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UNIDO - Czech Republic Joint Programme.
Pilsen, Czech Republic

ANNUAL REPORT

1998

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ANNUAL REPORT

1998

ACTIVITIES IN 1998

The UNIDO-Czech Republic Joint Programme, Pilsen presents the Annual Report reviewing the activities from March to December 1998 under the Contract No. 98/193 between United Nations Industrial Development Organization (UNIDO) Vienna and company IDEA Ltd., Pilsen.

The Joint Programme, Pilsen have carried on its activities in 1998 with the total staff of eight employees. The items specified by the terms of reference of the Contract for the reported period were successfully accomplished including "ad hoc" services of the Joint Programme.

The close collaboration of the Joint Programme, Pilsen with many research and development institutions, production plants and enterprises in the Czech Republic contributed significantly to the overall performance in 1998. This support is reflected mainly in 1061 training man/days which were spent by 52 trainees and experts during their study tours, individual trainings and technical training courses organized by the Joint Programme, Pilsen in the Czech Republic. This activity was perfectly backed by all the enterprises as well as by research and development bodies so that all the specialists from developing countries could extend their knowledge by practical in-plant training. The volume of requests raised by developing countries for participation in the study tours and in the training courses organized by the Joint Programme, Pilsen, exceeded the project capacity. The same trend is expected also for the years to come.

Organization of technical workshops and meetings together with active participation of the Joint Programme staff represents an important part of the overall activity. Although all the training activities are organized on cost-sharing basis - the Joint Programme covers the local expenses of participants in the Czech Republic and the participants the international transport costs - interest from developing countries in participation of their specialists was very high.

The Technical Workshop "Waste Management" held in Pilsen from 9 through 18 November 1998 was attended by 12 participants from 6 countries. Experts of the Joint Programme participated actively in one conference abroad (Tanzania) and in one seminar in the Czech Republic.

The Joint Programme organized six practical training courses:

- *Small Scale Production of Ceramics (two courses)*
- *Waste Water Management*
- *Processing and Upgrading of Non-metallic Raw Materials*
- *Waste Management*
- *Industrial Energy Auditing*

The courses represent very successful type of the technical assistance within the activities of the Joint Programme. They are organized as intensive practical training programmes, which give the participants quite a broad practical knowledge about the respective area. Interest of developing countries in participation is constantly very high, always higher than the Joint Programme capacity and highly above financial possibilities of the Project.

Nine lectures were delivered by the Joint Programme experts during technical workshops and conferences on different topics including sectors of ceramics, raw material testing and beneficiation, energy auditing, energy management, environmental protection etc. during the year 1998.

The demand for testing of industrial minerals has continued also in 1998. It is evident from requests for preliminary testing of the samples delivered to the Joint Programme. Altogether 27 samples of different raw materials from 4 developing countries were tested by the Joint Programme. A distinguishable feature of the testing was the concern of developing countries in an upgrading of industrial minerals to enhance their market value. Some of the raw materials under testing exhibited a very good quality, e. g. brick clay from Lithuania, silica sand and bentonite from Jordan, quartz and calcite from India. All the raw materials are tested from the point of view of their integrated utilization and applicability in all sectors of industry, agriculture and ecology.

The services in technical information dissemination were requested by developing countries in a stable manner in 1998. 730 particular Joint Programme publications were sent to 41 countries following their requests.

Fourteen titles of technical publications and papers were newly edited during the year 1998. Nineteen technological inquiries were responded.

The energy management component of the Project - reflecting the Business Plan of UNIDO - was revitalised and modified. New software for energy auditing calculations was developed on the basis of components which will be constantly completed and updated. The new Energy Auditing Kit was developed to be used for energy auditing in industries of developing countries. The practical training course on energy auditing raised extremely high interest of developing countries.

The UNIDO-Czech Republic Joint Programme, Pilsen continued its programme for the protection of environment. The topics involved testing of non-metallic sorbents from developing countries which are suitable for purification of waste waters, dissemination of technical publications and information as well as meetings with experts from all over the world within technical workshops and courses organized. The Joint Programme, Pilsen organized the practical training course on "Waste Water Management". The course was of a great interest of developing countries. Another environmentally oriented course on "Waste Management" was organized from 23 March through 10 April, 1998. Taking into account the UNIDO priorities and high interest of developing countries, the Joint Programme organized an international technical workshop on "Waste Management" from 9 through 18 November 1998. The objectives of the workshop were to provide the participating developing countries with relevant information on basic principles, methods and technologies of waste management and to give explanations and promote discussion on problems of solid wastes (municipal and industrial) and waste waters (also both municipal and industrial).

Visits from developing countries, UNIDO and other international institutions as well as participation of the Joint Programme experts in international events constitute an important element which gives both incentives and guideline for the activities of the Joint Programme. They are used for programming the activities in the future. Very active relationships were established with Egypt, Argentina, Romania, Jordan and India during the year 1998.

It is evident that the budget of the Joint Programme, Pilsen was effectively utilized within all activities which are further reviewed in the following Annexes:

Annex A	Review of accomplished activities in 1998
Annex B	List of countries that have received Joint Programme publications and papers in 1998
Annex C	Final Report of the Technical Workshop on "Waste Management"
Annex D	Programmes of the practical training courses organized during the year 1998
Annex E	Terms of reference for technical and training services - UNIDO-Czech Republic Joint Programme, Pilsen.

REVIEW OF ACCOMPLISHED ACTIVITIES IN 1998

(March - December)

UNIDO-Czech Republic Joint Programme, Pilsen

I. TRAINING ACTIVITIES

1. PRACTICAL TRAINING COURSES

a) *WASTE MANAGEMENT*

Date: 23rd March - 12th April

Venue: Pilsen, Czech Republic

Participation: 8 participants from 6 countries (Sri Lanka, Lithuania, Egypt, Gambia, Jordan, Tanzania)

168 m/days

Conclusion: All the activities of the course as specified in the Work Programme and Course Programme were completed (see Annex D).

b) *INDUSTRIAL ENERGY AUDITING*

Date: 14th April - 30th April

Venue: Pilsen, Czech Republic

Participation: 7 participants from 7 countries (Albania, Botswana, Egypt, Jordan, Sri Lanka, Thailand, Uganda)

119 m/days

Conclusion: All the activities of the course were successfully completed (see Annex D).

c) *SMALL SCALE PRODUCTION OF CERAMICS*

Date: 4th May - 14th June

Venue: Pilsen - Malesice, Czech Republic

Participation: 5 participants from 4 countries (India, Lithuania, Pakistan, Uruguay)

210 m/days

Conclusion: All the activities of the course as specified in the Work Programme and Course Programme were completed (see Annex D).

d) PROCESSING AND UPGRADING OF NON-METALLIC RAW MATERIALS

Date: 31st August - 20th September

Venue: Pilsen, Czech Republic

Participation: 6 participants from 5 countries (Egypt, India, Jordan, Lithuania, Thailand)
126 m/days

Conclusion: The programme of the course was completed successfully (see Annex D).

e) SMALL SCALE PRODUCTION OF CERAMICS

Date: 21st September - 31st October

Venue: Pilsen, - Malesice, Czech Republic

Participation: 6 participants from 5 countries (Mongolia, Ghana, Cyprus, Lithuania, Jordan)
246 m/days

Conclusion: All the activities of the course as specified in the Work Programme and Course Programme were successfully completed (see Annex D).

f) WASTE WATER MANAGEMENT

Date: 16th November - 29th November

Venue: Pilsen, Czech Republic

Participation: 4 participants from 2 countries (Egypt, Jordan)
56 m/days

Conclusion: All the activities of the course as specified in the Work Programme and Course Programme were completed (see Annex D).

2. TECHNICAL WORKSHOPS

TECHNICAL WORKSHOP ON WASTE MANAGEMENT

Date: 9th November - 18th November

Venue: Pilsen, Czech Republic

Participation: 12 participants from 6 countries (Argentina, Egypt/6/, Georgia, Jordan, Lesotho, Romania/2/)

120 m/days

Conclusion: All the workshop activities were completed (see Annex C - Final Report of the Technical Workshop).

3. INDIVIDUAL AND GROUP STUDY TOURS

Study tour on production of crystal glass

Venue: Czech Republic, different production plants

Dates: 11th – 14th June 1998

Participation: 4 participants from Thailand

16 m/days

Programme:

- Ruckl and Sons, Nizbor - production of traditional crystal glass, hand blowing, hand cutting
- Bohemia Glasswork, Chlum u Trebone - utility crystal glass production, machine shaping and cutting
- Crystalex, Novy Bor - coloured crystal glass production
- Sklopisek, Strelec - mining, processing and upgrading of glass and foundry sands

Conclusion: All the aims of the study tour were successfully attained and the possibility to see modern technological lines in production plants was appreciated by the group.

II. RAW MATERIAL TESTING

Totally 27 samples of different raw materials from 4 developing countries were tested. Some of the tested raw materials exhibited a good quality, e. g. brickmaking clay from Lithuania, quartz and calcite from India, silica sand and bentonite from Jordan. Developing countries have expressed their interest in the complex utilization of non-metallics as well as for various methods of their upgrading which will make their raw materials more valuable and marketable. There is a stable interest of developing countries in an assistance in traditional industrial branches of the Czech Republic - glass and structural ceramics productions, brickmaking, refractory production and industrial minerals upgrading.

The following preliminary testings of non-metallic raw materials have been already accomplished and Final Reports sent to the counterparts and to UNIDO.

1. SEYCHELLES Preliminary evaluation of pottery clay. The raw material was found suitable only as an admixture batch component, above all as colouring substance because of high iron oxide content.
1 sample
2. JORDAN Preliminary evaluation of six different samples of raw materials, the samples were identified as low quality quartz sands, zeolite polluted by calcite, low quality kaolin and medium quality feldspar.
6 samples
3. LITHUANIA Technological evaluation of clay which will be used as a basis for intended reconstruction of brickmaking plant. The work was primarily oriented to verify a possibility to produce light-weight insulating structural brick blocks.
8 samples
4. INDIA Preliminary evaluation of vein quartz, wollastonite, calcite and magnesite. High quality quartz and calcite.
4 samples
5. JORDAN Preliminary evaluation of bentonite, ceramic clay, glass sand and feldspar. Good quality sand and bentonite.
4 samples
6. JORDAN Preliminary evaluation of four samples of ceramic clays. Medium quality clays for utility ceramics production.
4 samples

III. MISSIONS TO DEVELOPING COUNTRIES BASED ON UNIDO REQUEST

Mission to Tanzania

The mission focused on lecturing in the Workshop "Forum on Strategies for Development of Non-metallic Minerals Sector in Africa" organized by the ESAMRDC in cooperation with UNIDO Vienna.

The lecture on Energy Auditing in Industry was delivered during 6 days mission in October 1998.

IV. INDUSTRIAL INQUIRY SERVICE

The following technical inquiries were answered during the year 1998:

- Jordan-Glaze fit adaption
- Jordan-Gypsum admixture removal
- Nigeria-Natural sorbents for food processing
- Egypt-Water cleaning from electroplating process
- Lithuania-Thermal resistance of perforated construction blocks
- Mongolia-River sediment analysis after excavation
- Argentina-Sealing layers for landfills
- Georgia-Legislation- system on environmental protection
- Romania-Treatment of waste waters from landfills
- Lesotho-Biogas production and utilization
- Lithuania-Saw dust sorting for lightweight insulation bricks
- Thailand-Processing of expanding clays
- India-Wollastonite upgrading and utilization
- Uruguay-Art glazes suppliers
- Pakistan-Fast firing of structural ceramics
- India-Energy efficient small scale glassmaking
- Ghana-Optimizing of firing curves for utility ceramics
- Bolivia-Utilization of natural fluxes for lowering of energy consumption
- Fillipines-Utilization of fly ash in cement production

V. PUBLISHING

JP/688/98	Pottery Clay from Seychelles
JP/689/98	Raw Materials from Jordan
JP/690/98	Effect of Lime on Heavy Metal and Bacterial Contents in Sludge and Sludge Amended Soil
JP/691/98	Risk Assessment of Sewage Sludge Application on Agricultural Land in Egypt
JP/692/98	Energy Auditing Kit (Basic Information)
JP/693/98	Energy Efficiency Through Energy Auditing
JP/694/98	Energy Auditing in Industry
JP/695/98	Brick Clay from Lithuania
JP/696/98	Energy Auditing Calculator
JP/697/98	Lead Leaching Cut by Crystal Surface Treatment and Composition Change
JP/698/98	Final Report of Technical Workshop on Waste Management
JP/699/98	Minerals from India
JP/700/98	Clays from Jordan
JP/701/98	Raw Materials from Jordan

VI. WORKSHOPS IN WHICH THE JOINT PROGRAMME PARTICIPATED

a) *Participation in the Czech Republic*

Technical Seminar on Plastic Raw Materials
for Non-metallic Industries

held in Brno at 20th May 1998

b) *Participation abroad*

International Technical Workshop
"Forum on Strategies for Development
of Non-metallic Minerals Sector in Africa"

held in Dar-es-Salaam, Tanzania - Eastern
and Southern African Mineral Resources
Centre (ESAMRDC)
from 5th through 9th October 1998

ANNEX B

List of Countries That Have Received Joint Programme Publications and Papers in 1998:

Albania	Lesotho
Algeria	Lithuania
Argentina	Malawi
Bolivia	Malaysia
Botswana	Mongolia
Brazil	Morocco
Cameroon	Namibia
Columbia	Nepal
Czech Republic	Qatar
Egypt	Romania
Ethiopia	Senegal
Georgia	Seychelles
Ghana	Sri Lanka
Guatemala	Tanzania
Guyana	The Philippines
Chile	Tunisia
India	Turkey
Indonesia	Uganda
Kenya	Venezuela
Laos	Vietnam
Latvia	

Final Report of the Technical Workshop on

“Waste Management”

TECHNICAL WORKSHOP

WASTE MANAGEMENT

Pilsen, the Czech Republic, November 9 - 18, 1998

F I N A L R E P O R T

by:

the Participants in the Workshop

and

the UNIDO-Czech Republic Joint Programme, Pilsen

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LIST OF ABBREVIATIONS

UNIDO.....United Nations Industrial Development Organization

UCJPUNIDO-Czech Republic Joint Programme, Pilsen

DSADaily Subsistence Allowance

INTIBIndustrial and Technological Information Bank

R + DResearch and Development

EMSEnvironmental Management Systems

I. INTRODUCTION

The Technical Workshop on Waste Management was organized by UNIDO Vienna and by the UNIDO-Czech Republic Joint Programme in Pilsen in cooperation with selected companies and external experts.

The objectives of the Workshop were to provide the participating developing countries with relevant information on basic principles, methods and technologies of waste management and to give explanations and promote discussion on problems of solid wastes (municipal and industrial) and waste waters (also both municipal and industrial).

This was primarily done through case studies of several real situations located in the Czech Republic. Attention was also given to various laboratory methods which are used for a proper testing and evaluation of wastes and which are decisive for development of appropriate technologies for wastes treatment. There was also an important aim to present the mechanisms and legislation involved in such a development with the emphasis on a pivotal role which should be played by testing and R+D institutions with links to both waste materials producers and companies dealing with wastes treatment.

The secondary objective was to assist the participants in the Workshop in identification and promotion of technologies consonant with national socio - economic conditions, environmental protection and such tasks as employment generation, foreign exchange savings, rural industrialization etc.

This was carried out through lectures, case studies and practical in-plant training. Several company visits illustrated various problems of the above.

The attached Programme of the Workshop (Annex 1) illustrates the scope of the event.

II. PARTICIPANTS

The Technical Workshop was attended by 12 participants from 6 countries:

Argentina	(1)
Egypt	(6)
Georgia	(1)
Jordan	(1)
Lesotho	(1)
Romania	(2)

The List of Participants is attached to this Report as Annex 2.

III. LANGUAGE

English was the official language of the Workshop. All the lectures, country reports, presentations and other information were presented and/or typed in English, too.

IV. ORGANIZATION OF THE WORKSHOP

The Workshop was organized by UNIDO Vienna in cooperation with the UNIDO-Czech Republic Joint Programme, Pilsen (UCJP). Preparation and management was carried out by the Organizing Committee whose members are listed in Annex 1 to this Report.

Address of the Workshop Office:

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The management of the Workshop was efficiently supported by the elected Board of Participants whose members were:

- Mrs. Maria Teodorescu (Romania) - Chairman
- Mr. Edgardo Maria Benvenuto (Argentina) - Deputy Chairman
- Mr. Adel Mahrous Ahmed Shehata (Egypt) - Deputy Chairman

1. Programme of the Workshop

The main objective of the Workshop was to provide the participating experts and their institutions with information on basic principles, methods and technologies of waste management and with ideas on how the related problems can be solved in their countries.

This was primarily done through lectures, practical case studies and discussions, including plant visits and study excursions.

The "Programme and Time Schedule of the Workshop" were discussed and approved by the participants - it is attached as Annex 1.

Six scheduled lectures were delivered by Czech experts from various institutions. The lecturers took into account various practical aspects of solid waste materials and waste water management. Follow-up activities as well as possibilities of further UNIDO Vienna and/or UCJP Pilsen technical assistance were discussed.

The programme of the Workshop included also 14 study excursions and in-plant trainings that enabled the participants to get acquainted with the most common approaches to handling, treatment and utilization of waste materials. The lectures and in-plant trainings were completed with round table discussions giving the participants enough opportunities of exchanging their opinions and experience with lecturers, managers and technical staff in the organizations visited as well as among themselves.

2. Documentation and Requisites

The following documentation and aids were handed over to each participant in the Workshop:

- Technical Workshop Schedule
- Set of lectures
- Bulletins and booklets of the UNIDO-Czech Republic Joint Programme, Pilsen
- Technical leaflets and the Cumulative List of the UNIDO-Czech Republic Joint Programme Publications
- English-Czech Practical Handbook
- Writing material
- City map of Pilsen, information about the Czech Republic, Prague and Pilsen
- Selected publications of the UCJP
- Basic information on certain study tours and sightseeings
- Country Reports (if delivered in a written form)

At the end of the Workshop each participant who successfully participated in it obtained an official Certificate and the Final Report.

3. Presentation of Country Reports

Most participants presented informative Country Reports describing the actual situation in the respective fields in their countries.

Some of the reports contained important contributions to the conclusions and recommendations of the Workshop and/or proposals for establishment of further cooperation between the respective country and the UCJP Pilsen or UNIDO Vienna.

The reports and other materials which were delivered in a written form were distributed among the participants in the Workshop, along with summaries and proposals on future activities. All these materials are also available in the UCJP Pilsen.

List of reports presented by the participants :

- a) Ms. Bernice Mafani Puling, Lesotho
- b) Mr. Adel Mahrous Ahmed Shehata, Egypt
- c) Mr. Nagi Abd El Sattar Ali Maklad, Egypt
- d) Mrs. Fadia Ahmed Mohammed Marei, Egypt
- e) Mr. Farouk Mohamed Abd El Rehim, Egypt
- f) Mrs. Maria Teodorescu, Romania
- g) Ms. Nino Tchanturia, Georgia
- h) Mr. Edgardo Maria Benvenuto, Argentina

4. Study Excursions, In-plant Trainings

a) Incineration Plant Slovany (in Pilsen)

Incineration plant for medical and other types of dangerous wastes. Technology „Norsk Hydro“ Norway. Established in 1993. Owned by municipality. Fully automatic, two sections, firing chamber heated with natural gas, cleaning of flue gas and waste water.

b) Municipal Wastes Dumping Site Vysoká (near Pilsen)

Dumping site established in former military area in 1994. Sealing system: 60 cm of compressed clay, polyethylene folie, a geotextile, drainage system.

c) Recycling of Plastics - Company Transform Ltd. at Stod

Recycling of mixed plastics - 20% of raw material of Czech origin, 80% granulate imported from Germany. Sorting line, milling, shaping, production of pallets, roofing tiles and cable tunnels.

d) Biodegradation - Company Dekonta in Prague

Company specialized in biodegradation of polluted soils using 200 types of bacteria. Decontamination sites over the whole territory of the Czech Republic. Bioremediation of petroleum pollutants „ex situ“ and „in situ“, accident service, development of new clean-up technologies, monitoring, production of bacterial preparations.

e) Municipal and Industrial Dumping Site - Company SOH Ltd. at Benatky nad Jizerou

Modern dumping site consisting of two parts. The first one for municipal waste, the second one for industrial waste (ashes, etc.). Total area 43.6 hectares, total volume 3 mil. m³, supposed time of dumping 30 years, gas and water collecting system, waste water treatment plant.

f) Laboratories of the BIJO Ltd. in Pilsen

Visit to laboratories equipped for complete analyses of all types of municipal and industrial wastes as well as waste water.

g) Pilsen, Prague

Development of conditions of living within the history of the recent 1000 years.

h) Municipal waste water treatment plant in Pilsen

Newly established treatment plant for municipal waste water with capacity for 400000 equivalent inhabitants. Sewage system of the city in two levels (4 meters and 6 meters underground), screening (3mm), sand trap, sedimentation, activation, sludge processing, biogas generation and utilization (engines 3x450 kW).

i) Waste water treatment plant at Chrást near Pilsen

Small scale treatment plant put into operation two years ago for 400 equivalent inhabitants. Mechanical screening controlled through the level of inlet water, sand trap (horizontal cylinder), activation, efficiency 90-95%.

j) Waste water treatment plant at Berounka river

A camping site for approx. 200 people which run from May to September. It has its own well and toilets. Very simple way of waste water treatment - a storage tank - 4m³ waste water per day is pumped to aeration tank at night, activation, sedimentation. The treated water is then released to the river while the sludge from the activation and sedimentation tank is removed once a year at the end of tourist season.

k) Waste water treatment plant at Vyhlička

The plant was established by a group of agricultural farms 14 years ago and is used for pigs` excrements processing. Collecting and transport of excrement sludge from surrounding pig houses. Storage tank, anaerobic towers - biogas production for power generation with biogas engines. Highly polluted water from anaerobic process is cleaned by an ordinary aerobic treatment plant.

l) Waste water treatment plant at diary Kralovice

Pretreatment of waste water before releasing it to the municipal sewage system. Aeration and flotation cell for grease removal.

m) Biodisc waste water treatment plant - Firework Station at Plasy

Small biodisc treatment plant with capacity 25 equivalent inhabitants. Sedimentation, rotating cylinders filled by cutted tubes, efficiency 90-92%.

Locations of the above excursions are displayed at the enclosed map (Annex 3).

5. Administrative and Financial Organization of the Programme

The UNIDO-Czech Republic Joint Programme Pilsen staff was engaged in organizing and arranging of lectures, in-plant trainings, study tours, discussions, translations into English, accommodation and board, local transport in the Czech Republic, social events, providing for visas, air tickets booking etc. The Secretariat of the Workshop was situated in the premises of the UCJP Pilsen.

The participants were provided through the budget of the UCJP Pilsen with:

- accommodation and board
- out-of-pocket allowance (in Czech Korunas)
- training facilities and materials (see page 7)
- travel inside the Czech Republic
- other facilities inside the Czech Republic relevant to the implementation of the Workshop programme.

V. EVALUATION OF THE WORKSHOP BY THE PARTICIPANTS

The Technical Workshop on Waste Management offered the opportunity for the participants from 6 countries to share their experience and views together with Czech experts and to improve their approach and upgrade their knowledge in the respective fields. The topics covered the followings:

- laws and regulations regarding the waste management and environmental protection
- technical information regarding waste identification, characterization, classification, treatment and pre-treatment
- relevant examples of modern technologies for waste management
- study excursion to different kinds of dumping sites, incineration units, waste water treatment plants, soil rehabilitation site and plastics recycling unit.

The contribution of Czech industries in this programme was significant. The participants appreciated their high standard and were able to recognize a practical exploitation of knowledge in various plants. They discussed in the institutions visited the problems of their concern, related to their home practice. The participants acknowledged that the information gained during visits, lectures, practical in-plant training and round-table discussions will help them in their further activities in their home countries.

Each visited site and every discussion involved was of a great interest for different participants. Possibilities of technology transfer were envisaged for most of the presented technologies, and possibilities for future co-operations are already looked for.

A special interest was shown in the laboratory activity and BIJO Pilsen Company capabilities for water and waste investigations.

The participants appreciated positively the fact that there is a cheaper equipment available in the Czech Republic at the technical level comparable to the world standards.

Some proposals for developing a similar workshop on the „Air monitoring and Purification“ were advanced.

The request for previous distribution of the written lectures was meant to offer faster communication between participants and the lecturer.

We appreciate good accommodation, good preparation of scientific material.

The workshop must include more information, catalogues, video films about the waste treatment, incineration, dumping areas.

During the visits to a wastewater treatment plant it would be appreciated to have records about the analysis of the waste water to see the efficiency of treatment.

Laboratory visit should be arranged during the working time to allow discussions with specialists and to get information about analytical procedures.

VI. CONCLUSIONS AND RECOMMENDATIONS

A) Specific Recommendations by the Participants (without formal editing)

1. All aspects and activities which are connected with waste management have been taken into consideration by the Organizing Committee who worked on the Workshop programme in both theoretical and practical ways.
2. The floor discussions were well organized avoiding unnecessarily long lectures. Every lecture and/or discussion was connected with practical aspects which was gained by the participants as well as the UCJP representatives. All the lectures were delivered in English to avoid any communication barriers.
3. The participants appreciated that those practices with good and quick results should be transferred to the interested parties and the possible way to develop such co-operations has to be found.
From the most obviously modern and good technologies for the participants of different countries, the following raised a great interest:
 - soil bioremediation (in- and ex-situ)
 - plastic waste recycling
 - modern technology for municipal waste water treatment and sludge processing.
4. The most important part of the Workshop consisted in real site visits and site discussions. The visited units revealed that there are cases where Waste Management implementation is one step ahead of the valid legislation. For this purpose a short presentation of environmental international legislation was considered helpful.
5. A presentation of some inefficient/or not fully successful technologies or approaches in the recent Czech experience could help the participants to avoid them.
6. The participants think that it would be very appreciated to receive economical and financial information about the experience in the Czech Republic and about how to calculate new projects establishing priorities for them.
7. Some participants suggested that it would be helpful to have no more than two participants per country, because this would help to have many and different experience to share. However the participants from Egypt and Jordan opposed this suggestion.
8. It will be better not to share rooms, because each person has its own privacy and that should be preserved.

B) Conclusions and Recommendations of the General Discussion Session

1. All the outlined objectives of the Workshop were achieved. The participants appreciated a good organization of the Workshop. Practical excursions and technical discussions with management of the visited plants as well as practical in-plant demonstrations were of a great interest to the participants. The practical demonstrations created a good opportunity for participants to acquaint themselves with some practical aspects in solving various waste management problems.
2. The participants recognized that UNIDO is an important UN agency assisting effectively developing countries in their effort to reach sustainable industrial development, and that there is a good opportunity to have the UCJP in the Czech Republic, in a country with a rich and long tradition of respective industries and technologies which also offers highly experienced experts in these fields. In this regard the participants recommended to repeat similar workshops in the future, focusing on specific aspects influencing sustainable economic development.
3. The participants have expressed their wish for closer cooperation with UCJP through UNIDO and their respective Institutions and/or Associations.
4. In general the country reports presented during the Workshop demonstrated a wide scope of problems related to the topics of the Workshop and their environmental and social impacts in developing countries. Possible solutions of the problems encountered and methods for efficient utilization of available knowledge and techniques were discussed with leading Czech experts from various branches and organizations dealing with waste management.
5. Good management and development programmes help to improve industrial efficiency and economic growth of any country. International cooperation and technical assistance is urgently needed in order to promote the implementation of industrialization in developing countries and to reduce the negative impacts of industry on environment. Such programmes, which have been developed by the Joint Programme Pilsen especially for non-metallic raw materials based industries, proved already their efficiency in many countries. The Joint Programme experts and their external Czech cooperators have many years experience in this field and their expertise as well as the company's facilities are available for individual or group training, consultation and advisory services, raw material testing and energy and environment monitoring and auditing which could be implemented in all developing countries.
6. Further technical assistance of the UCJP would be appreciated by the participants in the problems of waste management and waste water treatment in the respective sectors of economy.

A. ORGANIZING COMMITTEE

Director of the Technical Workshop	Mr. Milan Nový, Chief Executive of the UNIDO-Czech Republic Joint Programme, Pilsen
Programme Director of the Technical Workshop	Mr. F. Pecháček, Expert of the Joint Programme
UNIDO Vienna Representative	Ms. H. S. Yalcindag Industrial Energy Efficiency UNIDO Vienna
General Rapporteurs	Mr. Vladimír Nový, Expert of the Joint Programme, Mr. M. Jarausch, Expert of the Joint Programme
Experts and Technical Advisers	Mr. Zdeněk Čížek, BIJO Ltd. Company Mr. Jindřich Nágr, NÁGR Inc. Company
Organizational Matters	Mr. V. Zahradník, Expert of the Joint Programme
Financing, Secretarial Services, Administration, Passport Arrangements, Air-tickets	Mrs. Z. Zoubková, Chief of Administration of the Joint Programme

B. TIME SCHEDULE OF THE WORKSHOP

8 - 9 November (Sunday, Monday)

Arrivals and Accommodation (City Hotel)

10 November (Tuesday)

9:00 Registration (Salzmann Restaurant Lounge)

9:30 **Official opening by the Director of the Workshop Mr. M. Novy**
Addresses of the UNIDO representatives and official guests
Election of the Board of Participants, Organizational Matters
(Salzmann Restaurant Lounge)

10:30 Lecture No. 1 and floor discussion:

WASTE MANAGEMENT I.

Legislation related to the wastes, waste categorization, waste production in various industrial branches, industrial wastes, municipal wastes.

12:00 Official lunch hosted by the Director of the Workshop (Salzmann Restaurant)

13:30 Lecture No. 2 and floor discussion:

WASTE MANAGEMENT II.

Technologies of solid waste pretreatment, waste disposal, incineration, special methods of waste disposal, waste recycling.

11 November (Wednesday)

8:30 Departure for study excursions by bus (City Hotel)

9:00 Study excursions:

Visit to incineration plant (Pilsen)

Visit to the newly established municipal wastes dumping site (Vysoká)

12:30 Break for lunch - Salzmann Restaurant

14:00 Visit to municipal and industrial waste dumping sites

12 November (Thursday)

8:00 Departure for study excursions by bus (City Hotel)

9:30 Study excursions :

Visits to dumping sites for municipal and industrial wastes (Prague, Benátky nad Jizerou)

13 November (Friday)

Salzmann Restaurant Lounge

9:00 Lecture No. 3 and floor discussion:

CONTAMINANTS IN ENVIRONMENT

Main types of contaminants, their chemistry, toxicity, ecotoxicity, concentrations.

Coffe-break

10:30 Lecture No. 4 and floor discussion:

LABORATORY METHODS FOR EVALUATION OF WASTES PROPERTIES

Waste testing, review of analytical methods, instrumentation, evaluation of results.

12:00 Break for lunch - Salzmann Restaurant

13:30 Study excursions :

Visit to analytical laboratories of BIJO Ltd., specialized on the waste testing and evaluation

14 November (Saturday)

9:00 Sightseeing to Prague (departure from City Hotel by bus)

14:00 **PRESENTATION AND DISCUSSION OF COUNTRY REPORTS**

15 November (Sunday)

Individual programme

16 November (Monday)

Salzmann Restaurant Lounge

09:00 Lecture No.5 and floor discussion

WASTE WATER MANAGEMENT

Classification of waste waters, treatment technologies, limits, legislation

10:30 Lecture No.6 and floor discussion :

WASTE WATER TREATMENT PLANTS

Basic principles of treatment plants design, types of waste water treatment plants, equipment

12:00 Break for lunch - Salzmann Restaurant

13:00 Study excursion:

Municipal waste water treatment plant (Pilsen)

17 November (Tuesday)

8:30 Departure for study excursions by bus (City Hotel)

9:30 Study excursions:

Industrial waste water treatment plants (various technologies)

18 November (Wednesday)

9:00 **Presentation and discussion of Country Reports**

12:30 **Break for lunch**

14:00 **Discussion of Draft Final Report
Evaluation of the Workshop
Winding-up discussion**

15:00 **Approval of Final Report
Official closing of the Workshop**

18:30 **Official dinner hosted by the Director of the Workshop**

19 November (Thursday)

Departure of participants

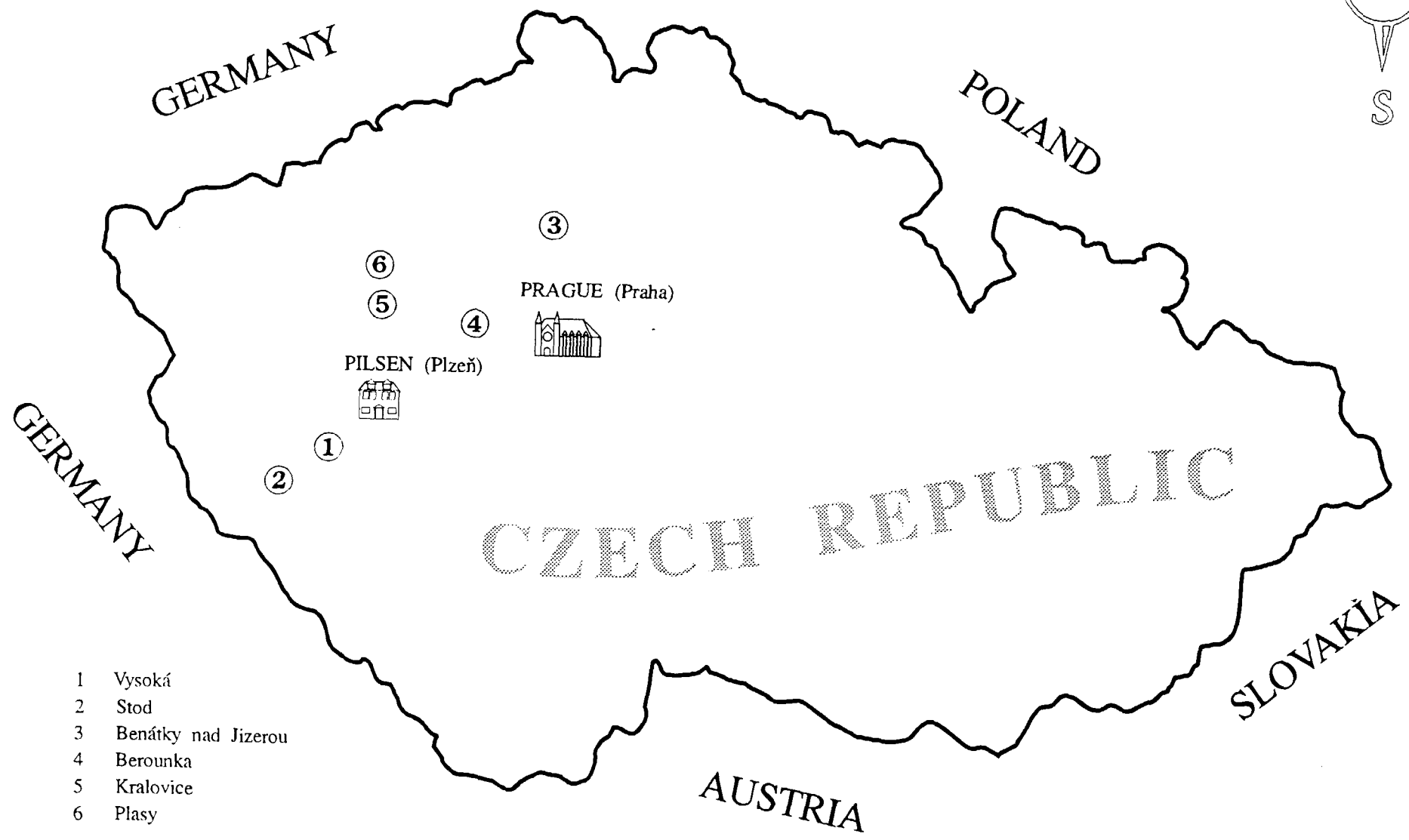
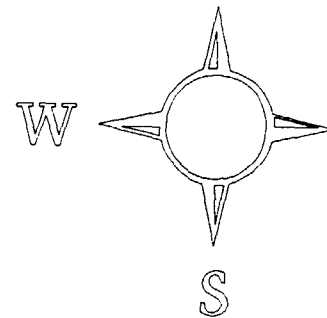
LIST OF PARTICIPANTS

in the Technical Workshop on Waste Management
(Pilsen, Czech Republic, 9 - 18 November 1998)

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- 1 Vysoká
- 2 Stod
- 3 Benátky nad Jizerou
- 4 Berounka
- 5 Kralovice
- 6 Plasy

ANNEX D

Programmes of the practical training courses organized during the year 1998

UNIDO-Czech Republic Joint Programme, Pilsen

PRACTICAL TRAINING COURSE

“WASTE MANAGEMENT“

Pilsen, March 23 - April 10, 1998

PROGRAMME

- 23.3. Arrivals, accommodation
(Mon)
- 24.3. Opening of the course
(Tue) Programme review
Topic environmental problems
Waste management - introduction
- 25.3. Practice (Prague, North Bohemia):
(Wed) Visit of dumping sites (municipal waste, industrial waste)
- 26.3. Lectures (Pilsen):
(Thu) Remediation of contaminated sites (survey, environmental audit, risk analysis,
methods of sanation, monitoring, legislation)
- 27.3. Lectures (Pilsen):
(Fri) Waste management (legislation, waste categorization, waste production,
industrial wastes, municipal wastes)
- 28., 29.3. Individual programme
(Sat, Sun)
- 30.3. Lectures (Pilsen):
(Mon) Waste management (waste pretreatment, waste disposal - dumping, incineration,
special methods of waste disposal, waste recycling)
- 31.3. Practice (Pilsen):
(Tue) Visit to contaminated site remediated by BIJO (metal treatment factory)
- 1.4. Lectures (Pilsen):
(Wed) Contaminants in environment (main groups, chemistry, toxicity, ecotoxicity)
- 2.4. Practice (West Bohemia):
(Thu) Visit to an incineration plant
Visit to a new dumping site

- 3.4. Practice (Pilsen and vicinity):**
(Fri) Visit to waste water treatment plants
- 4., 5.4. Individual programme**
(Sat, Sun)
- 6.4. Lectures (Pilsen):**
(Mon) Waste properties (testing methods, analysis)
Visit to BIJO analytical laboratories (excursion, practical demonstration)
- 7.4. Practice (Moravia):**
(Tue) Visit to contaminated site remediated by BIJO (industrial zone)
- 8.4. Lectures (Pilsen):**
(Wed) Environmental expertizes, solving of environmental problems (logistic, methods, demonstration of practical cases)
- 9.4. Lectures (Pilsen):**
(Thu) Environmental management system
Country reports
Discussion
- 10.4. Final discussions**
(Fri) Conclusion of the Course

UNIDO-Czech Republic Joint Programme, Pilsen

PRACTICAL TRAINING COURSE

“INDUSTRIAL ENERGY AUDITING“

Pilsen, April 14-29, 1998

PROGRAMME

- April 14 (Tue)* - Arrivals, accommodation
- April 15 (Wed)* - Organizational matters
- Basic information about the Czech Rep., its economy and energy policy
- Information about UNIDO and the Joint Programme Pilsen assistance to developing countries (by Mr. Milan Nový, Chief Executive of the Joint Programme)
- April 16 (Thu)* - Environmental impacts of energy use and energy conservation
- Country reports
- April 17 (Fri)* - Study excursion (in-plant measurements of gaseous emissions with a mobile diagnostic unit)
Road construction materials plant at Dobruška (near Sušice)
- April 18,19 (Sat, Sun)* - Individual programme
- April 20 (Mon)* - Energy auditing methodology, instrumentation
- Incineration plant (hospital in Pilsen) - incineration of wastes for steam production
- Training videoprogramme: Mobile diagnostic unit (Energy bus)

- April 21**
(Tue) - In-plant measurements (audits) with a portable energy auditing kit:
Ceramic factory at Třemošná (near Pilsen)
- April 22**
(Wed) - ŠKODA Enterprise, Pilsen : Generation of biogas for small scale
production of el. power
- April 23** *(Thu)* - Measured data processing, calculations, evaluation of an audit,
elaboration of a technical report
- April 24** *(Fri)* - Study excursion:
Nuclear power plant at Temelín
Gothic castle at Hluboká
- April 25, 26**
(Sat, Sun) - Individual programme
- April 27** *(Mon)* - Study excursion: Ceramic plant at Podbořany (wall and floor tiles
production, thermal devices, energy management at factory level)
- April 28** *(Tue)* - Elaboration of technical reports on energy audits; utilization of PC-s,
software
- Study excursion: Crystal glass production plant at Nižbor
- April 29** *(Wed)* - Final discussions, evaluation of the course, possibilities of further
(bilateral) cooperation, official closing (certificates)
- April 30** *(Thu)*
May 1 *(Fri)* - Departures of participants

UNIDO-Czech Republic Joint Programme, Pilsen

Practical Course on

SMALL SCALE PRODUCTION OF CERAMICS

TIME SCHEDULE

Pilsen, 4 May through 12 June 1998

Programme of the Course

1. WEEK

Monday -Tuesday 4-5 May

Arrivals of participants and accommodation
Registration of participants
Organizational matters

Tuesday - Friday 7-8 May

Practical training: Raw materials evaluation and simple methods of upgrading, body composition, properties of different ceramic ware, throwing on potter's wheel.

2. WEEK 11-15 May

Practical training: Throwing on potter's wheel, casting, model preparation, ceramics molding and shaping.

3. WEEK 18-22 May

Practical training: Throwing on potter's wheel, casting, surface finishing, mold making.

4. WEEK 25-29 May

Practical training: Mould making and finishing, glazing by brush and dipping, drying, kiln loading and firing.

5. WEEK 1-5 June

Practical training: Jiggering, finishing, glazing by spraying, decoration techniques, mold preparation.

6. WEEK 8-11 June

Practical training: Firing techniques, surface decoration.

Friday 12 June

Evaluation of the Course

Official Closing of the Course

Departure of participants

List of excursions

1. STEATIT Ltd., Klenčí p.Č.
 Electrotechnical ceramics.
2. West-Bohemian Ceramic Works, Horní Bříza
 Production of wall tiles, washed kaolin, stoneware pipes, refractories.
3. Chlumčany Ceramic Works, Staňkov
 Production of floor tiles, polishing of tiles.
4. Chodovia Cooperative, Klenčí p.Č.
 Production of decorative hand-painted tableware.
5. Starorolský porcelán Moritz Zdekauer a.s.
 Production of hard porcelain.
6. Keramo Kožlany Cooperative, Kožlany
 Production of tableware and artware.
7. Zahradní keramika, Horní Lukavice
 Production of garden pottery.
8. Mrs.Ulčová, Pilsen
 Hand decoration of tableware.
9. Mr.I.Hostaša, Starý Plzenec
 Art ceramics workshop.
10. Mr.Volf, Koloveč
 One-man company producing decorative tableware.

UNIDO-Czech Republic Joint Programme, Pilsen

PRACTICAL TRAINING COURSE

**„PROCESSING AND UPGRADING OF NON-METALLIC RAW
MATERIALS“**

August 31 to September 18, 1998

PROGRAMME

<u>Saturday - Sunday</u> 29/8 - 30/8	Arrivals of participants Accommodation
<u>Monday 31/8</u>	<u>Unido-Czech Republic Joint Programme, Pilsen</u> -assistance to developing countries - technical discussions - organizational matters - programme of the training
<u>Tuesday 1/9</u> 25 km	<u>Westbohemian Ceramic Works Ltd., Horní Bříza</u> - Kaolin Washing Plant Kaznějov - the biggest kaolin washing plant in the Czech Republic, production of filling and coating kaolins - Wall tile Plant, Horní Bříza - production of wall tiles, utilization and processing of raw materials
<u>Wednesday 2/9</u> 70 km	<u>Prionord Klatovy</u> - decorative stones mining and processing
<u>Thursday 3/9</u> 40 km	<u>Chlumčany Ceramic Works Ltd., Chlumčany</u> <u>Feldspar Plant, Meclov</u> <u>Feldspar Plant, Poběžovice</u> - mining and processing of feldspar - production of carbonate fillers
<u>Friday 4/9</u> 60 km	<u>Kaolin Hlubany Ltd.</u> - medium scale production of high quality kaolins for porcelain manufacture
<u>Saturday 5/9</u>	Study of technical publications of the Joint Programme
<u>Sunday 6/9</u>	Free time

<u>Monday 7/9</u> 45 km	<u>Keramo Kožlany</u> - medium scale tableware cooperative, methods of body mix preparation <u>Acidic lake, Žichlice</u> - residue after mining of sulphitic slates
<u>Tuesday 8/9</u> 115 km	<u>Garmica Měděnec</u> - mining of schists - SiO ₂ , mica and garnet upgrading
<u>Wednesday 9/9</u> 65 km	<u>Rückl & Sons Ltd., Nižbor</u> - crystal glass production Koněprusy cave - visit to the famous karst area with caves
<u>Thursday 10/9</u> 175 km	<u>Calofrig, Borovany</u> - diatomite upgrading - feldspatic sand classification and grinding
<u>Friday 11/9</u> 90 km	<u>LIAS Vintřov</u> - expanded clay and prefabricated insulating blocks (panels) production
<u>Saturday, Sunday</u> 12 - 13/9	Free time
<u>Monday 14/9</u> 25 km	<u>Keramika, Horní Bříza</u> - medium scale kaolin washing plant, kaolin for ceramic industry <u>Kyšice</u> - ceramic clays mining
<u>Tuesday 15/9</u> 90 km	trip to Prague
<u>Wednesday 16/9</u>	<u>Ceramic Workshop Malesice</u> - small scale production of ceramics
<u>Thursday 17/9</u>	Closing of the course - round table discussion
<u>Friday 18/9</u>	Departure of the participants

UNIDO-Czech Republic Joint Programme, Pilsen

Practical Course on

SMALL SCALE PRODUCTION OF CERAMICS

TIME SCHEDULE

Pilsen, 21 September through 30 October 1998

Programme of the Course

1. WEEK

Monday -Tuesday 21-22 Sept

Arrivals of participants and accommodation
Registration of participants
Organizational matters

Tuesday - Friday 23-25 Sept

Practical training: Raw materials evaluation and simple methods of upgrading, body composition, properties of different ceramic ware, throwing on potter's wheel.

2. WEEK 28 Sept-2 Oct

Practical training: Throwing on potter's wheel, casting, model preparation, ceramics molding and shaping.

3. WEEK 5-9 Oct

Practical training: Throwing on potter's wheel, casting, surface finishing, mold making.

4. WEEK 12-16 Oct

Practical training: Mould making and finishing, glazing by brush and dipping, drying, kiln loading and firing.

5. WEEK 19-23 Oct

Practical training: Jiggering, finishing, glazing by spraying, decoration techniques, mold preparation.

6. WEEK 26-29 Oct

Practical training: Firing techniques, surface decoration.

Friday 30 Oct

Evaluation of the Course

Official Closing of the Course

Departure of participants

List of excursions

1. STEATIT Ltd., Klenčí p.Č.
 Electrotechnical ceramics.
2. West-Bohemian Ceramic Works, Horní Bříza
 Production of wall tiles, washed kaolin, stoneware pipes, refractories.
3. Chlumčany Ceramic Works, Staňkov
 Production of floor tiles, polishing of tiles.
4. Chodovia Cooperative, Klenčí p.Č.
 Production of decorative hand-painted tableware.
5. Starorolský porcelán Moritz Zdekauer a.s.
 Production of hard porcelain.
6. Keramo Kožlany Cooperative, Kožlany
 Production of tableware and artware.
7. Zahradní keramika, Horní Lukavice
 Production of garden pottery.
8. Mrs.Ulčová, Pilsen
 Hand decoration of tableware.
9. Mr.I.Hostaša, Starý Plzenec
 Art ceramics workshop.
10. Mr.Volf, Koloveč
 One-man company producing decorative tableware.

UNIDO-Czech Republic Joint Programme, Pilsen

Practical Training Course

"WASTE WATER MANAGEMENT"

16 - 27 November 1998

PROGRAMME

14 November (Saturday)

15 November (Sunday)

arrivals of participants and accommodation

16 November (Monday)

Salzmann Restaurant Lounge

09:00 Lecture No.1 and floor discussion

WASTE WATER MANAGEMENT

Classification of waste waters, treatment technologies, limits, legislation

10:30 Lecture No.2 and floor discussion :

WASTE WATER TREATMENT PLANTS

Basic principles of treatment plants design, types of waste water treatment plants, equipment

12:00 Break for lunch - Salzmann Restaurant

13:00 Study excursion:

Municipal waste water treatment plant (Pilsen) -capacity 200.000 inhabitants.

Municipal waste water treatment plant (Křimice) - capacity 150 people

17 November (Tuesday)

8:30 Departure for study excursions by bus

9:30 Study excursions:

Industrial waste water treatment plants (various technologies)

1. Waste water treatment plant Škoda Company - Ejpvovice
 - ◆ treatment of municipal waste water (75 employes)
 - ◆ removal of oil matters from rain water
 - ◆ treatment of technological water from can production
2. Waste water treatment plant Škoda Company - Bolevec
 - ◆ treatment of water from canteen for 1.600 employes (grease trap)
3. Waste water treatment plant Aktiva Ltd. Kaznějov
 - ◆ anaerobic treatment of technological water from chemical production (citric acid production)
4. Waste water treatment plant Pašek Ltd. Kaznějov
 - ◆ biological treatment of municipal waste water
 - ◆ oil matters removal from rain water and car washing water

18 November (Wednesday)

a.m. Evaluation of water quality, BOD, COD, phosphorus, nitrogen, concentration limits for
Plasy surface waters, aerobic treatment of municipal waste waters, calculations of waste water
treatment plants

p.m. Study excursions:
Municipal waste water treatment plant Plasy – 3000 inhabitants
Waste water treatment plant Střela - seasonal plant in recreation center with biological
treatment and root field

November 19 (Thursday)

a.m. Complementary equipment for waste water treatment plants (grease traps, sand traps),
Pilsen pumping systems, measurement and regulation, removal of nitrogen and phosphorus,
examples of projects

p.m. Plzeňský projektový atelier Ltd., Plzeň
visit to the Company specialized in designing and construction of various types of waste
water treatment plants

November 20 (Friday)

a.m. Testing and measurement methods in waste water treatment plants,
Plasy stationary and mobile laboratory equipment, waste water analyses

p.m. Povodí Vltavy
Plzeň visit to the governmental organization responsible for surface water quality control, visit
to the specialized laboratories

November 21 (Saturday) Study of technical literature

November 22 (Sunday) Free day

November 23 (Monday)

a.m. Biological treatment of industrial waste waters
Plzeň (Characteristics of waste water sources, comparison of municipal and industrial waste waters, production and processing of biogas)

p.m. Other technologies for industrial waste water treatment (removal of oil matters, metals, industrial sludges, precipitation, flotation, sorption)

November 24 (Tuesday)

a.m. Municipal waste water treatment plant Klatovy - 40.000 inhabitants

p.m. KM Kinetics Ltd., Klatovy - biogas production and sludge treatment

November 25 (Wednesday)

a.m. Small and individual waste water treatment plants - systems,
Plasy example of engineering solutions, water recycling for gardening

p.m. Visit of small and individual waste water treatment plants

November 26 (Thursday)

a.m. Applications of natural sorbents for waste water treatment
Plasy Design of treatment plants, types and quality of sorbents, efficiency of cleaning process, utilization or disposal of sludges
Demonstration bentonite cleaning ability in laboratory

p.m. Visit to the bentonite waste water treatment plant (Plzeň)

November 27 (Friday)

Final technical discussions
Presentation of Country Reports
Evaluation and closing of the course

November 27 - November 25 Departure of participants

ANNEX E

Terms of Reference for Technical and Training Services

UNIDO-Czech Republic Joint Programme, Pilsen

TERMS OF REFERENCE FOR TECHNICAL AND TRAINING SERVICES

1. AIM OF THE PROJECT

The main goal of the UNIDO-Czech Republic Joint Programme, Pilsen is to assist the developing countries in their sectoral capacity building based on the Czech experience in industrial development and transition to market economy. The Joint Programme, Pilsen provides the framework for the transfer of know-how in many industrial sectors to meet the urgent needs of industrial development of developing countries. The programme is aimed to serve the requirements of sustainable development of the developing countries with regard to poverty alleviation, small and medium scale industries, restructuring and retraining environmental aspects, energy and mineral resources utilization in the public sector and private industries of the developing countries.

2. BACKGROUND AND JUSTIFICATION

The UNIDO-Czech Republic Joint Programme (JP), Pilsen has assisted developing countries since its establishment in 1978 up until 1997 under UNIDO's technical supervision and guidance. The present project is formulated on the basis of the aforementioned framework of partnership and has been updated in line with UNIDO's priorities specified in its business plan. It aims at providing technical support services to developing countries, particularly capacity building activities with focus on challenging issues concerned with environmental protection, technology management, energy efficiency and water management. Furthermore, it is specifically designed to provide assistance for improvement of the performance of small scale and medium enterprises in the subject field in developing countries.

In line with the Business Plan "On the Future Role and Functions of UNIDO", the main framework of the subject project is complementary to the following:

- Improvement of energy-efficiency in industry and cleaner production
- Environmentally sustainable industrial development
- Institutional capacity -building at sectoral levels
- Development of small and medium enterprises
- Quality and standardization
- Industrial information, investment and technology promotion

Based on above, the framework of the subject project which has been defined by UNIDO, responds to the following strategy:

- To foster twinning arrangements between Czech Republic institutions and similar ones in developing countries, under UNIDO's guidance;
- To arrange for fellowships, study tours, workshops, seminars, practical training courses and

- group training programmes, in areas identified by UNIDO;
- To conduct investigations of raw materials including technological research and development focusing on cleaner production and sustainable development;
 - To field experts to conduct exploratory, advisory and technical assistance missions;
 - To extend the energy-efficiency programme for industry (comprising technical assistance missions using a portable energy auditing kit) and research for alternative uses of non-metallic for reduction of energy consumption and harmful environmental impacts;
 - To promote integrated exploitation of non-metallic minerals and rocks comprising uses in ceramics, building materials and other industries, in agriculture and environmental protection;
 - To support the development of low-waste/no-waste technologies in developing countries;
 - To disseminate information on emerging clear and energy efficient technologies facilitating the performance of non-metallic mineral user industries.

The Project which is responding to the priority areas of UNIDO has a specific feature of being an interim arrangement for one year.

3. DESCRIPTION OF REQUIRED SERVICES

A. Basic considerations:

The activities of the contractor should be based on its human resource development consultancy and advisory services as well as its data base utilizing the know-how and experience of Czech industrial enterprises, banking, investment and business institutions. Group training programmes and individual training, industrial consultancy, transfer of technical information, investment promotion, facilitating of businesses etc., should be provided to institutions and industrial companies from developing countries in various regions in line with the request of UNIDO and in accordance with the rules and procedures of the Organisation for technical cooperation.

The Contractor should have at least ten years experience in the above fields, as well as thorough knowledge of the problems and awareness on the needs of the developing countries to enable his /her staff of the contractor and the experts of cooperating organizations in developing countries to work effectively in accordance with the rules and procedures and commitments of UNIDO.

The Contractor should be able to deliver services based on the experience gained in the transition of Czech economy towards market economy conditions particularly for the provision of services to small and medium scale enterprises responding to the Government's privatization initiatives in developing countries.

Introduction of solutions to problems related to energy efficiency and environment protection should be a highly focussed area of the Contractor's activities.

B. Special considerations:

This project will be financed through the Special Purpose Contribution of the Czech Republic to UNIDO (IDF).

C. Scope of services:

The Contractor is expected to provide permanent and locally recruited staff, premises and all other necessary facilities (i.e. classroom, computer equipment, copiers, communications, audio and video facilities, industrial visits, etc.) in the above outlined wide range of activities in multiple fields of industries.

The Contractor should organize workshops and training courses as outlined below. The offer for the organization of these events should include all staff cost, fees, accommodation (single rooms in at least two star hotels), meals, conference facilities, interpretation, secretarial and logistical support, preparation of training kits and manuals, documentation, report writing, reasonable pocket money, travel and all other costs arising within the Czech Republic. Cost of international travels and expenses of trainees of the Czech Republic should not be part of the offer. They have to be borne by the trainees or their employers.

In particular, the following programmes and services should be provided:

a) Practical Training Courses:

1. Technical Course on Waste Management
Date: 3rd quarter 1998 (max. 7 participants)
Duration: 3 weeks
2. Technical Course on Industrial Energy Auditing
Date: 3rd quarter 1998 (max. 7 participants)
Duration: 3 weeks
3. Technical Course on Small-scale Production of Ceramics
Date: June 1998 (max. 7 participants)
Duration: 6 weeks
4. Technical Course on Waste Water Management
Date: June 1998 (max. 7 participants)
Duration: 2 weeks
5. Technical Course on Processing and Upgrading of Non-metallic Raw materials
Date: August - September 1998 (max. 7 participants)
Duration: 2 weeks
6. Technical Course on Small-scale Production of Ceramics
Date: September - October 1998 (max. 7 participants)
Duration: 6 weeks

b) Workshops:

Technical Workshop on Waste Management

Date: October 1998 (15 participants, 10 days)

- c) Individual/group study tours on the request of developing and/or UNIDO
- d) Testing of raw material samples from developing countries (20 samples will be tested) and elaboration of reports with recommendations on processing, upgrading and applicability
- e) Two to four technical assistance, consultancy, project formulation, diagnostic and advisory missions to developing countries based on UNIDO's request. All the missions should be well documented by submission of detailed back-to-office mission reports. The Contractor should provide the services of the consultants for these activities within the budget of the subcontract.
- f) Providing of consultancy/advisory and information services on request on suitable technologies, equipment and machinery for non-metallic industry including formulation of project proposals.
- g) Elaboration, publishing and dissemination of specialized publications on topics dealing with non-metallic minerals and technologies, environmental protection and energy conservation.
- h) Promotion of UNIDO, Joint Programme, Pilsen and its cooperating organizations/companies at national and international levels.

The Aide-Memoire of group training programmes should be cleared by UNIDO in advance of their ~~distribution~~ distribution to developing countries.

4. LANGUAGE AND REPORTING:

All the programmes should be conducted in English. All reports to be submitted to UNIDO in five copies within 30 days after completion of each individual activity should also be written in English. The workshops should be conducted on the basis of specially prepared training handouts and programmes distributed to participants latest upon their arrival to the venue. These documents and list of participants including their addresses and full names should be annexed to the final report of each training programme. The raw material testing reports should be based on an outline to be defined by UNIDO. In the event of ad-hoc missions carried out by the staff of the Contractor, the mission reports should be submitted to UNIDO two weeks after completion of the mission according to a format to be provided by UNIDO prior to the mission together with its Terms of Reference.

5 PAYMENT TERMS:

The payments will be effected starting with down-payment and with installments upon satisfactory completion of the various training activities and receipt and acceptance of the respective reports by UNIDO. The proposed payment schedule is as follows:

a	Upon UNIDO's receipt of the Contract duly countersigned and the acceptance of the programme for the first two training activities,	20%
b	Upon UNIDO's acceptance of the training programmes to be organized during June-October 98, (5 courses)	20%
c	Upon UNIDO's acceptance of the final reports on the above training programmes	20%
d	Upon UNIDO's acceptance of the final version of the energy auditing kit, its software and promotional materials	20%
e	Upon UNIDO's acceptance of manuscripts of publications	10%
f	Upon UNIDO's acceptance of the Contractor's final report	10%