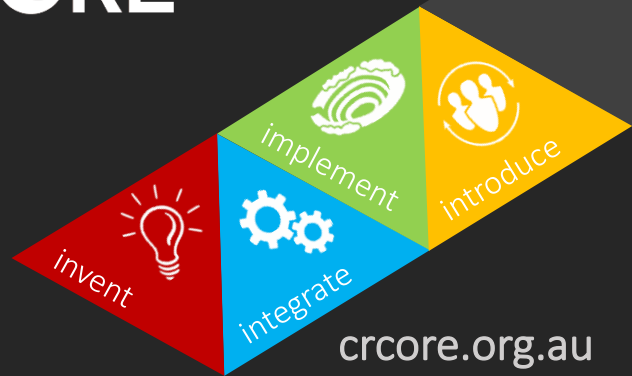


Development of gravity-based amenability test for coarse gangue rejection of base metal ores



Project number: P3-013
 Program Coordinator: Greg Wilkie
 Project Leader: Boris Albijanic
 Timing: December 2019 to March 2021
 Participants: Curtin, CRC ORE

PROJECT OUTCOMES

- The lognormal method of the feed particles (density and grade) can be used to predict the theoretical amenability for Cu, Ni-Co, and Pb-Zn ores for coarse gangue rejections.
- The Gangue Rejection Amenability Test (GRAT) confirmed the amenability of the selected ores for coarse gangue rejections.
- There were some deviations between the GRAT and the lognormal results.
- The dense medium cyclone model showed significantly better efficiency at the large size fractions than that at the fine size fractions.

RESEARCH COLLABORATION

This research collaboration included Curtin University, amira P420, IGO Ltd, CBH Resource Ltd and Glencore plc. Curtin University provided the scholarship for the MPhil student. The GRAT method, developed by amira P420, was used. IGO Ltd supplied the Ni-Co ore, CBH Resource Ltd provided the Pb-Zn ore, and Glencore plc supplied the Cu ore.

BACKGROUND TO THE PROJECT

CRC ORE has been developing an approach for assessing the theoretical amenability during ore particle sorting in which the grade of sub-samples (i.e., 50-100 particles) fits a lognormal distribution. As a result, there may be no need to use a large number of sub-samples. In this project, the same approach was used for the coarse gravity separation. The objectives of the project are:

- To investigate the application of the lognormal method for feed particles (density and grade) to predict the theoretical amenability of the ore for coarse gravity separation;
- To use the GRAT method for base metal ores;
- To compare the GRAT with the lognormal method;
- To estimate the efficiency of the dense medium cyclone and optimize operating variables.

