

"THE RELATIONSHIP BETWEEN HOLE SPACING AND MISFIRES OF PERMISSIBLE EXPLOSIVES"

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ABSTRACT

The Bureau of Mines, U.S. Department of the Interior, has been conducting research on delay blasting in underground coal mines in support of the efforts of Mine Safety and Health Administration (MSHA), U.S. Department of Labor, to revise coal mine blasting regulations. Part of the research centered on developing an understanding of the factors that lead to misfires of permissible explosives. Research was conducted to determine whether frequency of misfires was related to borehole spacing. For a wide variety of permissible explosives, misfires were observed for about 50 X of the holes at 45-cm (18-in) spacing. Misfires were also observed for 60-cm (24-in) spacing, but the frequency of misfires was much lower than observed for the 45-cm (18-in) spacing. The Bureau has recommended that hole spacings of less than 60 cm (24 in) be prohibited.

The Bureau of Mines also developed a test apparatus to measure the desensitization tendency of permissible explosives subjected to dynamic pressure pulses. Results obtained with this apparatus agree very well with misfire frequencies observed for borehole shots in coal.