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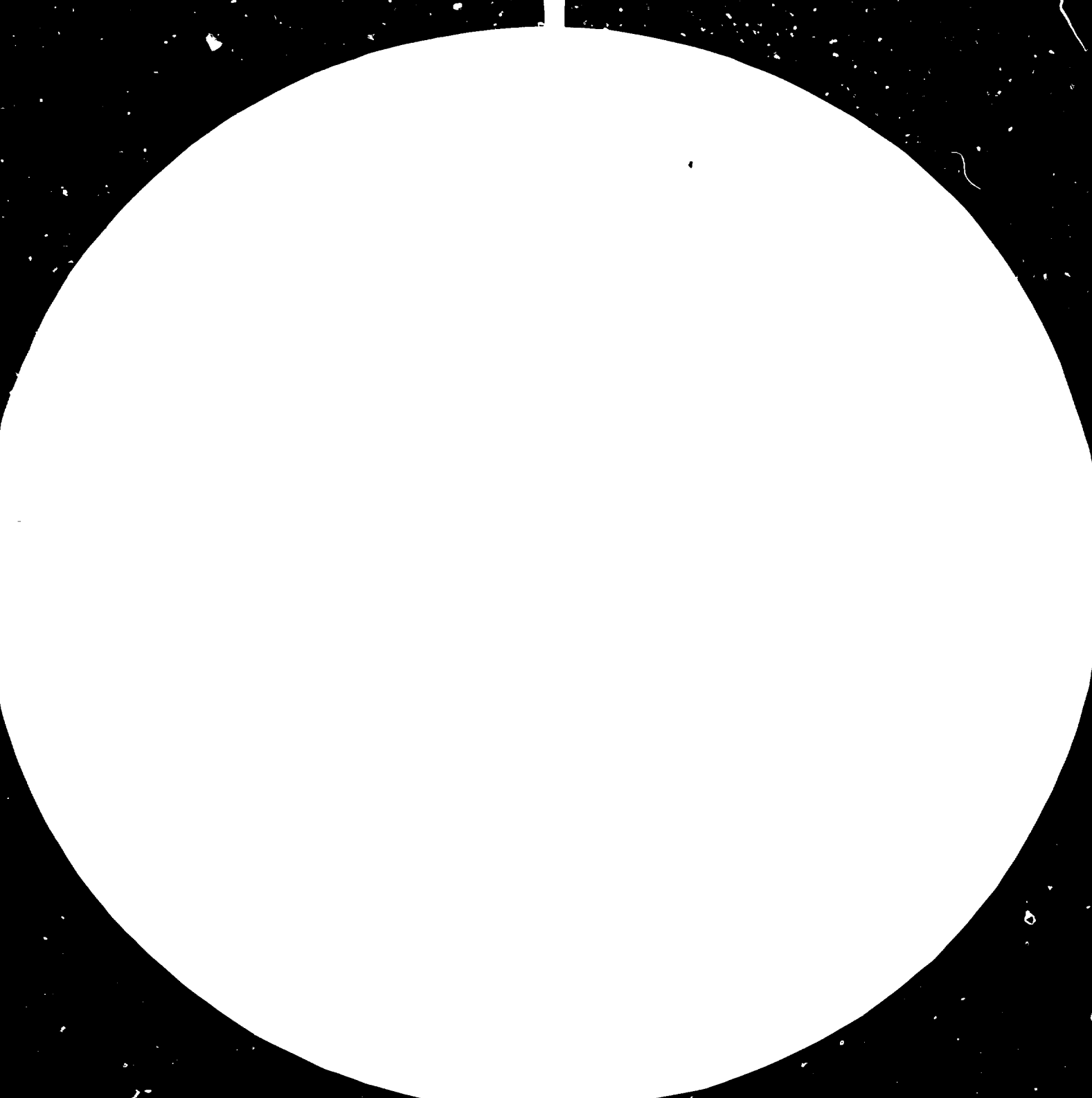
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ENGLISH

WORKSHOP ON PETROLEUM PROCESSING

organized by

United Nations Industrial Development Organization (UNIDO)

in co-operation with

the Government of Austria, the OPEC Fund for International
Development and ÖMV Aktiengesellschaft

held in Vienna, Austria, from 21 to 30 April 1981

REPORT*

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REPORT OF THE WORKSHOP

I. INTRODUCTION

Adequate supply of energy is an essential pre-requisite for economic growth. According to conservative estimates, energy requirements of the developing countries will increase from four to six times their present level by the year 2000. In all probability, petroleum and natural gas will still have to provide for the bulk of the increase in energy consumption.

Further, national petroleum enterprises and petroleum refineries in developing countries play an important role in the promotion of economic growth and development by stimulating and by fostering the establishment of other industries.

It is therefore of vital importance that petroleum enterprises and refineries in developing countries are managed and operated at maximum efficiency. To achieve this end it is necessary for refinery technical personnel from developing countries to exchange experience and information on their problems and constraints and to keep themselves in touch with the latest developments in petroleum processing technology.

Exchange of experience and information on a continuous basis among technical personnel has proved to be most valuable in this complex petroleum business comprising production, refining, processing, transportation, marketing, etc. For example "some national companies will have only one refinery and therefore do not have at their disposal such comparative data as will make it possible to determine whether the refinery is operated at maximum efficiency. If, however, the various national enterprises compare results, discuss possibilities of improvement, exchange development techniques, the profitability of refining operations of national companies will doubtless not be lower than that of the multinationals". This was the view expressed by Kommerzialrat Ludwig Bauer, President, OMV, Austria, at the United Nations Symposium on State Petroleum Enterprises held in Vienna in March 1978.

For over two decades Austria has owned and operated a successful petroleum enterprise, OMV, covering the whole range of oil and natural gas industry, from exploration and production to refining and distribution. OMV has erected a modern, efficient refinery at Schwechat to replace the many small, inadequate refineries that existed before 1955 at the oil

fields situated in Eastern Austria. The Schwechat refinery is reported to be the largest Central European refinery with a yearly throughput capacity of 14 million tons. The presence of multinational corporations has forced O.M.V. to always apply the most modern processing methods, the latest technical knowledge. It is believed that the experience gained by O.M.V. could be useful guidelines for developing countries.

This combined with the need for close co-operation and exchange of experience among refineries in developing countries, led to a decision to organize this Workshop. The Workshop is intended to benefit particularly those developing countries and least developed countries (LDC's) whose state-owned or state-controlled petroleum refineries are in urgent need of assistance to improve their efficiency and competitiveness.

Purpose of the Workshop

A. Development objectives

The development objectives are transfer of know-how from developed to developing countries and promotion of technical co-operation among developing countries.

B. Immediate objectives

The objectives are for petroleum refineries in developing countries to benefit from

- i) exchange of information and experience among themselves and with O.M.V.;
- ii) development of closer co-operation among themselves and with O.M.V.

Expected outcome of the Workshop

- i) Identification of areas of co-operation among petroleum refineries in developing countries and between them and O.M.V. with possible support of the OPEC Fund and UNIDO.
- ii) Recommendations and proposals for such co-operation.

II. THE WORKSHOP

Invitations

Nineteen developing countries, selected jointly by the organizers, were invited to nominate participants for the Workshop. Invitation letters with copies of the aide-memoire and programme were sent to each government through the UNDP office in the country. Selection of

candidates was carried out jointly by the organizers on the basis of information on the candidate's personal background and on the candidate's refinery, the candidate having been requested to provide such information by filling in a questionnaire.

Fourteen refinery managers from eleven developing countries were selected to participate in the Workshop (see Annex I for list of participants).

Programme

The technical programme, consisting of lectures, discussions and visits to the different units of OMV's Schwechat refinery, was arranged and conducted by OMV staff (see Annex II for the programme). Background information on OMV and lecture outlines were printed and sent to the participants before the Workshop started (see Annex III for lecture outlines).

Opening Session

The Workshop was opened by Mr. H. May, Chairman pro tem at 09.00 on Tuesday 21 April 1981. Mr. May welcomed all those present and gave the floor to the following speakers. The main points made by them are summarized below:

Mr. D.G.A. Butaev, Director, Division of Industrial Operations, UNIDO.

"There is no doubt that the petroleum industry will continue to play a vital role in the economies of many nations for years to come. It is therefore important that petroleum enterprises and refineries in developing countries are managed and operated at maximum efficiency. The acquisition and management of technology is one of the fundamental problems facing petroleum refineries in developing countries. This was one of the main issues discussed at the United Nations Symposium on State Petroleum Enterprises held in Vienna in March 1978. The views expressed at this Symposium pointed to the necessity for refinery technical personnel from developing countries to exchange experience and information on their problems and constraints and to keep themselves in touch with the latest developments in petroleum processing technology. One of the chief proponents of this view is Mr. Ludwig Bauer, President of OMV, who unfortunately is unable to be present here this morning but hopes to attend the closing session on 30 April 1981. Following up these ideas OMV approached UNIDO and the OPEC Fund to discuss possible collaborative action, and these discussions finally led to arrangements for this Workshop.

Within the overall objective of promoting exchange of information and experience and closer ties for co-operation, the Workshop aims to identify areas of co-operation among petroleum refineries in developing countries and between them and OMV with possible support of the OPEC Fund and UNIDO. What we want is concrete proposals for co-operation on a long-term basis. I recall that in our initial discussions, OMV emphasized the importance of developing a continuing programme of co-operation. So let us strive to achieve the aims of this Workshop."

Mr. Friedrich Hamburger, Counsellor, Alternate Permanent Representative, Federal Ministry for Foreign Affairs, Austria.

"It is considered an extremely important and valuable input into the industrialization policies of developing countries. It covers an energy related subject, the advancement of which is a prerequisite for progress in many other industrial spheres. By offering this Workshop to developing countries whose petrol policies in industry is at the beginning or expanding stage with only limited access to advanced technology and training opportunities, we hope to provide a substantial contribution to the petrol processing industry and thereby to their national economies as a whole."

Mr. Ibrahim F.I. Shihata, Director-General, the OPEC Fund for International Development.

"The OPEC Fund gives energy its utmost attention as the priority sector in its activities. The aim is to try and assist developing countries in becoming less dependent on oil imports, in other words OPEC countries are using their assistance not to promote their main export - oil - but rather to make the other developing countries less dependent on oil imports and therefore less dependent on the exports of oil from the OPEC member countries. It is a new concept in aid which, I am sure you realize, is quite different from the traditional idea of using aid for the promotion of exports. So far among the 224 loans which the OPEC Fund has provided to 76 countries, about 50 per cent of the amount went to energy-related projects. We are now in fact discussing the possibility of co-financing a refinery in the Sudan. This would be the first time the Fund gets involved in a refinery project. But we have been involved in oil development, like in the off shore oil project in India, in gas development in Bangladesh; we will pretty soon be involved in even oil exploration in Tanzania, the Songo-Songo project, and there will always be more and more opportunities for the Fund's involvement in oil development.

Therefore for us it is an opportunity to learn more about this subject with which we expect to be greatly involved in the future."

Ms. M. Ottilinger, Vorstandsdirektor Kommerzialrat, OMV Aktiengesellschaft

"The idea behind this Workshop was to give representatives of national oil companies the opportunity to exchange experience and know-how with other national companies thereby offsetting the big advantage multinational oil companies operating in various countries have over national oil companies."

Mr. H. Lederleitner of the Austrian Federal Economic Chamber also spoke words of welcome to the participants.

Closing day

The morning was taken up by a special programme organized by the OPEC Fund (see Annex II). This was followed in the afternoon by a session at UNIDO to evaluate the Workshop's programme and to discuss recommendations on future technical co-operation in this field. The Workshop's conclusions and recommendations are described in Part III below.

At the closing ceremony, Mr. F. Carré, Deputy Executive Director of UNIDO, delivered a speech thanking the co-organizers and the participants for their efforts towards the success of the Workshop and expressing the hope for further collaboration in the energy sector. This was followed by statements from representatives of the Austrian Government, the OPEC Fund and OMV.

III. CONCLUSIONS AND RECOMMENDATIONS

The following is a summary of the views and opinions expressed by the participants from developing countries and by the staff members of the sponsoring organizations who were closely involved in the preparation and conduct of the programme.

Conclusions

It was generally agreed that the objectives and the expected outcome of the Workshop had been largely achieved as far as this year's programme was concerned; further fulfilment of the objectives would depend on follow-up activities in technical co-operation in this field.

Recommendations

1) Future Workshops

Similar workshops should be held annually, if possible, since they can play a significant role in the transfer of know-how from developed to developing countries and in the promotion of technical co-operation among developing countries in the field of petroleum processing. However, the programme should be of a longer duration (say three weeks) and attended by more (say 20 to 24) participants from developing countries. It should have more in-depth discussions and be oriented to problem solving at the refinery management level. More time should be allowed for visiting the refinery units and consulting the specialist staff on specific problems encountered by each participant back home in his refinery. Two separate programmes may be organized, for two different levels of participants, e.g. one on refinery operation and planning for refinery managers and the other on maintenance, inspection, etc. for refinery middle management. A number of special topics were suggested for coverage by these programmes, e.g. process development, production planning with petroleum accounting, catalytic units (reforming, desulphurization, etc.), catalyst regeneration, modern technical services, use of computer programmes in technical studies, inspection and corrosion control, maintenance techniques and shutdown planning, energy conservation, safety. Lube oil manufacture was pointed out as one of the neglected areas in which it would be useful to have a workshop of this kind. The problems of small refineries should be given due prominence in future programmes.

ii) Co-operation among state-owned or state-controlled petroleum refineries

In addition to workshops of this kind, a more continuous mechanism for frequent technical consultations among state-owned or state-controlled refineries in developing countries and between them and ÖMV was thought desirable, and UNIDO was recommended to establish it. Such a mechanism, established as a UNIDO technical co-operation project, would enable one refinery to help the other through short visits or exchange of visits of appropriate personnel, in order to share experience and solve specific problems. Refineries in OPEC countries may wish to participate in this scheme.

The participants from developing countries expressed the desire for closer co-operation with ÖMV and suggested that ÖMV should

provide technical expertise and training facilities to national refineries in developing countries in order to solve problems, help modernize and improve performance of their refineries.

iii) UNIDO technical assistance

Certain specific requirements for technical assistance were mentioned by the participants from developing countries. Among them were the training handbook entitled "TYRO - Train Your Refinery Operators" prepared by Universal Oil Products Co., USA; universal trainers; process simulators; etc.

Acknowledgements

The participants from developing countries expressed their appreciation to the organizers and sponsors of the Workshop - UNIDO, the Austrian Government, the OPEC Fund, ÖMV Aktiengesellschaft, the Austrian Federal Economic Chamber - and the Austrian companies who introduced and demonstrated their activities in the manufacture of refinery equipment. They hoped that the Workshop was a starting point for closer co-operation with all the above mentioned parties.

ANNEX I

LIST OF PARTICIPANTS FROM DEVELOPING COUNTRIES

<u>COUNTRY</u>	<u>NAME</u>	<u>POSITION AND ADDRESS</u>
Bangladesh	MAFIN, Quazi Abdul	R and D Manager Eastern Refinery Ltd P.O.Box 35 Chittagong Tel: 502037 201327 Telex: Easternoil 607 Dacca
Bolivia	TORRES, Guillermo Orias	Asesor Seator Industrial Direccion de Planeamiento YPFB - Yacimientos Petroliferos Fiscales Bolivia Casilla N° 401, Calle Bucaro 185 - 6to piso La Paz, Bolivia. Tel: 37 11 42 Telex: 2376 YPFB GGLBV
China People's Rep. of	LI PUQING	Process Engineer Refinery, Maoming Petroleum Corporation Guangdong Province c/o Department for Science and Technology of China National Oil and Gas Exploration and Development Corporation Beijing (Peking)
Costa Rica	BOU, Marcelo Valverde	Operations Manager Refinadora Costaricense de Petróleo SA Apartado "O" Limón Tel: 58 03 44 Telex: 8512
	PORTUGUEZ, Francisco	Chief of Process Engineering Refinadora Costaricense de Petróleo SA Apartado "O" Limón Tel: 58 02 33 Telex: 8512
Egypt	MANSOUR, Abdel-Hadi Mohamed	Mostrad Refinery, General manager Suez Oil Processing Co 15 Nabil El Wakhod Str. Dokky Cairo Tel: 963560

Ghana	AIDOO, Kwesi	Production Planning and Control Manager GHAIP Oil Refinery P.O.Box 599 Tema, Ghana. Tel: 2881
Tanzania	NDESANJO, Michael M.	Production Manager Tanzanian and Italian Petroleum Refining (TIPER) Co. Ltd. P.O.Box 2608 Dar es Salaam Tel: 24 106 Telex: 41005
	RWEYEMAMU, Paul A.	Refinery Manager Tanzanian and Italian Petroleum Refining (TIPER) Co. Ltd. P.O.Box 2608 Dar es Salaam Tel: 24 106 Telex: 41005
Togo	ADE AMADOU, Ismaila	Chef Service Fabrication s/c STH Raffinerie de Pétrole P.O.Box 3289 Lomé Tel: 21 50 64
Turkey	TALU, Ergun	Assistant Refinery Manager TPAO Izmir Refinery Aliaga/Izmir Turkey Tel: 14 54 60 / 14 54 61 / 14 54 62 Telex: 52392 IRAF TR
Uruguay	EIREA, Luis Eduardo	Chemical Engineer Head of Operation II Administración Nacional de Combustibles Alcohol y Portland (ANCAP) Luis de la Pena 1000 Montevideo Tel: 39 45 01/05 Telex: UY 6692
Yemen People's Democratic Rep. of	AMAN, Abbas Shafiq	Senior Process Engineer Aden Refinery Company P.O.Box No. 3003 Little Aden 110 Aden Tel: 76 261 Telex: Refineries Aden 213
	AL-GIFRI, A.H.	Operations Superintendent Aden Refinery Company (address same as above)

ANNEX II

WORKSHOP PROGRAMME

21 April 1981

09:00 to 10:00

Opening session at UNIDO

Chairman pro tem: Mr. H. May, Deputy Director
Division of Industrial Operations, UNIDO

Opening speech: Mr. D.G.A. Butaev, Director
Division of Industrial Operations, UNIDO

Speeches by: Mr. Friedrich Hamburger, Counsellor
Alternate Permanent Representative
Federal Ministry for Foreign Affairs, Austria
Mr. Ibrahim F.I. Shihata, Director-General
The OPEC Fund for International Development
Ms. M. Ottlinger, Vorstandsdirektor
Kommerzialrat, OMV Aktiengesellschaft
Mr. Heinrich Lederleitner
Austrian Federal Chamber of Commerce

11:00

Arrival at Schwechat Refinery

Welcome by Refinery Director Dr. Cech, introduction
of his associates participating in the Workshop

Presentation of programme by Dkfm. Huber, Head of OMV
Training Centre

Lecture by Refinery Director Dr. Cech:

"A big refinery in a small country"

- 25 years development of Schwechat Refinery

configuration in past - present - future

12.30

Lunch in Refinery

13.30

MODERATING SESSION

with Workshop participants and Refinery Management
(Refinery Director Dr. Cech, Deputy Refinery Director,
Operations Manager, Chief Engineer, Head of Administration
and Accounting Department, Personnel Manager, Safety
Engineer)

Moderated by: Dkfm. Huber, Head of Training Centre
and Mrs. Smejda, OMV Training Centre,
"Foreign Trainees" Dept.

During this Session, topics of general and special interest
will be determined. Although participants will be asked at
the time of extending invitation to send a short summary
describing lay-out, configuration, problems of the refinery

which each participant represents, and such information will have been studied carefully by O&V experts PRIOR to Workshop, additional questions/problems will be gathered during this Session, and these will be displayed on boards and participants will have the opportunity to set priorities themselves - using the modern "moderating Technique" mentioned.

22 April 1981

Lectures and discussions on:

09:00 to 12:00

PERSONNEL: (a) Organization, (b) Training

(a) Organization

- Organizational plans of refinery
- Numbers of operators required in processing (Optimum number of craftsmen in maintenance)
- Job descriptions
- Job enrichment and enlargement
- Shiftplans
- Fringe benefits
- Industrial relations (participation of employees' representatives)

12:00 to 13:00

Lunch in Refinery

13:00 to 15.30

(b) Training

- Junior Staff Training (Train-the-Trainer-Programme)
- Operators Training (Simulator, on-the-job- and classroom training)
- Instrumentation Training

23 April 1981

Lectures and discussions on:

Time schedule
as on 22.4.81

OPERATION

- Simplified flow diagram
- Crude distillation
- Vacuum distillation
- Reforming
- Catalytic Cracking
- HDS
- Special units: desalting, decoking, catalyst loading and/or regenerating; washing operations (caustic, regenerative)

- Production Planning
- Process evaluation and control
- Automatic control by analyzers
- Control by laboratories
- Product Shipment out of Refinery:
 - On-spot-loading (railroad tankcars)
 - Automatic flow account. and control system (FIAS)

24 April 1981

Lectures and discussion on:

09:00 to 11:00

UTILITIES

- Steam/power coupling
- Water systems (cooling, injection)
- Primary energy supply
- Fuel gas system
- Liquid fuels
- Heavy liquid fuels for high pressure boilers

11:00 to 12:00

MAINTENANCE

- Shut-down planning and scheduling (network technique)
- Job evaluation and backlog; set-up of job priorities
- Maintenance by contractors

12:00 to 13:00

Lunch in Refinery

13:00 to 15.30

MAINTENANCE (continued)

- Tools and equipment
- Fire fighting, safety regulations

27 April 1981

Lectures and discussion on:

Time schedule
as on
22.4.81

MATERIAL AND PLANT INSPECTION

- Material supply
- Flow of information concerning spare parts
- Spare parts ordering inside refinery and from outside suppliers
- Estimating delivery time
- Warehouse administration
- Material standards
- Corrosion problems
- Lifetime of equipment
- Special testing methods (replacing common pressure testing by sonor-ray; temperature profiles)

28 April 1981

Time schedule
as on
22.4.81

Lectures and discussion on:

ENVIRONMENTAL CONTROL AND ENERGY CONSERVATION

- Waste water treatment
- Waste water recovery
- Slop treatment
- Flare gas recovery
- Sulphur recovery from fuel gas
- Energy recovery from low pressure catalytic cracker fuel gas
- Heat transfer to Schwechat Airport and to other utility companies (City of Vienna)
- Increase in efficiency of process heaters by use of forced draft fan burners
- Automatic control of access air in the heater's stack
- Air-preheating
- Control of heat losses by thermovision methods

29 April 1981

09.00 to 12.00

Trouble shooting

12.00 to 13.00

Lunch in Refinery

13.00 to 13.30

Discussion of any other topic

Summary and conclusion of Workshop's programme at DMV

30 April 1981

Meeting at the OPEC Secretariat Headquarters

09:30 to 12:00

- The screening of a movie entitled "For the Benefit of All"
- The presentation of a paper prepared by the Secretariat entitled "Refining and Downstream Operations"; and
- A short introduction, presented by the OPEC Fund, on their operations with particular focus on the Fund's assistance to the energy sector.

14:00 to 15.30

Closing session at UNIDO

Discussion on Workshop results and follow-up activities

Chairman pro tem: Mr. H. May, Deputy Director
Division of Industrial Operations, UNIDO

- Participants' views on the programme;
- Comments by the organizers;
- Recommendations on future technical co-operation and follow-up activities

15.30 to 16:00

Closing ceremony

Chairman pro tem: Mr. D.G.A. Butaev, Director
Division of Industrial Operations, UNIDO

Closing speech by: Mr. F. Carré
Deputy Executive Director, UNIDO

Statements by: Mr. Erich M. Schmid
Envoy Extraordinary and Minister
Plenipotentiary
Permanent Representative
Federal Ministry for Foreign Affairs
Austria

Mr. Ludwig Bauer, Generaldirektor
Kommerzialrat, OMV Aktiengesellschaft

Mr. Mehdi Garadaghipour, Assistant
Director-General, The CPEC Fund for
International Development

16:00 to 17:00

Reception, at Board Room Lounge.



