

Field Testing of a Real Time Roof Mapping Drilling Display System.

Craig M. Collins
Gene Wilson
J. H. Fletcher & Co.

David Xianguang Tang
Syd Peng
Dept. of Mining Engineering
West Virginia University

The object was to develop a Real Time Drilling Display System for Rotary Roof Bolting using Analyzing Software to display mapped holes as they are being drilled in real time.

The Analyzing Software was developed to analyze and interpret drill sensor data produced during a rotary drilled roof bolt hole by using algorithms and drill sensor data trends to find and locate roof separations or voids. After this software was validated through lab and field testing, its application needed to be tested in a production environment, however, the current method used to record the drill sensor data proved to be cumbersome for the mine to use on a continuous production basis. With different more practical mediums being explored and considered, a Drilling Display System was developed that will both map holes in real time and record the data for later review. With the Analyzing Software's current level of accuracy and with the convenience offered by the real time Drilling Display, the Drill Display System was implemented along with a test mine's current roof control plan and tested as a roof separation "Early Warning System". The proposed test site was in complete support of this project.

After installing the Drilling Display System onto a machine, input and suggestions from the mine environment were considered and design changes were made. The real world application provided a design direction that made the information produced by the Analyzing Software both convenient and significant for the test mine. Also, using the Drilling Display System increased the number of drilled holes that were both mapped and recorded. The results from studying these recorded data files lead to refinements in the current algorithms used by the Analyzing Software which increased the overall accuracy and capability of the system.

A fairly accurate representation of void or separation locations in the mine roof can be determined from sensor data recorded during production bolting cycle. The immediate feedback on the local roof condition that the Drilling Display System provides, amounts to a quicker and safer alternative to the scratch hole and the video bore-scope examinations that are performed after the bolting is completed. This project has shown that making the alternative method of examining the roof condition practical for the mine to use is just as important as the accuracy of its results. Based on the results of this field test, this or other methods of reviewing the analyzed drill hole data will be explored.

1-22-04