

MULTIVARIABLE CONTROL APPLICATION AT CODELCO NORTE'S TENIENTE CONVERTER No 2

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ABSTRACT

Globalization has increased competition and therefore is forcing industry to be more efficient. It is no longer enough to have the industrial processes continuously operating at predefined stable operating points. Today, the economics and technical features of the processes must be optimised subject to all the relevant environmental regulations while outputting products of the highest quality.

In the mining industry, this new framework has, in the realm of automatic control, generated interest for advanced process control technology. Industrial processes within the mining industry, Codelco's in particular, currently do not enjoy a widespread use of advanced control; just a couple of very special applications can be found in some of Codelco's Divisions.

In the light of all the above, and because of the significant benefits that the technology can generate across the corporation, the Automation Projects Department (GCTICA is its Spanish acronym) within its activities has decided to support and promote the implementation of advanced process control.

And so the author has lead the development and implementation of an advanced control application on the Teniente Converter No 2 (CT2) at Codelco Norte's concentrate smelter complex.

Controlling copper concentration in the white metal is by no means a straightforward task. Several factors impact its behavior, among them the most notable are the dry concentrate feed's chemical composition, oxygen enrichment of the supply air, total air flow, metal bath temperature, reverts feed (referred to as "carga fría" in Spanish) and flux injection. Furthermore, other materials are also fed into unit during normal operation.