Economic Simulation-based Decision Support for Cathode Re-lining Facility

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Abstract

Within Bechtel Mining & Metals, the Technology Center tests and validates design alternatives and operational variants including economic analysis. During the Front-end Engineering and Design (FEED) for the new Alba Potline 6 Project a study was done for a new cathode re-lining facility with limited available space for the new re-lining facility. The first generation of pots would fail following a Weibull distribution curve. Waiting for the pots natural end of life would involve a very high peak re-lining rate and therefore a high capital cost re-lining facility. Most new smelters prefer to have the pot out of service before the end of their predicted life to reduce the peak re-lining rate and therefore reducing the necessary capital cost. Using a dynamic model combined with a lifecycle cost analysis, it is now possible to generate a curve to determine the optimum lifecycle cost considering operating and capital cost for a series of different peak pot re-lining rates. The now available "economic-process" model would be well parameterized, adaptable to other plants and would provide the benefit of a more controlled program for various pot failure scenarios.

Keywords: Alba Potline 6 cathode relining facility; pot failure statistical distribution; Weibull distribution; lifecycle cost analysis.