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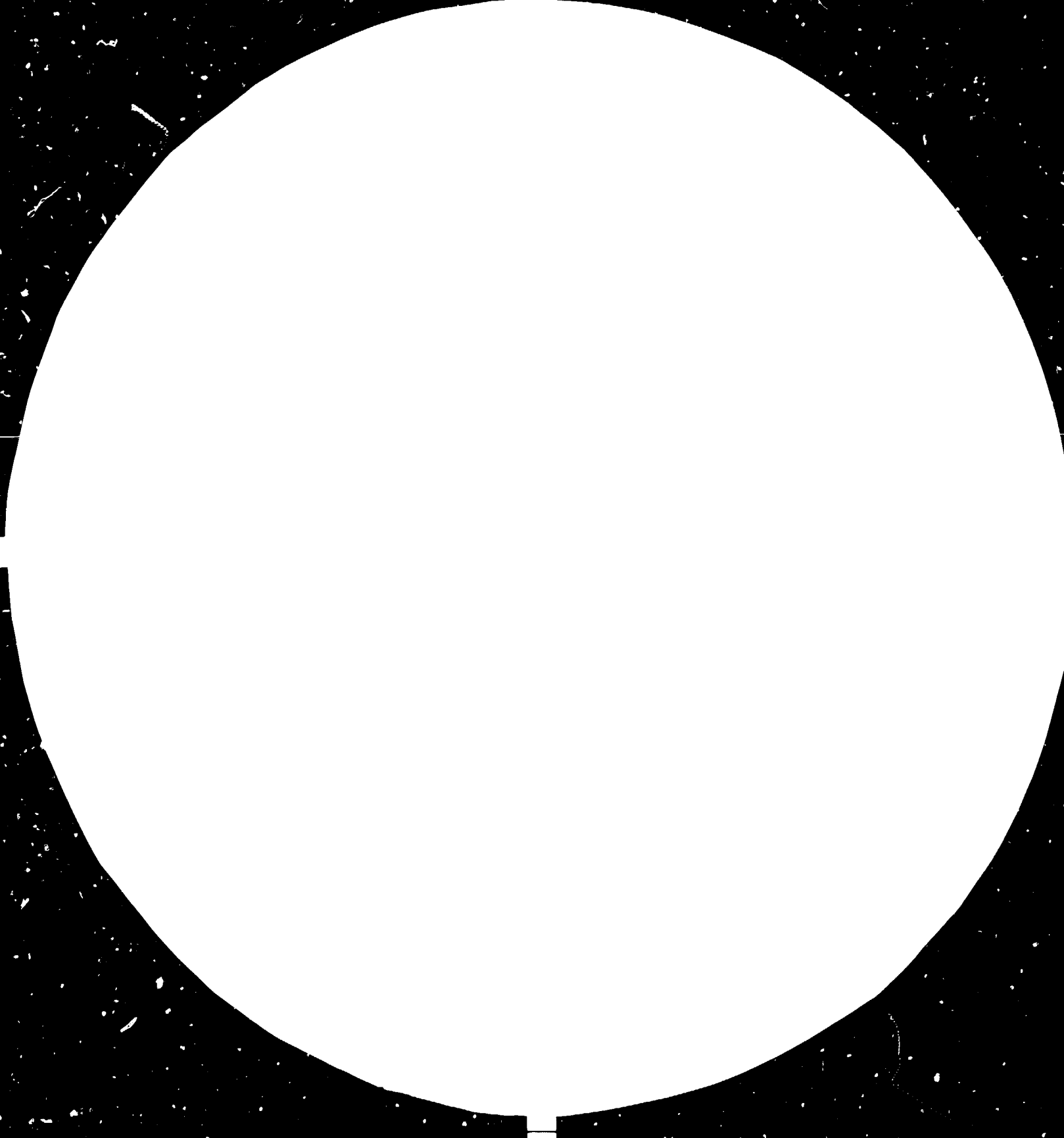
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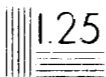
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5 January 1964
ENGLISH

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Comoros Islands
REHABILITATION AND EXPANSION OF
PETROLEUM PRODUCTS STORAGE AND
HANDLING FACILITIES
TF/COI/81/001
COMOROS ISLANDS

Technical Report*

Trip No. 5

Prepared for the Government of Islamic Federal Republic of Comoros Islands
by the United Nations Industrial Development Organization,
acting as executing agency for United Nations Development Programme

Based on the work of Buckley D. Bohna
Petroleum Engineer

United Nations Industrial Development Organization
Vienna

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I. INTRODUCTION

This is the fifth in a series of reports covering an assignment carried out by the United Nations Industrial Development Organization for the Government of the Islamic Federal Republic of Comoros Islands and the Islamic Development Bank for the rehabilitation and expansion of facilities for transporting, handling and distribution of petroleum products in the islands of Grand Comore, Anjouan, and Moheli.

This report is prepared primarily for the purpose of documenting the final acceptance of the first stage of rehabilitation and expansion of the Moroni Petroleum Depot. This work was completed by the French contractor, Technique & Construction S.A.R.L., (formerly COFITEC, S.A.) and accepted by the owner Comore Hydrocarbures, in October, 1982. (See Report No. 4 dated October 13, 1982).

Although not covered by a standard form of international construction contract with a formal 12 month period of maintenance following initial acceptance of the completed work, and requiring the issuance of a Maintenance Certificate to indicate the approval of the works and the closeout of the contract, the present inspection and final acceptance after 12 months of operation is the equivalent of the successful conclusion of the Period of Maintenance.

A general review of operations during the period was made with Comore Hydrocarbures operating staff. This review showed substantial improvement in the operation of Moroni Petroleum Depot, due primarily to the 1200 cubic meters of tankage added as part of the initial contract. Although there was a net increase of 9% in consumption of petroleum

products as compared with the earlier study, there were no actual interruptions of service during the twelve month period. In the period covered by the earlier survey there were disruptions in service 22% of the time.

At the conclusion of discussions with Comore Hydrocarbones Mr. Mradabi, the General Director, commented that there were still many deficiencies in the operations at Moroni, even though operations were much improved. He noted that whereas the recommended work at Mutsumudu Port appeared to be progressing nicely, the balance of the work outlined in the UNIDO 1982 reports for Grand Comore and Moneii would require further feasibility study and economic justification before international agencies could be approached for financing. He requested that UNIDO continue their preliminary studies.

Each of the items is discussed in detail below.

II. FINAL INSPECTION AND ACCEPTANCE - 1982
PROGRAM AT MORONI PETROLEUM DEPOT

The original acceptance documentation signed upon completion of construction of the works in October 12, 1982, noted certain items not yet completed by the contractor, due mainly to late delivery of minor items of equipment and materials. There was also an NPSH problem with the new pumps in emptying the new tanks. Discussion with Comore Hydrocarbures operating staff and inspection of the facilities by B. D. Bohna of UNIDO and Dr. Abdel Quahab Ghzala of the Islamic Development Bank on October 27 indicated that all of these items had been taken of by the contractor.

It was noted that certain of the civil works undertaken by the local contractor, Abbas, especially buried drain piping, was not yet complete. This work was handled directly by Comore Hydrocarbures and was not the responsibility of Technique & Construction S.A.R.L.

Accordingly on October 29 Comore Hydrocarbures drafted a certificate of final acceptance. This was signed by Mr. Mradabi for Comore Hydrocarbures, by Bernard Queyroix for Technique & Construction S.A.R.L., and by B. D. Bohna for UNIDO and the IDB. Dr. A. O. Ghzala witnessed the signing and obtained copies of the signed documents for the IDB records.

A copy of this signed certificate (French), if required, may be obtained from the Islamic Development Bank.

III. SURVEY OF PETROLEUM PRODUCTS
CONSUMPTION AND OPERATIONS FOLLOWING
COMPLETION OF 1982 PROGRAM AT MORONI
PETROLEUM DEPOT

From data provided by the operating staff of Comore Hydrocarbures an analysis was made of the movement of petroleum products through the Moroni Petroleum Depot for the twelve months following completion of the 1982 program. This is shown in the attached table (page 7).

In comparison with the twelve months studied in T. M. Lillo Economic Study a year earlier, petroleum products consumption increased by 9%. Even with the increased consumption there was no shortfall in supply of products and service to the public was not once interrupted. This is in contrast to interruptions of 79 days in 22% of the time during the earlier period. Part of this improvement may have been due to better scheduling of shipments (improved finances?). However the main improvement was obviously a result of the 2700 cubic meters of additional storage.

However there are still many deficiencies in the operation of the terminal, many of which were built into the original system; or inadequately covered in the initial rehabilitation program at Moroni.

Certain of these deficiencies were observed and noted during Inspection Trips 1, 2, 3, and 4. These are summarized in Report No. 4 as follows:

1. Replacement of liner in masonry firewater reservoir
2. Upgrading of fire water system
3. Testing of existing 6" loading line from the dock to the tank farm and reservation of the same for handling jet fuel (kerosene) only, eliminating the use of salt water plugs between batches.

4. Inspection, cleaning and repair of existing tanks.
5. Installation of wear plates on horizontal tanks T-06, T-07, and T-09.

The most serious of these relates to the method of handling the incoming products over the existing Moroni Dry Cargo Dock, utilizing a single line with a floating hose from the dock to the ships anchorage. The single line necessitates the use of salt water plugs between product batches with resultant excessive corrosion in tanks and piping. The floating hose from the Dry Cargo Dock in the general port area constitutes a serious hazard. Indeed several months ago an accident occurred when a ship discharging products dragged its anchor and broke the hose flooding the surface of the water with gasoline. This ignited and was extinguished only with some difficulty since there is virtually no fire protection provided in the dock area.

While the CICO engineering team was in Comoros in August with ultrasonic metal thickness detector equipment for inspection of the Anjouan Tankage, the tankage at Moroni was reinspected. This survey showed major corrosion in all of the original tankage leading to some questions as to how long the old tanks can be kept in service. One of the old tanks was scrapped last year and another has since been taken out of service. These tanks are twenty-five years old and while it is not unusual for tanks to last even 30 to 40 years, all of the existing tanks, because of single line loading system and the necessity for introducing salt water between batches, are near the end of the useful lives.

It would therefore be in order in planning for the further expansion of Moroni tankage (5590 cubic meters - 1987) to consider scrapping all of the old tanks and replanning the limited terminal space for larger and higher tanks which can be more economically constructed in the available space. Considering the time lag involved in arranging financing and also

the fact that the old tanks may not last until 1987 this planning should be done as early as possible.

Comore Hydrocarbures advises that they will be able to acquire some additional land between the present tank farm and the dock area. However this is very rough and will require major amounts of fill to adapt it for use.

There is already some effort being made by Comore Hydrocarbures to build an LPG bottling plant in the only readily available land west of the present tankage. The planning for this new facility should take into account future tankage requirements.

ANALYSIS OF PETROLEUM PRODUCTS
 MOVEMENT THROUGH MORONI TANK FARM
 12 MONTH PERIOD OCT. 20, 1982 TO OCT. 19, 1983

<u>Shipment Arrival</u>		<u>Product Receipts (Cubic Meters)</u>	<u>Tank Stocks At Arrival Date (Cubic Meters)</u>
Oct. 20, 1982	Essence	296,810	-0-
	Jet-ATK.	1,013,411	-0-
	Gas Oil	785,174	154,933
		<u>2,725,395</u>	
Dec. 13, 1982	Essence	1,019,722	292,598
	Jet ATK.	590,943	389,600
	Gas Oil	1,003,744	419,868
		<u>2,614,409</u>	<u>1,102,066</u>
April 5, 1983	Essence	1,061,089	-0-*
	Jet-ATK.	606,736	305,978
	Gas Oil	937,646	239,191
		<u>2,665,471</u>	<u>545,169</u>
June 23, 1983	Essence	1,165,723	122,374
	Jet-ATK.	752,456	169,574
	Gas Oil	1,044,966	321,332
		<u>2,963,145</u>	<u>613,280</u>
Sept. 18, 1983	Essence	1,040,374	224,424
	Jet-ATK.	843,678	201,551
	Gas Oil	966,396	393,102
		<u>2,850,448</u>	<u>819,077</u>
	Net Current Consumption		13,154,721
	Net Consumption 12 month 1981 - 1982 Per T. M. Lillico Economic Study		12,104,300
	Net Increase - 9%		

* No actual outage occurred as the point of -0- stock concurred with the arrival of the ship.

IV. REQUEST FROM COMORE HYDROCARBURES FOR
CONTINUATION OF IDB/UNIDO STUDIES ON
PRESENT AND FUTURE REQUIREMENTS FOR
GRAND COMORE AND MOHELI

Following review and discussion of the foregoing with Mr. Mradabi, he requested that the IDB/UNIDO planning effort be continued to the point where sufficient detail is available for presentation of the overall present and future requirements to international agencies for financing.

Mr. Bohna pointed out that sufficient detail was available from work already done to make a presentation on addition of heavy fuel oil storage tanks at Mutsumudu Petroleum Depot and for refueling facilities at Ouani Airport. He agreed to assist the Comoros government in drafting a request to the OPEC Fund and the Abu Dhabi Fund as part of his work on the present trip. This was done. A draft letter is presented in Annex B.

Beyond this it is not clear how additional planning work by UNIDO can be funded. Dr. Ghzala was able to confirm that there is some money left in the original IDB Technical Assistance Loan, a part of which had been earmarked for engineering studies. Mr. Mradabi stated he would ask the government to request that IDB release whatever funds were available for this purpose.

It was agreed that what is required at this point is a basic plan and schematic design which can be used for preliminary cost estimates and economic justification. This is to be in the form of a Feasibility Study covering:

- a) Grand Comore
- b) Moheli

The basic points to be studied for Grand Comore are easy to identify from information already available and are outlined in the next section.

Mohelis requirements, on the other hand are relatively small. Some improvement must be made to the present facility but planning for the future must take into account the possible future economic development of the island. A preliminary survey is required to clarify and define what should be covered in the Feasibility Study.

A copy of a letter dated October 29, 1983, formalizing the request for continuation of UNIDO/IDB planning services was handed to B. D. Bohna, Consulting Engineer, by Mahamoud M'Radabi of Comor Hydrocarbures and is included in Annex B.

1. OUTLINE OF PROPOSED FEASIBILITY STUDY
FOR GRAND COMORE

The following points need to be considered in making recommendations for additional work on Grand Comore:

- 1) Consider the removal of petroleum products offloading lines from the general cargo dock and provision of separate sea lines and anchorage for offloading gasoline / gas oil, kerosene, and fuel oil as at Mutsumudu Port Petroleum Depot.
- 2) Consider the area requirements and general layout of an expanded Moroni Port Petroleum Depot incorporating additional tankage as specified in T. M. Lillico Economic Study
i.e. 340 cubic meters Gasoline
2000 cubic meters Kerosene
3200 cubic meters Gas Oil/Fuel Oil
- 3) Provide salt water pump and expanded fire loop, possibly extending to cover all or part of the Dry Cargo Dock area.
- 4) Analyze the cost and practical aspects of establishing specifications for one grade only of multi-purpose fuel oil to be imported (Ideally about 1000 SSU viscosity which will not require heating and which is commonly used for bunkers in small ocean going vessels).
- 5) Include basic planning for renovation and expansion of existing service stations (Grand Comore only). Consider the requirements for expansion and maintenance of the tank truck fleet. (This has been initiated by Comore Hydrocarbures in the past year.)

- 6) Consider the need and possibly commercial implications of acquiring a small tanker or barge (500-1000 tons) which would be used for inter-island transportation and fuel oil (ships bunkers) sales.
- 7) Incorporate recommendations for a training component under which a small group of Comore Hydrocarbures employees would be provided with practical training in marine transportation and handling of petroleum products.
- 8) Include additional jet fuel storage at Hahaia International Airport, updating Special Preliminary Engineering Report No. 3 dated May 14, 1982 (Originally presented in UNIDO Interim Report - Trip No. 2) to take account of reported major new hotel construction and tourist traffic. Note the South African government involvement in this development.

ANNEX A
Diary - Trip No. 5

ANNEX A

DIARY - TRIP No. 5
UNIDO PROJECT TF/COI/82/001
COMOROS ISLANDS
PETROLEUM STORAGE & HANDLING FACILITIES

- October 20 (Thursday) Depart Minneapolis for JFK New York 14:05
- October 20 Arrive New York 17:30
Depart 22:20
- October 21 Arrive Paris CDG 7:10
Depart 13:50
- October 22 Arrive Moroni 6:35
Sleep
- October 23 Visit Moroni Petroleum Depot site for initial inspection.
- October 24 Call on UN Resident Rep. L. K. Darboux to acquaint him with purpose of mission. Call at Comor Hydrocarbures office to schedule work and obtain date for review of operations for past 12 months. Called at Ministry of Planning to advise of arrival.
- October 25 Met with Dr. A. Q. Gzala of Islamic Development Bank who was traveling on following day to Anjouan for review and meetings on Mutsumudu Port Project. Arranged to schedule required joint inspection of completed Moroni tank farm on Friday, October 28 following Dr. Ghzala's return from Anjouan. Met briefly with Mr. M'Radabi and arranged for meeting on Wednesday, October 26 to review overall developments at Moroni. Working at Hotel in PM.
- October 26 Two hour meeting with Mr. M'Radabi of Comor Hydrocarbures and B. Queyroix of Construction & Techniques S.A.R.L. discussing cleanup of deficiencies on original Moroni Petroleum Depot contract and planning for future developments at Moroni. Started drafting notes and report at Hotel in PM.
- October 27 Called at UN office and briefed Resident Rep. L. K. Darboux on developments to date. Obtained assistance in typing related correspondence. Continued work in Hotel in PM.
- October 28 Met with A. R. Mikidache in Planning Ministry to coordinate signing of final acceptance papers on completed first stage work on Moroni Petroleum Depot. Also received certain suggestions for amendments to tender documents for Mutsumudu Petroleum Depot. Telexed same to Minneapolis. Visited Moroni Petroleum Depot with Dr. Ghzala. Conducted joint inspection of completed facilities. Helped Comor

October 28 (continued) Hydrocarbures Operations Manager, A. Soalihy draft final acceptance certificate for typing and signing the next morning. Wrap-up meeting in Ministry of Planning with A. R. Mikidache, Minister of Finance, Ali Nasser, and Mr. M'Radabi representing Comor Hydrocarbures. Presented French translations of suggested correspondence to be originated by Government of Comoros. Advised group would be reporting same to IDB and OPEC Fund on return trip.

October 29 Met with Dr. Ghzala of IDB at office of Comor Hydrocarbures. Signed certificate of final acceptance of Moroni Petroleum Depot first stage expansion. Received letter from Mr. M'Radabi requesting continuation of IDB/UNIDO planning services. Delivered draft of proposed letter covering financing for installation of heavy fuel oil tanks at Mutsumudu Petroleum Depot and refueling facilities at Ouani Airport.
Departed Moroni 18:00.

October 30 (Sunday) Arrive Jeddah 12:40AM
Slept. Called at IDB for debriefing. Was requested to stay over one day for meeting with staff committee on Comoros.

November 1 Meetings at IDB until 16:30

November 2 Depart Jeddah for Vienna via Athens
Arrive Vienna 17:30

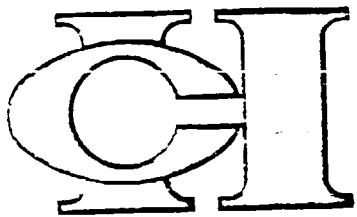
November 3 Meeting with D. Runca for debriefing.
Meeting with Ms. Springer re contract.
Meeting with OPEC Fund in PM
Requested by OPEC Fund to stay over for review of Mutsumudu Port Petroleum Depot Tender Documents.

November 4 Meeting with OPEC Fund from 9:00 to 4:30.
Depart Vienna for Paris. In Paris in transit overnight.

November 5 Depart Paris 13:00 for Minneapolis via New York.
Arrive Minneapolis 21:30.

ANNEX B

Copies of Related Correspondence



COMOR HYDF CARBURES
SOCIETE COMORIENNE DES HYDROCARBURES

Siege social:

MORONI (COMORES)

Boite Postale: 03

Tel: 24.71 & 22.16

Telex N° 225 - KO HYDROCOM)

To : BO BOHVA
Consulting Engineer - 1700 Thomas Place
Minneapolis, Minnesota
RE : Rehabilitation and Expansion of
Petroleum Products and Handling
Facilities
TF - 001.62, 001

MORONI, le 29 Octobre 1983

V. Réf. :

N. Réf. :

Dear Sir,

In accordance with our discussion of October 27 you are requested to continue the work started in 1982 under the sponsorship of the Islamic Development Bank and the United Nations Industrial Development Organization (UNIDO) on planning for modifications and expansion of petroleum products storage capacity and tanker unloading facilities to meet the further needs of our three islands through the period 1985-1989.

The results of the first recommendations arising out of these studies having been implemented and with work now started on the Mutsumudu Port Petroleum Depot we ask that you now concentrate on the balance of the items shown on the attached summary from your final Report Trip N° 4, which was reviewed and approved by our Government in October 1983.

We note in particular the improvement in operations of our Moroni Port Petroleum Depot since completion of the initial work on October 12, 1983. Due to the increased tankage and improved facilities we have had not a single interruption in supply of petroleum products to the country in the past twelve months. This is in contrast to the twelve months reported in Mr Lilloco's Economic Study when we were in difficulty 22% of the time. The frequency of our tanker shipments has decreased by 50% extending from 45 days to 20 days average. Our consumption (Moroni only) increased from 12,105 to 13,155 cubic meters on an average of 9%.

Where as the Mutsumudu Port Petroleum Depot was completely replanned and is now being completely rebuilt, the initial programme at Moroni was more in the nature of emergency repairs and a badly needed minimum increase in storage. We still have

many deficiencies in our operation including the continued handling of products over our Moroni Port Dry Cargo Dock, which resulted recently in a fire in the harbor. At the same time our fire protection system is substandard. We are anxious to bring the Moroni Port Petroleum Depot up to international standards at the earliest possible date.

We ask therefore that you now concentrate on the preparation of a complete Feasibility Study on the balance of the work required in the attached list, this work to be prepared in such detail that we can approach international financing agencies for funding on an overall planned schedule.

In addition to the items included in the attached list we request that two additional items be studied :

- 1) Inter-island transportation by small tanker or barge which could also be used for commercial fuel oil sales (ships bunkers)
- 2) A training component which would provide a small group of our employees with practical training in marine transportation and petroleum products handling techniques.

We have some funds left for studies and planning in our original \$ 1.0 million loan from the Islamic Development Bank and we shall be requesting them to release these for the purpose of continuing the IDB/UNIDO programme.

Attach : Comor Hydrocarbures
Program - 1983 - 1993

Mahamoud M'Radabi
Directeur de la Société Nationale
d'Hydrocarbures

cc : Islamic Development Bank
Jeddah

United Nations Industrial Organization
Vienna, Austria

IV. COMPLETION, REVIEW AND ACCEPTANCE
OF IDB/UNIDO TEN YEAR PLAN FOR
CAPITAL EXPENDITURES BY COMOR
HYDROCARBURES

The requirements of the Comoros for rehabilitation and/or expansion of facilities for the importation, storage, transportation, and distribution of petroleum products within the country for the next ten years have been identified by the UN Experts and formulated into a ten-year programme. The programme, if carried out by Comor Hydrocarbures, will ensure that facilities are available to supply the country's needs on a continuous basis. The recommended programme is optimized against utilization of a 4000 - 6000 ton tanker which results in minimum transportation, storage and handling costs for the projected consumption.

Between October 8-12 this programme was reviewed with and approved by :

- 1) Comor Hydrocarbures
- 2) Ministry of Planning
(Represented by World Bank Representative)
- 3) Ministry of Finance.

The programme can be summarized as follows:

	<u>PROJECT</u>	<u>YEAR SCHEDULED</u>	<u>BUDGET* COST (US\$)</u>
(1)	Mutsumudu Port Petroleum Depot		
	New Marine Facilities	1983	1,100,000 X
	Rehabilitation Onshore Facilities and Additional Tankage (5000m ³)	1983	1,300,000 X
(2)	Refueling Facilities - Cuani Airport (10M ³)	1983	275,000 C
(3)	Additional Storage - Hahaia Airport (100M ³)	1983	110,000
(4)	Emergency Repairs - Moheli Petroleum Depot	1983	100,000
	CURRENT FINANCING REQUIREMENT		<u>2,885,000</u>
(5)	Additional Tankage - Moheli Petroleum Depot (650m ³)	1985	186,000
(6)	Additional Tankage - Moroni Petroleum Depot (5590M ³)	1987	1,328,000
(7)	Renovation and Expansion Bulk Storage Depots and Service Stations (Grand Comore, Anjouan, Moheli)	1983-1987 Allow	600,000
(8)	Expansion and Maintenance Facilities - Tank Truck Fleet	1983-1987	
(9)	Addition Heavy Fuel Oil Storage - Mutsumudu Port Petroleum Depot (2400M ³)	To be established	435,000 600,000 C
	FUTURE FINANCING REQUIREMENT		<u>2,714,000</u>

* Foreign Currency Requirement only.

X WORK FINANCED BY IDB & OPEC

C PROPOSED APPLICATION TO OPEC FOR 424 FINANCING

BALANCE STILL UNDER STUDY BY IDB/UNIDO

Dr Ahmed Mohammed Ali
President
Islamic Development Bank
P.O.Box 3925
Jeddah, Saudi Arabia

DRAFT

Subject :Continuance of Planning and Preliminary
Engineering for Rehabilitation and
Handling Facilities - Comoros Islands -
Technical Assistance
Loan N^o _____

Dear Dr Ali,

We are pleased with the accomplishment to date on the planning work done under the arrangement with the Islamic Development Bank and the United Nations Industrial Development Organization for an improvement in the operations of Comor Hydrocarbures.

The total scope of our requirements has been defined as shown in the attached schedule and implementation of work on Mutsumudu Port Petroleum Depot has been started with financial assistance from your organization and the OPEC Fund for International Development.

We now wish to proceed as quickly as possible with a detailed Feasibility Study for the remaining items of work, primarily on Grande Comore but also including minor new facilities on Moheli. This Feasibility Study must be in sufficient detail to present our requirements for another \$ 2.5 - 3.0 million of construction to international financing agencies, in advance of required implementation dates.

Certain work which was scheduled for completion in 1963, such as emergency repairs at Moheli Petroleum Depot has not yet been started.

Likewise planning for our permanent facilities at Moroni must be completed as the remaining useful life up the original tankage is projected as not more than 2-3 years . Two of the old tanks have necessarily been taken out of service in the past year.

We therefore request that the balance of the funds from Technical Assistance Loan N° _____ be made available for completion of this programme. We recommend retaining the original pattern of IDB/UNIDO cooperation for this purpose especially since we wish to incorporate a training programme for certain of our staff and UNIDO has such programmes in effect.

Please advise of any formalities which may be required to carry this programme forward.

Respectfully yours,

Attach : Camor Hydrocarbures
Program - 1983 - 1993

CPEC Fund For International Development
P.O. Box 995
1010 Vienna, Parkring 8

DRAFT

Austria

Attention : Mr. Said Aissi
Regional Director (Africa Branch)

Dear Sir,

You are familiar with the work being carried out for the Mutsumudu Port Petroleum Depot with joint financing being provided by the Islamic Development Bank and the CPEC Fund.

This project has now progressed to the point that drawings and specifications are being released for international competitive tender on November 1, 1983. Bids are to be received at the Comorian Embassy in Paris on November 30. We expect to negotiate a Construction Contract by December 31, 1984. The project is scheduled for completion in October 1984.

General planning and feasibility studies for this work were done in 1982 with assistance from the Islamic Development Bank and the United Nations Industrial Development Organization. The results and recommendations of these studies are summarized in reports prepared by UNIDO experts T.M. Lilloco (Economist) and ED Bohna (Petroleum Engineer). The Lilloco report entitled "Economic Evaluation - Expansion of Petroleum Products Storage and Handling Facilities, Comoros Islands" covered the basic economic factors influencing the cost of supplying petroleum products to the islands. The Bohna reports (4) provided preliminary engineering studies for implementing the basic plans outlined in the long range economic plan.

The present project has been carried forward on the basis of these studies. Although provision is made for future importation of aviation jet fuel and heavy fuel oil use and possible ships bunkering, the original financing did not provide for a complete installation for handling these products. Certain facilities such as the separate sea lines for offloading jet fuel and fuel oil and concrete foundations for two 1200 cubic meter fuel oil tanks are for practical reasons being installed as part of the present project.

The balance of these facilities require further detailed engineering and separate construction financing. The purpose of this letter is to outline these requirements and to make a preliminary application to your organization for the funding for construction of the same, so that they can be installed as part of the current

Mutsamudu Port Petroleum Depot, with resultant savings in completion all required work while the selected contractor is on the site.

The two items of jet Fuel for Ouani Airport and Heavy Fuel Oil Storage and Distribution are discussed separately below.

Jet Fuel - Ouani Airport

Special Preliminary Engineering Report N° 2 included in UNWCO Interim Report , Trip N° 2 dated May 30 , 1982 recommended installation of refuelling facilities at Ouani Airport on Anjouan to make better utilization of the air fleet of Air Comore. Prior to the current Mutsamudu Port Petroleum Project there were no facilities on Anjouan for handling incoming shipments of jet fuel from tankers. Without refuelling facilities on Anjouan Air Comore planes are forced to carry fuel for the return trip to Grande Comore, with a resultant loss in load carrying capacity. The loss in revenue is equated at $\$ 1,516,000$ per year in freight carrying capacity or $\$ 67,000$ per year in passenger carrying capacity.

Taking into account the foregoing study the current Mutsamudu Port Petroleum Depot makes provision for incoming shipments of jet fuel through a separate 6 "submarine pipeline and conversion of two existing tanks to jet fuel storage.

The present project does not include the mechanical refuelling facilities at Ouani Airport or a 5 000 liter tank truck to transport the jet fuel from the storage tanks at the Petroleum Depot to the Airport.

The estimated funding required for this addition, taking into account a local equivalent currency contribution of $\$ 50,000$ by Comor Hydrocarbures is $\$ 215,000$.

Heavy Fuel Oil Storage and Distribution

At the present time the only fuel oil being imported into the Comoros is gas oil or diesel fuel.

A preliminary survey shows there is already a certain demand for a less expensive fuel than gas-oil for industrial use. Currently ylang-ylang factories, which use a distillation process in the manufacture of perfume essence fire their boilers with wood or gas-oil. Crank case drainings are also used to the extent available. Any further industrialization is likely to require boiler plants. When electric power generation outgrows the stage of the small diesel-electric generating sets, which are thermally, inefficient there will be a definite switch to fuel oil as the most economic fuel alternative.

Likewise the Government has given some thought to the importation of fuel oil for use as ships bunkers. This subject was touched upon in Lillioos Economic Study and was the subject of Special Engineering Report No 4 dated July 16, 1982. As a result of this study provision for future importation of heavy fuel oil for both domestic use and future ships bunkering was made in designing the present Mutsumudu Port-Petroleum Depot.

Comor Hydrocarbons has asked its Engineering Consultant, CICC Industrial Consultants Overseas Inc, for assistance in establishing specifications for one grade of heavy fuel which will be most economical in serving the Comoros several purposes, i.e. local fuel and/or ships fuel. This study is expected to be available by December 31. While the results are not yet definite it is expected that recommendation will be against importation of a very heavy grade of fuel oil which would, sophisticated heating and handling procedures.

require

A lighter grade of fuel oil which can be handled without heating and which a number of smaller vessels operating in the area use is cheaper than gas-oil and may be a more practical standard.

Pending the results of this study the estimated cost of installing two 1200 cubic meter fuel oil storage tanks with associated piping and a fuel oil loading pump (without heating facilities) is estimated as :

	£
Tanks	335,000
Pump, piping and Accessories	100,000
	<hr/>
	£ 435,000 x

x Note that this figure is lower than the preliminary figure of £ 800,000 given in the Lillico Economic Report which included site preparation, fire walls, power and lighting etc, all of which have already been included in the current construction programme.

Over request, therefore, is for assistance in financing the following as an addition to the present petroleum facilities handling programme on Anjouan

Cuani Airport Refuelling -	£ 215,000
Heavy Fuel Oil Storage	£ 435,000
	<hr/>
Total Foreign Exchange	£ 650,000

This amount includes an allowance of 10% for detailed engineering and supervision.

Both items are sound and logical additions to the work currently under way and we anticipate savings of 10-15% in cost if we are able to carry them out as additions to the present larger programme.

Both additions were anticipated in the basic economic planning outlined in the Lillico Economic Study were recommended in the UNEDC studies and have subsequently been studied in detail by CICO Industrial Consultants Overseas

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Inc., our Consulting Engineers.

We shall look forward to hearing from you and will be pleased to provide any further supporting data which might be required to support a formal loan application.

Very truly yours

Abdou'Rahim Mikidache

