

# **Methodology for Assessing the Benefits of Grind Control Using PST Technology for True On-Line Particle Size Measurement**

*Robert Maron<sup>1</sup>, Christian O'Keefe<sup>1</sup>, Jaime Sepulveda<sup>2</sup>*

1. CiDRA Minerals Processing, USA
2. J-Consultants, Ltd., Chile

Corresponding author: John Viega

## **ABSTRACT**

Despite the recognized significance of ground product fineness on both line capacity and downstream process performance (typically flotation), mineral ore concentrators today are limited in their utilization of particle size measurements in automatic control applications for the final product particle size.

Although “near-line” particle size measurement instrumentation has been in place for several decades and is commonly installed in most modern concentrators, its availability and low measurement frequency have typically been inadequate for reliable use in automatic control. Their low availability is often due to problems with slurry sampling and transport systems required to deliver samples to the measurement instrument.

An innovative technology for real-time particle size measurement, capable of tracking particle size in real time on each individual hydrocyclone overflow stream, rather than just from a single stream, has been developed by CiDRA Minerals Processing under the commercial name of CYCLONetrac™ PST. This entirely unique technology overcomes the limitations of traditional particle size measurement instrumentation and is commercially utilized in copper and gold concentrators throughout the world. For over four years PST technology has been demonstrating near 100% availability with minimal maintenance and contributing to step change improvement in net metal production.

However, investment decision makers require convincing, reliable estimates of the expected economic value that automatic grind control projects would deliver. This paper presents a methodology for estimating such value from the installation of the new PST particle size measurement technology, adding unique new options for improved process stability and performance. Based on actual plant operating records, accumulated over long periods of time, the evaluation approach described here assesses and highlights the significant potential process improvement to be expected from this unique PST technology.

This paper presents the key operating criteria that permit increasing mill throughput and optimizing the production of valuable metal by identifying the optimal grind size. As this normally requires operating closer to the process physical boundaries, accurate real-time particle size measurement, such as those provided by the PST system, become essential for the practical achievement of the maximum potential value of every operation. For further illustration, data from three different copper grinding/flotation plants are shown and compared.