BLASTING IN THE LOWER SHAFT STATION OF ATOMIC ENERGY OF CANADA LIMITED'S UNDERGROUND RESEARCH LABORATORY

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ABSTRACT

Atomic Energy of Canada Limited (AECL) has the responsibility for research, and development of technologies, for the safe and permanent disposal of Canada's nuclear fuel wastes. As part of this comprehensive program, AECL is constructing an Underground Research Laboratory (URL) near Lac du Bonnet, Manitoba, to evaluate aspects of the concept of waste disposal deep in stable geological formations. No nuclear wastes will be used in the URL program.

The lower shaft station of the URL was excavated between 1984 December and 1985 February. Substantial effort went into producing good results from the blasting to minimize the blast damage to the rock surrounding the excavation.

All headings of the lower shaft station were excavated by the pilot heading and clash method. The blasts for the pilot headings were designed using a combination of Swedish and Canadian blast design methods, with the detailed layout of the blast holes being finalized at the excavation face.

By experimenting with the perimeter of the pilot headings, it was possible to finalize the perimeter blast design before starting on the final walls. Good perimeter control was achieved from the wall and crown slashes with a wide range of hole spacings and burdens as long as the perimeter holes were correctly aligned and drilled and all the perimeter holes were detonated with B-line. Xactex produced a clean split between perimeter holes with minimal damage to the final wall.

This paper gives details of the blast designs used, details of the drilling and blasting methods used, results of the blasting, and conclusions that can be drawn from the experience at the URL.