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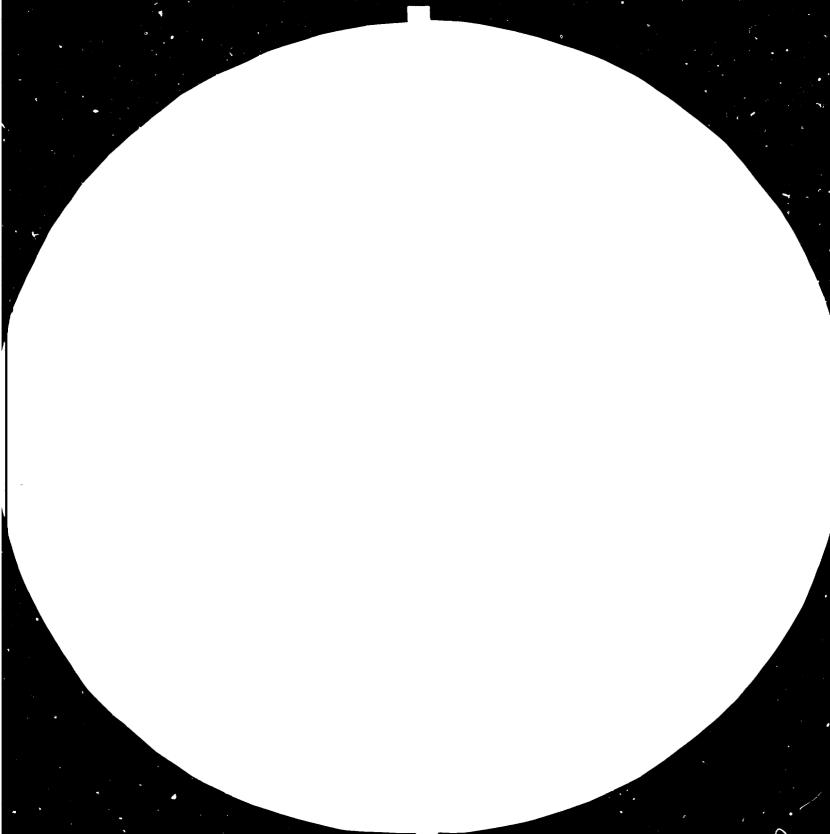
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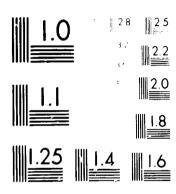
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Technical Workshop on "EMERGY CONSERVATION IN SILICATE INDUSTRIES FOR THE LEAST DEVELOPED COUNTRIES"

Organized by the UNIDO-Czechoslovakia Joint Programme for International Co-operation in the Field of Ceramics, Building Materials and Mon-metallic Minerals Based Industries from 5 through 16 October 1981 in Pilsen, Czechoslovakia



This report has been prepared by:

- Mr. G. Komissarov, Industrial Development Officer, Office of the Director, DIO, Industrial Energy Engineering Unit, Liaison Officer of the UNIDO-Czechoslovakia Joint Programme, UNIDO Headquarters Vienna
- Mr. Z.A. Engelthaler, Chief Executive of the UNIDO-Czechoslovakia Joint Programme and Director of the Research Institute for Ceramics, Refractories and Raw Materials, Pilsen
- Mr. J. Dřevo, Acting Senior Expert of the UNIDO-Czechoslovakia Joint Programme, Pilsen
- Mr. J. Lahovský, Expert of the UMIDO-Czechoslovakia Joint Programme, Pilsen

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Pilsen, Czechoslovakia October 1981

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1. INTRODUCTION

The Technical Workshop on Energy Conservation in Silicate Industries for the Least Developed Countries, organized by the UKIDO-Czechoslovakia Joint Programme for International Co-operation in the Field of Ceramics, Building Laterials and Hon-metallic Linerals Based Industries in Pilsen and endorsed by the UMIDO-Czechoslovakia Joint Committee, was held in Pilsen, Czechoslovakia from 5 through 16 October 1981.

The objectives of the Technical Workshop were to provide the participants from the least developed countries with practical and theoretical knowledge in the field of energy conservation in the production of ceramics, glass and cement. The programme emphasized some of the most important aspects of energy conservation regarding a proper choice of heat-consuming equipment and efficient technologies with regard to locally available raw materials in the least developed countries.

2. PARTICIPALITS

Fifteen participants from seven least developed countries were selected to take part in the Technical Workshop:

Country:	Humber of Participants:
The Democratic Republic of Afghanistan	2
The People's Republic of Bangladesh	3
Tepal	2
Somali Democratic Republic	2
The Democratic Republic of the Sudan	2
The United Republic of Tanzania	3
The People's Republic of Democratic Yemen	1
	15 *

The List of Participants - See ANNEX I.

3. LANGUAGE

The programme was entirely conducted in English. Typed lectures were submitted by the lecturers to the UNIDO-Czechoslovakia Joint Programme to be available for all the participants at the opening of the Workshop.

4. ORGANIZATION OF THE TECHNICAL WORKSHOP

The programme prepared for the participants was published as Time Schedule. Lectures and lecturers are listed in ATTEX II, in-plant and in-research institute trainings are reviewed in ATTEX III.

4.1 Theoretical part

The theoretical part consisting of lectures and movies took 40% of the training time. The lectures were dealing with energy conservation in connection with technology, applied thermal units and energy management in ceramic, cement and glass industries. Diagnostic methods and simulation of thermal processes in silicate industries were described.

The lectures were delivered by experienced factory senior technicians, industry, science and research directors and university professors.

4.2 Practical part

This part taking 60% of the training time consisted of training in diagnostic methods, practical measuring of thermal units, in technologies of silicate products and laboratory testing. The practical part was implemented in five factories and two divisions of the Research Institute for Ceramics, Refractories and Raw Materials, Pilsen. An exhibition of non-metallic raw materials and products was opened for participants in the URAL Hotel. The original programme of the practical part was extended by the visit to a cement plant at Prachovice, the largest kaolin pit in Europe at Kaznějov and to the ŠKODA Concern in Pilsen with regard

to the interest expressed by the participants.

4.3 Documentation and aids

The following documentation and aids were handed over to each of the Technical Workshop participants:

Guide to the Technical Workshop
Technical Workshop Time Schedule
Complete set of 11 lectures
Set of questionnaires of plants to be visited
Technical leaflets
Publication on the Research Institute for Ceramics,
Refractories and Raw Laterials, Pilsen
Publication on Industrial Exploitation of Phonolites
Publication on Ceramics in Architecture
Book on Electric Melting of Glass
Review of Production Assortment of the Czechoslovak
Ceramics.
Various samples and album with the collection of photos
Writing materials and handbag
Protective helmet for in-plant training

The participants enriched their scope of knowledge by discussions with officials, Mr. J. Ludvík, General Director of the ŠKODA Concern, Mr. A. Lošťák, General Pirector of the Czechoslovak Ceramic Works, representatives of Foreign Trade Corporations Polytechna and Pragoinvest, Mescri Přerov Machinery, Teplotechna and Crystalex.

5. ADMINISTRATIVE ORGANIZATION OF THE PROGRAMME

5.1 Administrative work

Administrative staff was engaged in organizing and arranging lectures, in-plant training in factories and the Research Institute, board and lodging arrangements, local transportation, cultural programme and social events, providing of visas and air-ticket booking, securing medical care (Mr. Abdul Halim from the People's Republic of Bangladesh was taken ill and attended by physicians of the Health Centre).

5.2 Secretariate and audience hall

Secretariate of the Technical Workshop and audience hall were established in the URAL Hotel in Pilsen.

5.3 Lodging and board

The participants were accommodated in the URAL Hotel, too, so that the time losses were eliminated.

6. EVALUATION MADE BY THE PARTICIPANTS

The evaluation made by the participants is expressed in the attached summary evaluation sheet reflecting a very positive picture of organization and training programme (AHMEX IV). A positive evaluation resulted also from the following round-table discussion.

7. CONCLUSIONS AND RECOLLENDATIONS

The participants from the least developed countries, having exchanged the experience of their countries in energy conservation in ceramic, cement and glass industries, recommend:

- 1/ The UNIDO-Czechoslovakia Joint Programme for International Co-operation in the Field of Ceramics, Building Materials and Mon-metallic Minerals Based Industries should continue its activities in the energy conservation programme as an important component of its work with regard to the importance of this problem for the least developed countries.
- 2/ The objectives of the UNIDO-Czechoslovakia Joint Programme should encounter:
 - (a) Arrangement of Technical Workshops on Energy Conservation specialized in particular fields of silicate industries (ceramics, cement and glass) to be organized in future years.
 - (b) Extending technical assistance to developing countries in energy problems by diagnosing their thermal units and analyzing their technologies with regard to energy savings.
 - (c) Lediating operational instructions and know-how for the application and local construction of mobile diagnostic unit.
 - (d) Individual training in energy conservation of recommended participants.

- 3/ Testing of local materials based on geological exploration, followed by technological evaluation and concluded by proposals of technology preferring low energy consuming processes, elaboration of pre-feasibility, market and feasibility studies.
- 4/ Research based on indigenous raw materials aimed to the increased quality of products and removation of product assortment comprising the stages of raw material selection, body composition, technology and finished product testing the basic instruments for acceleration of industrial development.
- 5/ Group training (in-plant training workshops) in technological problems of non-metallic based industries.
- 6/ The optimum duration of Technical Workshops was recommended to be 3 weeks.

8. INDIVIDUAL RECONSENDATIONS OF PARTICULAR COUNTRIES

The participants elaborated country reports reviewing the state of silicate industries in their countries and expressed the following recommendations regarding their potential co-operation with the UNIDO-Czechoslovakia Joint Programme:

- 1. The United Republic of Tanzania
 - Training of technical staff
 - Investigation of the possibility to establish a central research institute for silicate industries
- . 2. The Democratic Republic of the Sudan
 - Training programmes for workers and managerial staff
 - Energy auditing programmes to rationalize energy consumption
 - Modernization of the existing plants through adapting new technological equipment
 - Transfer of technology of Mobile Diagnostic Unit
 - 3. The People's Republic of Bangladesh
 - Technological training of technicians in sanitary ware and insulator manufacture
 - Assistance for local raw material exploration
 - 4. The People's Republic of Democratic Yemen
 - Technical assistance in the establishment of brick, fine ceramics and glass industries

- 5. Nepal Training of technical personnel for cement industry
- 6. The Somali Democratic Republic
 - Training of manpower and assistance in the establishment of a ceramic pilot plant
- 7. The Democratic Republic of Afghanistan
 - Individual training in energy conservation with respect to solar energy
 - Technical assistance in technological evaluation of raw materials including no. .raditional technologies

LIST OF PARTICIPALITS

- Mr. Mohammed Yasin Moory Coordinator of the cement project directorate Department of Industries, Ministry of Mines and Industries Kabul, The Democratic Republic of Afghanistan
- Mr. Akhtar Mohammad Timar
 Director of Engineering Dept.
 of Industrial Services Projects
 Ministry of Mines and Industries
 Kabul, The Democratic Republic of Afghanistan
- Mr. S. Mohammad Shahidullah Assistant Chemist BISF, Bangladesh Chem. Industries Corp. (BCIC) Bangladesh Insulator and Sanitaryware Factory, Murpur, Dacca, The People's Republic of Bangladesh
- Mr. Abdul Halim Assistent Chemist Bangladesh Chemical Industries Corporation (BCIC) Dacca, the People's Republic of Bangladesh
- Mr. Ali Ashraf Assistent Chemist Bangladesh Chemical Industries Corporation (BCIC) Dacca, the People's Republic of Bangladesh
- Mrs. Shanta Karmacharya Chemist
 H.M.G. Ministry of Industry Dept. of Mines and Geology
 Lainchaur, Kathmandu, Mepal
- Mr. Narendra Prasad Pokhrel Chemist H.M.G. Ministry of Industry Dept. of Mines and Geology Lainchaur, Kathmandu, Mepal

- Lr. Abdi Hassan Farah Head of Organic Chemistry Dept. Somali National University Mogadishu, Somali Democratic Republic
- Mr. Ahmed Maye Abdurahman Head of Physical Chemistry Dept. Somali Mational University Mogadishu, Somali Democratic Republic
- Mr. Murtaza Abdeali Khambalia Project Leader Hational Chemical Industries Dar-es-Salaam, The United Republic of Tanzania
- Mr. Jones Mewonaona Saronga Ceramic Project Leader Heading the Construction of Ceramic Plant Tanzania Saruji Corporation Dar-es-Salaam, The United Republic of Tanzania
- Mr. Sabinus Karani Halima Deputy Production Hanager Hibeya Cement Company, Ltd. Hibeya, The United Republic of Tanzania
- Mr. Salem Al-ammari Abdulrahman Project Manager, Cement Project Ministry of Industry Aden, The People's Republic of Democratic Yemen
- Mr. Maimoud Mohamed Rashad El-Makim Engineer - inspector Mational Energy Administration Khartoum, The Democratic Republic of the Sudan
- Mr. Ml-Tayeb Ibrahim Sabeel Economist - inspector Hational Energy Administration Khartoum, The Democratic Republic of the Sudan

LIST OF LECTURES AND LECTURERS

1. Czechoslovak Ceramic Works, Their Structure, Development and Energy Management

Dr. A. Lošťák General Director Czechoslovak Ceramic Works

Trojská 13

182 00 Prague Czechoslovakia

2. World Energy Problem

Mr. J. Rousek Senior Research Worker

EGU Power Research Institute

884 03 Bratislava Czechoslovakia

3. General Consideration on Energy Consumption in Silicate Industries

Mr. L. Kuna Scientific Secretary Research Institute for Ceramics, Refractories and Raw Materials

P. 0. Box 211 305 11 Plzen Czechoslovakia

4. Ceramic Industry - Reducing the Energy Requirements in the Technological Processes

Mr. Z.A. Engelthaler Chief Executive of the UNIDO/CSSR Joint Programme Director of the Research Institute for Ceramics, Refractories and Raw Materials

P.O. Box 211 305 11 Plzen Czechoslovakia

5. Heat Consuming Units in Ceramic Industry

Er. J. Kout
Technologist
Prefa, National Enterprise
600 00 Brno

600 00 Brno Czechoslovakia

Mr. P. Navrátil Designer Přerov Machinery 600 00 Brno Czechoslovakia 6. Cement Industry - Reducing the Energy Requirements in the Technological Processes and Heat Consuming Units

Mr. J. Lahovský Expert of the UNIDO/CSSR Joint Programme for International Co-operation in the Field of Ceramics, Building Materials and Mon-metallic Minerals Based Industries

P. O. Box 211 305 11 Pilsen Czechoslovakia

7. Diagnostics

Mr. M. Nový Senior Research Worker Research Institute for Ceramics, Refractories and Raw Materials

P. O. Box 211 305 11 Pilsen Czechoslovakia

8. Simulating of Thermal Processes in Silicate Industries

Mr. M. Hěmeček Assistent Professor Academy of Sciencies Suchbátarova 1905 166 28 Prague Czechoslovakia

9. Glass Industry - Reducing the Energy Requirements in the Technological Processes

Mr. V. Kohl Deputy Manager SKLO UHEON, OBAS Concern

415 Ol Teplice Czechoslovakia

10. Heat Consuming Units in Glass Industry

lir. J. Staněk Professor Chemical-technological University Suchbátarova 1905 166 28 Prague Czechoslovakia 11. Recent Advances in Crude Oil Saving Systems in Petrochemical Industries

Mr. J. Baburek
Head of the Division
Research Institute for Ceramics,
Refractories and Raw Materials
360 00 Karlovy Vary - Všeborovice
Czechoslovakia

AMEX III

IN-RESEARCH INSTITUTE AND IN-PLANT TRAININGS

A - In-research institute training

- In-research institute training (technologies and laboratory testing of products)
- Research Institute for Ceramics, Refractories and Raw Materials, Pilsen Division at Horní Bříza
- In-research institute training (technologies and laboratory testing of raw materials)
- Research Institute for Ceramics, Refractories and Raw Materials, Pilsen Division at Karlovy Vary
- In-research institute training Research Institute for (instrumentation of mobile diagnostic unit)
 - Ceramics, Refractories and Raw Materials, Pilsen Division at Horní Bříza

B - In-plant training

- Technology and energy measurements by mobile diagnostic unit
 - West-Bohemien Ceremic Works, Wall Tile Plant at Horní Bříza
- Technology and energy measurements
- Chlumčany Cerami orks, Floor Tile Pla Chlumcany
- Technology and energy analyses of the energy consumption
- MOSER Glass ractory, Plant for the manufacture of metal glass at Karlovy Vary
- Cement technology of low energy consumption
- Cement and Lime Works at Prachovice
- Machine-tool and power-generator production
- ŠKODA Concern in Pilsen



UNIDO

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		mpa menera poorona	nee	•
Kumber Kane. o	EVALUATION - GROUP F participants 15	TRAINING PROGRAM		try: 7 countries
Progra	Technical Worksho Conservation in S Industries for th Developed Countri	ilicate e Least	Host cour Cz Year 198	echoslovakia
ı.	PRE-COURSE INFORMATION:	•		
1.	How was the introductory : country about: (please me			
		Sufficient	Not sufficient	Missing
•	Aim of the training Content of the programme Level of the programme	14 / 12 / 12 /		
	What, if any, other informincluded:	mation do you fe	el should have	been
		lesionine of 4h	training pro	ogramme did
2.	How many weeks before the you receive the following		e training pro	_
	Information about the pro		<u> </u>	7 weeks 7 weeks
	Comments:			

. <u>P</u> 1	ROGRANME CONTENT AND O	GANIZATION:	
. w	hat is your spinion of	the total duration of the course:	
	Too long		
	Just right		
	Too short	15	
	If not "just right	t", what, in your opinion, would be the mos	t
	suitable duration	for the course?	
	3.3 weeks aver	age recommended duration	
	Please comment;		
		·	
S	tate your opinion abou	t the daily schedule:	
	Too heavy	<u>_</u> 9	
	Just right	<u></u> 57	
	Too light		
·c	omments:		

5. Would you suggest any changes in the general nature of the training programme?

6.	Do you feel that the training of	orresponded to your professional needs?
	To a very large extent	6
	To a large extent	$\sqrt{3}$
	To a sufficient extent	<u>(6)</u>
	To a small extent	
	To a very small extent	<u>-</u>
	Please comment:	
7.	Please give your opinion about	the study visits (if any):
		•
		•
	Please suggest other study visi	ts that might have been valuable:
	•	
	-	·
		-
8.	What do you think of the genera	l level of the training?
	Much too high	2
	Too high	
	Adequate	12
	Too low	
	Nuch too low	
	Comments:	

9. Which subjects of the programme did you find most valuable? (please state reason; for example new subject, my speciality, relevant to my work, new information, etc.)

Subject

Reason

Ceramists preferred subjects related to ceramics, participants engaged in cement industry were interested in subject of their field

10. Which subjects of the programme did you find <u>least valuable</u>?

State why (for example too elementary, inadequate instruction, irrelevant to my work, etc.)

Subject

Reason

11. Were there in your opinion any relevant subjects that were not adequately covered in the programme?

Yes 5

No 10

If yes, what did you miss?

.

.2.	Which changes would you have prefer	red in the methods of	f instructions?
		no changes	more less
	a) lectures		$\begin{bmatrix} 2 \end{bmatrix} \begin{bmatrix} 3 \end{bmatrix}$
•	b) group work	9	
	c) demonstrations	[8]	5 2
	Comments:		
		-	
13.	How did you find the general stands	ard of the instructor	with respect of:
		i) command of English	ii) method of instruction
	Very good	5	8
	Rather good	8	$\sqrt{5}$
	Fair	2	[2]
	. Poor		
	Very poor		
	Please comment:		
			·
14.	Did you have sufficient time for p		
		i) the programme staff	ii) <u>fellow-</u> participa
	Yes	12/	$\Delta 3$
			•

15. How much did you benefit from these exchanges of views with:

	i) the programme staff	ii) <u>fellow-</u> <u>participants</u>
A great deal		4
Xuch -		[7]
Somewhat -		[2]
Little		
Not at all		
Please comment:	•	

III. RELEVANCE AND APPLICABILITY:

16. Did you find the contents of the programme relevant to conditions in your company (institute)?

To a very great extent	_5_7
To a great extent	6
To a sufficient extent	4
To a small extent	
Please state why:	

17. Do you feel that by <u>participating</u> in this training programme you have <u>benefitted</u> professionally?

To a very great extent	<u> </u>
To a great extent	5
To a sufficient extent	<u> </u>
To a small extent	
To a very small extent	
Please state why:	

10.	Do you think you will have an opportunity to	sprly your newly
	acquired knowledge and experience in your pr	resent job?
	To a very great extent	5
	To a great extent	<u></u>
	To a sufficient extent	4
	To a small extent	<u>-</u>
	To a very small extent	
	What difficulties, if any, would you	expect to meet?
		•
19.	Will you be in a position to transfer your	acquired knowledge to others
	in your home country?	•
	To a very great extent	4
٠.	To a great extent	5
	. To a sufficient extent	<u>[6]</u>
	To a small extent	<u>-</u>
	To a very small extent	<i>_</i>
. 20.	How will this transfer be done?	
	 a) In day-to-day work to colleagues and subordinates 	<u> </u>
	 b) In specific training activities inside present employment 	<u></u>
	 c) In specific training activities outside present employment 	
	What difficulties, if any, would you expect	to meet?
	~-	

IV	•	SOCIAL	ASPECTS	OF THE	PROGRAMME:

21. Please state your opinion about the <u>leisure time activities</u> organized by the programme staff:

What additional activities would you have appreciated?

22. Please give any comments you choose on aspects not adequately covered by this questionnaire:

ANNEX V

ORGANIZING COMMITTEE

Director of the Technical Workshop

Programme Director

UNIDO Vienna Representative

Technical Secretary

General Rapporteur of the Technical Workshop

Administration, Financial and Passport Arrangements

Dr. A. Lošťák, General Director of the Czechoslovak Ceramic Works, Prague

Mr. Z.A. Engelthaler, Chief Executive of the UNIDO/CSSR Joint Programme and Director of the Research Institute for Ceramics, Refractories and Raw Materials, Pilsen

Mr. G. Komissarov, Industrial Development Officer, Office of the Director, DIO, Industrial Energy Unit, Liaison Officer of the UNIDO/CSSR Joint Programme

Mr. J. Dřevo, Acting Senior Expert, the UNIDO/CSSR Joint Programme

Hr. J. Lahovský, Expert of the UNIDO/CSSR Joint Programme

Mrs. E. Engelthalerová, Chief of Administration of the UNIDO/CSSR Joint Programme

Mrs. A. Fremlová, Administrative Clerk of the UNIDO/CSSR Joint Programme

CULTURAL PROGRALIE FOR PARTICIPANTS

Lionday 5 October 1981

Music Show

Wednesday 7 October 1981

Visit to the Pilsen Brewery, degustation of Pilsen beer

Thursday 8 October 1981

Sightseeing of Karlovy Vary Spa - Visit to the exhibition of the LOSER Glass Factory products

Friday 9 October 1931

Music Show

Saturday 10 October 1981

Sightseeing of Prague, Prague Castle

Sunday 11 October 1931

Sightseeing of Pilsen - West-Bohemian Museum in Pilsen (collection of Czech, German, French and Austrian porcelain, exhibits of glass), Brewery Museum in Pilsen

Visit to the Picture Gallery of Pilsen and Chamber Concert

Wednesday 14 October 1981

Short cultural programme of Czech folklor music

Friday 16 October 1981

Lusic Show

ANNEX VII

SOCIAL EVENTS

5 October 1981

Official lunch after the official opening of the Technical Workshop given by Dr. A. Lošták, General Director of the Czechoslovak Ceramic Works, Prague, and Member of the UNIDO/CSSR Joint Committee, for honourable guests, participants in the Technical Workshop and members of the Organizing Committee

Coctail given by Mr. D. Butaev, Director, DIO, UNIDO Vienna, for honourable guests, participants in the Technical Workshop and members of the Organizing Committee followed by the official dinner and meeting with participants

Friday 9 October 1981

Reception by the Lord Mayor of Pilsen City Mr. E. Kopáček in the Town Hall of Pilsen

Coctail given by Mr. and Mrs. Z.A. Engelthaler, Chief Executive of the UNIDO/CSSR Joint Programme and Director of the Research Institute for Ceramics, Refractories and Raw Materials, Pilsen, on the ocassion of the visit of Mr. and Mrs. P.J.F. Carré, Deputy Executive Director, UNIDO Vienna, followed by the official dinner and meeting of Mr. and Mrs. Carré with participants

Friday 16 October 1981

Coctail given by the UNIDO representatives and Dr. A. Lošták, General Director of the Czechoslovak Ceramic Works, Prague, and Member of the UNIDO/CSSR Joint Committee, for honourable guests, participants in the Technical Workshop and members of the Organizing Committee followed by the official closing dinner

