

How Lightning Detection Has Influenced AMAX Coal's Delta Mine

Steve Kane
P.O. Box 730
Delta Mine
Marion, IL 62959

Lightning is a very real problem in the surface mining industry. Today, as adverse market conditions continue to influence the surface coal industry, it has become necessary that all functions of the surface mining process become as efficient as possible. High production with reduced manpower is the winning combination of staying competitive in the market place. We at AMAX Coal are committed to staying in the coal business, but we have always been committed to providing a safe work environment for our people and will continue to do so in the future. Approximately two years ago, our Midwest mines installed state of the art lightning detection and warning systems at our mines. This paper will cover its application at Delta Mine; the benefits and problems encountered, and the impact this system has had on Delta Mine.

The Delta Mine is located ten miles east of Marion, Illinois on State Highway #13. The mine produces approximately two million tons of washed coal to various customers each year.

Delta's method of mining the lower Herrin (No. 6) and the upper Harrisburg (No.7) utilizes cast blasting and a twin bench stripping method. All of the drilling patterns at Delta on the No.6 bench are computer designed keeping a constant 1.2 pounds per cubic yard.

The Harrisburg (No.7) shallow top seam is designed according to overburden depth keeping a constant 1.0 powder factor. The average depth of the overburden over the top (No.7) seam is 30 feet.

The average depth of overburden over the lower (No.6) seam is 75 feet. The type of material over the upper (No.7) seam is soft clay, sandstone and a small depth of limestone. This material is very hard to cast because of the depth and type of material. The material over the lower (No.6) seam is very responsive to cast blasting. There are two seams of limestone present. An upper seam is located 20' to 25' from the surface and a lower band averaging 7' to 9' thick is laying on top of the coal seam. The interval between these limestone bands is a hard shale and sandstone mix.

Drilling at Delta is accomplished with two Bucyrus Erie 61R Series III drills, drilling a 13-3/4" diameter vertical borehole and one C-75K Driltech, drilling a 10-5/8" or 12-1/4" diameter borehole utilizing both angle and vertical drilling.