



A Rockwell Automation Company

## Companhia Val Do Rio Doce (CVRD) Mine AUTONET Phase 1 - Underground Communication

### The Client:

Companhia Val Do Rio Doce is one of Brazil's largest mineral and natural resource companies. CVRD operates a potash mine and mill near Aracaju, Brazil. The mine uses continuous mining methods in a room and pillar

pattern. CVRD is undertaking an aggressive program to modernize the mine to increase production.

### The Requirement:

CVRD was in the process of modernizing their underground mining methods. Part of this modernization required a dependable and flexible underground communications system. The system would initially be voice only but it had to be able to accommodate data and video in the future as the automation of the underground progressed. Since the CVRD mine is classified as a hazardous location the radio equipment had to be located only in areas of fresh air or be rated as intrinsically safe or explosion proof.

After an initial study on the available technologies, CVRD chose a trunked radio system using a distributed antenna system for propagation throughout the mine from

Hinz. There are a number of advantages in using a distributed antenna system for a potash mine. First the long straight drifts act as wave guides thus greatly improving the signal propagation. Second the architecture of the mine, which has a conveyor way running in parallel with the travel way, allows the antenna cable to be run in only one tunnel. An antenna can then split off to pick up each tunnel thus reducing material cost, installation cost and ultimately maintenance costs. Third the distributed antenna method allows an antenna to be placed in the opening of a new panel allowing the signal to travel into the panel without having to run cable.

### The Design Solution:

Hinz received the order to design, supply and assist in the installation of a Trunked Radio System. Hinz first performed a survey of the mine to determine the proper placement of the antennas and amplifiers to provide coverage throughout the existing mine workings. It was confirmed that the drift dimensions of the mine dictated the best carrier frequency to be in the 800 MHz range.

The mine will initially have two channels with the capability to add additional channels as needed. Wide band amplifiers are used throughout the mine to enable the addition of data and video transmission in the future. The system will initially cover close to 7 kms and will expand as the mine expands. The radios used are manufactured by EF Johnson. Two types of radio units were supplied, mobile units for mounting in vehicles and hand held units. The hand held units are intrinsically safe, allowing them to be taken to the face and into the conveyor ways.

The trunked system is an efficient and versatile method of

communications, offering person to person on separate channels, person to group, person to telephone, telephone to individual radio, as well as a system wide emergency override and broadcast capability. The distributed antenna system also insures continuous reception at very low transmission levels reducing any danger from microwave energy to personnel or equipment (such as computers or detonators).

CVRD personnel installed the hardware while Hinz supplied the installation supervision. Hinz instructed the mine personnel on the proper handling and installation of the cable, cable connectors, amplifiers, splitters, etc. Hinz also provided complete training so the mine can be self sufficient and continue to expand the system in the future. The system is presently installed, and will be commissioned in June of 1996.

