Spotlight
on the Selection of Equipment for Underground Mining

by P. M. Scott

The South African Institute of Mining and Metallurgy held a colloquium on "The Selection of Equipment for Underground Mining" in Johannesburg on 22nd September, 1982, which, judged by the interest shown, was an unqualified success. The colloquium was attended by 264 delegates from all over the world. The President of the Institute, Professor A. N. Brown, opened the proceedings. The keynote address was delivered by Professor M. D. G. Salomon, and the two sessions were chaired by Mr B. C. Alberts and Mr P. T. Fewell.

Six papers were presented, covering gold mining, coal mining, and underground iron-ore mining. Since only 15 to 20 minutes was allowed for each paper, the presentations had to be summaries or excerpts from the full papers. However, most of the presentations were profusely and excellently illustrated by colour transparencies, which added to their interest and content. A short summary of each of the papers is given below.

Witwatersrand Gold Mines

In a paper entitled 'Considerations Governing the Selection of Underground Mining Equipment for Witwatersrand Gold Mines', L. E. F. Leask showed how a considerable proportion of the research and development effort of the Research Organization of the Chamber of Mines since 1974 has been directed at improving the stoping operation, which is particularly labour intensive and physically demanding. Gold Fields envisage the integration of present equipment and methods to maximize production and improve productivity. Mr Leask predicted, inter alia, an increased use of stoped drill rigs, hydraulic rock drills, and high-pressure water jets as a cleaning unit.

Mechanization Projects

J. W. Wilson, in 'The Economic Appraisal of Mechanization Projects', gave a general industrial-engineering method of assessing mechanization projects in which he compared cost curves for manual methods with those for the mechanized method. A mechanized method generally requires more skilled manpower to operate and maintain it, which is expensive and may not be offset by the saving in unskilled labour. Also, the cost of overheads is usually higher than for manual methods. It is generally expected that these higher costs will be offset by the increased rate of production. Two case studies drawn from the Gencor group were presented.

Underground Environment

"The Influence of the Underground Environment on the Selection of Materials for Mining Machinery" by B. E. Protheroe and J. C. Heathcock was a very interesting and well-illustrated presentation showing the roles played by temperature, humidity, blasting fumes, and mine service water in the corrosion of machine components underground. Galvanic corrosion was explained, and a table of common engineering materials arranged in order from base to noble materials was presented. It was shown how the juxtaposition of dissimilar metals leads to severe corrosion of the base metal. The colour transparencies to illustrate this were very convincing.

Coal-mining Equipment

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Iron Mining at Thabazimbi

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at Thabazimbi' by P. J. Steynberg and P. M. Scott described the selection of equipment for Iscor's iron-ore mine at Thabazimbi. Heavy emphasis was placed on the parameters associated with the serviceability and maintainability of the equipment. Such factors as robustness of design, availability of spares, existing workshop facilities, training offered by dealer organizations, and data available from suppliers were highlighted. Other technical points covered included body configuration, transmission, hydraulics, engines, and tyres.

Much of the paper concerned the selection of underground load-haul-dump machines, and the presentation was amply illustrated by colour transparencies.

Managerial Policy

In 'A Managerial Philosophy towards Underground Equipment Selection as Developed for Wessels Man-
ganese Mine' by A. D. Oehse and P. A. Townsend, Mr Oehse showed how Wessels Mine came to select surface-type loaders and haulers for their underground operation, these being the units with which the Wessels personnel were familiar. Naturally, these machines had to be modified to suit the prevailing conditions, i.e. the equipment had to be 'Wesselized'. A strong argument was presented that Management should set policy guidelines for the selection of equipment so that lessons learnt in the past could be usefully employed in the future.

Conclusion

Full use was made of the time available for questions, and, at the concluding luncheon, the authors were able to exchange views in a convivial atmosphere.

Mintek 50

As announced earlier, the Council for Mineral Technology (Mintek) will be celebrating fifty years of growth in 1984 and is organizing an international conference, MINTEK 50, on its areas of special expertise. The dates have been changed, and the Conference will now be held from 26th to 30th March, 1984.

The following subjects will be covered in a series of technical sessions and excursions:

- Pyrometallurgy
- Hydrometallurgy
- Mineral dressing
- Mineralogy
- Control of mineral-processing plants
- Analytical chemistry in mineral processing
- Mineral and process chemistry
- Physical metallurgy.

A number of international authorities in mineral science and engineering will be contributing to the conference, and the proceedings will be issued as a special publication.

Enquiries should be directed to The Conference Secretary (C.25), Mintek, Private Bag X3015, Randburg, 2125 South Africa.

Drilling

Once again the South African Drilling Association will be holding a technical symposium in 1983. The topics to be covered include drilling equipment, practices, and problems, as well as matters relating to contracts. The Symposium is to be held in Johannesburg on 13th and 14th September, 1983.

The event will follow the pattern of previous years with a cocktail party for delegates, wives, and guests on the evening of Monday 12th. Technical papers will be read on Tuesday 13th and Wednesday 14th.

The organizers would appreciate receiving offers to present papers that will be of interest to delegates.

Enquiries should be addressed to Mr M. G. Adamson, Symposium 83 Convenor, P.O. Box 127, Roodepoort 1725.

ILAFA Congresses

The Instituto Latinoamericano del Fierro y el Acero (ILAFA) has scheduled the following congresses for 1983:

(1) ILAFA-Electric Furnace Congress, 12th to 15th June in Mexico D. F. (Mexico)
(2) ILAFA-24 (Latin American Iron and Steel Congress), 28th to 31st August in Rio de Janeiro (Brazil)
(3) ILAFA-Rolling Mill Congress, 6th to 9th November in Buenos Aires (Argentina.)

Each of these congresses will have a concurrent exhibition (ILAFAXPO), where organizations and companies related to the iron and steel industry may present stands.

For further information, write to ILAFA's General Secretariat, P.O. Box 16060, Santiago 9, Chile. Telex: 340348 CK.