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PROGRAM INFORMATION BULLETIN NO. P09-08

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SUBJECT: Methane Ignitions at Surface Highwall Auger Operations

**Who needs this information?**

Surface highwall auger operators, miners' representatives, independent contractors, state mining agencies, Coal Mine Safety and Health enforcement personnel and other interested parties need this information.

**What is the purpose of this Program Information Bulletin (PIB)?**

The purpose of this PIB is to inform the mining industry that using inert gas will significantly reduce the likelihood of methane ignitions at surface highwall auger operations.

**Information**

Auger mining has evolved from a secondary production method to become an integral part of many surface mining operations throughout the United States and the world. Along with this increase of auger operations comes an increased risk of methane ignitions.

Research conducted by the National Institute for Occupational Safety and Health (NIOSH) in 1992 by Jon C. Volkwein and James P. Ulery, Unites States Department of the Interior, Bureau of Mines, at an auger operation in Kentucky, has shown that methane gas liberated during mining migrates to the face, creating a larger volume of methane gas than would otherwise be expected. Using the same principles that cause the methane gas to migrate to the face, research has shown that inert gas introduced at the collar of the auger hole can render the entire hole inert, promoting safe mining conditions.

Adequate volumes and concentrations of inert gas may be produced by a nitrogen generator, a diesel fuel burner, the exhaust from a gasoline engine or a combination of exhaust from diesel and gasoline engines. However, the exhaust from a gasoline engine may not produce enough volume for larger size auger holes. The volume of the inert gas injected should exceed the volume of the coal being extracted from the auger hole. The burner or engines should be placed a sufficient distance from the collared hole to prevent them from becoming an ignition source should an explosive concentration of methane be liberated from the collared hole.

Inert gas may be introduced into the hole via a stub pipe positioned above the augers after the lead auger has been inserted. Alternatively, if augers are not reduced in size to allow placement of a stub pipe, a shroud may be used with similar results. The shroud surrounds the collar of the hole and inert gas is injected through a piping method to the collar of the hole. These measures effectively create a volume of inert gas at the collar of the hole that is in excess of the volume of coal that is being removed such that, as air is needed to replace the coal, only inert gas is drawn into the hole.

If the distance between auger holes is inadequate to ensure that the current hole will not intersect the previous hole or if the previous hole has been intersected, the previous hole should be filled with inert gases and noncombustible material pushed to seal/close the hole before mining the next hole.

Additional safety precautions include: installing water sprays on the inerting pipe to cool the system, installing oxygen sensors to monitor the exhaust and installing a methane detector with an audible and visual alarm and the sensor located near the collar of the auger hole.

The method described above of replacing oxygen with an inert gas, consisting primarily of nitrogen and carbon dioxide, represents the best and most cost-effective approach to date to help prevent methane ignitions at surface auger-type mining systems.

**What is the background for this PIB?**

MSHA has investigated numerous incidents resulting from methane ignitions at surface highwall auger operations.

**What is MSHA's authority for this PIB?**

The Federal Mine Safety and Health Act of 1977 as amended, 30 U.S.C. § 801 et. seq.

**Is this PIB on the Internet?**

This PIB may be viewed on the internet by accessing [MSHA's home page](#), choosing "Compliance Info" and "Program Information Bulletins."

**Who are the MSHA contact persons for this PIB?**

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**Who will receive this PIB?**

MSHA PPM holders

Surface Mine Operators-Coal

Miners' Representatives-Coal

Independent Contractors