

Support for Seabed Mining

India has been granted the status of a pioneer investor and has been given the rights to undertake mining in an area measuring 52,000 sq. kms. in the Indian Ocean. Work has been taken up in the various areas of seabed mining by the National Institute of Oceanography, Goa, Central Mechanical Engineering Research Institute, Durgapur, Regional Research Laboratory, Bhubaneswar, Indian Institute of Technology, Madras and Hindustan Zinc Ltd. As far as seabed mining is concerned, India needs support in technology, equipment, training and in R & D.

The Future

The year 2000 A.D. and beyond will witness numerous changes in the equipment size and automation. While the common equipment size in the 1970s were 4.6 m³ shovels in conjunction with 25/35 ton dumpers, the equipment size has now increased up to 20 m³ shovels and 170 ton dumpers. The dragline size which was 10/70 A 15/90 in the 1970s, increased to 24/32 Cum. in the bucket size and 75/96 m boom length. The maximum size of the mine which was up to 1.0 MTY has increased to 10.0 MTY. Mines with the annual capacity of 14.0 MTY are under construction. The average OB and coal ratio which was 0.6 m³ per ton of coal in the early 70s has now been increased to approximately 2.4 m³ per ton of coal. Mines with the stripping ratios of 4.25 m³ per ton of coal are under production and those up to a stripping ratio of 5.5 m³ are under implementation. The automation area will involve:

- Computers in day to day operation as well as planning & design
- On-board computers and systems for better monitoring of the systems involved in drilling, blasting, excavation, transportation, off-pit conveying, crushing, etc.
- Communication system, etc.
- It has been predicted that there will be an increase in size of all classes of equipment by about 25 - 30% of current level. Another assessment has given emphasis to the under-mentioned trends:
 - * Draglines to have 170 m³ bucket and 122 m boom length, rope shovels with 43 m³ (dipper) and matching trucks of 155 t, blasthole drills 300 - 350 mm dia, dozers of 784 KW engine weighing 132 t and draw bar pull of 200 t.
 - * Continuous mining systems with giant BWE to find extensive use in lignite mining, Surface continuous mining, etc.
 - * Use of high angle conveyors.
 - * Application of heavy ANFO, in-hole delays, electronic delays, 'tailored' blasting, throw blasting, etc.

Technology for the design and development of mining methods, mine planning, environmental management, blasting, optimum ventilation system, pit slope stability for open cast mines and support design for tunnels and underground excavations in hard rock mining are well developed in India.