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REGIONAL PETROLEUM TRAINING CENTRE (PTC), SUMBE, ANGOLA

TRAINING NEEDS SURVEY

DP/RAF/88/062

ANGOLA

Final Report*

Prepared for the Government of the Republic of Angola
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Mr. K. Stoltenberg
Team Leader

Backstopping officer: M. Derrough, Industrial Operations Technology Division

United Nations Industrial Development Organization
Vienna

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0.0 SUMMARY.

The Petroleum Training Centre in Sumbe, Angola, was established in 1984 as a Regional Training Centre. Initially for a 4 year period.

In July 1987 and February 1988, TCC decided that national consultants should carry out a Training Needs Survey in all member countries, in preparation for a second phase. SADCC/TAU was requested to undertake the survey and prepare the Training Needs Assessment Document.

The Terms of Reference for the survey was approved by the Energy Ministers at their meeting in Maputo in May 1988.

The objectives of the survey are to provide a basis for the planning that has to be undertaken to enable PTC to better serve the training needs of the SADCC countries, and to develop PTC management and staff so that they can manage the Centre by own resources.

The survey was carried out by National Consultants assisted by Energy Ministry Representatives.

The survey was conducted by structured interviews and questionnaires with Senior Managers, Heads of Departments and other senior management personnel.

The survey established the important role that PTC has played in the development and training of manpower in Angola.

It reached the unanimous conclusion that PTC is of vital importance for the further development of the SADCC petroleum industries.

To better serve the needs of the countries which are not engaged in petroleum exploration and production, it is necessary to extend the curricula with short, specialized courses, for training in specific disciplines and skills.

The basic technical training is carried out at national schools and institutes in the member countries.
These technical schools have the capacity to provide a sufficient number of candidates with basic technical training.

The oil companies all have training programmes to further train their personnel.
Training is carried out in-house, as on the job training or attachments to other company units or projects.

Due to attractive salaries and prospects the oil industry have no problems in meeting their demand for technical personnel or the various categories of professionals.

Apart from Angola, Mozambique and Tanzania, participation from the other SADCC countries has been minimal.

There are several reasons for this, such as the living conditions, lack of telecommunications, the long duration of courses, the level of training, the lack of suitable courses, general lack of knowledge of PTC and its activities, and the cost of sending trainees to Sumbe.

To make the training better suit the needs of the region, a series of new courses were suggested.

It was further proposed to improve external relations, expand PTC activities to the other countries, provide scholarships, improve conditions of employment to attract national teachers and establish cooperation with other regional training institutes.

This final report has been compiled by the TAU external consultant, based on the findings, conclusions and recommendations of the national consultants.

1.0 INTRODUCTION AND BACKGROUND.

The Petroleum Trainig Centre (PTC) in Sumbe, Angola, was established in 1979, with the purpose to increase Angolan participation in the Petroleum Industry, by the training of national technicians.

The Centre was supported by UNDP/UNIDO Projects 1978-1982.

In December 1982 the Government of the People's Republic of Angola proposed to develop the School as a Regional Training Centre for the SADCC Petroleum Industries.

The Project was implemented in 1984 for a four year-period. Actual training started in July 1985.

During the first half year of 1987, a methodological restructuration of the PTC Curriculum was carried out to ensure that the training covered the needs of the oil companies, and conformed to their levels and standards. The new programmes are presented in the "INP Methodological Restructuration Report".

The review and revision of the Curricula and Programmes were undertaken by technical committees with participants from the oil companies, and PTC.

The programme is under implementation and testing. The results have been very encouraging so far, with excellent reports from the companies with regard to examination results and trainee competence. This proves that the School is conforming to international oil industrial standards for the PTC level of training.

The project was evaluated in April 1987. The Report concluded that the Petroleum Training Centre was a viable enterprise of great importance to Angola and to other SADCC member states, and should be maintained and supported in the future.

In July 1987 the Training Coordinating Committee (TCC) met in Luanda and Sumbe. The Committee recomended that:

- In order to adopt a coherent approach and develop a basis for the development of programmes, that will adress the needs of all member states, it was necessary to appoint local consultants to undertake a Training Needs Survey.

- These Surveys would determine training levels, prerequisites for admission, type of teaching materials and practical application of courses.

- These consultancies to be funded under the present Project Budget.

The Training Coordinating Committee held its second meeting in Gaborone, Botswana, 3 - 5 February 1988, regarding the PTC second phase.
As a result of this meeting, SADCC/TAU was requested to undertake the Training Needs Survey and prepare the Training Needs Assessment Document.

In March 1988 the SADCC Energy Sector, Technical and Administrative Unit, requested assistance from UNDP for another year to be able to undertake the Training Needs Survey, and formulate the Objectives for a second phase, 1989-1994.

The Terms of Reference for the Training Needs Survey were approved by the Energy Ministers at their meeting in May in Maputo, Mozambique.

It was decided that the Survey Report should be presented at the next Ministers meeting in Arusha, Tanzania, in September 1988.

2.0 TERMS OF REFERENCE.

2.1 Objectives.

The Terms of Reference Document establishes the Objectives for the Survey, specifies the results, information and proposals to be expected. It describes the methodology, work procedures and organization, and establishes the schedule for the activities.

2.1.1 Development Objectives.

The overall objectives of the Training Needs Survey and Assessment are to:

- Provide a basis for the planning that has to be undertaken to enable PTC to better cover the needs of SADCC member states for trained personnel, within the energy sector, in particular within the petroleum sector, for the next five years.

- Develop PTC Management and Staff to a level of competence required to manage the Centre by own resources.

2.1.2 Immediate Objectives.

The training needs survey shall:

- Define the qualifications required to fill the designated positions in the Petroleum Sectors of the SADCC Countries.
- Identify the gaps between the skills required to perform satisfactory in the designated positions and those that are acquired through previous education, training and experience.
- Outline the consequences of the findings on the training strategy, training levels and programmes and organization of PTC.

2.2 Methodology.

Due to the nature of the survey, and the very short time available for such an extensive task, the collection of information was limited to structured interviews with Senior Managers and Heads of Departments.

The Institutions and the selected persons were contacted in advance of the meeting, to be able to collect the required information and prepare for the interview.

2.3 Implementation.

TAU was given the responsability to produce the Regional Training Needs Assessment Document, and, if necessary, contract the services of an external consultant.

The Survey was carried out by National Consultants assisted by Ministry Representatives.

The National Consultants, Ministry Representatives, TAU Representatives and external Consultant met in Harare 22-24 June 1988 for a conference and workshop to plan and coordinate the Surveys.

Unfortunately Malawi, Zambia, Angola and Lesotho were not able to attend the meeting.

Zambia and Angola were briefed by the external consultant after the meeting, and the conference papers were delivered to the Malawi Consultant.

The Zambia Survey was carried out by a TAU Consultant.

After completion of the National Surveys the consultants met again in Harare 17-19 August 1988, to exchange information and discuss their experiences and common issues and draw conclusions.

At the August meeting in Harare all countries, except Angola and Lesotho were represented. Zambia was represented by the TAU Consultant.

The Angolan Consultant and the external Consultant met in Luanda immediately after the meeting in Harare for a debriefing on the Angolan Survey.

3.0 OUTPUT

3.1. Manpower Needs.

The estimate of manpower and training needs are in some cases based on firm company plans and programmes, in other cases on assumptions and conclusions drawn from the interviews and questionnaires. In some cases the interviewees were unwilling to disclose figures, as they were considered confidential information, or figures were not available due to lack of longterm plans.

Detailed estimates are given in appendix 1, tables 1-7.

Angola.

The Government of Angola has formulated laws to the effect that the multinational oil companies must employ nationals up to 90% of their workforce by 1995. This means that training will be at a high level in the coming years.
Approximately 15000 persons are employed in the energy industries, with an estimated 7500-7800 employed in the petroleum industries.
The manpower needs of the petroleum sector cover the whole range of operations, including exploration, drilling, production, refining, storing and distribution.

Angola estimates its needs to 700 new employees over next five years. Of these an estimated 300 could be potential trainees at PTC, undergoing full skills training programmes.

Mozambique.

The manpower needs for the next five years have been estimated at:
Mechanics, fitters, electricians and operators. 173

The Refinery in Mozambique has been closed down and personnel are transferred to other activities at depots and in transport.

Tanzania.

The estimated manpower needs is based on the present staff which is expected to remain fairly constant over the five year period 1989 - 94. The technician manpower staff of Tanzania Development Corporation and the operating oil companies cover 11 categories and 187 employees.

Based on the modification of courses according to the Restructuration Report, the following estimate indicates the training needs that can be covered by PTC.

Pump Mechanics, Plant Operators, Fitters and Draftsmen	76
Supervisors, Head and Senior Fitters and Foremen	29
	105

Botswana, Malawi, Swaziland and Zimbabwe.

These countries are engaged in procurement, storing and distribution.

Zimbabwe's national requirements for manpower, that can be trained at PTC, over the next 5 years include 13 categories of employees. 160

A 2 year estimate for Malawi and Swaziland indicate a need of:

Safety and firefighting operators	53
Safety and firefighting trainers	7
	60

Botswana needs training for:

Department managers/supervisors	18
Safety and firefighting operators	4
Economists	2
Technicians in oil exploration and drilling	2
	26

Due to the limited size of their downstream activities other training needs can be easily met by their national school systems.

Zambia.

A yearly estimate gives the following figures:

Maintenance Technicians	18
Superintendents and Supervisory personnel	13
Operators, Radio Operators and Firefighting	6
Trainers	2
Total per year	39
Total for five years	195

This overview of manpower needs indicate a training need in the range of 1000 petroleum industry personnel, partly undergoing full skills training and partly short-time specialist and upgrading courses, over the next 2 - 5 years.
These figures should undergo a yearly review for better planning of PTC activities.

New finds of commercial oil or gasfields can increase these figures to a significant extent in the longer term.

3.2 Manpower Supply.

Angola.

PTC is the main technical school supplying the petroleum industry with manpower for skilled jobs.

More than 500 technicians have been trained at PTC up till 1988. Approximately 82% have been from Angola.

High school graduates from the National School System, with specialized courses in geology, chemistry, physics, accounting, etc., are recruited and given on-the-job training.

University graduates are recruited for professional categories, and given additional skills training.

Sonangol and the operating companies coordinate their internal training activities. Employees are provided with further education and training, to develop and improve their performance and to qualify for promotion to higher levels.

The supply from the labour market is below the needed level. The work force has therefore been supplied from external sources through service companies or the operating companies.

Training will have to be intensified during the coming years to replace expatriates with national personnel.

Mozambique.

The refinery in Mozambique has been closed down. Employees are being transfered to other activities at depots and in transport.
The hiring of manpower from the labour market and technical schools will be temporarily postponed until a natural balance has been achieved.

Tanzania.

The manpower output from technical schools for the period 1981-1986 showed a shortfall of 49% compared to the demand at the national level.

The situation for the period 1989-1994 is not expected to show any significant improvement.

This general shortage is not much felt in the petroleum sector, as requirements are limited. Better employment terms and career prospects tend to attract manpower to the petroleum industry, also in a situation of shortage.
The only acute shortage is in computer applications, as these are relatively new, and the relevant training not yet well established.

The common traditional academic skills are readily available.
They will, however, need some additional training in typical petroleum industry skills, and need experience to man higher positions.

People with general technical qualifications are also available, except in the professions of petroleum exploration (geologists/engineers), lube oil blending and computer science.

Botswana, Malawi, Swaziland and Zimbabwe.

With the present size and level of operations the petroleum companies have no pressing manpower needs. They do not expect any problems in covering their needs from the local school systems and labour markets in the next few years.

Zambia

The current needs of the Petroleum Industry in Zambia are easily covered from the Technical Schools and the labour market.

All the institutions surveyed practice in-house training for upgrading in special skills and professional work.

3.3 EDUCATION AND TRAINING.

3.3.1 Educational Levels and Standards.

The SADCC School Systems are to a large extent similarly structured.

Basic technical education can be divided into 5 major levels:

- Primary school level, 7-8 years.
  Leavers are a source of unskilled and semiskilled labour.
- Vocational training, 1 year, providing basic training in preparation for entering industry.
- Secondary technical training of 3-4 years.
- Technical college or polytechnic institute of 3 years.
- University B. Sc. in engineering taking 4 years.

The restructured PTC programmes are based on an entry level of 8 years primary education.

For the courses in Instrumentation and Electronics, an entry level of 12 years of education is recommended.

The new programmes have been developed in close cooperation with the oil companies, and are therefore comparable with similar training institutions, at the same level, serving the international oil companies.

The students that have lately graduated from PTC have been well received, and been rated as good to excelent.

The level of teaching has been rated by the Tanzanian Consultant to be intermediate between vocational and college/polytechnic certificate level.
This rating is based on the experiences of Tanzanian trainees that have attended courses at PTC.

3.3.2 Number of Technical School Leavers.

Approximately 100 students are passed out from PTC annually.

From the country reports one can conclude that the petroleum industries succeed in covering their technical manpower needs from national technical schools, universities and the labour market.

There is general consesus among the SADCC countries that they prefer to train their technicians at their own national vocational and polytechnic institutions. However, they all express a serious interest in sending employees and trainees to PTC for training in specific skills and to acquire special knowledge, based on short courses.

3.3.3 In-house Training and On the Job Training.

In-house and on-the-job training is recognized as an important part of the development of human resources.

All the oil companies have programmes covering several categories of jobs and skills. Professionals and managers are trained on attachement basis within their own organizations nationally or abroad, or they are attached to ongoing projects as counterparts or participants in exchange programmes.
Language training is carried out on a broad basis.

3.3.4 Trade Standards and Apprenticeship Programmes.

Angola has no formal system of trade standards and apprenticeship programmes.
Sonangol and the oil companies compare and maintain similar trade standards.
Sonangol employees are provided with 3-6 months work programmes with the oil companies.

The other SADCC countries run apprenticeship programmes, in some cases comparable to a City and Guilds Certificate.

The available information, however, is not sufficient to undertake an evaluation of the relative merits of their systems.

3.3.5 PTC Status

3.3.5.1 Management and Administration.

PTC has a well established status of international standard at its level of training.
The school is well equipped and its facilities are adequate and well maintained.
It plays an important role in manpower training at skill level in the petroleum industry.

Development at the School has been positive the last couple of years.
It is now equipping itself for more advanced training in electronics and instrumentation.

The School is selfsufficient in management and administration.

In maintenance assistance from the expatriate experts is still needed, particularly in extraordinary cases.

3.3.5.2 Teaching and Instructors.

The next phase is aiming at self sufficiency also in teaching staff.

The school has not succeeded in attracting or training Angolan or SADCC teachers and instructors. Of 10 Angolan instructors trained only 3 remain, teaching general subjects.
Expatriate assistance will therefore be needed to a large extent also through the second phase.

3.3.5.3 Curriculum.

According to the INP Methodological Restructuration Report the following main courses are offered:

- Production Operators
- Firefighting and Safety
- Electrical Maintenance
- Instrument Maintenance
- Mechanical Maintenance
    - Motor Vehicles
    - Plant and Machines

  - Rotary Machines
- External Refinery Operations
- Administration
  - Clerical
  - Accounting

In addition to these main courses, 6 seminars or short courses have been prepared:

- Cathodic Protection
- Management Techniques — held 3 times
- Maintenance Planning — held once
- Educational Engineering
- Pipeline Corrosion Control and Protection
- Introduction to Personal Computer (Use of Symphony Programme) — held 3 times

It is an objective for the second phase that the school shall better cover the training needs of the SADCC countries, and act as a true regional training centre.

3.3.5.4 Attendance.

Untill May 1988, 502 persons have been trained. Table 1. More than 80% of the trainees have been from Angola, with fair attendance from Tanzania and Mozambique.

TRAINED PERSONNEL

	Techn. courses	Seminars and short courses	Language courses	Total
Angola	233	121	57	411
Tanzania	45	0	0	45
Mozambique	26	2	0	28
Lesotho	10	0	0	10
Botswana	0	4	0	4
Swaziland	2	0	0	2
Zambia	0	1	0	1
Zimbabwe	0	1	0	1
Malawi	0	0	0	0
	316	129	57	502

Table 1.
School leavers from start of training till May 88.

The main purpose of the interviews was to identify training needs, but it was also important to establish the reasons for lack of attendance from the majority of SADCC countries.

The reasons for not sending people to Sumbe are many and varied.
The interviews have disclosed:

- A considerable lack of knowledge about PTC and its activities.
- A fear for the security situation.
- The lack of communications, particular telecommunications.
- The lack of infrastructure and recreational opportunities.
- The high cost of sending trainees to Sumbe, i.e. lack of scholarships or sponsorships.
- The level of training is too low. Basic vocational and technical training is taken care of in their own national schools and institutes.
- Courses should be shorter, so the trainees will not have to be away from their jobs for so long.
- They need short, specialized courses, at higher levels, for professionals and management.

3.3.6 Suggestions and Further Actions.

3.3.6.1 Courses.

The training has so far been limited to mainly Angolan technical personnel, at vocational level, of long duration. In the other countries general basic vocational training is preferably taken care of at national institutes.

There are certain skilled job positions, that are not covered by PTC training. These are presently filled by expatriates.

To better cover the needs of the other countries, and also to be able to replace expatriates with nationals, it is suggested that training is expanded to cover management disciplines, and specific courses of

short duration, at post certificate and graduate levels, for technicians, engineers and professionals.

A series of courses have been suggested covering:

- Energy and Petroleum Management.
- Management of Oil Installations.
- Depot Management.
- Maintenance Management.
- Construction Management in Relation to the Oil Industry.
- Supervisory Management.
- Crude Refining and Processing.
- Natural Gas Technology.
- Formation Evaluation.
- Reservoir Management.
- Seismic Interpretation.
- Economics of Energy.
- Transport Economics.
- Petroleum Economics.
- Computer Science.
- Analytical Techniques and Computers Applied in Petroleum and Geological Laboratories.
- Pipeline Design and Construction.
- Procurement and Distribution of Petroleum Products.
- Lube Blending Technology.
- Product Costing and Profitability Analysis.
- Product Marketing.
- Petroleum Regulations.
- Advanced Technical Courses for upgrading of: Auto Mechanics, Instrument Technicians, Pump Mechanics, Maintenance Electricians, Maintenance Mechanics.

- Laboratory Technicians for Petrochemicals and Aviation Products.
- Advanced Accounting.
- Secretarial Course.
- Training of Trainers.

In the short time given for this survey, it has not been possible to go into detailed analysis regarding contents and levels, and to which extent present course material can be adjusted and included in the proposed courses, or to which extent they require development of new course modules and material.

It is therefore suggested that these proposals are further evaluated by technical committees, working in close cooperation with the local petroleum industries.

3.3.6.2 Location of Training.

The location of the Training Centre in Sumbe has been a constraint on the attendance.

The SADCC members have therefore suggested that PTC arrange courses and seminars at suitable locations, or in-house, in the respective countries.

This will reduce the cost of training for the companies, and permit the participation of a greater number of managers, professionals and technicians.

It will have the added advantage of bringing PTC staff in closer contact with the local industries, make PTC better known, establish the profile of a truly regional institute, and enable PTC to better structure its training to the members' needs.

It has also been suggested that certain programmes are arranged in cooperation with local institutions, colleges or universities.

3.3.6.3 Teachers and Instructors.

The ambitious goal of nationalizing the technical teaching staff has not been achieved.
The location of Sumbe will undoubtedly act as a restraint.

However, the main reason is probably that there is a shortage of technical personnel in general, and particularly technical personnel with teaching qualities and ambitions.

As long as there is a shortage of qualified technicians , and competition in industry to attract the best candidates, industry will tend to offer favourable conditions of employment.

It will therefore be a prerequisite, to be able to recruit national teachers, that conditions of employment are comparable to industrial conditions.

Another approach could be for the industry to release qualified persons for a certain period of time, preferably tied to better prospects for promotion on return to their jobs.

This particular problem should be considered with the purpose to work out a solution.
The plans for the next five years must, to a considerable extent, be based on expatriate instructors.

3.3.6.4 External Relations.

The Survey has had the added advantage to act as a promoter for PTC.
The lack of knowledge of PTC's activities must take some of the responsibility for the lack of response and participation from SADCC members.
This survey will have to be followed-up by more detailed analyses to establish training levels and course contents, as a basis for curriculum revisions.

Regular reviews should be established with the member states, to be able to keep the school programmes up to date, and in line with technological and industrial developments and needs.

This will increase the awareness and interest of the members and tend to improve attendance.

4.0 CONCLUSIONS.

The Training Needs Survey was carried out according to the time schedule and Terms of Reference.

In some instances the Consultants had difficulties in obtaining certain information, which was considered confidential, or it was not available.

The Reports cover adequately the main areas, and provide a good basis for the planning of phase 2, as stated in the Development Objectives.

The PTC has played a vital and major role in Angolas efforts to train technicians, at the skills level, for its petroleum industries.

The other SADCC countries, except, to a certain extent, Mozambique and Tanzania, have preferred to give the basic skills training in their own vocational schools and technical institutes.

It is unanimously concluded that PTC is of vital importance to the development of the SADCC petroleum industries, and that it must be supported for the next 5 year period.

The petroleum industry is a truly international industry.
This requires that courses and levels are comparable with international standards.

The School's new curricula and courses have been developed in close cooperation with the oil companies, and conform with international standards at the operator / technician vocational level.

The School is well equipped, the physical facilities are adequate and well maintaned.
The trainees are achieving good results and are recognized as generally good to excellent by the industry.

The schools and universities in the SADCC region provide the industry with adequate academic skills for higher levels of personnel. To adequately execute their responsibilities in the petroleum industry the graduates need additional specific training and experience in special petroleum fields.

The interests displayed in safety and firefighting training go beyond the petroleum industry and include city and municipal fire brigades.

The second phase is aiming at reaching a wider selection and more even distribution of trainees in the SADCC countries.
To achieve these objectives, and attract students from the other countries, it is necessary to develop shorter special courses appropriate for professionals, engineers and senior personnel.
The training offer must be adjusted to local requirements.

Other restraining factors, such as lack of infrastructure,in particular telecommunications and transport, unfamiliar living conditions, and lack of financial support, must be vigourously attacked to find practical solutions.

To raise the level of information about PTC in the region, a more active information policy must be developed and implemented.

It has not been possible to develop a national staff of teachers and instructors. To achieve this objective, it is necessary to consider comparable living standards, conditions of employment and particular incentives, being practiced in the industry, for personnel with similar qualifications.

The National Consultants were deeply committed to their tasks. They managed in a very short time to get a good grasp of the status of the training needs and other conditions in their petroleum industries.

The Survey has had the additional effect of increasing the awareness of the role that PTC can and should play in the regional development of manpower resources in the petroleum industries.

5.0 RECOMMENDATIONS.

This list of recommendations is based on the findings and recommendations given in the reports from the National Consultants, and also on the discussions and conclusions from the meeting in Harare in August, on completion of their missions.

- The curriculum at PTC should be further developed to include short-time, advanced courses, in specific subjects at post certificate and graduate levels, for further and upgrading training of technicians, engineers and professionals, and supervisory and management personnel.

- For the longterm development of the curricula a raising of the entrance level from 8 to 12 years to the general courses should be considered.

- In the Restructuration Report, an entry level of 12 years of education is proposed as a basis for admittance to the Instrumentation and Electronics Course.
  We support this proposal.

- PTC should put greater effort in producing courses covering dowstream activities, such as purchasing, storage, distribution and transport.

- Safety and firefighting is covered in the Methodological Restructuration Report. It should however be reevaluated in light of the great interest shown by firebrigades in general.

- A plan and programme for the recruitment and development of

national or regional teachers and trainers must be developed and implemented without delay.

This must include conditions for employment to make it advantageous economically and professionally, to take up teaching as a temporary or permanent occupation.

- PTC should offer in-house and on-the-job training courses in member countries to cut down the cost of training and secure local relevance.

- Scholarships should be made available to students from countries that cannot afford to pay for their students.

- PTC should also work for the improvement of training in general, and actively work to expand their training of trainers activities.

- The external relations of PTC must be improved to make the School and its programmes better known in the member countries.

  This can be achieved by:

  . Cooperation in development of new courses to better meet the national needs.

  . Regular News letters and leaflets to Personnel and Training managers and Instructors. These can also be distributed to potential trainees.

  . Regular meetings and conferences with the same officers to enable them to include PTC in their training plans. The PTC representatives will then become conversant with local conditions.

  . Establish relations and cooperation with other Technical Institutes in the Region.

- To ensure a regular supply of trainees the living conditions must be improved. Communications, in particular telecommunications, must be established on a permanent basis. Recreational opportunities should be improved.

APPENDIX 1. Manpower Needs.

The following tables are copied from the National Reports.

Table 1 & 2	Angola
Table 3	Mozambique
Table 4	Zimbabwe
Table 5	Tanzania
Table 6	Botswana, Malawi, Swaziland, Zimbabwe
Table 7	Zambia

T A B L E - I

AREAS	JOB POSITION														
PRODUCTION	ASSISTANT	OPERATOR	MECHANIC	MEDIUM TECHNICIAN	INSTRUMENTALIST	SUPERVISOR	SUPERIN-TENDENT	ENGINEER							
DRILLING	ASSISTANT	MECHANIC	MEDIUM TECHNICIAN	SUPERVISOR	SUPERINTENDENT	DRILLER	ENGINEER								
GEOPHYSICS	OPERATOR	ASSISTANT	MEDIUM TECHNICIAN	OBSERVER	GEOPHYSICIST	-	-	-							
GEOLOGY	SUPPORTING LAB MAINTAINER	LAB MAINTAINER	ASSISTANT	MEDIUM TECHNICIAN	GEOLOGIST	-	-	-							
PORT (MARINE/LAND)	OPERATOR	MARINE OIL TANK FILLER	SUPERVISOR OF EXPEDITIONS	ASSISTANT OF EXPEDITIONS	-	-	-	-	-						
REFINERY	LAB. OPERATOR	PLANT OPERATOR	FURNACE OPERATOR	PUMP MEASURER	LAB MAINTAINER	BLENDING PLANT SUPERVISOR	INSTRUMENTA-TION TECH-NICIAN	CHIEF OF THE GROUP	CHIEF OF SHIFTS	ANALYST	PLANT CHIEF	CHEMICAL ENGI-NEER IN BLEN-DING LAB	LUBRICATION ENGINEER		
AIRPLANE	MECHANICS	SUPERVISOR	CHIEF OF SUPPLY EQUIPMENT	SUPERVISOR OF SUPPLIES	SUPERVISOR FOR PETROLEUM PRODUCT MOVEMENT	-	-	-	ADDITIONAL - JOB POSITIONS						
GAS	ASSISTANT	INSTALLATION OPERATION TECHNICIAN	SUPERINTENDENT FOR INSTALLATION	-	-	-	-	-	CARTOGRAPHER						
AUDITOR	MEDIUM TECHNICIAN	SUPERIOR TECHNICIEN	SUPERVISOR	-	-	-	-	-	TOPOGRAPHER						
									DRAFTER IN GEOLOGY/GEOPHISICS						
									RESERVOIR ENGINEER						
SHIPPING	ASSISTANT SHIP MASTER	SHIP MASTER	SHIP COMMANDOR	MASTER FOR CARGO MAR/LAND	CHIEF OF CARGO CONTROL MAR/LAND	PRODUCT INSPECTOR FOR CARGO MOVEMENT	SUPERVISOR FOR CARGO MOVEMENT	-	PROJECT ENGINEER						
									ECONOMIST SUPERIOR						
SALES	INSPECTOR MARINE/ AVIATION	INSPECTOR CONSUMER	SALES ASSISTANT FOR PETROL & CONCESSIONAIRE	TECHNICIAN FOR PETROL MARKE-TING	TECHNICIAN SUPERIOR FOR MARKETING				STOCK CONTROLER						

T A B L E - 2

COMPANY	AREA	1988		1989		1990		1991		1992		TOTAL	
		TEC SUP	TEC MED	TEC SUP	TEC MED	TEC SUP	TEC MED	TEC SUP	TEC MED	TEC SUP	TEC MED	TEC SUP	TEC MED
	DRAFTING	0	2	0	1	0	0	0	0	0	0	0	3
	ACCOUNTANTS	1	4	0	3	1	3	0	0	0	1	2	11
S	ADMINISTRATION	5	1	1	2	2	0	0	0	0	1	8	3
	COMPUTERS	5	2	2	0	3	0	2	0	2	0	14	2
O	SECRETARIES	0	3	0	2	0	0	0	0	0	0	0	5
	FINANCE	2	0	0	0	0	0	0	0	0	0	2	0
N	MINES	3	0	3	0	2	0	2	0	2	0	12	0
	PRODUCTION	4	0	5	2	4	0	3	1	3	1	19	4
A	MECHANICAL ENGINEER	8	13	3	7	3	3	2	0	2	0	18	23
	ELECTROMECHANICAL ENGINEER	1	0	2	1	2	0	0	0	0	0	5	1
G	DRILLING	3	0	3	0	2	0	2	0	2	0	12	0
	RESERVOIR	2	0	3	0	3	0	2	0	1	0	11	0
O	ATTORNEYS	1	0	1	0	2	0	0	0	1	0	5	0
	LIBRARY	0	0	1	2	0	0	0	0	0	0	1	2
L	TRANSPORT	0	0	0	1	0	0	0	0	0	0	0	1

... 2

T A B L E - 2 (CONTD...)

COMPANY	AREA	1988		1989		1990		1991		1992		TOTAL	
		TEC SUP	TEC MED	TEC SUP	TEC MED	TEC SUP	TEC MED	TEC SUP	TEC MED	TEC SUP	TEC MED	TEC SUP	TEC MED
	SOCIOLOGY	0	0	1	0	0	0	0	0	0	0	1	0
S	CHILDCARE	0	0	0	6	0	0	0	0	0	0	0	6
O	PSYCHOLOGY	2	0	0	0	2	0	1	0	0	0	5	0
	GEOLOGIST	7	2	9	1	9	3	4	3	3	0	32	9
H	GEOPHYSICIST	3	3	4	3	4	1	3	0	2	0	16	7
A	ELECTRICIAN	0	2	0	3	0	1	0	0	0	0	0	6
H	CHEMISTRY PRODUCTION	1	2	0	0	2	0	0	0	0	0	3	2
	CIVIL CONSTRUCTION	0	1	1	0	0	1	0	0	0	0	1	2
G	ECONOMIST ORGANIZATION	1	0	0	0	0	0	0	0	0	0	1	0
O	ELECTROTECHNICIAN ENGINEER	3	0	1	0	0	0	0	0	0	0	4	0
L	ENGINEER SYSTEM ORGANIZATION	1	0	0	0	0	0	0	0	0	0	1	0
	ENGINEER INSTALLATIONS	0	0	0	1	0	0	0	0	0	0	0	1

T A B L E - 2

COMPANY	A R E A	1 9 8 8	1 9 8 9	1 9 9 0	1 9 9 1	1 9 9 2	T O T A L
	PRODUCTION TERMINAL	45	30	30	15	0	120
	ACCOUNTANTS	0	12	0	12	0	24
C	ELECTRICITY/ INSTRUMENTATION	0	12	0	12	0	24
	SECRETARIES	10	10	10	10	0	40
A	SUPPLIES	12	0	12	0	0	24
	TRAINING	6	0	6	0	0	12
B	AUTO MECHANICS/ MAINTAINANCE	10	10	10	10	0	40
	PRODUCTION EQUIP-MENT ENGINEER	3	5	5	5	0	18
G	CONSTRUCTION ENGINEER	3	5	5	5	0	18
	RESERVOIR ENGINEER	3	5	5	5	0	18
O	PERFORATION	3	5	5	5	0	18
	GEOLOGIST	3	5	5	5	0	18
C	FINANCE	3	5	5	5	0	18
	COMPUTERS	2	3	3		0	8
	ELECTRICITY ELECTRONIC	1	2	2	2	0	7

ADDITIONAL JOB REQUIREMENT FOR CABGOC IN 1988 IS IN THE ARE OF REFRIGERATIION OPEN POSITIONS ARE 12.

T A B L E - 2 (CONTD...)

COMPANY	AREA	1988	1989	1990	1991	1992	TOTAL
	ANALYST	1					1
	HUMAN RESOURCES	2					2
	ADMINISTRATION	4					4
F	REFINARY OPERATOR	18					18
	REFINARY MAINTAINER	5					5
I	MECHANICAL ENGINEER	1					1
	ELECTRIC ENGINEER	1					1
E	GEOLOGIST	1					1
	PROJECT ENGINEER	2					2
A	DRAFTING CHIEF	1					1
	OPERATION ENGINEER	2					2
	PRODUCTION OPERATORS	6					6

MOZAMBIQUE MANPOWER NEEDS

The training involves skills training and upgrading of the actual and provisional manpower, projected over 5 years.

CATEGORIES AND NUMBER OF MANPOWER NEEDED

	Positions	Quantities
1.	Mechanics maintenance	26
2.	Auto mechanics	22
3.	Depot & Terminal Operators	42
4.	Electricians	20
5.	Fire-Fighting Operators	27
6.	Mechanical & Pipe Fitters	17
7.	Production Operators	19
		173

The prerequisites for admission to the courses above will be 8 or 9 years primary education.

TABLE 3

ZIMBABWE TRAINING NEEDS

The list of manpower needs that follows here below is divided into two main categories viz. those that can be catered for at PTC in Sumbe and those that can be catered for by CPS either in Oxford on extended secondment or at University of Harare (in conjunction with CPS) as a thin sandwich. Further, due to similarities and duplication of needs in certain and several areas by the companies, the request of the industry have been consolidated and there is, therefore, deliberately no company by company requirements but instead a national requirement.

Proposals for PTC short-time advanced courses.

Post	Education required at entry	Candidates 1989-1994
Laboratory technician (for petrochemical and aviation products)	A-Level chemistry	6
Computer programmers	AlLevel/degree	10
Technical Manager (incl ship handling)	A-Level	6
Pump Mechanics	O-Level/Journeyman	20
Depot Operative	O-Level	20
Fire Fighters	O-Level	40
Depot Manager (product distribution, safety and loss control)	A/O-Level	10
Maintenance Electrician	Journeyman	5
Mechanical Technician	Journeyman	5
Motor Mechanics	Journeyman	5
Train-the-Trainer	Senior Technicians	8
Product Marketing	A-Level/degree	10
Instrument Technician	Polytechnic diploma	15
		160

Note: Journeyman means a tradesman who has served a full apprenticeship as accepted by, or equivalent to, the City and Guilds (London).

Proposals for CPS - COLLEGE OF PETROLEUM STUDIES

The programmes shown below are those that should be offered by CPS, in conjunction with PTC, at Oxford, Luanda or Harare.

Post	Education required at entry	Candidates 1989-1994
Chemist (Hydrocarbons)	B.Sc	5
Engineers (Oilfield Operations)	B.Sc	2
Petroleum Economist (source, supply, shipping, etc.)	B.Sc	2
Marine Insurance and Financial Management	B.Sc	2
Engineers (Dowstream Operations)	B.Sc	5
Sales Engineers (Lubrication Technology)	B.Sc/Diploma	5
Computer programmer	B.Sc	5
Petroleum Engineer	B.Sc	5
Management & Administration (M.B.A.)	B.A/B.Sc	15
Engineer (Lubricant Formulation)	B.Sc	7
Management (Forecasting Technics & practices)	B.A/B.Sc	5

TABLE 4

TANZANIA TRAINING NEEDS

Estimate to be trained at Sumbe with modification of existing courses (1994):

COMPANY CATEGORY	BT(T)	ESSO(T)	AGIP(T)	CALTEX(T)	TOTAL	TIPER	LOBP	TOTAL
1. Pump mec. Plt. Oper. Fitters Draughts- Foremen	12	5	18	2	5	34	-	76
2. Supervrs. Head and Senior Fitters, Foremen	3	4	9	1	-	9	3	29
TOTAL	15	9	27	3	5	43	3	105

The above figures are just estimates provided by the respective companies. The categories identified are mostly with Full Technician Certificate or Trade Test Certificate.

TABLE 5

TRAINING NEEDS

PROCUREMENT - STORING - DISTRIBUTION

COURSES	CATEGORY	Botswana	Malawi	Swaziland	Zimbabwe	Course Duration Weeks	YEARS		
							89/90	90/91	
Safety-Depot Managers	Managers	3			6	2 - 5	5	4	
Depot Managers	Managers Supervisors				6	2 - 4	3	3	
Supervisory Management	Managers Supervisors	15		2	6	2	12	11	
Pump Station Management	Superintendents				4	2 - 4	4		
Economics Energy Planning	Economists	2			8	2 - 4	10		
Procurement					2	2 - 4	2		
Oil Exploration/Drilling		2				2 - 4	2		
Safety and Firefighting	Trainers	4	5	2		2 - 4	11		
Safety and Firefightings	Operators		50	3	6	2 - 3	30	29	
TOTAL		26	55	7	38		79	47	GRAND TOTAL: 126

Estimated Training Needs 1989 - 1991

for

Botswana, Malawi, Swaziland, Zimbabwe,

to be carried out at PTC, Sumbe

TABLE 6

ZAMBIA TRAINING NEEDS

Zambia's manpower needs are limited.
The numbers and figures are estimates, as accurate figures were not readily available, and therefore represent an order of magnitude.

YEARLY ESTIMATES OF CATEGORIES AND NUMBERS OF MANPOWER REQUIRED FOR TRAINING 1989-94

CATEGORY	ESTIMATED NUMBER
Electricians	7
Pump fitters	3
Mechanics	6
Workshop Superintendentes	5
Section Heads	2
Departement Heads	2
Fire Fighting	2
Intrumentationists	2
Maintenance Coordinators	2
Operators	2
Shift Leaders	2
Radio Operators	2
Trainers	2
Per year	39
Total for 5 years	195

TABLE 7

APPENDIX 2.

List of National Consultants

List of Participants at the Start-up Conference

List of Participants at the Final Meeting

LIST OF NATIONAL CONSULTANTS

Angola

Mr. Syanga Abilio
SONANGOL

Botswana

Ms. Joyce Thobega
Institute of Development Management
P.O. Box 1357
Tel. 352371
Tlx. 2429 BD
Gaborone/Botswana

Malawi

Prof. C. Chipeta
Head Economics Dept
University of Malawi
Tlx. 44742
Lilongwe/Malawi

Mozambique

Mr. Antonio J. Langa
Petromoc
P.O. Box 417
Tel. 30182
Tlx. 6582
Maputo/Mozambique

Swaziland

Ms. Zakhe Hlanze
Ministry of Agriculture
and Cooperatives
P.O. Box 162
Tlx. 2109 or 2301
Mbabane/Swaziland

Tanzania

Mr. M.K. Nilla
Tanzania Petroleum Develop.
Corporation
P.O. Box 2774
Tlx. 41219 PETROL TZ
Dar-es-Salaam/Tanzania

Zambia

Mr. J.S. Caholo (From TAU)

Zimbabwe

Mr. Steve M. Mpofu
Total Zimbabwe Ltd
Harare/Zimbabwe

RPTC MEETING, HARARE 22-24 JUNE 1988

NAME	FUNCTION MINISTRY REP. OR CONSULTANT	COMPANY/MINISTRY ADDRESS	TELEX
1. Mr. M.K. Nilla	National Consultant	Tanzania Petroleum Development Corporation P.O.Box 2774, Dar-es-Salaam, Tanzania	41219 PEZROL TZ
2. Ms. Joyce N. Thobega	National Consultant	Institute of Development Management Box 1357, Gaborone, Botswana	2429 BD Tel: 35 23 71
3. Mr. Nozipho Sekgoma	Ministry Representative Training Coordinator	Ministry of Mineral Resources & Water Affairs B/P 0018, Gaborone, Botswana	2503 MIRWA Tel: 35 24 54
4. Zakhe Hlanze	Consultant	Ministry of Agriculture and Cooperatives P.O.Box 162, Mbabane, Swaziland	2301
5. Mr. António J. Langa	Consultant & Ministry Representative	National Oil Company of Mozambique Petrocom-Min. of Industry & Energy Box 417, Maputo, Mozambique	6382 Tel: 30 182
6. Mr. Steve N. Mpofu	Consultant	Total Zimbabwe P.O.Box 2994, Harare, Zimbabwe	4433 ZW Tel: 68 367
7. T.W. Samunyai	Ministry Representative	National Oil Co. of Zimbabwe-Chairman Assistant Director Dep. of Energy	4362 & 4289 ZW
8. Mr. Pat Travers	Consultant	Total Zimbabwe Ltd. P.O.Box 2994, Harare, Zimbabwe	4433 ZW
9. Mr. Joao S. Caholo	SADCC/Energy	SADCC Energy Sector Box 2876, Luanda, Angola	4090 TAUANG AN
10. Mr. Egil G. Arntsen	SADCC/Energy	SADCC Energy Sector Box 2876, Luanda, Angola	4090 TAUANG AN
11. Mrs. D.Q. Chandiwana	Ministry Representative SADCC Energy Contact Point	Ministry of Energy & Water Resources Develop. Private Bag 7758, Cause way, Harare, Zimbabwe	2141 ZAMGOV ZW

L I S T O F P A R T I C I P A N T S

RPTC JOINT ROUND UP MEETING, HARARE 17-19 AUGUST, 1988.

Botswana

Consultant:

Ms. Joyce Thobega
Institute of Development Management
P.O. Box 1357 Gaborone/Botswana
Tel. 352371
Tlx. 2439 BD

Malawi

Consultant:

Prof. C. Chipeta
Head Economics Dept
University of Malawi
Tlx. 44742
Lilongwe/Malawi

Ministry Representative:

Mr. H.B. Chibwana
Deputy Secretary
Tlx. 44839
Lilongwe/Malawi

Mozambique

Consultant:

Mr. Antonio J. Langa
P.O. Box 417
Tel. 30182
Tlx. 6382
Maputo/Mozambique

Ministry representative: Same

Swaziland

Consultant:

Ms. Zakhe Hlanze
Ministry of Agricultural
and Cooperatives
P.O. Box 162
Tlx. 2109 or 2301
Mbabane/Swaziland

Tanzania

Consultant:

Mr. M.K. Nilla
Tanzania Petroleum Develop.
Corporation
P.O. Box 2774
Tlx. 41219 PETROL TZ
Dar-es-Salaam/Tanzania

Zambia

Consultant:

Mr. J.S. Caholo (From TAU)

Zimbabwe

Consultant:

Mr. Pat Travers
Total Zimbabwe LTD
P.O. Box 2994
Tel. 68367
Tlx. 4433 ZW
Harare/Zimbabwe

Mr. Steve M. Mpofu
(Same address)

Mr. F.N. Maziveyi
(Same address)

Ministry Representative:

Mr. T.W. Samunyai
National Oil Co of Zimbabwe
Chairman Assistant Director
Dep of Energy
Tlx. 4362 or 4289 ZW
Harare/Zimbabwe

Organizer:	Mrs. D.O. Chandiwana Ministry of Energy, Water Resources and Development P. Bag 7758 Tlx. 2141 or 4254 Zimgov ZW Harare/Zimbabwe
RPTC ----	Mr. J. Nunes e Sa Tel. 34345 (House) R. Conego Manuel das Neves nr. 1-2, apt. 5 Luanda/Angola
TAU ---	Mr. J.S. Caholo Mr. E.G. Arntsen Mr. M. Vicente P.O.Box 2876 Tel. 345288/345147 Tlx. 4090 TAU an Luanda/Angola
Norconsult ----------	Mr. K. Stoltenberg Kjorboveien 20 1300 Sandvika International call +472471000 Tlx. 72075 norco n Oslo/Norway

APPENDIX 3.

TRAINING NEEDS SURVEY

Project 1.0.2, second phase

Summary

The Ministers are invited to recall that during their last meeting in Maputo, in May 1988, they decided that a training needs survey should be undertaken by national consultants in order to adjust courses and training levels to better suit the member States' needs.

Following this decision, and according to the approved Terms of Reference for the survey, each member State appointed a national consultant to undertake the Survey and one ministry representative to assist the consultant. TAU appointed an external consultant to assist in the implementation and coordination of the survey.

The national consultants were briefed on methodology and procedures in a start-up meeting in Harare, 22-24 June.

Two months later their reports and findings were presented in joint meeting with the external consultant, also in Harare, 17-19 August.

In spite of the absence from the first meeting of the consultants from Angola, Malawi, Zambia and Lesotho, eight member States submitted reports according to the Terms of Reference.

The findings of the reports were consolidated into a Final Report (enclosed) by the external TAU consultant.

Given the short time for the survey, this result must be considered as very satisfactory.

Angola, NORAD and UNDP have funded the PTC during the first four-year period 1984-1988, and during the interim period covering the second half of 1988.
The SADCC Country Surveys unanimously conclude that the PTC plays an important role in manpower training in the petroleum industries. The school must continue as a regional training centre and be supported during the second phase for a further 5-year period, 1989-1994. To avoid disruption in programmes and activities, financial support is urgently needed during an extended interim period, to work out the new Project Document and make funds available for the second phase.

Proposal

1. The Ministers are invited to endorse the conclusions and recommendations consolidated in the Survey Report, together with the comments from the Energy Officials.

2. The Ministers are further invited to instruct TAU to:

2.1. Forward the Report to NORAD, the TCC, UNDP, UNIDO and any other institution TAU may feel of interest for the funding of the Second Phase.

2.2. Direct TCC, in cooperation with PTC management, to immediately start the review and revision of curricula, and the selection and development of new courses identified in the Survey report. This work will serve as a necessary input for drawing up the Project Documentat and requesting funding. Any outside assistance that might prove necessary may be hired.

2.3. Submit an application to NORAD and UNDP to fund:

a) Operation of PTC for an extended period of time to avoid disruption of PTC activities, until funds can be made available for the Second Phase.

b) The work to develop the Project Document as mentioned in 2.2.

2.4 Closely monitor the progress of these activities with the objective of starting the Second Phase by July, 1989.

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COMMENTS FROM ENERGY OFFICIALS, RE. AGENDA ITEM 5.7.A "PTC TRAINING NEEDS SURVEY"

The Energy officials endorsed the conclusions and recommendations from the Final Survey Report, with the following comments.

1. Stressed the need for local/regional instructors and teachers for the regular long-term courses.

2. Introduction of a certificate of competance that is recognized in the region.

3. Flexibility in entrance levels is a must; For example:

   a) 8 - 9 years of schooling at entry (skilled workers for industry which needs good operators and mechanics).

   b) Twelve years of schooling at entry (certain areas such as electronics instrumentation systems).

4. PTC shall concentrate on areas where member countries will not concentrate training efforts. For example, for specialized subjects where there are insufficient trainees in memeber States, training should be done in PTC.

5. Pre-selection testing should be undertaken in the trainees' country before they are sent to PTC.

6. Widening the range of users, now restricted to petroleum and power utilities, to other potential users.

7. Module construction of courses, with a view to establishing a career, and flexibility to cope with each country's entrance level requirements.

8. Improve external relations to be better known in SADCC countries.

9. Improve PR activities and liaise with other training institutes in the region.

10. Emphasize downstream development.

11. Grant scholarships, paid travels to/from Angola.

12. Satisfy the needs of the trainees themselves e.g.better communications.