

TECHNICAL PROGRESS REPORT

Quarterly Report

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ABSTRACT

Work is being done to transmit data via our through-the-earth communications system. After evaluating several methods, quadrature phase shift keying was selected as the preferred method. Coding was added to voice communication to increase reliability when two-way radios are being used as input and output devices. For in-mine communication, we are studying to increase the versatility of our system through the addition of Ethernet ports.

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RESEARCH, DEVELOPMENT, AND EXPERIMENTAL

Work has begun to transmit data via our through-the-earth communications system. Several methods were considered. Quadrature phase-shift keying was chosen as the preferred method. Voice communication with input and output devices either telephone handsets or panel-mount microphones and speakers worked out successfully. A challenge was encountered when two-way radios were being used as input and output devices. This related to the activation of the remote transmitters when wireless information was being received. An effort to meet this challenge through the application of coding is underway.

A “SPEED” – Shutdown Prevention through Early Error Detection – circuit was added to the in-mine system to facilitate system installation and initial adjustments.

As wireless data communication throughout society at large is expanding, the needs of the mining industry also become more demanding. Whereas RS232 communication has been the common link to communicate with sensors and transducers, more versatile means, including Ethernet and video communication are now becoming appropriate to provide service for emerging applications. Accordingly, we are evaluating technologies and costs to add these capabilities to our in-mine communication systems.

RESULTS AND DISCUSSION

As the effectiveness of our systems becomes known, we are receiving inquiries from several domestic as well as overseas quarters. Some inquiries concern coalmines while others concern aboveground, non-mining, applications. To be able to install our system in coalmines, we engaged the services of a person experienced in MSHA approval procedures so we can expedite the approval process.

CONCLUSIONS

Through inquiries and meetings with potential users of our systems, we find that the systems are applicable to other uses, in addition to mines. Some of these markets are rather large. The wider use of the systems, beyond mines, will result in lowering production costs making the systems less expensive and therefore more attractive to potential users including mine owners and operators.