ABB Hoisting System
at Cannington Mine

1. The BHP Cannington headframe
BHP Minerals Cannington Mine, Australia

In May of 1998, BHP Minerals commissioned a new hoisting system at their Cannington Mine in northwest Queensland, Australia. The mine is based on a silver, lead and zinc ore body extending 550 meters below the surface. It is currently the world’s largest single-mine producer of silver (750 tonnes per year) and lead (170,000 tonnes per year). In addition, the mine produces 50,000 tonnes per year of zinc concentrate.

Scope of supply

ABB has supplied the complete state-of-the-art hoisting system comprising:

- A 4-rope, 2.6-m-diameter friction hoist, direct-coupled to an overhung 1,500 kW synchronous motor.
- The synchronous motor controlled by a 12-pulse cycloconverter using fully digital control.
- Pony drive.
- A hard-wired, redundant relay-based safety circuit.
- A digital hoist monitor to provide back-up protection and supervision of the control system.
- Controlled retardation, dual redundant disc brake system.
- Dual 13-tonne dead weight skips with 10-tonne payload capacity, fitted with a removable pushbutton control panel on the top maintenance platform of each skip.
- Four 26-mm head ropes with thimble-type attachments including hydraulic rope length adjustors and weight links. Control, data and voice signals from the skip are transmitted via a VHF leaky feeder communication system.
- Two 38-mm, right-hand ordinary laid tail ropes per skip, with thimble-type attachments and swivels.
- Top and bottom overwinding arrestors.
The complete mine hoisting system, including both mechanical and electrical parts, as well as shaft equipment, was designed, manufactured, installed and commissioned by ABB. This fully automated vertical hoisting system gives BHP Cannington Mine the best life cycle cost.

- Four 35-mm half-lock-coil rope guides per skip.
- Emergency egress cage with winch.

**Main design criteria**

- Hoisting capacity: 2,000,000 wet tonnes/year.
- Ores: silver/lead/zinc, or primary crushed with a maximum rock size of 350 mm.
- Hoisting depth: 650 m from loading station to surface bin.
- Operational: fully automatic, unattended operation for rock hoisting.

**Operational experience**

After more than two years of operation, “the Cannington hoisting system has demonstrated that it fully meets the performance criteria established at the outset of the project,” said Mr. Cisłowski, BHP Cannington, Townsville, Queensland, Australia, during the Mine Hoisting 2000 Conference held by the South African Institute of Mining and Metallurgy. “The new hoisting system represents a benchmark in the design of systems that are safe and highly automated, and provides a very cost-effective solution to meet the current needs of the industry in Australia.”