WETROCK GRINDING--THEORY AND PRACTICE *

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This presentation outlines New Wales' operating experience since converting to wetrock grinding and presents future plans. Some grinding theory is explained; however, the paper concentrates on actual operating experience. The topics discussed are outlined below:

I. The design basis for installing an open circuit rod mill/ball mill series grinding system is discussed. The grinding characteristics of open circuit rod mills and ball mills in parallel and series are explained.

The cause of high slurry viscosity is explained; a bench test and an in-line method for measuring viscosity is shown; various agents (chemical and other) for controlling viscosity are shown; and a reliable method for controlling slurry viscosity is presented.

II. The design basis is discussed for converting to parallel operation of closed circuit ball mills (with cyclones) and open circuit rod mills. The theoretical design is compared to operating plant results. An equation is presented for closed circuit ball mills (with cyclones) that predicts power requirement based on feed rock particle size.

The following alternatives are evaluated as possible methods for reducing the grinding power requirement.

- Precise cyclone feed density control.
- Removal of slimes from rock.
- Changing ball mill circulating load.
- Series grinding consisting of rod mill/ball mill/cyclone, and rod mill/cyclone/ball mill.
- Rod mill and ball mill operation at lower slurry percent solids followed by de-watering.
- Use of a hammer mill to precrush ball mill feed.

III. The benefits of using some pond water for wetrock grinding are discussed. A method is presented to determine the instantaneous slurry corrosion rate for various materials of construction.

IV. Possible future methods for reducing rock grinding power are discussed. These include closing the rod mill and ball mill circuits with screens, and the direct acidulation of screened concentrate.

*Paper not available at time of publication.