

Teniente Investments.

Over the past 10 years El Teniente has invested approximately US\$ 1.1 billion in technological improvements, allowing the Division to adequately face important problems such as the change in rock composition, the reduction in mineral grade, and ecologically acceptable tailings disposal. In addition, it has introduced new technologies that have increased productivity and decreased costs, which have even been applied in other Divisions of Codelco, in Enami, and abroad, like the Modified Converter technology being used in Zambia with the technical assistance of professionals from the Division.

Modernization of the Caletones smelter started in 1985 with the application of the Modified Converter technology mentioned above, refining with fire in tilting furnaces, the injection of dry concentrate in converters and others such as anode casting, implemented in 1988, and important investments in environmental control that should be completed in 1992 with the installation of a new 1500 tpd production sulfuric acid plant.

In 1985 the first industrial plant for solvent extraction started operating with a capacity of 9,000 tons of cathodes per year, which can be expanded to 12,000 tpy. There are plans to initiate the construction of a new plant in Sewell with a capacity of 8,000 tpy of cathodes. This kind of process makes it possible to reduce operating costs to US\$ 13.5 per pound of copper, compared to US\$ 41.5 in traditional mining; in both cases, this does not include depreciation of facilities and equipment.

During 1990 the Division's total investments were US\$ 137.5 million or 42% of the Corporation's total investments. These financial resources were directed to the Division's current development program, which plans to increase productive capacity to 383.000 tpy and to develop exploitation fronts for the next 15 years.

This program was originated in 1988, with two basic objectives: the expansion of both the smelting capacity and the mineral processing capacity.

Teniente Expansion of the Smelting Capacity.

According to the Development Plan of the El Teniente Division, this project will increase the processing capacity of concentrates at the Caletones smelter.

The following works are included:

- Replacement of two Teniente type converters with larger ones.
- Dry concentrate injection system into Teniente converters.
- Anode casting system.
- Replacement of two conventional converters with larger ones.
- Construction and assembly of the electric substation.
- Tilting furnace system for slag cleaning.

During 1988 one El Teniente type converter, two conventional converters and the anode casting system started operating. The latter will provide a better quality cast product than blister with a different form. The project included the enlargement of the converters' shed by approximately 80 meters, construction of a casting shed with a 3,400 square meter area, an Outokumpu casting wheel which is the largest in South America, and two anode refining furnaces. The wheel or carrousel has an tph capacity of 275 kg anodes each. Production capacity is approximately 150,000 copper tons as anodes, that are being sent to the electrolytic refineries in Ventanas and Chuquicamata. The investment of US\$ 56 million was completed in 1991.

In 1990 capacity was increased by means of the Slag Crushing Plant and Conventional Converters 1 and 2.

Teniente Expansion of Mineral Processing Capacity.

The objective of this project was to increase the processing capacity of the concentration facilities from 95,000 dry tons per day to the mine production level of 110,000 dry tons per day in 1991, and 116,000 dry tons per day in 1992. It included a 42 inch wide conveyor belt, a 54" x 74" semi-autogenous mill for 24,000 tpd, 2 ball mills, 1 pebble crusher, 1500 cubic feet cells, flotation columns in the Molybdenum Plant, a new 325" tailings thickener, expansion of the electric substation and new water catchments. Investment in the new crushing plant was US\$ 42 million.