Modernization of Electric Mining Shovels
for Companhia Vale do Rio Doce in Brazil (2002)
New drive and control system for BE295-BII Shovel

ABB, the power and automation technology group, has finished the installation, commissioning and test operation of a 40 ton Electric Mining Shovel BE295-BII for Companhia Vale do Rio Doce (CVRD) in Brazil. The project continues ABB’s success with efficient and economical modernization of discontinuous mining equipment. Mr. Carlos A. Favato, CVRD’s Maintenance Manager at Carajás, is completely satisfied with this system. “This project ends a nightmare of 16 years,” he said, absolutely convinced of the system performance after the short time of commissioning and test operation. “With this drive and control package we bought the most competitive system that was offered to us.”

CVRD’s iron ore mine in the Carajás Range is the world’s largest high-grade iron ore deposit. Its excavator BC1401 is one of five Mining Shovels BE295-BII operating in the mine. A second shovel is going to be reconstructed soon and CVRD intends to modernize the other three units by the end of this year.

The scope of the electrical modernization covers the replacement of the inverter cabinets and the superior relay control system as well as the overhaul of the machine’s main motors. Both drive and control system were designed as digital control distributed by powerful and reliable ABB Drive™ Controllers. Especially adapted to the rugged conditions of discontinuous mining, ABB’s most advanced Drive™ ACS600 Multi Drive inverter system replaced Thyristor converters. Intelligent drive supervision software, developed by ABB (One team, one ABB), monitors the machine’s operation and prevents breakdown and hardware damage.

The Shovel was tested with full load from the first day of test operation, loading 270 ton Haul Trucks in a 3-shift, 7-day mode. After a few weeks of operation, CVRD anticipates the machine to have increased productivity of 10 – 20%. MTTR (Mean Time To Repair) has dropped from 3 to 1 hour and is likely to improve further in the future.