CASE STUDY

IMPROVED PRODUCTIVITY AND REDUCED COST THROUGH FLEXIGEL™
West Bokaro, Tata Steel, India

Site Profile
Tata Steel, West Bokaro is located in the central portion of west Bokaro coal field and administratively, it falls in the kedla block of Ramgarh district, Jharkhand India. Tata Steel owns two mines, namely Quarry SEB and Quarry AB, which operate shovel – dumper combination for overburden removal.

Orica supplies Powergel™ and Flexigel™ Bulk systems at West Bokaro, Tata Steel along with Exel™ Nonel systems and i-kon™ electronic blasting systems.

The Situation
Based on strength of Overburden benches, the strata vary from 15 MPa to 80 MPa. Orica offered Flexigel™ to tailor the energy needs of the strata accordingly by varying density. After meticulous application of Flexigel™ and witnessing blast performances, the site team along with the customer conducted a productivity study of which key project deliverables were productivity improvement and reduced cost of operations with effective use of Flexigel™ in Overburden benches. Based on the face turn out and strata conditions sector C area of Quarry AB at West Bokaro, Tata Steel was considered suitable for conducting the study.

Technical Solutions
Based on the type of rock a zone of interest was selected and a productivity study was conducted between Powergel™ and Flexigel™ to be used and compared in same Overburden benches under the same parameters of design. The productivity study demonstrated to the customer that Flexigel™ improved their productivity and a combination of Flexigel™ 100 and Flexigel™ 80 in the same hole even proved beneficial economically.

For the initial study, a blast patch was selected with 5 m burden, 6 m spacing and 12 m depth holes of 165 mm diameter. In that patch comparison was done between Conventional Bulk and Orica’s Flexigel™. Maintaining a powder factor of 2.1 Cu. M/ Kg Flexigel™ showed improved productivity results at nearly same cost of explosive charged.

For the final study, another blast patch was selected where comparison was done between Powergel™ and Flexigel™. The nominal parameters were 5 m burden, 6 m spacing and 14 m depth holes of 165 mm diameter. Here, a combination of Flexigel™ 100 and Flexigel™ 80 was tried in the same hole which has given high productivity results with reduced cost of explosive charged.

The Result
Flexigel™ blasts, compared with Powergel™, produced at par fragmentation results along with the following benefits:

- Based on the typical excavator operated in the study area the digging production rate obtained was 10-12% higher with Flexigel™.
- With use of 75% Flexigel™ 80 and 25% Flexigel™ 100 in the same hole, a cost reduction of 8% was achieved.
- The results proved that Flexigel™ has intrinsic property of producing better throw of the blasted muck.

DIG RATE AND COST COMPARISON

Figure 1 Study results for blasts in VI OB

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Testimonial

The study demonstrated that Flexigel™ provides good throw of the blasted muck and the combination of using Flexigel™ 100 and Flexigel™ 80 is cost beneficial with satisfactory results. A 25% Flexigel™ 100 and 75% Flexigel™ 80 combination gives encouraging results with reduced cost with no compromise in the blast results.

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Quarry AB, West Bokaro, Tata Steel

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