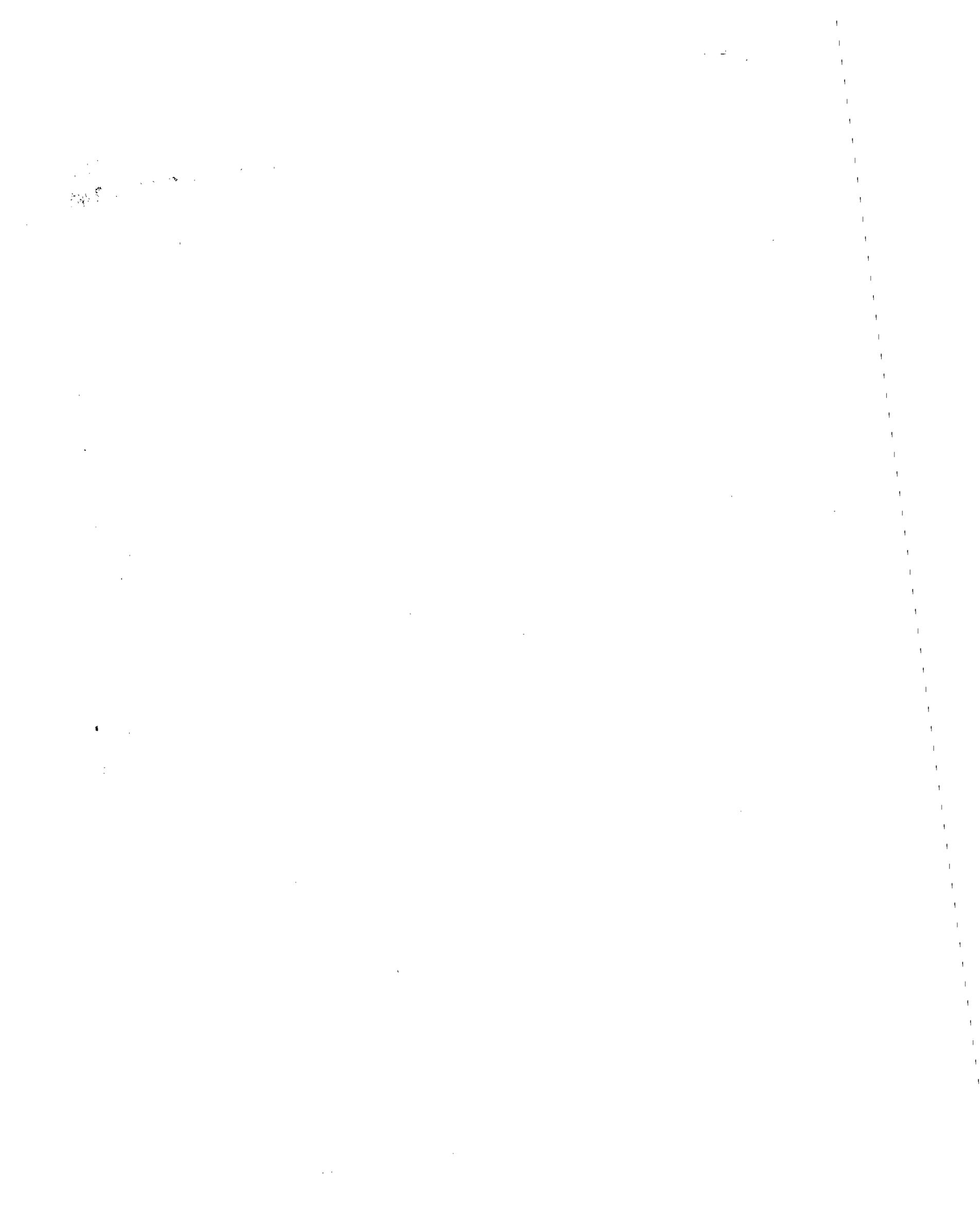
Values for safe levels of braking effort could not be located in the available literature, but the work system should be designed to prevent overloading of the musculoskeletal system [Olishifski 1979]. With regard to musculoskeletal injury, abrupt deceleration greater than 10g (gravity - 32 ft/sec²) can produce human injury, especially if the deceleration is due to free fall. Furthermore, transverse deceleration, seated and restrained, of 30 to 40g can cause severe injury [Bolz et al. 1970; Parker et al. 1973].

Although values for deceleration of mine vehicles could not be located in the available literature, NIOSH has determined that most decelerations will be much less than 10g [Weast 1987]. Furthermore, if the vehicle occupants are properly restrained, then most decelerations will not result in musculoskeletal injuries. Therefore, NIOSH recommends that all underground vehicles be equipped with seat belts and shoulder harnesses to minimize the potential for injuries resulting not only from rapid deceleration but also from vehicle roll-overs, rapid turns, or other vehicle mishaps.

NIOSH is also concerned that under 30 CFR 75.523, paragraph (e), rubber-tired, self-propelled electric face equipment that travels less than 2.5 miles-per-hour would not be required to have automatic emergency-parking brakes. NIOSH understands that the great majority of equipment falling into this classification at the present time is roof bolting equipment that, due to its drive design, will not tend to move if power is interrupted. We are, however, concerned that the proposed wording creates a blanket exemption that might allow slow-moving equipment to move out of control on a grade if power was interrupted. Unless these vehicles have drive mechanisms that quickly stop the machine when it is deactivated, then NIOSH would recommend that all underground vehicles be equipped with automatic emergency-power brakes.

Finally, NIOSH believes that this regulation should apply to all underground mining vehicles, both diesel and electric, and that the standard should not apply only to electric vehicles.

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<p>16. Abstract (Limit: 200 words) This testimony dealt with the concern of NIOSH over the requirement that equipment fully loaded be supplied with emergency parking brakes sufficient to allow a complete stop on the maximum grade used in the mining industry. The concern arose from the fact that parking brakes which could safely bring a traveling 15.8 ton shuttle car with a 10 ton payload on a 17 percent downhill grade to a complete stop would be able to inflict injury to the operator if the same braking effort were applied to an empty shuttle car on a level grade. NIOSH recommended that all underground vehicles be equipped with seat belts and shoulder harnesses to minimize the potential for injuries resulting not only from rapid deceleration but also from vehicle roll overs, rapid turns, or other vehicle mishaps. NIOSH was also concerned that self propelled electric face equipment traveling less than 2.5 miles per hour should be equipped with automatic emergency power breaks unless these vehicles have drive mechanisms that quickly stop the machine once it is deactivated. NIOSH also recommended that the entire standard be applied not only to electric operated underground mining vehicles but to diesel operated vehicles as well.</p>				
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REFERENCES

Bolz RE, Tuve GL (eds) (1970). CRC handbook of tables for applied engineering science. Cleveland, OH: CRC Press Inc., p. 615.

Cummins AB, Given IA (eds) (1973). SME Mining Engineering Handbook. New York, NY: Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers, 14-36.

Olishifski JB (ed) (1979). Fundamentals of industrial hygiene. 2nd edition. Chicago, IL: National Safety Council, p. 406.

Parker JF, West VR (eds) (1973). Bioastronautics data book. 2nd edition. Washington, DC: Scientific and Technical Information Office, National Aeronautics and Space Administration.

Weast RC (ed) (1987). CRC handbook of chemistry and physics. Boca Raton, FL: CRC Press, Inc.

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