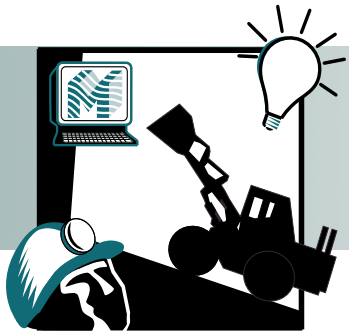
MINING

Project Fact Sheet



IMAGING AHEAD OF MINING

BENEFITS

- Expected energy savings of 2.7 trillion Btu
- Improved mine planning
- Better product quality by reducing the unintentional introduction of anomalous material

APPLICATION

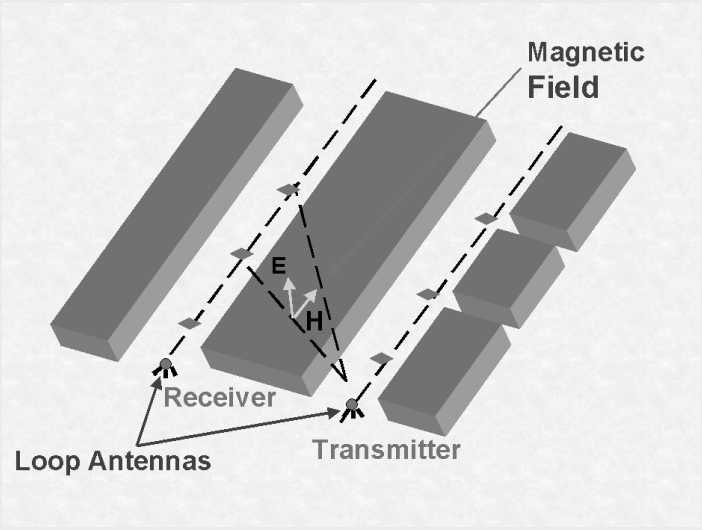
This new technology can be used for both underground and surface mining operations.

NEW IMAGING SYSTEM WILL IMPROVE MINE PLANNING AND PRODUCE BETTER QUALITY PRODUCT

The mining industry would greatly benefit from economical methods to image the ore bodies ahead of the mining process. The crosswell technology, Radio Imaging Method (RIM), was developed to meet this need, but could be improved by using more sophisticated interpretational software. This project will use RIM acquired data to test new interpretational software.

RIM is an electromagnetic (EM) system that was developed to detect and map anomalous geologic conditions far in advance of the mining face. The elements of RIM are deployed on each side of the ore seam of interest that forms a natural waveguide for transmission of electromagnetic waves. Until recent hardware improvements, it was not possible to use a superior imaging algorithm with it. This project will analyze actual RIM data with a sophisticated finite difference imaging scheme and traditional tomographic methods. This new imaging scheme will accept data from RIM to produce an image of the distribution of electrical resistivity. This graphical map can delineate the interface between bounding rock and an ore seam, or show the presence of an anomaly within the seam ahead of the mining face. This project will also examine the possibilities of using the Internet to allow mining engineers to determine the applicability of RIM with the new software for specific geologic situations. By allowing mining operations to see beyond the mining face, this technology will improve mine planning, increase energy efficiency, decrease equipment wear, and produce a better quality product.

SYNCHRONIZED RIM



RIM transmits electromagnetic waves on one side of the geologic target and uses a receiver on the other side to collect data about the geolgic mass.

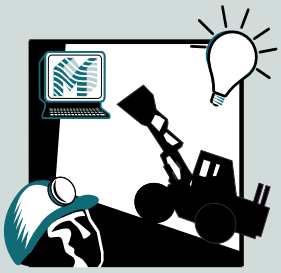
Project Description

Objective: To use the Internet, instrumentation advances, and newly developed modeling and analysis software to accurately image the volume of material ahead of mining, thereby improving the quality of mined ore, reducing wear of mining machinery, facilitating mine operations, and reducing costs.

Progress and Milestones

This project includes the following milestones:

- Complete collection of RIM in-mine data
- Collect ground-truth data to compare with RIM data
- Complete imaging using both tomographic algorithms and the newly developed finite difference imaging scheme
- Investigate and report on the feasibility and logistics of developing a web site that would allow engineers to determine the applicability of the RIM system for a specific geologic situation



Project Partners

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