

lamproite bodies in the Dharwar craton, quite a few are fresh and are amenable for detailed petrographic studies. Yet, no attempt has been made in this direction. Known bodies are vaguely labelled as kimberlites, lamproites, intermediate varieties and transitional varieties. In the absence of fresh samples in the Bastar craton, pipes have been identified as kimberlites on the strength of chemistry of indicator minerals. The saucer shaped Tokapal intrusion was earlier identified as an ultramafic rock but is now being considered as kimberlite, though it does not exactly fit into the petrographic description of kimberlites. The case of the only diamond producing pipe rock at Majhgawan is not very different. It has been variously named as agglomeratic tuff, serpentine rock, ultramafic tuff, lamproite, kimberlite, intermediate between lamproite and kimberlite and also as orangeites. Since in several respects, these bodies do not conform to the well-founded definition of the archetypal kimberlite, the identity and nomenclature of such rocks is passing through a confused stage.

Recent resurgence in exploration and research activities on Indian kimberlite group of rocks has produced considerable new information which can be made use of in overcoming hurdles in exploration. The Geological Society of India has identified the study of Indian kimberlites as an area of prime importance and therefore intends to have a group discussion involving all active workers at Bangalore during the month of November 2005. This group discussion would be a prelude to a peer reviewed

volume on "Kimberlites and Related Rocks of India". It is proposed to involve all geoscientists who are deeply interested in this area of study. Efforts will be made to invite experts from abroad (South Africa, Australia, Canada and Russia) who are deeply involved in kimberlite exploration and research.

It is one of the avowed objective of the Geological Society of India to provide a forum for the governmental organizations, academia and private entrepreneurs to interact and share information on ongoing research, state-of-art technologies in exploration and for synthesis of newly generated data. Society will therefore approach governmental organizations (Department of Science and Technology, University Grants Commission, Geological Survey of India, National Mineral Development Corporation, National Geophysical Research Institute, Indian Space Research Organisation and Andhra Pradesh, Jharkhand and Madhya Pradesh Mineral Development Corporations) and non-governmental agencies (Rio-Tinto, Dee Beers, BHP, Billiton and MSPIL) and Universities and IITs etc. for sponsorship and active participation in the proposed group discussion.

Those interested in participating in the Group Discussion may contact the undersigned for further details.

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TECHNOLOGY UPDATE IN MINING AND MINERAL INDUSTRIES

The above international seminar was organized by the Mining Engineers Association of India in association with the Department of Mines and Geology, Government of Karnataka, Bangalore in J.N. Tata Auditorium, Indian Institute of Science, Bangalore, from 16 to 17 October 2004. About 300 delegates including some foreign participants took part in the seminar. In all 44 papers were accepted, out of which 23 were presented in six technical session as follows:

- 1) Latest trends in exploration methodology and resource assessment.
- 2) Technology update in mining and mine mechanization, ferrous, non-ferrous minerals, coal, lignite and dimensional stones.

- 3) Technology update in mineral beneficiation.
- 4) Management and utilisation of waste and effluents.
- 5) Information technology update in mining and allied industries.
- 6) Update on mining environment, safety and health.

Keynote addresses were delivered before each session, which included Innovations in mining technology and mine mechanization; Eco-friendly coal mining in SCCL; Technology update in mineral beneficiation; Mining waste pollution control and utilization technologies; Scope of IT applications in the Mineral industry; and Mining environment policy issues in India.

Some of the important aspects of the seminar are summarized here.

A mineral deposit will turn into a successful mine depending on the results brought out by exploratory drilling. Iron ore is traditionally explored by core drilling. The drilling in Eastern India conclusively proves that RC (Reverse Circulation) pneumatic drilling technique is effective and economical tool in iron ore exploration program over conventional core drilling.

The projection of basic necessities for accelerating the exploration activity for yielding mineral deposits for mining purposes and the necessity for a time bound action plan is important in mining sector reforms. As private sector participation is envisaged on a very significant level, it is not out of place to think of perceivable fiscal concessions for all mineral surveys and exploration activity either for discovery of new deposits or promoting scientific extraction of the known deposits and value addition to the low grade non-saleable minerals and ores.

The emerging trends in mining industry focus on the run-of-mine ore at lowered costs and the technological advancements in exploration techniques, automation and mining equipments. Globalization and advancements in communications has brought in awareness to the public of environmental, economic and social issues posing new challenges to the mining industry.

The site-specific software packages on "blast design optimization" was dealt with utilizing the example of blast vibrations at Kudremukh Iron Ore mines in Karnataka.

The mass mining or bulk mining in Balarua offers a beacon as the variable cost is reduced by about one half of the regular mining cost. The paper explored potential of emulsion-based cast booster to be used as primer to initiate bulk delivered emulsion explosives used in open cast coal mines. Explosive energy is the most commonly used form of energy to fragment and displace the rock-mass/overburden, mineral deposits in the mines. Fragmentation obtained in the blasting process influences the downstream costs like loading cost, transportation cost, processing cost etc.

Blasting operation is an important aspect of day to day activity of any open cast mine. Performance of blast plays a major role in optimizing the total production cost. There is a need to change the blast design within the mine when there is a considerable variation in the strata/bench-height/hole diameter. Blasthole deviations in opencast workings are mainly caused by inaccurate collaring and alignment operations and inappropriate choice of drilling parameters. For avoiding or rectifying these deviations, the drilling accuracy has to be improved by training the drill operators and studying the rock structure while designing a blasting pattern. Periodic check of the quality and

performances of the explosives of different manufacturers collected from the users magazines may serve a useful purpose towards ensuing safety and quality of such products.

Donimalai Iron Ore mine is achieving the targets due to continuous improvements, innovative maintenance practice, condition-based monitoring with a technoeconomic feasibility approach to overcome the challenges. A detailed geostatistical analysis of Balaidila iron ore deposit revealed that the variation of Fe grade within the deposit is high, which causes deviation in short-term production plans. To overcome the problem, Fe isograde lines were drawn by Krigging for projection of ROM grades. The projected grades in plans are found to be closer to the actual.

In view of bulk transport of material, a study was presented on the design parameters to select and establish the most economical haulage system for an open cast mine considering the type of ore, type of waste, depth of mine, distance of beneficiation plant and several other tectono-economical factors. An attempt has been made to apply Petri Nets modelling technique based planning and scheduling of initial activities of an opencast coal mine project, in place of PERT network for developing a dynamic system, thus enhancing further scope of analysis of the model mathematically as well as graphically.

An attempt has been made to formulate a nomogram for the selection of techno-economically optimum techniques for hard roof management in Indian underground coal mines under prevailing techno-economic and geo-mining conditions.

Use of diamond wire sawing technique and derrick crane has brought about a revolution in the granite and marble production in India. The dimensional cutting and shattering technique (DCST) is an innovative technique conceived, conceptualized and developed indigenously for development of raises in underground mines incorporating all the basic advantage of raise border avoiding exorbitant initial capital investment.

The long experience and exposure in the planning and quality management departments of Singareni Collieries Company Limited, a large non-coking coal producing company was utilized to critically analyse the present status of production of high ash non-coking coals and utilisation of the same by various consumers like power, cement, etc. The diamond mining project of NMDC Ltd is the only producing diamond mine in India as well as in Asia. The present technology of Kimberlite mining and state-of-the-art beneficiation for diamond have been described. Floatex Density Separator (FDS) is finding increasing application in the processing of iron ores apart from silica sand and

beach sand beneficiation. FDS was found to be an effective deslimer as well as pre-concentrator on feed sample and proved to be a simple and cost-effective device for removing the fine residual silica from the concentrate without adversely affecting the iron recovery.

For economic growth and development of the nation and for maintaining ecological balance, environment and mining must co-exist. Waste management which is a significant activity in the production of ores/minerals should be given due consideration at the planning stage itself; and must be carried out in a scientific manner with due regard to threshold limits stipulated with respect to solids, liquid and gaseous emanations from the mines or beneficiation plants. An attempt has been made to review the management of the waste with respect to its possible utilisation and commercial applications. On industrial waste utilisation, studies have been made to assess making commercial products using the wastes which are generated from different minerals. Building materials and technology promotion council (BMTPC) has been actively involved in developing appropriate technologies using mining and metallurgical wastes in order to provide cost effective and environment friendly building materials and development of value added products.

Information technology is changing the style of every industry. Mining cannot be an exception. It is essential that the mining industry-SCCL implements information technology in all its facets to remain competitive. Information technology is being increasingly used at micro and macro levels in management and governance of Indian mineral resources, since the last one decade or so.

It has been established from the geomodels generated that the horizon module is a useful software package with which the geological model of a coal deposit could be created effectively. The methodology of iron ore reserve estimation (Balaidila range) using different softwares such as AUTOCAD, INDAL, Mine Planning package and Geostatistics (Krigging, Co-krigging etc) was also dealt. IT

can play a useful role in accident analysis and in Decision Support Systems in the area of mine safety. The methodology for integration of GPS/GIS with computer based information and mine operational/management system was also described.

Further, problem in following areas were also discussed: Safety problems in un-organised metalliferous mines; soil erosion prediction, quantification and mitigation from the mine dumps; various environmental and technical consideration required for decommissioning/closure and reclamation of a mine site; Various aspects of radio-activity in connection with beach placer deposits and a suitable control mechanism for protection of employees engaged in the industry; The thrust of existing laws in India for mining regulation and development and the provisions made in them to protect the quality of the environment, bio-diversity etc.

In conclusion, it was felt that with structural changes having come about in the mining sector, it is necessary for all the big and small players in the field to adapt themselves to the new methods by which mining activity can be made more efficient, competitive, cost effective and eco-friendly. The industry will have to upgrade the technology in order to carry out the mining activities economically and retain its place in the global market. Safety aspects as they concern human lives should always receive utmost consideration. The seminar addressed all relevant issues and attempted to find out ways and means by which mining activities are not only made sustainable, but also as a beneficial economic activity for the society. The seminar emphasised that mining is an important economic activity making significant contribution to the Gross Domestic Product in more than one way and helped the participants to inform themselves about the present scenario and future course of action.

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CORRIGENDUM

The last reference in the list of references in the paper of Santosh Kumar et al. (*JGSI*, v.64, Sept., 2004) on p.291 should read as follows:

TRIPATHI, C. (1979) The Malanjkhand-Taregoan Porphyry Copper Deposit. *Geol. Surv. India Misc. Publ. no.34*, pp.161-168.