

SPOTLIGHT

on 'Ferrous Pyrometallurgy: A Challenge for South Africa'

by D. WILSON*

Introduction

The Technical Programme Committee—Metals Technology of The South African Institute of Mining and Metallurgy, in association with its Vaal Triangle Branch, held a one-day colloquium on 18th April, 1989, the theme being 'Ferrous Pyrometallurgy: A Challenge for South Africa'. The venue was the Auditorium 100 at the campus of the Vaal Triangle Technikon in Vanderbijlpark.

A total of 93 delegates attended the Colloquium, which was given a touch of international flavour by the presence of a delegate from France and one from Zimbabwe. These were respectively Mr P. Faure, an engineer representing Pechiney Electromet (France), and the General Manager of the Kwe Kwe Division of Union Carbide, Zimbabwe.

Opening Address

The proceedings were opened by Professor R.J. Dippenaar, Chairman of the Technical Programme Committee—Metals Technology, who introduced Mr C.E. Fivaz, President of the Institute. Mr Fivaz, in his opening address, made special mention of the two international delegates, adding that it was particularly important that a delegate had travelled from France to attend the Colloquium. He said that the Institute was pleased to be able to present the Colloquium in the Vaal Triangle. He added that, as the aim of the Vaal Triangle Branch was to promote an interest in physical and pyrometallurgy, the Colloquium had been scheduled for the area to assist in meeting this objective. He regarded the role of the Branches as fundamental in strengthening the Institute, and in serving to broaden the Institute's base in the mining and metallurgical industry. The Institute had an important role to play in the economy by promoting the application of science and technology in industry, and the papers to be read at the Colloquium would most certainly help to fulfil this role.

Technical Papers

In the first session, chaired by Mr J.L. Nel of Iscor, four papers were presented. Dr R. Falcon of Falcon Research Laboratories presented a paper entitled 'The relationship between the properties of coal and the efficiency of reduction in coal-based reduction processes'. She discussed the relevance of some of the fundamental properties of coal in relation to its efficiency as a reducing agent in non-blast-furnace technology. The paper proposed that South African coals should be characterized in more detail in order to match them more adequately to the newly developing direct-reduction technologies of the future. In his paper, 'Solid state reduction of composite chromite pellets in an externally heated moving-

bed shaft furnace', Mr M.J. Niayesh of Mintek described the development of a computer model for simulating the prereduction of composite chromite pellets and the methods used to verify the predictions. The paper 'Description of non-ideal slag and metal systems by the intermediate compound method', presented by Mr R.T. Jones of Mintek, examined a model that attributes deviations from ideal solution behaviour to the formation of complex component liquids and solid phases. Mr A. de Sousa of Afrox presented a paper describing an exploratory study of the primary business objectives of South African mining and metallurgical organizations. His paper was entitled 'In search of excellence in the South African mining and metallurgical industries'.

Three papers were presented in the second session, which was chaired by Dr F.W. Guldenpfennig of Usko Limited. 'The production of high-quality clean steel in a continuous billet-casting operation', presented by Dr M. van Wijngaarden of Usko Limited, identified and discussed the critical areas in the operation and their effect on the production of high-quality clean steel at a competitive price. Mr G. Andrew of Fedgas, in his paper 'Refining of silicon metal and ferrosilicon alloys', described the Fesirox process, which has as its principal feature a bottom-blown shrouded nozzle with which oxygen as the active component and an inert gas as the mixing agent are fed into the melt. 'The use of oxygen in pyrometallurgy' was the title of the paper presented by Mr E. Frommolt of Fedgas, who showed how the range of oxygen applications has grown continuously in recent years as a result of the need to make energy-intensive combustion processes more economical.

During the afternoon session, which was chaired by Mr J.P. Hoffman of Middelburg Steel & Alloys, four papers were presented. Mr D.W. de Vos of Iscor presented a paper on 'The commissioning of the desulphurization plant at Iscor's Pretoria Works', which discussed the commissioning and operation of the Injetall Side Injection Device (ISID), and the determination of the optimum process variables. 'The charging of high percentages of liquid iron to an electric arc furnace: Experience gained, present status, and future prospects', by Mr M. Fischer of Iscor discussed the establishment of a safe and economical practice that makes possible the use of hot metal of varying quality. Mr D. Hayman of Mintek, in his paper 'Mintek's new 1 MW plasma furnace', described the major reconfiguration of the facility. 'A new immersion probe system for the quick determination of hydrogen in molten steel' was presented by Mr P. Faulkner of Electro-Nite and described the system developed for an accurate on-line measurement of the hydrogen content.

The delegates responded well to the technical presentations, and the discussion sessions were well utilized to

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expand on the contents of the various papers.

General

The morning of 18th April was certainly one that had all the early-rising delegates muttering that winter had arrived early this year. The delegates were eager to speed up the registration process so that they could be comforted by the tea, coffee, and toasted sandwiches that were to follow and, as always, the competent secretariat handled the registration efficiently.

The venue seemed to be popular with most of the delegates and, as usual, the catering was of a high standard. A good turn-out of delegates enjoyed the post-Colloquium cocktail party, and it was even remarked that the Phys Mets may soon thaw enough to provide a serious

challenge to the party-loving miners!

All in all, the Colloquium must be recorded as having been very successful, and the Vaal Triangle must be regarded as a possible venue for future events of a similar nature.

Acknowledgements

The Technical Programme Committee thanks all those who contributed to the success of the Colloquium, particularly Pam Binstead for her administrative abilities, the Vaal Triangle Branch for arranging the venue, the Vaal Triangle Technikon for the use of their facilities, and the following companies for financial assistance: Afrox (Pty) Ltd, Cullinan Refractories, Falcon Research Laboratory, and Valley Refractories.

Project and contract management

A Project and Contract Management Conference is to be held on 19th and 20th September, 1989, at the CSIR, Pretoria. A faculty of highly experienced executives will address this working Conference on the various critical aspects of project and contract management, which is, in practice, one of the most complex forms of management to execute. It calls for special skills, as well as a clear understanding of the diversity of technical human relations and financial factors governing the project's progress and success.

Despite this, little training is given to contract managers in South Africa; yet new managers need to be trained and old managers retrained. Project and contract management involves an extraordinary team effort with collective creativity and the highest professional skills. Executed correctly, project and contract management can be very rewarding. Done wrongly, it can be a financial and human disaster.

Today's project and contract managers face a grave shortage of skilled manpower, go-slow actions by Unions, construction technology doubling every five years, material costs escalating at the rate of 1,7% or more a

month, cost overruns, and the increasing difficulty of relating cost to schedule during the course of a project.

Delegates attending the Conference will obtain a solid grounding in the principal tools and techniques necessary to effectively manage and control contracts—how to complete projects in the shortest time, at the lowest cost, and with the highest quality.

The Conference will include the difference between project and contract management, how to develop your own project-and-contract-management company, leadership in running a project, value engineering, problem solving and decision-making, handling the international contract, computerized project and contract management, management quality, and the future outlook and applications of contracting management. Those attending must be project managers, contract managers and engineers, estimators, quantity surveyors, consulting and site engineers, quality assurance managers, and clerks-of-work.

For further information on this essential Conference, telephone Joanna Bown at Whitehead Morris (Pty) Ltd on (011) 789-1574.

Powder metallurgy

The PM 90 exhibition is to be held in Wembley, London, from 2nd to 6th July, 1990. The wide range of powders, processing machinery, and powder-metallurgy components at the exhibition will reflect the growth in this highly specialist industry.

Metal powders are metallic elements or alloys in finely divided particulate form. These powders offer a series of unique raw materials whose applications are limited only by imagination and the fundamental properties of the metal. In addition to their use in powder-metallurgy parts and products, metal powders are used in welding applications, decorative coatings, medical and dental applications, office copiers, electrical applications, pyrotechnics, and nuclear engineering.

The exhibition is being run alongside the International Powder Metallurgy Conference, which is being organized by The Institute of Metals on behalf of The European Powder Metallurgy Federation.

For further information about the PM 90 Exhibition, please contact

Doris Stidston
Mack-Brooks Exhibitions Ltd
Forum Place
Hatfield
Hertfordshire AL10 ORN
England.

Tel: 07072 75641, telex: 266350, fax: 07072 75544.

Details about the PM 90 Conference can be obtained from

Jane Butler
Institute of Metals
1 Carlton House Terrace
London SW1Y 5DB
England.

Tel: 01 839 4071, telex: 8814813.

Castings and forgings

Exhibition organizers, FMJ International Publications Ltd, are set to build upon the success of Castings & Forgings '88, which was held as a joint event with Patt-Cast '88. Castings & Forgings '89—with Patt-Cast '89—has already generated a high level of interest, which has been reflected in the demand for stands.

Castings & Forgings '89—the exhibition for buyers and specifiers of castings and forgings—with Patt-Cast '89—the exhibition for the pattern making industry—will be held at the Telford Exhibition Centre, Shropshire, England, on 3rd and 4th October, 1989. The event is sponsored by the British Forging Industry Association, British Foundry Association, Diecasting Society, Institute of British Foundrymen, Institute of Purchasing and Supply, and the National Society of Master Patternmakers, and is supported by the journals *Castings Buyer*, *Foundry Trade Journal*, and *Metals Industry News*.

Accompanying the exhibition will be a major, one-day, conference 'Developing a Market Strategy', organized by The Institute of British Foundrymen and the British Cast Iron Research Association (BCIRA), which is to be held on 3rd October, 1989.

The subjects to be presented include

- The urgent need for the effective marketing of castings, both by individual foundries and by the foundry industry in general
- The difference between marketing and selling
- Effective casting buying for a multi-national group

- International marketing of castings—challenges and opportunities
- Effective advertising of castings—where, when, and how
- Establishment of an effective strategic marketing plan
- Case studies by practitioners.

Further information can be obtained from

Mr P.J. Wakeman
Technical and Courses Co-ordinator
Institute of British Foundrymen
3rd Floor
Bridge House
121 Smallbrook Queensway
Birmingham B5 4JP
England.

Tel: 021 643 4523.

For further information on the exhibition, contact

Brian Wilkinson
Exhibition Sales Manager
Castings & Forgings/Patt-Cast '89
Queensway House
2 Queensway
Redhill
Surrey RH1 1QS
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Tel: 0737 768611 Fax: 0737 761685

Telex: 948669 TOPJNL G.

Furnaces

FURNACES '90, the eighth in this series of exhibitions for the thermal-processing industry, will be held in Solihull, West Midlands, England, on 6th and 7th March, 1990. The show is sponsored by the British Industrial Furnace Constructors Association (BIFCA), the Contract Heat Treatment Association, the Wolfson Heat Treatment Centre, and the journals *Metallurgia* and *Metals Industry News*.

The exhibition will be of interest to personnel involved in purchasing or specifying plant and related materials. They will have the opportunity to view a full range of plant and equipment, plus the diverse range of services associated with furnace technology and thermal processing.

The categories of equipment that will be on display include the following:

- Heat-treatment furnaces
- Re-heating furnaces
- Melting furnaces
- Kilns and ovens
- Laboratory furnaces and analytical equipment
- Burners and electric elements

- Controls and instrumentation
- Furnace repair and engineering services
- Fume and dust extraction
- Refractories.

Complementing the exhibition, there will be a two-day conference consisting of technical presentations from leading companies and authorities. This is being organized jointly by FMJ International Publications Ltd and BIFCA. Further details will be available shortly.

For further details on the FURNACES '90 Exhibition, please contact

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Queensway House
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