Total Ore Processing Integration and Management

6th Quarterly Technical Progress Report
01 October - 31 December 2004

written by
Leslie Gertsch and Richard Gertsch

submitted
16 May 2005

DOE Award Number DE-FC26-03NT41785

University of Missouri-Rolla
Rolla, MO 65401
Disclaimer

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.
Abstract

This report outlines the technical progress achieved for project DE-FC26-03NT41785 (Total Ore Processing Integration and Management) during the period 01 October through 31 December of 2004.
# Table of Contents

- Executive Summary ................................................................. 5
- Introduction .............................................................................. 6
- Work in Progress .................................................................. 6
  - Minntac Mine ..................................................................... 6
  - Hibtac Mine ........................................................................ 9
- Future Work ........................................................................... 9
- Dissemination and Outreach ..................................................... 9

# List of Graphical Materials

- Figure 1 ..................................................................................... 6
- Figure 2 ..................................................................................... 7
- Figure 3 ..................................................................................... 7
- Figure 4 ..................................................................................... 8
- Figure 5 ..................................................................................... 8
- Figure 6 ..................................................................................... 9
Executive Summary

Work in Progress: Minntac Mine

A new dataset to illustrate ordinary, non-segregated operation of the mine and mill has been collected. Beginning in mid-November, it ended on 31 December, 2004.

Drill monitoring data for several blast patterns is being analyzed. Figures 1 through 6 represent one of the patterns.

Work in Progress: Hibpac Mine

Sample preparation for laboratory rock strength tests is underway, for comparison with the density and point-load test results measured last summer.

Future Work

The relationships among data mined from the databases and the ore segregation tests of both mines are being examined, mainly through use of multiple regression analysis. The study is ongoing.

Dissemination and Outreach

One technical paper and two presentations have been finalized for the SME Annual Meeting to be held in Salt Lake City, UT in 2005.
Introduction

This sixth quarterly report discusses the activities of the project team during the period 1 October through 31 December 2004.

Work in Progress

Minntac Mine

A new dataset to illustrate ordinary, non-segregated operation of the mine and mill has been collected. Beginning in mid-November, it ended on 31 December, 2004.

Drill monitoring data for several blast patterns is being analyzed. Figures 1 through 6 represent one of the patterns being studied. The remaining patterns are being prepared for graphical analysis during the next quarter.

Figure 1. Variation of average specific energy through one of the blast patterns monitored at Minntac Mine in 2003.
**Pattern 03022**

**Drilling Rate of Penetration (ROP) Averages per Blasthole**

Figure 2. Variation of average penetration rate.

**Pattern 03022**

**Drilling Pi1 Averages per Blasthole**

Figure 3. Variation of average Pi1 index.
Pattern 03022
Drilling Pi2 Averages per Blasthole

Figure 4. Variation of average Pi2 index.

Pattern 03022
Drilling Rock Quality Averages per Blasthole

Figure 5. Variation of average rock quality index.
Hibtac Mine

Sample preparation for laboratory rock strength tests is underway, for comparison with the density and point-load test results measured last summer.

Future Work

Statistical Analysis

The relationships among data mined from the databases and the ore segregation tests of both mines are being examined, mainly through use of multiple regression analysis. The study is ongoing.

Dissemination and Outreach

One technical paper and two presentations have been finalized for the SME Annual Meeting to be held in Salt Lake City, UT in 2005.