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PROGRAM INFORMATION BULLETIN NO. P09-20

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SUBJECT: Re-Issue P97-24 - Portable Methane Detectors Magnetically  
Attached to Mining Machinery (The "Gizmo")

### **Scope**

This Program Information Bulletin (PIB) applies to Mine Safety and Health Administration (MSHA) Coal Mine Safety and Health (CMS&H) enforcement personnel, equipment manufacturers, and underground coal mine operators.

### **Purpose**

This bulletin informs MSHA enforcement personnel, equipment manufacturers, and mine operators of the results of testing of portable methane detectors attached to mining machinery via brackets and magnets (in a configuration commonly called the "gizmo") to check for methane at the face in accordance with Title 30, Code of Federal Regulations (30 C.F.R.) § 75.362(d)(2). The purpose of the testing was to determine if the performance of the handheld methane detectors is affected by the magnet.

### **Information**

MSHA has conducted accuracy tests on several methane detectors placed in a bracket attached to various magnets. MSHA used the accuracy requirements specified in 30 C.F.R. § 22.7(d)(2) as the basis for testing and for determination of acceptability. The performance of the following detectors was not affected by the presence of the magnet:

- CSE Models 102 and 102-LD
- Industrial Scientific Model CD210
- MSA "Spotter" P/N 474115

A survey conducted by CMS&H showed that three types of detectors comprised 89 percent of the units used with magnets: the CSE Models 102 and 102-LD, and the Industrial Scientific Model CD210.

Also being used are the Industrial Scientific Models MX250 and CMX270. Samples of these were not available for testing from the manufacturer because they are no longer produced. Likewise, samples could not be readily supplied by the districts. The survey shows that only 4 percent of the mines are using either of these types of detectors. Because of their similarity to detectors that were tested, the Industrial Scientific Models MX250 and CMX270 should not be affected by magnets. MSHA has made no determination as to other detectors in use. Their performance may or may not be affected by the presence of the magnets.

### **Background**

Various mine operators have developed a method of sampling the atmosphere at the face of extended-cut mining sections that allows measurement of the methane concentration at this location without exposing personnel to unsupported roof.

The method uses either a commercial or a custom detector bracket mounted to a magnet either directly or by means of a post. The post is made of steel or flexible conduit and varies in length from 2 to 36 inches. The "pull" rating of the magnets ranges from 90 to 250 pounds.

Each MSHA District Office investigated the equipment comprising each "gizmo" used underground and provided the information to the Approval and Certification Center (A&CC). The A&CC then obtained representative samples of the magnets, brackets, and detectors.

The magnets obtained and tested did not include every magnet type reported to be in use. Rather, the magnet/bracket/detector configurations that presented the greatest likelihood of magnetic interference were determined and tested, without testing every configuration.

For initial testing, MSHA mixed test gas per 30 C.F.R. § 22.7(d); monitored the concentration of the test gas; introduced the test gas to the detector via the appropriate calibration adapter; and monitored the reading on the methane detector while it was mounted in the "gizmo" which was placed on a laboratory bench.

A magnet's greatest effect on a methane detector would most likely occur with an alternating magnetic field, which would require the magnet to rotate in relation to the detector. The magnet used with the "gizmo" in the field will remain substantially stationary in relation to the detector. To simulate the magnetic field moving in relation to the detector, vibration tests were performed. The "gizmo" was magnetically attached

to a vibration table that was operated per 30 C.F.R. § 27.39(a). The accuracy of the detectors was then tested in the same manner as before. A complete report of testing is available from the A&CC, Division of Electrical Safety.

**Authority**

30 C.F.R. § 22.7; 30 C.F.R. § 75.320(a); and 30 C.F.R. § 75.362(d)(2).

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