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DE/RAF/83/022

14846

Angola.

ASSISTANCE TO THE PETROLEUM TRAINING CENTRE.

SOMBE (KWANZA SUL)<sup>1/</sup>

PEOPLE'S REPUBLIC OF ANGOLA

Report of  
the Project Technical Committee  
Second Meeting, 21 - 25 January 1985

by

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<sup>1/</sup> The views and opinions expressed in this report are those of the consultants, and do not necessarily reflect the views of the United Nations Secretariat. This document has been reproduced without formal editing.

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### ANNEXES

1. Preliminary assessment of the list of equipment and materials purchased by the Contractor
2. Initial comments by the Project Technical Committee on the technical content of courses formulated by the Contractor
3. Proposed Terms of Reference for the visit to Angola by V. Pavlykhin, UNIDO consultant

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## I. INTRODUCTION

### Terms of Reference of the Project Technical Committee

UNIDO has been entrusted with the execution of the project DP/RAF/83/022, "Assistance to the Petroleum Training Centre", Sumbe, Angola, which was approved in March 1984 by UNDP, Government of the People's Republic of Angola on behalf of SADC Member States, and UNIDO.

In order to discharge its responsibilities as an Executing Agency as required in the project document, UNIDO has decided to establish a Project Technical Committee with the following Terms of Reference:

- i) To assist UNIDO in reviewing and monitoring the training activities carried out by the accepted sub-contractor at the Petroleum Training Centre, (PTC), in order to ensure that these activities fully meet the requirements of SADC Member States and the objectives of the project DP/RAF/83/022;
- ii) To advise UNIDO on the cost effectiveness of the training activities;
- iii) To recommend to UNIDO the technical areas requiring special emphasis and modifications if necessary in the training programmes.

The Project Technical Committee shall consist of a number of independent experts with extensive experience in personnel training for petroleum industry and UNIDO technical officers responsible for implementation of the project. UNIDO shall convene Project Technical Committee meetings whenever appropriate and necessary during the entire duration of the project. The Committee may meet at the PTC in Sumbe, Angola, or at UNIDO headquarters in Vienna. The Committee Members may be required to undertake any travel necessary for the discharge of their responsibilities.

The costs arising from the operation of the Project Technical Committee will be financed from the project funds. The Committee Reports shall be submitted to UNIDO.

Composition of the Project Technical Committee for the Second Meeting,  
from 21 to 25 January 1985

- L. Brezula, UNIDO Consultant
- H. Huber, UNIDO Consultant
- J. Mohr, UNIDO Consultant
- T. Russell, UNIDO Consultant
- S. Sazonov, Industrial Development Officer  
Chemical Industries Branch, UNIDO
- M. Kohonen, Purchase and Contract Service  
UNIDO  
(attended on a part-time basis)
- V. Pavlyukhin, UNIDO Consultant, scheduled to visit Angola,  
also participated on a part-time basis.

Agenda of the Second Meeting

The following agenda was adopted:

1. Briefing by Mr. S. Sazonov.
2. Consideration of follow-up action taken regarding the recommendations made by the Project Technical Committee in their report on their first meeting, 15 - 18 May 1984.
3. Consideration of the report submitted to UNIDO by Mr. L. Brezula (member of the Project Technical Committee) on his visit to the home office in Rome of the Contractor from 15 - 29 October 1984.
4. Consideration of the short Interim Report submitted to UNIDO by the Contractor on his activities over the period from 7 May - 31 August 1984.
5. Consideration of:
  - (a) The first Progress Report submitted to UNIDO in Vienna and UNDP in Luanda by the Contractor covering the work performed in the Project Area and at the Contractor's home office in Rome over the period May - 31 December 1984, and
  - (b) The letter of transmittal dated 9 January 1985 attached to the above Progress Report.
6. Discussion with representatives of the contractor.
7. Conclusions and recommendations of the Project Technical Committee.
8. Future activities of the Project Technical Committee.

## II. MAIN FINDINGS AND RECOMMENDATIONS

### Main Findings

1. Over the period under review, May - December 1984, the efficiency of UNIDO monitoring activity has been constrained by:
  - (a) Lack of receipt by UNIDO in Vienna of timely information and data from the Contractor both as regards the operational viability of the Petroleum Training Centre (PTC) at Sumbe (Kwanza Sul) and the services he has provided under the contract, and
  - (b) Delays in receipt of clearance by the Government of Angola of proposed visits by UNIDO staff and consultants concerned with the project (in accordance with the project document monitoring visits have to be made at least once a year). This in particular had created the situation when UNIDO had no other source of information from the field except for that provided by the Contractor.
2. The Contractor's first Progress Report (May - 31 December 1984) is not informative enough. Further information and data is required from the Contractor to permit UNIDO to accept the report. Details of the Progress Report discussions are provided in Part III herein below. The data sought shall be in form of detailed description of activities and be supported by detailed justification of the deviations from the contract and agreed upon work plan occurred.
3. No training courses have been implemented at the PTC as it is not yet operational for reasons discussed later in this report. Meanwhile, without obtaining the prior approval of UNIDO, the Contractor has implemented the first training course at Luanda on a temporary basis while awaiting restoration of the operational viability of the PTC.
4. The programme for fellowships and study tours has not yet commenced due to lack of funding for travel and subsistence of the participants.
5. The Ministry of Energy and Petroleum on behalf of the SADC Member States has requested UNIDO to authorize the Contractor to undertake certain specialized training courses in other SADC countries.

Recommendations

1. To strengthen lines of communication and thereby improve the efficiency of UNIDO monitoring activity, the following actions are recommended:
  - (a) More frequent visits to Argola by members of the Project Technical Committee, the backstopping officer, and specially appointed consultants should be scheduled;
  - (b) A further visit to the Contractor's home office should be scheduled at an early date for members of the Project Technical Committee, and the backstopping officer;
  - (c) Strong representation should be made by UNIDO to the Contractor to improve the flow of information and data regarding his activities in the Project Area and his work at the home office relating to the contract;
  - (d) The matter should also be discussed with the Resident Representative and the UNIDO Senior Industrial Development Field Adviser in Luanda to obtain their comments and suggestions.
2. The delays being experienced in receiving Government clearance of proposed visits to Angola by UNIDO staff and consultants concerned with the project should be discussed at an early date with the Resident Representative in Luanda.
3.
  - (a) UNIDO should not accept the first Progress Report dated May - 31 December 1984 as it stands;
  - (b) The Contractor should be requested to resubmit the report containing the additional information and data discussed with his representatives at the meeting on 25 January 1985 in Vienna and elaborated further in this report.
4. UNIDO should approve the late request from the Contractor to undertake some training activities in Luanda (already started) on a temporary basis while awaiting the restoration of the operational viability of the PTC. This should not, however, be repeated without prior written consultations with UNIDO.



UNIDO will co-ordinate such requests with the Angolan authorities concerned, therefore any applications for ad-hoc deviations from the contract must be made well in advance.

5. UNIDO should take the necessary action at an early date to discuss all the project difficulties so far encountered at a Tripartite Review Meeting in so far as possible solutions to these difficulties may depend upon approval of appropriate amendments to the project document.

**III. COMMENTS OF THE PROJECT TECHNICAL COMMITTEE ON  
THE DOCUMENTS EXAMINED AND DISCUSSIONS WITH  
REPRESENTATIVES OF THE CONTRACTOR**

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**General**

1. Both the Interim Report of 31 August 1984 and the Progress Report, May - 31 December 1984 were received late by UNIDO. The Interim Report was received end September 1984 instead of mid August 1984 and the Progress Report on 14 January 1985 instead of mid November 1984.

At the meeting with representatives of the Contractor, the Contractor undertook to ensure that the second Progress Report was received by UNIDO not later than 1 June 1985.

2. The Progress Report was found not to be informative enough and contains too much extraneous material that does not really contribute to the understanding of the Contractor's work over the period. For example, Annex IV to the Progress Report includes SADCC energy policy papers, documentation in respect of Energy Meetings at Maseru and Lusaka and documentation in the Portuguese language concerning Angolan Law No. 20/82.

Such voluminous data is not required in future reports of the Contractor. Only such material as is pertinent to the understanding of the performance of the Contractor should be included in accordance with the UNIDO guidelines contained in its reference document entitled "Basic Principles of Scientific Report Writing" in the possession of the Contractor.

At the same time the report does not provide the information that is to explain certain deviations in the field activities from the original contract and the work plan. In some cases, such information is not timely adequate to enable UNIDO to take remedy action. For example, the inability to start training in September as planned was apparent long before UNIDO received such intimation in the Interim Report. The Interim Report itself did not indicate reasons for that, although the situation at the PTC was known before and the prospects for its improvement were the same in August as in September.

Besides, certain material of interest to all those concerned with the project is other than in the English language. The Committee would be very interested to know the content of the team leader's reports to the home office, however, those reports, although included in the Progress Report, are in Italian and therefore of no use to the project. Here the Committee wishes to remind that the contract specified that all the reports submitted by the Contractor should be in English.

3. Definition of the "Project Area" has been misused by the Contractor in his Progress Report and could lead to misunderstandings in relation to the contract.

The Project Area is defined in the contract as "Kwanza Sul" only. Luanda is not included in the Project Area.

4. The PTC description booklet contained in Annex III of the Progress Report is headed:

"UNDP - UNIDO  
Regional Project for the SADCC Member States"

and has been widely circulated by the Contractor among the SADCC countries. This gives the false impression that the booklet is an official document of UNIDO.

Services delivered by the Contractor during 1984

1. As indicated in Table 1, page 5 and Table 2, page 10 of the Progress Report, only 40 m/m of technical services were delivered by the Contractor during 1984 by thirteen staff instead of 88 m/m by twenty-one staff as required by the contract, clause 2.03(a).

2. The errors in item (d) of Table 1 should be amended as follows:

	<u>Amend to</u>		
	<u>Foreseen</u>	<u>Performed</u>	<u>Progress</u>
	(m/m)	(m/m)	
<u>Language Courses, Managerial</u> <u>Courses and Seminars</u>	(13)	(4)	30%
Language teaching	8	-	-

3. Table ? should be amended to include additional columns indicating the allocation of services delivered in:

- the Project area
- other areas in Angola
- other SADC countries
- Home office.

4. The summary of the cost of services delivered during 1984 is shown in Table 1 on page 6 of the Progress Report, totalling US\$ 895,391 compared to the target expenditure of US\$ 1,288,827 for 1984. This has enabled the Contractor to claim that total percentage progress achieved was 70% during 1984. On the other hand, judging overall progress in 1984 on a man-month basis (40 m/m services delivered instead of 88 m/m) gives a total percentage of progress achieved of only 45%.

5. The main deficiency of the description of services in the report is that it does not provide the account of services delivered but does not provide the description of the work done nor it provides details on the results achieved. The Committee believes that any future reports should be more specific in describing the outputs achieved. Only this kind of reporting can witness the quality of services delivered.

#### Supply of Equipment and Materials

1. It was noted that the purchase of equipment and materials by the Contractor had not conformed with the requirements of UNIDO to regulate the procurement of equipment and materials to comply with UNIDO financial regulations.

At the previous meetings with the Contractor on 16 and 17 May 1984, the Project Technical Committee had specifically drawn the attention of the Contractor to the latter point and had requested the need for a cost breakdown of the equipment and spare parts included in the Contractor's original proposal dated May 1984 in terms of estimated gross cost of major items of equipment together with appropriate spares back up provision. This breakdown was not provided by the Contractor.

2. A preliminary assessment of the cost of some equipment and materials by the UNIDO Purchase and Contract Service (Annex 1) after obtaining several quotations for some of the major items listed, has shown that the cost of procurement could probably have been significantly less than that incurred by the Contractor.

However, a complete assessment by UNIDO must await specification details in English for each item costing US\$ 5,000 or more before a final judgement can be made by the UNIDO Purchase and Contract Service regarding the level of expenditure incurred by the Contractor.

3. Further justification is required from the Contractor for the addition of general expenses over and above the amounts charged for the Contractor's procurement and purchasing services and the further addition of COMERINT profit included in the price breakdown.

4. The Contractor undertook to provide the above cited information details to UNIDO Purchase and Contract Service not later than 6 February 1985.

#### Surveys, Research and Educational Engineering

1. It appeared to the Project Technical Committee that the human resources and selection survey by 9 m/m as shown in the Table on page 11 of the Progress Report had taken too long and results achieved are too humble taking into account the duration of the survey. One might expect that 9 m/m of services could bring about more detailed information on the candidates to be considered for training in 1985. The Committee was of the opinion that the results of the survey could have been achieved by using less inputs in terms of direct missions and more using the mail. If, however, there were specific reasons or handicaps that made the survey so lengthy, they were not presented in the Report.

2. The Contractor confirmed that the results of the survey shown in Table 3, page 19 of the Progress Report cover the needs of the SADCC countries in 1985 only. Selection of suitable candidates for training should follow later.

The Contractor undertook to amend Table 3 to include projections of such needs in later years and to include such forecasts in future Progress Reports on a routine basis.

3. The Contractor advised that he was not responsible for the selection of candidates in the SADCC countries for training but he was willing to assist in this process if required.

4. No details are included in the Progress Report regarding the adaptation of software (textbooks and relevant teaching aids) undertaken by the Contractor at his home office. However, the Committee noted that the Contractor failed to prepare the training materials on time (by September 1984 as was planned), although the Committee meeting held in May recommended to UNIDO to satisfy the request of COMERINT to transfer the adaptation of the training material from Sumbe to Rome, and UNIDO agreed to that, taking into account the difficult situation in the Project Area at that time. Hence nothing prevented COMERINT to be in line with the schedule. However, according to a UNIDO consultant, Mr. L. Brezula, in October COMERINT could not present to him any training material in English. That should have been prepared by September. The first course material for external refinery operations was brought by Messrs. di Marco and di Martino later in December.

Language Courses, Managerial Courses and Seminars, Fellowships and Study Tours

1. Training Programmes implemented and number of delegates trained

At the request of the Project Technical Committee the Contractor undertook to include Work Progress Charts on a routine basis on lines similar to the Work Progress Chart on page 11 to show the following information in suitable bar chart form:

Chart 1: Training courses implemented for training 800 qualified operators, technicians and industrial management personnel

Details required:

- Reference number allocated to the course implemented
- Course title
- Name of Course Director or Supervisor
- Course starting date
- Course completion date
- Number of candidates trained
- Cumulative number of candidates trained

Chart 2: Training courses implemented for training 180 teaching staff at the PTC

Same details required as Chart 1 above.

Chart 3: Fellowships and Study Tours

Same details required as Chart 1 above.

2. Course Contents

The Project Technical Committee will appreciate if the Contractor finds it possible to let UNIDO have a set of any training material as soon as such is ready in English. This will be regarded as a courtesy to the Committee and will let UNIDO through their consultants assist in strengthening such materials, if necessary.

3. Fellowships and Study Tours

No fellowships or study tours were implemented by the Contractor during 1984 due to lack of funds to finance the travel expenses of fellows and their accommodation and subsistence.

The Contractor confirmed that the programme to be developed for fellowships and study tours would not be confined to Italy but could be implemented elsewhere in Europe.

The 1985 Programme

The Contractor has undertaken to deliver the shortfall in 1984 services of 48 man-months (88 minus 40) during his 1985 work plan. This will place a considerable burden on his efforts to retrieve the situation in 1985.

However, after consultations with Government authorities in Angola on 21 January 1985, the Contractor is confident that full training activities can be resumed at the PTC in May 1985. The main problems are (a) the restoration of electric power supply to meet the total requirements of the PTC (b) restoration of water supply to the PTC and (c) the provisioning and feeding of the trainees at the PTC all of which are the responsibility of the Government.

The Contractor confirmed that some limited training might be possible at the PTC prior to May 1985 depending upon the repair and commissioning of the existing emergency generators which however can provide only one third of the power requirements of the PTC.

Meanwhile, the Contractor has commenced the first training course in External Refinery Operations in Luanda for 14 Angolans on a temporary basis until such time as the PTC becomes fully operational.

The Ministry of Energy and Petroleum in Angola acting on behalf of the SADCC Member States has written to UNIDO formally requesting approval to the Contractor undertaking certain training courses for specialized subjects in other SADCC countries. This proposal must be discussed at the first Tripartite Review Meeting before a decision could be made.



#### IV. SUMMARY

Following examination of the documentation made available to the Project Technical Committee, the Committee formulated comments which were discussed with representatives of the Contractor and main findings and recommendations were reached.

The next payment to be made to the Contractor according to the schedule of payments in the contract, is dependent upon acceptance of the Progress Report by UNIDO.

The Contractor was requested to provide further information and data in a revised Progress Report to permit a fuller understanding of the Contractor's work during 1984 thus enabling UNIDO to accept the report.

In the light of the delay in implementing the training programmes including fellowships and study tours and having regard to the estimated date of May 1985 before the PTC becomes fully operational, the level of training to be accomplished by the Contractor must rise during 1985 and succeeding years if the output targets listed in the Project Document are to be realized.

As a result of the outcome of its second meeting, the Project Technical Committee is of the opinion that realization of these outputs by the existing subcontract in terms of the number of qualified operators, technicians and industrial management personnel (800) and the number of qualified teaching staff at the PTC and other trainers (180) will be difficult if not impossible during the remaining duration of the contract viz 41 months from 1 January 1985 to 31 May 1988.

The Project Technical Committee is therefore most concerned at the longer term viability of the project within the existing parameters of the Project Document.

Consequently, the Project Technical Committee has recommended in this report that the first Tripartite Review Meeting should be convened at an early date with a view to approving appropriate amendments to the Project Document to suit the changed situation.

The Terms of Reference of the Project Technical Committee have thus been discharged for the second meeting.

The next foreseen activities of the Project Technical Committee are shown in Section V overleaf.

V. FUTURE ACTIVITIES OF THE  
PROJECT TECHNICAL COMMITTEE

1. Following the visit by Mr. L. Brezula, member of the Project Technical Committee, to the Home Office of the Contractor in October 1984, a further visit by members of the Committee to the Contractor's Home Office should be scheduled during the First Quarter of 1985 as follow-up action to the meeting with representatives of the Contractor in Vienna on 25 January 1985.

2. A visit by Mr. V. Pavlykhin, UNIDO consultant, to Angola for weeks is scheduled to commence on

Proposed terms of reference for the mission of Mr. Pavlykhin have been formulated by the Project Technical Committee and are included in Annex 3 of this report.

3. As UNIDO does not have a Project Manager stationed in Angola, more frequent visits to Angola by members of the Project Technical Committee should be scheduled.

4. Such members of the Project Technical Committee as are available should support UNIDO at the First Tripartite Review Meeting when scheduled.

5. Such members of the Project Technical Committee as can be available should visit the SADCC countries other than Angola at an early date to sustain interest in the objectives of the project in terms of the regional training to be achieved and to obtain confirmation of the following Government inputs:

- (a) selection and despatch of suitable students to the PTC;
- and
- (b) nomination of candidates for fellowships and study tours.

Verification of Equipment, Supply of Spare Parts and Consumables

<u>Materials</u>	<u>Shipped in 1984</u>	<u>Expected but not on the list of shipped goods</u>
<u>1. Spare parts replacement materials</u>		
1.1. Laboratories (Instrumentation lab. miscellaneous materials for columns)	not found on a packing list	Thermocouples, thermometer resistance, different pipes, fittings, gaskets, rolls of teflon for gaskets, rolls of rolled paper, squared papers, pneumatic valves, pressure gauge, et
1.11 Electrical laboratories	not found on a packing list	Connectors, thermomagnetic switch, complete voltage transformer, remote control switch, selector unit, set of pilot lamps
1.12 Electric machine room	not found on a packing list	Loose parts of motors, rubber washers, complete coupling, set of connecting cables, set of terminal board brushes, set of various levers for loads, etc.
1.13 For the remaining equipment	not found on a packing list	Set of levers for voltage transformers, set of levers for ohmic-inductive capacity loads, set of relays and remote control switches for teaching unit, set of fuses, different miscellaneous electrical material, e
1.14 Chemical laboratory	not found on a packing list	Standard electrode for pH meter, standard calomel electrode, thermostats, stirrer motors, heating elements, different laboratory equipment for chemical laboratory, viscosimeters, distillation apparatus for ASTM D 86 distillation, reagents, et
1.2. Workshops	not found on a packing list	Spare parts for drilling machines, spare parts for lapping machines, belts, gaskets, spare parts for motor engine test bench, spare parts for spot welder, safety valves and pressure gauges, membranes and pressure valves for acetylene station, pressure hoses, electrode holders, etc.

1.3. Printing department	not found on a packing list	Power punch for punching volumes. table stapler for thicknesses up to 17 mm, electric tracing duplicat machine, spare parts for heliografic machine, spare parts for perforator, spare parts of rotaprint printing machine, spare parts for Canon P/50 photocopier, exposure lamp, etc.
1.4. Cars	Spare parts shipped for cars already in use and for new purchased	Seems necessary to increase number of items as follows: brake cylinders, alternators-regulators, power break pumps, engine shaft bearings and shells, platinum points and distributors, brake shoes, cylinder rings and valves, crouckshaft and distribution chain, etc.
1.5. Water pumping station and emergency VM generator set	spare parts shipped for pumping station and for emergency generator	Found complete
1.6. Electric transformer room	not found on a packing list	Fuses, 550V, 600A, various relays, set of diodes, switches, indoor terminal, different contacts, minimum tension relay, 24V dc, etc.
1.7. Emergency generators	not found on a packing list	Different filters, ventilator belt, stop electromagnet, alternato diodes, alternator voltage regulato assorted fuses, auxiliary relay, alternator belt, stop diodes, signal lights, etc.
1.8. Civil installations	shipped building stage 1 and 2, infirmary, refrigerator cells and refrigerated table, kitchen accessories, etc.	Found complete

<u>Materials</u>	<u>Shipped in 1984</u>	<u>Expected but not on the list of shipped goods</u>
<u>2. Consumables materials for laboratories, workshops and printing department</u>		
2.1. Printing department	Canon NP photocopy machine and very limited consumables	Sheets A4 format, tracing paper, acetate film in A4 format, plastic and rigid binders, staples, ink for photocopiers, silicon oil, lubricating oil, soap grease, etc.
2.2. Workshop materials	not found on a packing list	Steel flats, square buss, steel plates, aluminium sheets, copper sheets, tubes, flanges, bronze rounds, cast-iron rounds, tapes, etc.
2.3. Fire fighting and	not found on a packing list	Asbestos suits, asbestos gloves, fireproof boots, filter masks, flameproof glasses, headsets, CO2 cylinders, dry chemicals for extinguishers, spare parts for dry chemical extinguisher, etc.
2.4. Chemical laboratory	not found on a packing list	Laboratory glass, reagents, rubber hoses, laboratory heating plates, etc.
<u>3. Means of Transportation</u>	shipped 2 cars Fiat Ducato Panorama, 8 seater Fiat Campagnola, Diesel and 1 Pulman	Shipment found complete in pieces. If "Pulman" is identical with Fiat type A.60.10 van Ruggery body, the deliverance is right.
<u>4. Materials and Equipment for Construction of Demonstration Logistical Building</u>	shipped different kinds of civil engineering materials without deeper specification for what use	Shipment found complete
4.1. Work tools	shipped	Found complete
4.2. Building material	shipped	Found complete

4  
1

Preliminary Comments to Spare Parts and Replacement Materials  
Shipped by COMERINT to Luanda

Total 117,600 kg of spare parts and replacement materials

- materials and equipment for construction of demonstration logistical building and
- consumables for laboratories, Workshop and Printing Department,

were shipped on a board vessel AMARANTIA at Leghorn for carriage to Luanda.

Above items were packed in 18 containers as per Liner Bill of lading page 2 of 20 November 1984.

Checking and evaluating of Packing Lists of Crates it was found that most of the shipped items consist of civil engineering materials and deliverous of new cars and cars' spare parts as well. Verification of equipment, supply of spare parts and consumables are on an attached table. Studying the packing list items, these preliminary obligations can arise

Materials shipped in 1984 batch gives strong idea that most of financial means in the next year are going to be used for construction and civil engineering activity. Just very small amounts of items could be used as spare parts and consumables for operation of existing PTC.

As known from COMERINT the shortage of energy and water supply still exists at RTC, but no spare parts for emergency generator were shipped. The shipment of spare parts for water pumping station and emergency generator are for existing unit on the river.

At existing situation the maximum amount of spare parts for transformer, electrical equipment and water supply system are "must" for successful operation of PTC. Crate No.1/18 to No18/18 content spare parts and consumables for cars existing at Sumbe (Fiat 238 Ambulance , MOD.370/12.26 BUS, and Fiat 50/F10) as for new shipped cars Ducato Panorama 2 pcs, 1 car Compagnola Diesel and 1 Pulman 22 seater, what is believed the expected bus van Ruggery.

Comparing the list of spareparts and consumables of COMERINT Technical Annex/ COMERINT Services and list of items actually shipped at Leghorn (Livorno), the shipment exceeded previous suggestions.

On the list of shipped materials are some confusing items, which are not expected to be for reasonable consumption - as Crate No.18/18 of 5 tons battery liquid, or 975 kg of grit, what is expected could be found in Angola.

Spare parts for cars and bus are of excess amount going to such a detail, like abrasive paste, nitrothinner, handbrake cables, etc.. The missing parts are more brake cylinders, platinum distributors contacts, alternator regulators, distributors chain, bearings and shells, cranshafts, etc.. More details of expected materials are to be found at the covering table.



## PRICE BREAKDOWN OF THE MATERIALS

	PRICE BREAKDOWN OF THE MATERIALS											
ORDER - PROJECT - OF DATE/NO/REV	<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">COST OF THE MATERIALS IN ITALIAN LINES (THOUSANDS)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">UNIT SERVICE AND COMMODITY</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">PACKAGING AND PURCHASING SERVICE</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">FACTORY COSTS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">TRANSPORT - INSURANCE FREIGHT</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">GENERAL EXPENSE*</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">CONCRETE PROFIT</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">TOTAL IN ITALIAN LINES (THOUSANDS)</div> </div>										SUPPLY PRICE CIF/UNITED STATES DOLLARS	
REVENUE PROJECT FOR THE SOURCE												
REVENUE STATES												
ASSISTANCE TO PTC												
CORRECTION DATE AT 0.3.04												
18 - 111, 1,502												
EXTERIOR FIXTURES Ref. 4.3 page 74												
MAIN DOOR	7.000											
VISOR	36.000											
FALCE STILLO	16.932											
<b>TOTAL</b>	<b>66.932</b>	2.474	3.888	2.474	15.198	2.474	8.836	102.276				64.650
INTERIOR FIXTURES Ref. 4.4 page 74	22.290	1.050	1.500	1.050	6.564	1.050	4.000	37.464				23.682
FRIDGE Ref. 4.5 page 74	24.600	1.230	1.720	1.230	4.031	1.230	3.690	37.731				23.850
FINISHES Ref. 4.6 page 74												
- VINYL	4.760	178	280	178	1.097	178	637	7.308				4.620
- RED ORES	5.890	300	410	300	1.780	300	1.055	9.995				6.318
FINISHES Ref. 4.7 page 74	6.900	400	500	400	2.240	400	1.250	12.090				7.643
BRASCIETTA MACHINE Ref. 4 page 73	13.201	660	923	660	3.960	660	2.375	22.439				14.184



Recommendations on the Content of Courses

Due to the aims of PTC and necessity to increase practical and theoretical level of African students to be prepared for future jobs in the petroleum production, refining, distribution and manipulation with crude oil and petroleum products, the following recommendations are given:

1. Training Course for Refinery Technicians

Beside of proposed subjects this additional lectures are recommended:

Methods of laboratory quality control of chemicals, crude oil and products.

Principal refinery equipment and new process systems (heaters, heat exchangers, columns, coolers, extractors, pumps, compressors etc.).

Bottlenecking and troubleshooting in the refinery.

Transport of liquids and gases.

Energy conservation and modern systems of heat utilization.

Systems of measurement and process control.

Implementation of computers and microprocessors to the process flow scheme of the modern refinery.

Regular revisions of the refinery equipment and recording to the revision documentation.

Pressure and leak testing methods of pressure vessels.

Refinery utilities, cooling water and process water treatment.

Environment protection.

Human relations and principal methods of organization of the work.

What is concerning description of the Luanda refineries processing units it is desirable to give wider pictures about refinery operations processes generally. To describe modern complex refinery first and then to start with description of Luanda facilities as practical demonstration.

To the second phase of training: this takes place in the form of a practical training period in the refinery.

we understand for all pupils in Luanda Refinery in Angola. This would cause some problems concerning with:

- responsibility for fulfilling of production targets,
- safety of the equipment,
- safety of the manpower (workers and pupils).

To solve this problem, there are 2 possible ways:

a) Students are working beside of refinery regular personnel in the shifts, dealing under responsibility of the regular worker or foreman. After some time they can replace people of normal crew (during holidays, annual leave, absence etc.).

b) Students are watching the regular worker, consulting with him his activity, but not touching the equipment and no making any changes of the process factors and operations.

More effective is the case a.

## 2. Course for external refinery operators

Comments are the same as in the paragraph 1, just the level of lectures could be at adequate measures.

3. Course of production operators

Comments to subjects: To put additional subjects as follows.

Chemical, fluids and other additives and materials supporting oil production.

Secondary methods of oil production and their economy (not only water injection but gas injection, chemicals treating, using of biological agents, etc.).

Offshore drilling and production.

Crude oil transport.

Safety devices and fire extinguishing.

Notions about laboratory control and quality of main crude oil world reservoirs.

Environment protection.

4. Training course for electricians

Subjects: to be added: energy production and special conditions of electrical installations in the fireproof conditions of the refinery.

Testing of the electrical installations and trouble shooting of underground installations.

Questions of the safety, especially connected with hydrocarbon gas exhalations, leaking, and flammable liquids pollution to the soil near to the electrical cables etc.

5. Training Course for Instrument Operators

Subjects: Beside of mentioned subjects the following lectures must be included to the training programme:

Computer installations in the refinery operation.

Close loop systems of computer control of the refinery production units.

Instruments and computer's hard-ware.

Microprocessors and their installations as a way for increasing of the economy and quality of the products.

Modernization and extension programmes by microprocessors.

Examples of the up to date computerized refinery units.

6. Training course for rotary machine mechanics

Beside of the subjects of the project, part of the course should be dedicated to nondestructive methods of material testing such as: X-ray testing methods, ultrasonic methods, thermovision etc.

The other important diagnostic tests are tests for corrosion, infrastructure corrosion, structural changes of metals during operation, especially that parts of equipment working under pressure, high temperatures, hydrogen medium and corrosive agents (sulphur, hydrogensulphide etc.).

The other very important are methods saying how to determine and how to judge the life of the vessels, equipment and the necessary safety precautions.

7. Training course for automechanics

The course lasting 14 months for newcomers is adequate, but for people coming from workshops with some practical experience looks very long and may be 6 - 8 months course is fair enough.

8. Training course for welders/pipemen

Comments: The importance of this profession for safety and process reliability was deeply underestimated. The lasting if compared with other maintenance professions is short and the subjects of the training programme are not extensive enough. Students should know in detail the behaviour of different metals under the different temperatures and operation conditions (high temperatures, low temperatures of liquid gas evaporation and separation, etc.).

Methods of thermal treating and pretreating of specific steel materials, welding under inert atmosphere, welding of non ferrous materials, welding of "live" pipes, etc..

This profession is of first importance and good and skilled welder can save many hours of operation.

9. Training course for firefighting and safety operators

Subjects elements of arithmetic, geometric and physics are not necessary. What is concerning chemistry, the subject of petroleum products and crude oil as flammable liquids, and hydrocarbon gases, their properties and fire safety hazards must be extensively described. Further part of the course let be dedicated to the first aid need in the case of accidents. Students have to know how to assist to injured people, how to save somebody who is poisoned by gas, H<sub>2</sub>S or nitrogen. How to protect oneself, etc..

Subjects described in the project look very simple. This profession is very important not only during firefighting action (generally if the fire is not extinguished by unit crew in the first few minutes, firemen can only make localization and limitation of the fire and only in very rare case to stop the fire until there is liquid or gas inside of the equipment) but under normal conditions as routine preventists checking the safety precautions, and safety prescriptions, how they are realized and kept by workers.

10. Training course for production technicians

No comments excepting to add lectures on environment protection. Some other comments are the same as by paragraph 3.

11. Training course for deposits and terminals

The notions of arithmetic, geometry, physics and chemistry are not necessary and if so, how deep it will be and what time is planned for these theoretical lectures.

Also here the subject of environmental protection is mission.



ASSISTANCE TO THE PETROLEUM TRAINING CENTRE (SADCC)

TERMS OF REFERENCE OF THE MISSION

In accordance with the Terms of Reference described in the job description and the proposed Terms of Reference mentioned above (see "Introduction"), and taking into account the existing local situation, the following agenda was adopted:

1. A visit to the Petroleum Training Centre in Sumbe (Kwanza Sul) in order to investigate the state of operational readiness of the PTC, and estimate when the PTC would be fully operational.
  - 1.01 In which condition the Petroleum Training Centre is, and what does it look like.
  - 1.02 Chemical, instrumentation, electrical and language laboratories, workshop and practical fire exercise area.
  - 1.03 Staffing structure of the Centre.
2. Logistical structure of the Centre
  - 2.01 Water supply
  - 2.02 Electricity supply
  - 2.03 Fuel supply
  - 2.04 Food supply
  - 2.05 Communication system
  - 2.06 Maintenance
  - 2.07 Other services
3. Discussions with representatives of COMEXINT and the national authorities of the PTC about their suggestions to accelerate readiness of the PTC for starting courses in May 1985 for the following:
  - 3.01 Selection of students
  - 3.02 What courses are they planning to start in May 1985?
  - 3.03 Teaching staff required
  - 3.04 Improvement of water supply
  - 3.05 Improvement of electricity supply
  - 3.06 Problems of food supply
  - 3.07 Increasing the efficiency of joint work of Italian and Angolan personnel.

4. A visit to the Luanda Refinery.
5. A visit to the course of External Refinery Operations in Luanda.