

**MAPPING INDUCED POLARIZATION WITH NATURAL
ELECTROMAGNETIC FIELDS FOR EXPLORATION AND RESOURCES
CHARACTERIZATION BY THE MINING INDUSTRY**

Quarterly Technical Progress Report

Reporting Period Start Date: 4/1/01

Reporting Period End Date: 6/30/01

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Report Date: July 11, 2001

DOE Award number DE-FC26-01NT41060

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Abstract

In this quarter we completed the manufacture and bench testing of the first prototype of the MT-24/LF system to be used in the natural IP survey. The MT-24/LF will dramatically reduce field costs by simplifying field operations through the use of high accuracy GPS synchronization between wide band high accuracy (24 bit) autonomous recording systems. The simplification of field operations comes about from the elimination of the need for long lengths of telemetry cable and also from the elimination of trained operators for field data acquisition. Instead, all data is now synchronized by GPS and recorded to compact Flash media which is quickly and efficiently recovered and brought back to base for processing.

Table of Contents

1. Objective
2. Porject description
3. Summary of Progress
 - 3.1 Prototype
 - 3.2 Software
 - 3.3 Survey Plan

Mapping induced polarization with natural electromagnetic fields for exploration and resources characterization by the mining industry

1. Objective

The objectives of this project is to demonstrate the use of a new geophysical system to collect economically competitive induced polarization (IP) data using natural electromagnetic (EM) field as a source.

The proposed technology uses naturally-existing EM fields, which provides greater depth of exploration and significant economic, energy, environmental and safety benefits.

2. Project Description

The purpose of this project is to use a new geophysical field system, designed to efficiently collect EM data along a profile line, to obtain IP data using natural EM fields as the source. The technique is non-invasive, eliminates the need for current electrodes and motor generator sets, and provides greater depth of exploration than controlled-source IP surveys. During the course of the project we will complete the adaption of a new field system for natural IP data collection, determine the procedures for its efficient deployment, and demonstrate the usefulness of natural IP.

3. Summary of Progress

In this quarter we completed the manufacture and bench testing of the first prototype of the MT-24/LF system to be used in the natural IP survey. The MT-24/LF will dramatically reduce field costs by simplifying field operations through the use of high accuracy GPS synchronization between wide band high accuracy (24 bit) autonomous recording systems. The simplification of field operations comes about from the elimination of the need for long lengths of telemetry cable and also from the elimination of trained operators for field data acquisition. Instead, all data is now synchronized by GPS and recorded to compact Flash media which is quickly and efficiently recovered and brought back to base for processing.

The new system has been designed in order to achieve the following goals:

- 1) low power consumption
- 2) low weighth
- 3) low cost field operation
- 4) low cost of equipment manufacture

3.1 Prototype

The first prototype of the MT-24/LF system has been assembled and bench tested. Attached is a picture of the new system.



As a result of the bench testing of the system a new PCB will be made to include the modification in the circuit of the electric preamplifier. No change will be done for the digital acquisition which is working up to specs.

In July we will complete production of two systems that will be employed as remote reference units in Japan during a marine MT survey. This test will allow to characterize the system in the field. The two system will be collecting data continuously for a period of three weeks.

After this field test five more units will be manufactured for the survey in Nevada.

3.2 Software

The firmware and acquisition software has been completed and will be tested in the field on the two units that will be deployed in Japan in August.

3.3 Survey Plan

In August, two units of the MT-24/LF will be tested in Japan as remote reference during a marine MT survey. We expect to complete production of additional 5 units by end of August, to perform calibration by September and perform the survey in Nevada by October.