LARGE DIAMETER PRESPLITTING IMPROVED THROUGH TWO NOVEL TECHNIQUES.

G.F. Brent and L.W. Armstrong.
ICI Explosives Technical Centre,
George Booth Drive,
Kurri Kurri, NSW,
2327, Australia.

ABSTRACT

It is recognised that presplitting is a special case in blasting which requires the reduction of conventional explosive pressures in order to avoid excessive rock damage. Two routes to achieving this are the use of reduced density explosives or the practice of decoupling the explosive from the blasthole walls. Applications of two such systems in large diameter, deep blastholes are described. Both systems were tested in presplits alongside sections charged with decks of conventional explosives.

The first system comprised an explosive formulation with an unusually low bulk density of 0.2 g/cm (12.5 lb/ft). Following unconfined characterisation trials, a field trial at a large open cut coal mine was performed in 311 mm (12 ¼ in) diameter vertical holes at depths of about 45 m (150 ft). In-hole velocities of detonation (VOD) averaged 2200 m/s (7660 ft/s). The resultant highwall after excavation revealed a half barrel factor of 62 % for the test section compared with only 32 % for the adjacent section which had been charged conventionally. This demonstrated the success of this approach for large diameter presplitting.

The decoupled system comprised charges of 150 mm (6 in) diameter and 6 m (20 ft) length containing an emulsion bulk explosive at a nominal density of 1.2 g/cm (75 lb/ft). These charges were employed in a presplit blast in a large open cut coal mine in 270 mm (10 5/8 in) diameter inclined holes which were up to 70 m (244 ft) deep and contained up to 60 m (200 ft) of water. The presplit blast was successful and VOD measurements averaged 5800 m/s (20 200 ft/s). After excavation, the resultant highwall was seen to be smoother in the test section in comparison to the adjacent section where conventional charges had been used, demonstrating that this system also provided improved presplit results.