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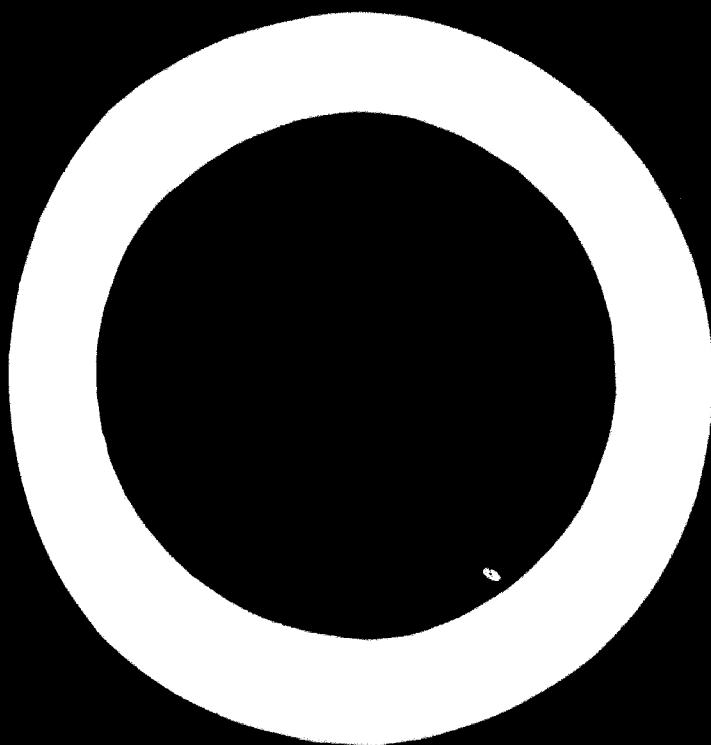


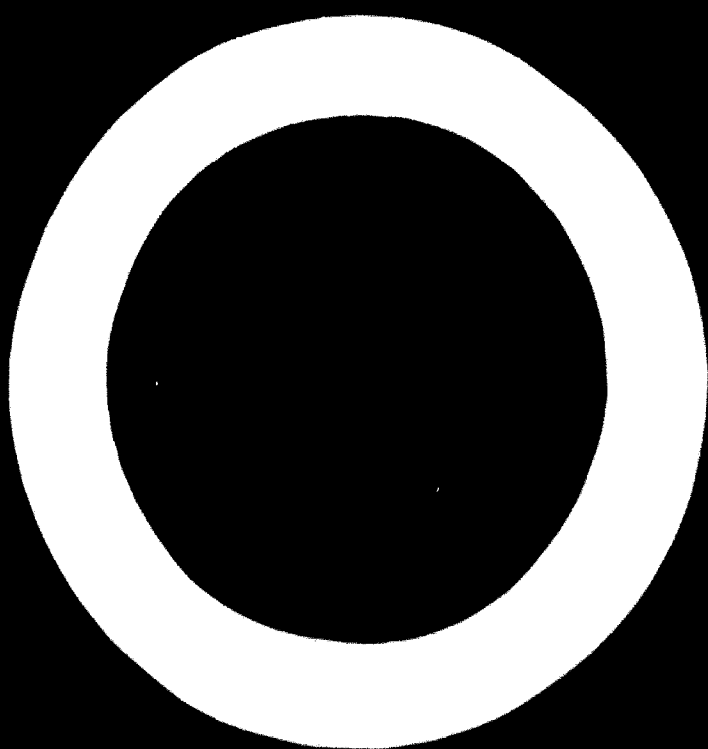
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UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

**THIRD
INTERREGIONAL
SYMPOSIUM
ON THE
IRON AND STEEL
INDUSTRY**

**BRASILIA, BRAZIL
14—21 October 1973**





**THIRD INTERREGIONAL SYMPOSIUM ON
THE IRON AND STEEL INDUSTRY**

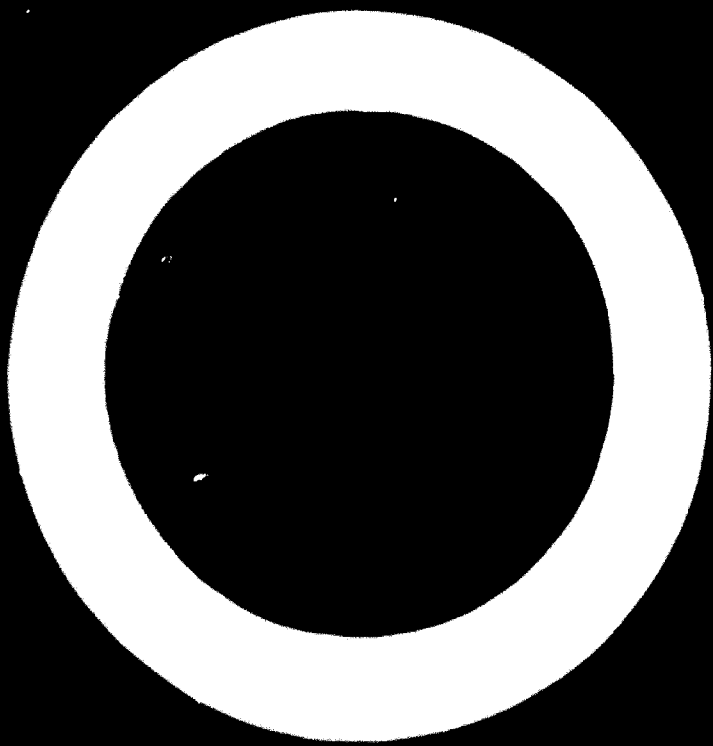
BRASILIA, BRAZIL

14—21 October 1973

**organized by
United Nations Industrial Development Organization
in co-operation with
the Government of Brazil**

Location

**Itamarati Palace
(Ministry of Foreign Affairs)
Brasilia
Brazil**



SYMPOSIUM INFORMATION

Admission

Only persons designated by UNIDO and the Government of Brazil can be accepted as participants.

Registration

Participants should report on arrival to the registration desk in the Itamarati Palace.

Badges

Participants are requested to wear the name badges distributed to them upon registration. In case of loss, the registration desk should please be informed.

Distribution of Documents

Participants will have received copies of the majority of the papers by mail in advance of the Symposium; the remaining papers will be distributed through the registration desk. Only limited supplies of papers will be available in Brasilia; moreover, duplicate copies of papers already sent in advance to participants cannot be supplied. Participants are therefore requested to bring the *advance copies* of the papers with them to Brasilia in order to participate fully in the Symposium.

Services

Post office, banking, travel agency, and other services will be at the disposal of participants at the Itamarati Palace.

Hotel accommodation

All hotel bookings in Brasilia will be made on behalf of participants by the Government of Brazil. Participants are reminded that they are responsible for the payment in full of their individual hotel bills before departure.

Seating

There are no formal seating arrangements in the conference hall. However, the front row of seats will be reserved for authors of the technical papers under discussion in each session; authors are requested to occupy these seats during the appropriate working sessions.

Languages and Interpretation

The working languages of the Symposium are English, French, Spanish, and Russian. All speakers must use one of these languages. Simultaneous translation will be provided into the other three languages during the working sessions of the Symposium.

Discussion

Speakers will start presenting their contributions when invited to do so by the Chairman of the session and their microphone will then be switched on. They should begin their contributions by giving their name and country of origin. They are requested to speak slowly and clearly, in order that the interpreters can simultaneously translate their contributions into the different working languages. Such contributions should not normally exceed 10 minutes; however, the Chairmen of the working sessions, in co-operation with the discussion leaders, will regulate these timings. Immediately after completing their contributions, participants are requested to summarize their comments in writing, using the forms available for this purpose. These forms should be returned as soon as possible to the Rapporteur.

Visual aids

There will be facilities in the conference hall for the projection of slides. Participants are requested, however, to limit the slides to the minimum in support of their oral contributions, with a view to permitting full discussion of the topics under review.

Plant tours

Details of plant tours will be made available to those participants who have already expressed a wish to take part in them at the end of the working sessions of the Symposium in Brasilia.

PROCEEDINGS

Publication of Report

The Report of the Symposium will be published by the United Nations about six months after the Symposium. It will contain reports of the papers and will reflect the discussions at the working sessions, conclusions and recommendations of the Symposium, list of participants, etc. in accordance with UNIDO requirements governing such publications.

Publicity

United Nations publications are given a very wide publicity. They are reviewed and advertised in scientific and technical journals, abstracted in abstracting journals, listed in national bibliographies, deposited for public reading in libraries, and displayed at book fairs and scientific conferences. Catalogues and advance notices of United Nations publications are distributed widely, and may be had free on request.

TIME-TABLE

Sunday, 14 October 1973

**Registration of participants
at Symposium headquarters**

Monday, 15 October 1973

10.00—12.30

Opening Session

Working Session 1

14.30—16.30

Working Session 2A

16.30—18.00

Working Session 2B

Tuesday, 16 October 1973

9.00—12.00

Working Session 3

14.00—18.00

Working Session 4

Wednesday, 17 October 1973

9.00—12.00

Working Session 5

14.00—18.00

Working Session 6

Working Session 7

Thursday, 18 October 1973

9.00—12.00

Working Session 8

14.00—18.00

Working Session 9

Friday, 19 October 1973

9.00—12.00

Working Session 10

Closing Session

14.00

Leave for plant tours

Saturday, 20 October 1973

Plant tours

Sunday, 21 October 1973

**Plant tours
End of the Symposium
Participants disperse**

**THIRD INTERREGIONAL SYMPOSIUM ON
THE IRON AND STEEL INDUSTRY**

14 - 21 October 1973, Brasilia, Brazil

SECRETARIAT

- | | |
|----------------------------|--|
| Chairman | H. E. Marcus Vinicius Pratini de Moraes
(Minister of Industry and Commerce,
Government of Brazil) |
| Co-Chairman | Mr. Bal R. Nijhawan
(Acting Chief, Metallurgical Industries Section,
Industrial Technology Division, UNIDO) |
| Technical Chairman | Mr. Luiz Fernando Sarcinelli Garcia
(Executive Secretary, CONSIDER, Ministry of Industry
and Commerce, Government of Brazil) |
| Technical Secretary | Mr. Christo Popov
(Industrial Development Officer, Metallurgical
Industries Section, Industrial Technology Division,
UNIDO) |
| Rapporteur | Mr. Henry Cleere
(UNIDO (consultant)) |

**THIRD INTERREGIONAL SYMPOSIUM ON
THE IRON AND STEEL INDUSTRY**

14—21 October 1973, Brasilia, Brazil

FIRST WORKING DAY, MONDAY, 15 OCTOBER 1973

Opening Session, 10.00—11.00

In the Chair	H. E. Marcus Vinicius Pratini de Moraes
Co-Chairman	Mr. B. R. Nijhawan
Opening of the Symposium	Mr. L. F. Sarcinelli Garcia
Addresses on behalf of Mr. I. H. Abdel- Rahman, Executive Director of UNIDO, and Mr. G. P. Veliky, Director, Industrial Technology Divi- sion, UNIDO	Mr. B. R. Nijhawan
Chairman's Address	H. E. Marcus Vinicius Pratini de Moraes

Working Session 1, 11.00—12.30

Chairman of the Symposium	H. E. Marcus Vinicius Pratini de Moraes
Co-Chairman	Mr. B. R. Nijhawan
Technical Chairman	Mr. L. F. Sarcinelli Garcia
Statement of the aims of the Sym- posium and descrip- tion of its <i>modus operandi</i>	Technical Secretary (Mr. Christo Popov)

ID/WG.146/109	Lessons learned from a lifetime in the steel industry	W. F. Cartwright (BSC International Ltd., UK)
ID/WG.146/102	Changing features of the world iron and steel industry	S. Tabata (Iron and Steel Institute of Japan)
<i>Working Session 2A, 14.30—16.30:</i>		<i>International Co-operation in the Establishment and Expansion of Iron and Steel Industries in the Developing Countries</i>
In the Chair	Mr. Mario Lopes Leão (COSIPA, Brazil)	
Co-Chairman	Mr. M. N. Dastur (M. N. Dastur and Co. Private Limited, India)	
Discussion Leader	Mr. Samir Taher (Delta Steel Mills, Arab Republic of Egypt)	
ID/WG.146/100	Assistance by the United Nations to the iron and steel industries of the developing countries	UNIDO Secretariat
ID/WG.146/20	Assistance by Nippon Steel to developing countries in establishing their own iron and steel industries	S. Maehara (Nippon Steel Company, Japan)
ID/WG.146/53	Experience of the Arab countries of international co-operation in the field of iron and steel	A. H. Momtaz and S. Etewa (Industrial Development Centre for the Arab States—IDCAS)
ID/WG.146/101	Some aspects of the technological development of the USSR iron and steel industry and techno-economic co-operation between the Soviet Union and developing countries	P. A. Shirayev (Gipromez, USSR)
ID/WG.146/30	Co-operation between member countries of CMEA and the activities of the Standing Commission on Iron and Steel	Secretariat of the Council for Mutual Economic Assistance—CMEA

ID/WG.146/65 Multinational companies in the iron and steel industry: the example of USIMINAS T. Takahashi (USIMINAS, Brazil)

ID/WG.146/66 The role of technical associations in the extension of international co-operation and know-how transfer UNIDO Secretariat

Working Session 2B, 16.30—18.00:

Environmental Aspects of Iron and Steel Industries in Developing Countries

Statement on the United Nations Environment Programme Representative of the Secretariat

ID/WG.146/58 Steelmaking and the environment in the developing countries J. R. Miller (Consultant, USA) and T. M. Barnes (Battelle Memorial Institute, USA)

ID/WG.146/ Pollution control and the iron and steel industry I. Codd (University of Leeds, UK)

ID/WG.146/113 The iron and steel industry and the environment Viktor Epstein and Carl G. Herthelius (Scandiaconsult International AB, Sweden)

SECOND WORKING DAY, TUESDAY, 16 OCTOBER 1973

Working Session 3 9.00 - 12.00. The Planning and Financing of Iron and Steel Projects in the Developing Countries

In the Chair	Mr. John W. P. Jaffe (International Bank for Reconstruction and Development)	
Co-Chairman	Mr. Kasem Balajiva (Applied Scientific Research Corporation of Thailand)	
Discussion Leader	Mr. Luiz Fernando Sarcinelli Garcia (CONSIDER, Brazil)	
ID/WG.146/90	International co-operation in the planning, financing, construction, and operation of iron and steel plants	J. W. P. Jaffe (IBRD)
ID/WG.146/35	Steel: the evaluation of feasibility studies	M. N. Dastur and Co. Private Limited, India
ID/WG.146/42	Factors affecting the evaluation of steel plant feasibility studies	S. Ruykun (Kaiser Engineers, USA)
ID/WG.146/83	Methods of external financing for the iron and steel industry in the developing countries	L. F. Sarcinelli Garcia (CONSIDER, Brazil)
ID/WG.146/24	Methods of financing iron and steel industries in developing countries	K. Miyagi (Japan Consulting Institute, Japan)
ID/WG.146/110	The role and evaluation of international technical consultants for the establishment of iron and steel industries in developing countries	UNIDO Secretariat
ID/WG.146/43	Pre-investment surveys and the role of technical consultancies in the establishment of iron and steel industries, particularly in a developing country	V. M. G. Raman and K. C. Mohan (Hindustan Steel, India)

ID/WG.146/7	State planning of iron and steel product demand	K. Kémeny and L. Berendik (National Planning Office, Hungary)
ID/WG.146/107	Static and dynamic methods for the study of factors influencing the choice of location	W. H. Mieth (Hoersch AG, Federal Republic of Germany)
ID/WG.146/22	Plant location and cost aspects of integrated steel plants in developing countries	M. Sato (Ministry of International Trade and Industry, Japan)
ID/WG.146/56	Scale factors in the Italian steel industry	M. Bucchi (Società Italiana Impianti, Italy)
ID/WG.146/95	Expansion of the non-flat rolled products sector in Brazil: aspects relating to economies of scale	C. H. Miranda de Faria and O. A. Villas Bôas (CONSIDER, Brazil)
ID/WG.146/79	The economy of size and scale of steel-making units, with particular reference to the Indian steel industry	A. C. Banerjee and M. B. Silgado (Steel Authority of India)
ID/WG.146/23	Factors affecting location of iron and steel works at coastal sites	G. Suzuki and M. Saito (Nippon Kokan K.K., Japan)
ID/WG.146/29	Economic, financial, and technological considerations in the choice of mini steel plant technology by developing nations	M. L. Shrikant (Mukand Iron and Iron and Steel, India)
ID/WG.146/104	Mini-steel mills and their importance for steel production in developing countries	Dieter Ksinsik (Korf- Stahl AG, Federal Republic of Germany)
ID/WG.146/5	Mini mills for developing countries	C. W. Chua (South East Asia Iron and Steel Institute, Singapore)
ID/WG.146/85	Observations on mini-mills	Luigi Danieli (Danieli & C., Italy)

Working Session 4, 14.00—18.00: Economic and Market Aspects of the Iron and Steel Industries of the Developing Countries

In the Chair	Mr. Shintaro Tabata (Iron and Steel Institute of Japan)	
Co-Chairman	Mr. K. Maksoud (General Organization for Industrialization, ARE)	
Discussion Leader	Mr. George Andrejević (Jugometal-Kombinat, Yugoslavia)	
ID/WG.146/6	Participation of developing countries in the world iron-ore market	P. M. Bohomoletz (CVRD, Brazil)
ID/WG.146/76	Planning for and promotion of the use of steel: comments on the Brazilian experience	F. J. H. Pegurier (CODEMIN, Brazil)
ID/WG.146/19	Planning and promotion of the use of steel	Secretariat of the Chilean Steel Institute — ICHA
ID/WG.146/34	The direct and indirect effects of an iron and steel industry on the overall economy	M. N. Dastur and Co. Private Limited, India
ID/WG.146/28	Participation of developing countries in the world steel market	G. Andrejević (Jugometal-Kombinat, Yugoslavia)
ID/WG.146/88	The steel outlook and the developing countries	Charles B. Baker (International Iron and Steel Institute, Belgium)

THIRD WORKING DAY, WEDNESDAY, 17 OCTOBER 1973

Working Session 5, 9.00—12.00: Technological Developments in the Iron and Steel Industry: Raw Materials and Ironmaking

- In the Chair** Mr. Jacques E. Astier (Institut de Recherches de la Sidérurgie française — IRSID, France)
- Co-Chairman** Mr. Akinwunmi Adegboye (Nigerian Steel Development Authority, Nigeria)
- Discussion Leaders** *Conventional Processes:* Mr. E. W. Voice (British Steel Corporation, UK)
Direct Reduction: Mr. B. Rollinger (Battelle-Institut, Federal Republic of Germany)

- ID/WG.146/13** **Developments in coking technology** M. Takemoto, K. Sugasawa and Y. Otake (Sumitomo Metal Industries, Japan)
- ID/WG.146/40** **Changing technology in the light of coking coal availability** M. Conti and R. Sacerdote (Italsider, Italy)
- ID/WG.146/18** **Changes in ironmaking technology in relation to the availability of coking coals** E. W. Voice and J. M. Ridgion (British Steel Corporation, UK)
- ID/WG.146/69** **Changing technology in the light of the availability of natural gas** Abdelmadjid Chaker (Union Générale Sidérurgique Arabe, Algeria)
- ID/WG.146/67** **On-site processing of iron ore in developing countries through the stage of pre-reduced agglomeration** J. R. Miller (Iron and Steel Consultant, USA)

ID/WG.146/25	Developments in blast furnace practice and design	T. Hasegawa and T. Satoh (Nippon Kokan K.K., Japan)
ID/WG.146/10	Production of self-fluxing pellets and their blast-furnace performance	K. Taguchi (Kobe Steel, Japan)
ID/WG.146/4	Development in ironmaking practice	J. M. Ridgion (British Steel Corporation, UK)
ID/WG.146/33	Diversification of energy sources for the blast furnace: the double injection process	P. Coheur and A. Decker (Centre de Recherches Métallurgiques — CRM, Belgium)
ID/WG.146/73	Progress in blast-furnace production in the Soviet Union)	Z. I. Nekrasov (Academy of Sciences, USSR)
ID/WG.146/3	Direct reduction of iron ore: technical and economic aspects	ECE Secretariat
ID/WG.146/	An appraisal of some of the direct reduction processes for the production of sponge iron	UNIDO Secretariat
ID/WG.146/86	Economic aspects of using a gaseous direct-reduction process in a developing country	J. M. Peña and P. W. MacKay (Hojalata y Lamina, Mexico)
ID/WG.146/91	Direct reduction for the developing nation	R. Lawrence Jr. (Swindell-Dressler Company, USA)
ID/WG.146/47 (Chapter on iron making)	Recent achievements of the iron and steel industry of the Soviet Union and the availability to developing countries of Soviet experience in metallurgy	L. M. Efimov (TsNIChMet, USSR)

Working Session 6, 14.00—16.00: Technological Developments in the Iron and Steel Industry: Steelmaking and Casting

In the Chair	Mr. Amaro Lanari Jr. (USIMINAS, Brazil)	
Co-Chairman	Mr. L. M. Efimov (Central Scientific Research Institute of Ferrous Metallurgy — TsNIChMet, USSR)	
Discussion Leader	Mr. B. Trentini (Institut de Recherches de la Sidérurgie française — IRSID, France)	
ID/WG.146/46	Availability, collection and preparation of scrap in developing countries	E. V. Poubel (Instituto Brasileiro de Siderurgia — IBS, Brazil)
ID/WG.146/44	Developments in oxygen steel-making	B. Trentini (IRSID, France)
ID/WG.146/12	Some developments in top-blown BOF equipment	I. Hamabe, S. Yamazaki, J. Tsunoda, S. Yamada and K. Yanagida (Kawasaki Heavy Industries, Japan)
ID/WG.146/74	The use of oxygen in steel production	L. M. Efimov (TsNIChMet, USSR)
ID/WG.146/84	The development and operation of the Q-BOP process in the United States Steel Corporation	A. H. Brisse (United States Steel Corporation, USA)
ID/WG.146/108	Theory and practice of bottom-blowing oxygen metallurgy	K. Brotzmann (Eisenwerk-Gesellschaft Maximilianshütte, Federal Republic of Germany)
ID/WG.146/38	Oxygen steelmaking in bottom-blown converters	P. Nilles (CRM, Belgium) and M. Boudin (Forges de Thy-Marcinelle et Monceau, Belgium)

ID/WG.146/97	The submerged injection process for improved productivity in open-hearth furnaces	D. W. R. Haysom (Sydney Steel Corporation, Canada)
ID/WG.146/21	Development in electric steel-making	J. E. Astier and J. Antoine (IRSID, France)
ID/WG.146/87	Utilization of direct reduction iron in electric steelmaking	R. M. Smailer, H. B. Jensen, and W. W. Scott, Jr. (Lukens Steel, USA)
ID/WG.146/105	Design of the USIBA steel plant in Brazil with a view to the massive utilization of sponge iron in the charge of the electric furnaces	Luis Arpad Driesel (USIBA, Brazil) and Bernard Lacoste (Fives Lille-Cail, France)
ID/WG.146/68	Choice of heavy blooming mill versus continuous casting: technical and economic comparison	B. Missbach (Concast, Switzerland) and J. Th. Wasmuht (Concast, Argentina)
ID/WG.146/41	Economic and technical comparison between conventional casting (small and large ingots) and continuous casting	S. Kojima (Kobe Steel, Japan)
ID/WG.146/45	Some aspects of small-scale continuous casting plants	E. Takehara and O. Nishimura (Mitsubishi Heavy Industries, Japan)
ID/WG.146/106	A specialty plate producer's experience with continuous slab casting	L. I. Mandich and L. Pompa (Lukens Steel, USA)
ID/WG.146/59	Trends in the construction of LD steel plants	L. Neuner (Vöest-Alpine, Austria)
ID/WG.146/47 (Chapter on steel-making)	Recent achievements of the iron and steel industry of the Soviet Union and the availability to developing countries of Soviet experience in metallurgy	L. M. Efimov (TsNIChMet, USSR)

In the Chair	Mr. W. F. Cartwright (BSC International Limited, UK)	
Co-Chairman	Mr. Osamu Miki (Kobe Steel Limited, Japan)	
Discussion Leader	Mr. Josif Kuchoukov (Higher Chemical Technological Institute, Bulgaria)	
ID/WG.146/17	Developing a steel industry	Wean-United, USA
ID/WG.146/32	Stage-wise expansion programme of a steel strip mill	S. Nomura and H. Watanabe (Ishikawajima-Harima Heavy Industries, Japan)
ID/WG.146/16	Techno-economic comparison of typical wire-rod mills: the experience of Kobe Steel	O. Miki and T. Onishi (Kobe Steel, Japan)
ID/WG.146/8	The No. 4 pickle line at BSC Ebbw Vale Works	K. T. Lawson (Head Wrightson Machine Company, UK)
ID/WG.146/80	Technological improvements in rolling-mill equipment	J. Fiat (SECIM, France)
ID/WG.146/	Automation of small rolling mills	Hans H. Rohde (Korf Engineering, Federal Republic of Germany)
ID/WG.146/11	Automation and computer control of hot and cold strip mills	T. Okamoto and Y. Misaka (Sumitomo Metal Industries, Japan)
ID/WG.146/98	Automation and automatic gauge control in cold rolling mills	A. V. Souza e Silva (Westinghouse Electric Company SA, Brazil)

ID/WG.146/47 **Recent achievements of the iron
(Chapter on rolling) and steel industry of the Soviet
Union and the availability to
developing countries of Soviet
experience in metallurgy**

**L. M. Efimov
(TsNIChMet, USSR)**

FOURTH WORKING DAY, THURSDAY, 18 OCTOBER 1973

Working Session 8, 9.00—12.00: The Creation and Transfer of Metallurgical Know-How to and between Developing Countries

In the Chair Mr. Oscar Masi (Centro Sperimentale Metallurgico, Italy)

Co-Chairman Mr. A. Decker (Centre de Recherches Métallurgiques, Belgium)

Discussion Leader Mr. L. C. Corrêa da Silva (Ministry of Industry and Commerce, Brazil)

ID/WG.146/103 Follow-up Report on the UNIDO UNIDO Secretariat Workshop on Creation and Transfer of Metallurgical Know-How held at the National Metallurgical Laboratory, Jamshedpur, India, on 7--11 December 1971

ID/WG.146/78 Transfer of know-how in metallurgy to and between Latin American countries **Fernán Ibañez** (University of Chile)

ID/WG.146/15 Assistance by metallurgical research institutes to developing countries **J. E. Astier** (IRSID, France)

ID/WG.146/82 The National Metallurgical Laboratory of India: a case study of the development of a research and development institute **V. A. Altekar** (National Metallurgical Laboratory, India)

ID/WG.146/94 The Institute of Technological Research, São Paulo (IPT): a case study **A. Pereira de Castro and P. S. Pereira da Silva** (IPT, Brazil)

ID/WG.146/31 Co-operative metallurgical research: the Centre de Recherches Métallurgiques **P. Coheur and A. Decker** (CRM, Belgium)

- ID/WG.146/60 The organization of industrial research in a developing country: the Metallurgical Institute "Hasan Brkić", Zenica, Yugoslavia K. Kapetanović (Metallurgical Institute Hasan Brkić, Yugoslavia)
- ID/WG.146/112 Co-operative research in Italy, a country with a recently developed steel industry: technical and organizational problems and the possibilities for international collaboration O. Masi (Centro Sperimentale Metallurgico, Italy)
- ID/WG.146/96 Heavy Engineering Corporation — backbone of India's industry S. C. Vadera (Heavy Engineering Corporation, India)
- ID/WG.146/77 Manufacture of iron-ore mining and steelmaking equipment in Latin America Aníbal Gómez (Instituto Latinoamericano del Hierro y el Acero — ILAFA, Chile)
- ID/WG.146/50 Steel plant design and engineering organizations: the Indian experience M. N. Dastur and Company Private Limited, India

Working Session 9, 14.00—18.00: Problems of Management and Manpower in the Iron and Steel Industries of the Developing Countries

In the Chair **Mr. Alfredo Americo da Silva** (Companhia Siderúrgica Nacional, Brazil)

Co-Chairman **Mr. W. H. Mieth** (Hoesch AG Hüttenwerke, Federal Republic of Germany)

Discussion Leader **Mr. Fernando Aguirre Tupper** (Consultant, Chile)

ID/WG.146/111 **Data processing in the iron and steel industry: the state of the art and trends in computer applications** **H. A. Kirschgaesser** (IBM, Japan) and **C. Gilbert** (IBM, UK)

- ID/WG.146/14** **The use of linear programming in the optimization of coal blends** Aloísio Falco, Pedro E. Santos, Mario R. F. Monteiro, Odilon Leocádio Filho, and Romeu P. Gouveia
(USIMINAS, Brazil)
- ID/WG.146/27** **Computerized integrated production control systems** I. Nagasawa and T. Kobayashi
(Nippon Steel, Japan)
- ID/WG.146/9** **Activities for personnel training and determination of manpower requirements in Chiba Works** T. Kadooka
(Kawasaki Steel, Japan)
- ID/WG.146/90** **Manpower requirements and training for an expanding steel industry in a developing country: a projection for the Indian steel industry over the next decade** R. P. Billimoria
(Hindustan Steel, India)
- ID/WG.146/37** **The development of personnel training for the start-up of Propulsora Siderúrgica** M. A. Punte (Propulsora Siderúrgica SA, Argentina) and Luigi Iperti (Techint Engineering Co., Italy)
- ID/WG.146/26** **The activity of CESSID** J. Szczeniowski
(Centre d'Etudes Supérieures de la Sidérurgie, France)
- ID/WG.146/72** **Personnel training for the iron and steel industry in the USSR** A. A. Novozhilova
(Ministry of Ferrous Metallurgy, USSR)

FIFTH WORKING DAY, FRIDAY, 19 OCTOBER 1973

*Working Session 10, 9.00—11.30: Identification of Technical Assistance
Projects in Developing Countries
Discussion and Formulation of Conclusions
and Recommendations of the Symposium*

In the Chair	Mr. G. Dominjon (Ministry of Industrial and Scientific Development, France)	
Co-Chairman	Mr. B. R. Nijhawan (Metallurgical Industries Section, Industrial Technology Division, UNIDO)	
ID/WG.146/61	Developments in the iron and steel industry and its markets in the ECE region since 1960	ECE Secretariat
ID/WG.146/39	Developments in the iron and steel industry in the ECAFE region	ECAFE Secretariat
ID/WG.146/62	Development of the Latin American iron and steel industry in the period 1960—1971	ECLA Secretariat
ID/WG.146/55	Establishment of iron and steel industries in the Arab countries to suit local conditions	S. Y. Ezz (Cairo University, Arab Republic of Egypt)
ID/WG.146/36	Survey of the development of the Spanish steel industry	J. J. Alzugaray (Altos Hornos de Vizcaya, Spain)
ID/WG.146/93	The development of the Brazilian iron and steel industry	Secretariat of CONSIDER, Brazil
ID/WG.146/54	The establishment and development of the Bulgarian iron and steel industry	V. E. Iliev (Ministry of Heavy Industry, Bulgaria)
ID/WG.146/48	La industria siderúrgica mexicana	R. Betancourt de Jiménez (Ministry of Industry and Commerce, Mexico)

ID/WG.146/49	The Indonesian iron and steel industry	T. Ariwibowo (Directorate-General of Basic Industry, Indonesia)
ID/WG.146/52	La sidérurgie en Tunisie	A. Cheikh Khalfallah (Centre National d'Etudes Industrielles, Tunisia)
ID/WG.146/51	L'usine sidérurgique de Maluku, Zaïre	Mambu Panda (Société Nationale de Sidérurgie, Zaïre)
ID/WG.146/64	The iron and steel industry in Iraq	A. M. M. Al-Jalil (Ministry of Industry, Iraq)
ID/WG.146/57	Situación actual, problemas, y planes de desarrollo de la industria del hierro y del acero en Venezuela	A. Rivas (SIDOR, Venezuela)
ID/WG.146/63	The iron and steel industry in Pakistan	S. Shafqat Ali (Pakistan Steel Mills Corporation, Pakistan)
ID/WG.146/70	Quelques considérations sur la possibilité d'installer une unité sidérurgique au Maroc	Abdelhaq Fakhani (Ministère de l'Industrie et des Mines, Morocco)
ID/WG.146/71	The Sri Lanka iron and steel industry	B. Manukulasuriya (Ceylon Steel Corporation, Sri Lanka)
ID/WG.146/75	La industria siderúrgica chilena	Hector Goldfarb S. (Instituto Chileno del Acero, Chile)
ID/WG.146/81	The steel industry of Iran	Massoud Rafi (National Iranian Steel Corporation, Iran)

ID/WG.146/89 Estado actual y problemas
relativas a la industria sider-
úrgica en la República
Argentina Joaquín de la Heras
(Ministry of Defence,
Argentina)

ID/WG.146/92 The steel industry in Colombia Francisco Triana
Murcia (Acerías Paz
del Rio, Colombia)

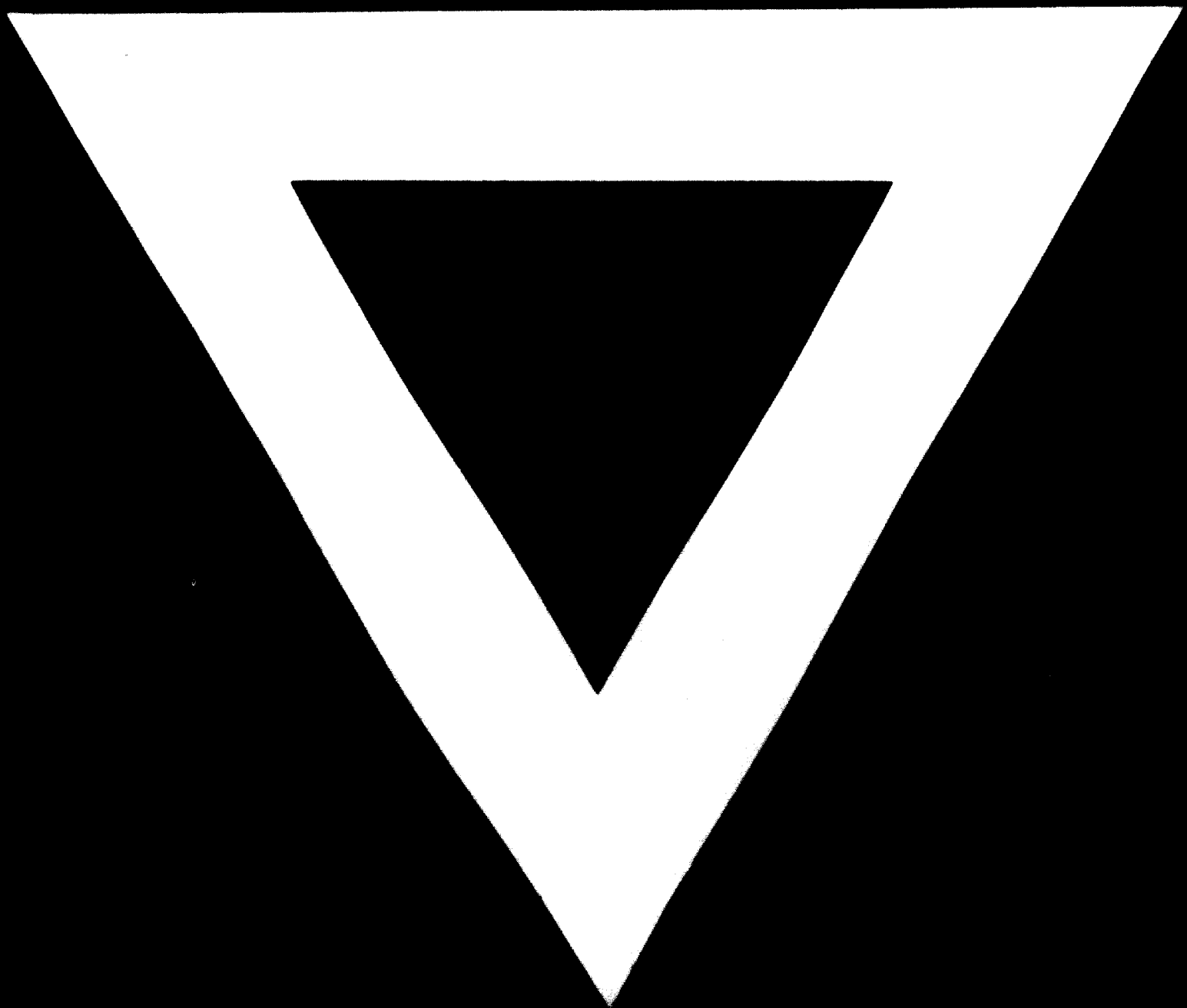
Closing Session: 11.30—12.00

11.30—11.45 Concluding remarks of
Symposium Co-Chairman Mr. B. R. Nijhawan—
UNIDO

11.45—12.00 Closing Speech of Symposium
Chairman H. E. Marcus Vinicius
Pratini de Moraes
Minister of Industry
and Commerce,
Government of Brazil

PLANT TOURS

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|----------------------------|---|
| Group 1: Minas Gerais | <i>a.</i> Cia. Siderúrgica Mannesmann
<i>b.</i> Magnesita S.A. |
| Group 2: Minas Gerais | <i>a.</i> Cia. Siderúrgica Belgo Mineira
<i>b.</i> Cia. Vale do Rio Doce (CVRD) — Caué Mine |
| Group 3: Minas Gerais | <i>a.</i> Usinas Siderúrgicas de Minas Gerais (USIMINAS)
<i>b.</i> Cia. Aços Especiais Itabira (ACESITA) |
| Group 4: Rio de Janeiro | <i>a.</i> Cia. Siderúrgica Nacional (CSN)
<i>b.</i> Cia. Metalúrgica Barbará |
| Group 5: São Paulo | <i>a.</i> Cia. Siderúrgica Paulista (COSIPA)
<i>b.</i> Aços Villares S.A. |
| Group 6: Rio Grande do Sul | <i>a.</i> Aços Finos Piratini S.A.
<i>b.</i> Siderúrgica Riograndense S.A. |
| Group 7: Bahia | <i>a.</i> Usina Siderúrgica da Bahia S.A. (USIBA)
<i>b.</i> Ferro Ligas da Bahia (FERBASA) |
| Group 8: Espírito Santo | <i>a.</i> Cia. Vale do Rio Doce (CVRD)—Port of Tubarao
<i>b.</i> Cia. Ferro e Aço de Vitória (COFAVI) |



7 . 8 . 74