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TECHNICAL ASSISTANCE IN THE PETROLEUM PRODUCTS SECTOR

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GUINEA-BISSAU

Technical Report: A Review of the Hydrocarbon Industry*

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

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United Nations Industrial Development Organization
Vienna

73

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EXPLANATORY NOTES

1 US Dollar ($) = 1360 peso Official = 1800 pesos Parallel (as used in this report unless otherwise stated)

= 305 CFA

1 US Barrel = 159 litres

1 Cubic Metre = 6.29 Barrels

ABBREVIATIONS

UNIDO	United Nations Industrial Development Organisation
FOB	Free-on-Board = loaded cost (ie before transportation)
CIF	Carriage Insurance Freight = Landed Cost (ie after transportation)
E	Written in English
F	Written in French
P	Written in Portuguese
DICOL	National Enterprise for the Distribution of Fuels and Lubricants
PETROGAL	The National Oil Company of Portugal
M3	Cubic metre
Mn	Million
NA	Not available
TON	Metric ton
DWT	Dead Weight Ton

ABSTRACT

Guinea Bissau suffers regularly from supply breakdowns of its petroleum products. This translates into power cuts, rationing and the existence of a secondary market. Apart from the negative effects on the economy the management by crisis used at DICOL to alleviate or avoid shut downs, costs the company dearly.

Safety

The most pressing technical problem concerns the safety of the depot. In September 1988 a fire in the depot destroyed 2 storage tanks. It cannot be emphasised enough that DICOL was extremely lucky that this fire did not completely destroy the only depot in the country. This risk has not been removed. The Depot does not contain a self sufficient fire fighting system. This should be installed immediately. These and other problems stem from two weaknesses, financial and training. These problems are detailed in the body of the report.

Financial Review

DICOL is not an independent company. It is a section of the Ministry of Natural Resources or in the larger sense a branch of the Government. DICOL does not have financial independence. Tanker loads are purchased only with Government approval. As the Government has extreme currency problems, the fuel purchases - always quoted in convertible money - have to compete with other national needs. At best the purchases are delayed resulting in shortages at the pump. In addition less than economic deals are made to supply the depot - road tankers from Senegal, small sized tanker loads carrying a proportionally higher transport overheads, no long term supplies etc.

The information available at the DICOL depot is adequate for predicting demand and avoiding supply ruptures. It does not however reflect the true picture of the company's business. By accounting completely in pesos and using strict book keeping rules the system ignores:

- the parallel exchange rate for the dollar
- the effects of rapid inflation on the true value of sales
- the depth of bad debt (principally owed by other state operations) which is recorded in the accounts as an asset.

The DICOL accounts in 1987 showed a profit on turnover of 3%. If the parallel rate of exchange had been used this would translate into a loss of some 14%. The effects of inflation during that year were such that a 90 day delay in payment - a quite acceptable business norm - was equivalent to paying less than half of the original price corrected for the drop in value of the currency. The average credit customer took three times this delay to settle accounts. Many customers never do.

The debt carried in DICOL s accounts exceeds its turnover. In every accountancy system debt can only be carried in the books for a certain length of time. When this time comes for DICOL the writing off of this debt will show the true financial state of the company - that it is

bankrupt.

The company should be financially restructured, with the bad debt paid off by the Government. In addition the company should maintain its own hard currency account for purchases and have complete control over the supply or non supply of the numerous non paying clients. Without these changes none of the current projects planned to expand sales will be economically successful. These and other similar projects should be blocked until DICOL can demonstrate its ability to finance the supply to satisfy the existing demand. Once this situation is reached and an economic price charged for its products it would make sense to generate more demand and hence more revenue.

The current storage capacity is more than adequate to handle a growth in demand of 6% compounded over 10 years. In any event the storage requirements should be reviewed every couple of years.

Training Needs

The safety problem in the depot is not only one of a lack of fire fighting equipment but also a lack of safety training and a lack of management housekeeping. Abandoned cars and trucks clutter the depot. Customers drive in without apparent control. Unsupervised welding occurs near pools of spilled fuel etc. Partially due to a lack of spares, maintenance is rudimentary if it exists at all. A Training and Safety Officer should be recruited immediately for a 1 - 2 year contract. He should also be given authority to control safety in the depot.

The most radical solution to DICOL's and Guinegaz's management and financial problems would be to privatise it ie to sell the company to an experienced company. Less radically the management of the depot could be merged and handed over completely to a similar company. The present policy of have PETROGAL provide advisors without line authority is not working fast enough for the nations needs.

TABLE OF CONTENTS

INTRODUCTION

An identification mission of UNIDO visited Guinea Bissau in January 1986 (annexe 3 reference 1). Among other recommendations it proposed the recruitment of an expert in the petroleum industry for a period of 3 years to:

- review and complete the legislation with regard to exploration and production contracts
- advise on the negotiations with international oil companies
- suggest the best sources of supply for petroleum products
- recommend the product prices for resale on the local market
- draw up specifications on the quality of products imported and establish regulations concerning their storage, transport and distribution
- suggest substitute fuels for petroleum products and wood
- establish a technical information archive and library

By March 1988 this blueprint had produced plans for a two man x two month mission detailed in the job descriptions for a Petroleum Engineer and a Petroleum Economist (annexe 3 references 16 and 17). Subsequently in September 1988 the Petroleum Economist's two month assignment was split in two - a one month mission for the Petroleum Economist (annexe 3 reference 18) and a one month mission for a Petroleum Lawyer /Negotiator/Economist whose job description is not to hand.

The objectives of this 3 man assignment was to assist the Government, Ministry of Natural Resources and Industry in monitoring the energy consumption based on imported petroleum products and promoting exploration activities in hydrocarbon industry.

In consultation with the Ministry, appropriate Government authorities and local national companies like Petroguin, DICOL and Guinegaz their duties can be broken down into six tasks:

1. <u>Exploration Promotion</u>

- list actions and measures to be taken by the Government on the technical and legal side in order to attract investors in exploration and exploitation of hydrocarbons

2. <u>Supply and Demand for Petroleum Products</u>

- compile existing data and analyse the pattern of imported petroleum products
- evaluate additional facilities needed to meet the requirements of the market on short, medium and long term

3. Programming and Pricing Policy

- analyse the conditions of import, storage and distribution of petroleum products, especially regarding freight costs, insurances and margins for distribution

4. Rehabilitation

- appraise the cost of rehabilitation of existing facilities: loading and unloading systems, storage facilities and transportation fleet

- appraise the cost of complementary investment for new facilities needed to satisfy the demand on short, medium and long term

- appraise technical conditions of import, sea transportation handling, storage and distribution

5. Substitute Fuels

- list actions and measures to be taken in order to promote substitute fuels which can be acquired under better conditions

- make recommendations on energy savings in the industrial sector, transportation sector and households.

6. Infrastructure

- evaluate the impact of the proposed plan of action on the network of distribution of petroleum products in the country

- evaluate training needs to support these actions

This report covers the work carried out by the Petroleum Economist. It should be read in conjunction with the reports of the other two experts. At the time of writing this report the third member of the team (the Lawyer/Negotiator/Economist) had not commenced his study. As a result tasks 1 and 3 have not been completed. In addition the requirement to complete this report in advance of the Engineers study has meant that any project costing resulting will not have the necessary economic evaluation.

It should be noted that as well as suffering from regular shortages of fuel, Guinea Bissau suffers from an excess of technical and financial missions seeking to advise the Government. This report recommends little that has not been recommended and re-recommended in the studies listed in Annexe 3. This report draws heavily on these sources and as a result is able to be much more comprehensive than the 3 week site survey could normally hope to be.

The study diary is given in annexe 1. Annexe 2 lists the people who assisted.

RECOMMENDATIONS

PETROGUIN

- complete the review of exploration promotion (cost $3000)
- revive concession leasing through an international campaign (cost $140 000)

GUINEGAZ

- purchase butane bottles and valves (cost $700 000)
- distribute butane from DICOL's filling stations
- merge with DICOL

DICOL

- rehabilitate, with immediate effect, all fire fighting facilities in the 2 depots
- halt all other projects until the financial viability of DICOL (and Guinegaz) is assured
  - bad debts written off
  - strict credit control
  - interest charges set at realistic rates
  - prices set at economic levels based on parallel exchange rate
  - hard currency account established
  - purchase in large shipments to minimise transport costs
- improve housekeeping
  - remove all broken down transport
  - limit personal access to the depot
  - cut down product losses
  - close down the filling station

GOVERNMENT

- Privatise DICOL
- Remove monopoly position on the supply of petroleum products
- Switch to hard currency

To appreciate the current financial, managerial and engineering problems of Guinea Bissau s Hydrocarbon companies it is necessary to follow the country's development since independence.

A. Background

Guinea Bissau is a small country on the West African coast (map 1) with about 915,000 inhabitants (1988). The country consists of a mainland with large areas of river delta and a number of islands in the Atlantic Ocean (map 2). It covers an area of some 36,000 square kilometres. The coast line is crossed by rivers forming deep estuaries making surface transportation difficult and costly to operate. With creation of suitable infrastructure, water transportation in general looks to be more appropriate and cheaper for this area (section IX A).

The annual temperature is about 25 C with minimal variation during the year. The monsoon season is from May through October and the average rainfall is about 150 cms in the north and 300 cms in the south. In July and August the rainfall is heavy and the southern part of the country is not accessible by road due to flooding of low lying areas. In the absence of railway facilities, people and cargoes are transported by road and barges to the extent possible with the available infrastructure. Transport and communication facilities, in general, are inadequate in the country. The expansion of these facilities is essential for the economic recovery of the country.

The consumption of petroleum products, some 31,700 tones in 1988, is mainly for transportation, diesel power generation, fishing, agriculture and illumination (table 4). All fuel is imported. Motor gasoline is used for cars and for outboard engines of small fishing boats. Larger fishing boats, pusher tugs, barges, etc. use diesel oil. Kerosene for illumination is used in the towns and villages in the absence of satisfactory electricity distribution. Liquefied petroleum gas (LPG) is consumed for cooking, but due to lack of cylinders and badly managed distribution system, the consumption is limited to customers in the capital area. Very small quantities move into other areas.

With an estimated per capita income of about US$170 (1987), the country is among the 10 poorest in the world. This GDP per capita has been decreasing steadily over the last 10 years being now just over half its former level. The economy is characterised by a large rural sector, producing primarily for self consumption. Agriculture, fisheries and forestry account for about 90 percent of employment and an estimated 50 percent of GDP. Marketed output is largely confined to export crops, primarily cashews, groundnuts, and palm kernels. In 1987 cashews accounted for almost 70 percent of total exports. Rice is the main food crop. In the 1950's Guinea Bissau was a net exporter of rice (around 40,000 tons annually); however, since 1962 the country has relied on imports to supplement domestic production. Since the reintroduction of price incentives in 1983, production has been steadily increasing, to about 140,000 tons in 1987, and it is expected that the country will re-achieve self-sufficiency by the early 1990's.

After independence in 1974, Guinea Bissau faced the task of rebuilding its economy. The protracted liberation war had dislocated one fifth of the population, destroyed an important part of the economic infrastructure, and reduced output of the main crops by over one third. An ambitious public investment programme financed mainly by external borrowing was implemented, focusing on the manufacturing sector but neglecting agriculture. Inappropriate pricing policies, an increasingly overvalued exchange rate, and an inefficient marketing system prevented recovery of agricultural production, depressed official exports, and stimulated the parallel market. Severe fiscal imbalances, resulting from a rapid rise in government expenditures and limited growth in revenues, were increasingly financed by central bank credit, thereby fuelling inflation. In the period 1980-82, the external situation was aggravated by drought and depressed world market prices for the country's main exports. The balance of payments deteriorated rapidly, exacerbated by rapidly increasing external debt service payments, and external arrears accumulated.

Faced with a deteriorating situation, the Government implemented a recovery programme in late 1983 with support from the World Bank and the IMF. The programme consisted of a devaluation of the currency, the Guinean peso, increases in produced prices, and steps to liberalise domestic trade. However, due to a sharp deterioration in the prices of the country's major export products, delays in the implementation of institutional reforms, and the inability to control the fiscal deficit, the adjustment process lost momentum in 1985. In 1986, domestic financing of a worsening fiscal deficit kept the inflation rate in the 45 percent range and contributed to the further deterioration of the external accounts.

B. Recent Developments.

Against this background the Government prepared a comprehensive medium-term economic adjustment programme in early 1987 in close co-operation with the World Bank and the IMF. The programme aims at re-establishing internal and external equilibria, stimulating growth, improving resource allocation and normalising relations with foreign creditors.

During 1987, the Government vigorously implemented the policy measures envisaged in the adjustment programme. These included a substantial devaluation of the exchange rate, accelerated removal of price controls, the adoption of tight fiscal policies, the liberalisation of marketing arrangements, and retrenchments in the public sector.

C. Exchange Rate and Trade Policies.

Under the programme, the Government implemented a flexible exchange rate policy aimed at reducing the divergence between the official and parallel exchange rates. In May 1987 the Guinean-Peso was devalued by 60 percent, from PG263 to PG650 per US$. Notwithstanding the official devaluation, the parallel exchange rate depreciated rapidly and the spread widened - reaching 50 percent in November 1987 - reflecting delays in the arrival of imports through official channels and an associated expansion of domestic liquidity. By January 1988, the arrival of official imports, and the related withdrawal of liquidity as well as the continued depreciation of the official exchange rate, had resulted in the virtual elimination of the gap. The first quarter

of 1987 has been a renewed widening of the gap to about 30 percent.

D. Trade and Price Liberalisation

The private section has responded enthusiastically to the elimination of trade restrictions, especially in the marketing of agricultural crops. Import licences for commercial imports are now issued autom tically, except for a short negative list including PETROLEUM PRODUCTS. All prices have been liberalised, with the exception of rice and PETROLEUM, and the retail prices of these goods have been raised close to import parity levels.

E. External Debt and Creditworthiness.

For the foreseeable future, external debt will continue to be a heavy burden. Annexe 4 shows exports even in good years covering only 25% of imports. The trade balance is mainly made up by development assistance External debt continues to rise and Guinea Bissau has been included in the World Bank's list of economically distressed countries in Sub Sharan Africa since its debt service ratio is significantly over 30%.

The Ministry of Natural Resources and Industry is the government institution responsible for the petroleum sector. The ministry supervises three public enterprises: DICOL, GUINEGAZ and PETROGUIN. These three hydrocarbon companies must wait in line with other parastatal organisations such as Health, Education, Agriculture, Fisheries etc etc for a share of the International Assistance. As their credit worthiness in the open market is virtually zero, all payments have to be cleared before deliveries are made. Almost all of the problems of these companies can be traced to a common source - lack of hard currency.

II EXPLORATION PROMOTION - PETROGUIN

One of the principal tasks of the third team member was to address this subject.

The resulting report should include

- exploration history - Geological Surveys, Seismic, Drilling
  - pre independence 1958 - 1974
  - post independence 1974 -1988
  - future work commitments
- past and present
  - concession holders
  - operators
- World Bank Credits - Values and objectives
- descriptions of existing petroleum laws and concession agreements (originally written in Portuguese) covering
  - contract type
  - state participation
  - licence terms for exploration
    - relinquishment
    - exploration obligations
    - bonuses
  - licence terms for production
    - type of licence
    - area
    - duration
  - financial terms
    - royalty
    - taxation
    - depreciation
    - price
    - domestic supply obligation
- international comparison of petroleum legislation
- assessment of exploration potential for major oil companies and independents
- list of actions and measures needed to accelerate exploration of hydrocarbons
- petroleum evaluation reports ready to progress a promotion campaign to attract more exploration companies and to cover the tectonics, sedimentology, geophysics, reservoirs and associated seals, plays and prospects of the region.
- a planned promotional campaign involving
  - internationally targeted audiences
  - advertising campaign

- seminar schedules and locations
- promotional documentation
- governmental and consulting representation
- overall time table, manpower needs and costs (the most recent 2 centre promotion with which the author was associated cost around $140 000).

The report should also include maps showing

- geology
- concession boundaries
- seismic shot
- exploration wells

The basic data for this study has already been assembled from data provided in Guinea Bissau and other oil industry sources.

This work would take some two weeks, cost some $3000 and would round off this review of Guinea Bissau's Hydrocarbon Industry which is currently incomplete. Guinea Bissau has no indigenous supply of hydrocarbons, but the potential is there and should be aided.

It is recommended that this work be completed forthwith and that any resulting promotional campaign expedited.

III PETROLEUM PRODUCT SUPPLY AND DEMAND - DICOL

A. Background

In 1962 a private Portuguese Company SACOR built a tanker terminal and storage depot at BANDIM on the outskirts of Bissau. In 1976 this company was fused with 3 others to form PETROGAL the National Oil Company of Portugal. In December 1987 the Government of Guinea Bissau created a joint company DICOL having as shareholders:

- the Government (through Armazens do Povo) 70%
- PETROGAL 30%

DICOL has virtual monopoly control over the importation, storage, transportation and sale of the petroleum products diesel, gasolene, jet fuel and kerosene. DICOL owns and operates the main terminal at Bissau and a number of retail outlets situated in the capital (3) and at different locations across the country (8). The total storage capacity in the country is 189,765 m3 (6 month's coverage based on 1988 sales). Of this 18,270 m3 is at the main terminal, indicating no significant storage in the interior part of the country (Tables 5 and 6). The consumption of petroleum products in 1988 was 37,841 m3 (see Table 1). This low consumption may be attributed to financial constraints and transportation bottlenecks. The present mode of transportation is by road, all originating from Bissau terminal.

The eastern and the southern regions are not accessible by road during the monsoon season due to flooding of low lying areas. The country has river navigation facilities which are not utilised currently for petroleum transportation. It has been proposed to provide storage depots and handling facilities at strategic locations in the eastern and southern regions to facilitate water transportation of petroleum products(section IX A). These water transportation facilities would establish a reliable supply source to meet the requirements of the eastern and southern regions throughout the year, thus contributing to the growth of the agricultural and fishing industries. The Consulting Engineer on this study will be investigating this further.

The total number of personnel in DICOL is approximately 170 including 13 working in a drum making plant. The organisation is headed by a Director General and consists of managers in charge of Finance, Commercial, Maintenance and Personnel. In addition, the Director General is assisted by an economic consultant, an expatriate from Petrogal, who advises in all activities in management and operation of the terminal.

B. Supply

Guinea Bissau has no indigenous supply of petroleum products. All are imported either by ship or road tanker (table 3) . During 1988 almost all supplies were from BP Senegal. Supply is irregular and does not meet the demand as is described below.

The shortages have created an active black market in the resale of fuel. In 1985 as much as one third of the original supply was

estimated to be recycled. At the time of this study the black market gasolene was being sold at 30% above pump prices.

C. Demand

The demand estimate for DICOL's four major products, diesel, gasolene, jet fuel and kerosene is extracted from tables 11 to 13.

Tables 11A - 11L show daily stock levels in the depot over the whole of 1988. On some days sales were unrestricted but when stocks fell to a predetermined safety level, sales were rationed or restricted to certain privileged clients. On some days sales were completely halted as stock ran out completely. Table 12 summarises these shortages viz

Diesel - 67 days

Gasolene - 31 days

Jet Fuel - 121 days

Kerosene 5 days

As DICOL staff have highlighted, the two products which could bring in most hard currency, diesel for shipping and jet fuel for aircraft, suffered the most from shortages.

Table 13 giving weekly sales. By taking out anomalous weeks, that is during rationing and in the week of new deliveries (when large backlog of demand may be met) normal weekly demand can be estimated as shown in table 14. The situation of jet fuel is particularly bad with one third of potential sales lost:

Diesel 4.2% of potential sales lost

Gasolene 2.5% of potential sales lost

Jet Fuel 33.3% of potential sales lost

Kerosene 0% of potential sales lost

The pattern of the sales of imported petroleum products over the last 10 years is very haphazard no doubt reflecting more the health of the national treasury than the demands of DICOL's customers (table 1 and figures 3, 4 and 5). To predict forward 10 years a smoothed approximation has been superimposed on the actual sales to achieve a "best fit" approximation as follows:

Diesel 6.6% based on 10 years of sales statistics

Gasolene 2.9% based on 10 years of sales statistics

Jet Fuel 33.3% based on 10 years of sales statistics

The pattern for Kerosene (figure 6) is so irregular as to negate any "best fit" formula, instead the population growth rate has been used - 2.0%.

Similarly the sales of lubricants (table 2) shows no discernibl pattern. Most likely the supply has been dictated by the availability

of hard currency. DICOL no longer enjoys a monopoly position on the sales of this product. Demand for lubricants is also being met by the local hard currency supermarkets.

Table 14 uses this analysis to predict future demand. Over the next 3 years this prediction falls very close to that of DICOL's own estimates. Similarly their earlier forecast for 1988 was less than half of 1% in error.

A World Bank telex on 24th January 1989 reluctantly releasing funds to cover distress purchase which arrived 30th January (photograph 5)asks their Resident Representative to

SUBLINHAR A DICOL A IMPORTANCIA DE MANTER UM PLANO REALISTA DE IMPORTACOES PROJECTADAS DE COMBUSTIVEIS A FIM DE EVITAR QUE TAIS CRISES VOLTEM A OCORRER NO FUTURO

(Underline to DICOL the importance of maintaining a realistic plan of the projected importations of fuel to avoid such crises occurring in the future.)

As noted above DICOL's planning is more than adequate but the National Bank do not usually release funds until a crisis level in the stocks has already been passed. This particular shipment is a typical example of management by crisis. The tanker load had been ordered much earlier and for some time the tanker had been waiting notice of the payment being cleared before sailing into port and discharging its cargo. At this time the Depot had run completely out of jet fuel and was severely restricting sales of both gasolene and diesel. A small emergency delivery was made by road tanker form Senegal (photograph 6) arriving on the same day that the tanker was cleared to unload (photographs 4 and 5) being by that time both superfluous and costly.

Another misconception held by the World Bank and other aid donors was mentioned by the DICOL management. Apparently the aid organisations are reluctant to loan money for the purchase of jet fuel which they rightly say is not for the country's internal consumption. However it is the sole product for which DICOL makes a true profit and is in addition paid largely in hard currency.

D. Additional Facilities

Table 14 shows predicted demand in 1998. Even assuming that DICOL's financial viability is such to meet this demand, existing storage capacity is adequate:

PRODUCT	FORECAST DEMAND M3	CAPACITY M3	MONTHS OF CAPACITY
Diesel	51407	9470	2.2
Gasolene	8940	3200	4.3
Jet A1	9974	4000	4.8
Kerosene	896	1600	21.4

The two tanks, not yet operational, will add a further 3000 cubic

metres of capacity. Eventually with growth in demand and the replacement of old or defective tanks, extra capacity will be needed but this is sometime in the future. In any event good industry practise requires a regular review of long term storage requirements.

Section VI summarises the rehabilitation facilities ideally needed for DICOL and the expert Engineer will be detailing the associated costs and no doubt adding to the list of items given in annexe 5. It should be noted that apart from the urgent items needed for the safety of the depot no other investment can be justified economically on the present financial performance of DICOL. This aspect is covered more fully in section V.

IV GUINEAS SUPPLY AND DEMAND - GUINEGAZ

A. Background

Guinegaz in sole charge of handling Liquefied Petroleum Gas (LPG), owns and operates the terminal at Bissau. The total number of personnel in Guinegaz is approximately 32. The organisation is headed by a Director General and consists of Secretary, Cash Manager and Installation Manager. Guinegaz staff operates unloading of bulk LPG at the DICOL jetty and the terminal where LPG is stored and bottled.

B. Supply

Table 2 shows that the last 9 years LPG has been imported in 600 tone lots of one shipment per year. DICOL's jetty is used for the vessel's discharge from where a 4 inch pipeline delivers the product to the storage. The billing quantity is based on ship's outturn.

C. Demand

The few records kept at Guinegaz are insufficient to estimate demand. Only one shipment per year of 600 Tons is made, as this is consumed one can assume that demand is greater than supply. Weekly sales figures are not kept but estimates of 10 000 kilograms have been given by the depot staff. No figures for losses are available as Guinegaz has no established procedures for stock taking.

According to the management the restraint on sales are due to the low levels of bottles available. The number in circulation is not recorded but is estimated at 3500. Assuming 3 bottles per user this equates to under 1200 customers which would appear very small for the capital of Bissau with a current population possibly around 150,000.

No formal waiting list exists for old clients requesting extra or replacement bottles. Neither are details kept on potential new customers but both numbers are reckoned to be large.

As a step in order to increase the sale of LPG and to replace existing damaged cylinders, it is recommended to provide some 3000 x 13 kg cylinders and 500 x 55 kg cylinders which would double existing stock. This should be done immediately to allow estimates of the true market potential to be made.

The management have been quoted prices for 3000 x 13 kg ano 450 x 55kg cylinders of $700000. This is equivalent to $140 per 13 kg bottle and seems excessive. At these prices the bottle deposit charge of 94 cents should be drastically revised upward. Time was not available to verify these costs.

The stagnant LPG sales may be partly attributed to financial constraints and limited availability of cylinders but also it is due to the inefficiency and lack of business expertise in the company. Guinegaz has no trucks to transport cylinders. Customers, after obtaining vouchers for advance payment from the company's city office, bring their empty cylinders to the terminal, wait until the cylinders are filled and carry them back.

In view of the small size of the market and to have an efficient operation, it is recommended to integrate the operation of Guinegaz with DICOR's operation and to provide intensive training of qualified personnel in storage, bottling and marketing of LPG.

D. Additional Facilities

If the foregoing figures are broadly accurate then the existing storage capacity of 700 tones is equivalent to 14 months of supply. The existing storage is more than adequate at this level of sales. Extra capacity to allow bigger and cheaper shipments cannot be justified when future demand is unknown.

As Guinegaz makes a loss on its sales (section V) apart from the need for additional bottles mentioned above and the urgent items needed for depot safety no other facilities can be economically justified. Annexe 6 gives a list of desirable improvements which will be amplified in the expert engineer's report.

V PURCHASING AND PRICING POLICY

Guinegaz and DICOL are not in reality independent companies. They are more akin to sections of the Ministry of Natural Resources or in the larger sense as branches of the Government. Neither has financial independence. Tanker loads are purchased only with Government approval. As the Government has extreme hard currency problems, the fuel purchases - always quoted in convertible money - have to compete with other national needs. As best the purchases are delayed resulting in shortages at the pump.

It is believed that the Government is hoping to join the French Franc zone in West Africa. This would be beneficial to the companies and should be achieved with all possible speed. Among other gains it would reduce the smuggling of fuel to Senegal where its conversion into hard currency is often used to purchase items unavailable in Guinea Bissau. Until this change in the currency is realised the companies should be allowed their own hard currency accounts.

A. Transport Costs

Less than economic deals are made by DICOL to supply their depot. Figure 2 shows a graph of transport costs for various sizes of tanker. The largest tanker which can dock at the DICOL jetty is 10 000 tones equivalent to about $20/tone transport cost. 1988 sea shipments averaged only 3545 tones at a higher unit transport cost of $50/tone. Road haulage was naturally even more expensive at $190/tone. The unnecessary additional cost to DICOL of poorly organised transport in 1988 amounted to $638 100 (by sea) and $69 400 (by road).Had this been avoided it would have increased the operating profit from a weak 3% to a healthly 15% on turnover.

Some doubts were expressed that the entry channel to Bissau would only accommodate 6000 tone ships under normal tidal conditions. If this is the case dredging may be economic. Whatever the channel/jetty limitations however the maximum possible loads should be ordered.

The transportation of butane is also very expensive at about $250/tone for the normal 600 tone purchase. As these shipments are at the limit of the existing storage capacity no reduction in transport costs can be suggested.

B. Economic Costing

The book keeping at DICOL is well done in strictly accountancy terms. It is not dynamic enough for the financial situation in Guinea Bissau in that it does not take adequate account of the parallel exchange rate, inflation and the bad debt.

The information available at the DICOL depot is adequate for predicting demand and avoiding supply ruptures. Management information at the Guinegaz depot is practically non existent.

B.1 Exchange Rate

The Government has made considerable progress in narrowing the gap between the official and parallel exchange rates. Nevertheless 1989

started with a 30% difference between the two. DICOL takes no account of this. By using the official rate of exchange in its price determination DICOL equates costs in dollars (for the purchase of fuel) with revenue in pesos. The accounts in 1987 showed a profit on turnover of 3%. Only some 40% of DICOL's sales are in hard currency so if the parallel rate of exchange had been used this would translate into a drop of some 17% that is a real loss of 14% on turnover. In future DICOL should do all its economic calculations using the parallel exchange rate.

B.2 Inflation

As an example of the effects of inflation take 1987 when the peso devalued 267% ie 24 1/4 % per month. Any client delaying payment for 91 days - quite a normal business delay - would save over half his bill by paying in "old" ie 91 days Pesos. Average payment delays were much greater - 292 days.

In 1987 inflation was estimated to have cost DICOL 3.4% of turnover.

Charging 1% per month interest on overdue payments does not take sufficient notice of the rampant inflation to which the country has been subjected. The interest rate should be tied to the inflation rate and updated monthly.

B.3 Bad Debt

In 1987 DICOL accounts showed a book profit. The accounts refer to the 10 years of the company's existence and the cumulative loss which was finally cleared in that year's accounts. In fact the company is making an enormous loss and the cumulative loss is increasing. The company is bankrupt in economic terms.

Parastatal companies make up 45% of sales but 67% of the debtors. At the end of 1987 DICOL was owed $3.7 million which exceeded its turnover by 13%. Long term debt was noted at 20% of turnover. This itself is an underestimate as no account is taken of the considerable deflation in the value of money. The electrical company is DICOL's largest customer (with 30% of sales) and also its largest debtor owing 50% of the total. The company has not paid for any of its purchases for the last few years. DICOL and the electric company report to the same Ministry. The Ministry feels unable to agree to DICOL cutting off supplies to its own company and which would lead to power black outs in the capital. (It should be noted that the electric company has exactly the same payment problems as DICOL being mainly parastatals who consume the most and pay the least.)

The accounting system used only permits debt to be written off at a maximum 5% per year. To balance the ledgers the horrendous debt is carried as an asset - and an asset which is growing annually. In most accounting rules that bad debt is written off quickly - at the most in 2 years. Even so the accounts will only show the loss some time after the problem has started and possibly too late for effective action to be taken. In DICOL's case the situation is much more clouded - it will take 20 years before the true picture emerges from the accounts.

As of 1st January 1989 the electric company was to commence paying for current purchases. No attempt was to be made to pay off the old

All of DICOL's bad debt should be written off by the Government. The company should be given complete control of the supply or non supply of indebted customers. A policy should be initiated to stop sales one month after non payment of accounts. New debts should be written off after 1 year.

C. Pricing Policy

Neither DICOL nor Guinegaz controls its prices. Recommendations for price increases are delayed awaiting Government approval. Butane and the product drums are knowingly sold at a loss. DICOL estimated a book loss of 2% on a sale price of 8500 pesos/drum. As mentioned earlier their accounting system greatly understates losses. No equivalent analysis is carried out at Guinegaz but if the butane is purchased at around $500/tone and sold at about 715 peso/kilogram then the company is making a 26% loss on the purchase price without even costing overheads. In 1985 it was estimated that the gas was being sold at half its economic cost. In theory DICOL establishes prices for its products incorporating a profit margin for each one (table 9). By not taking into account the parallel exchange rate diesel, the major product, is actually sold at a loss.

The profit margin used does not take adequate account of inflation and bad debt as mentioned above and should be increased to cover these items.

The Government should consider further increasing prices of all products to an economic level (table 10). It has been admitted however that the sharp devaluation of the peso and the partial liberalisation of the domestic market has hit the urban population hard. Real incomes continue to fall and uncertainty still remains about the long term benefits of the tough package of economic reforms demanded by the IMF.

Sometime in the future the prices could be moved from the economic level to a market determined level. For example the sales price for butane is below the retail price in the Canary Islands from which it has to be transported doubling its cost. Similarly the price of gasolene in neighbouring Senegal is over twice the current price in Guinea Bissau. As a result of this and the need for hard currency fuel is moved across the border. The quantity of fuel illegally exported to Senegal is thought to be relatively small in comparison with the estimated 80% of the nation's ground nut production which was smuggled into Senegal in 1985.

The dual price system used for diesel in which the electric company has a special low rate should be considered for clients paying in hard currency.

VI REHABILITATION OF DICOL FACILITIES

Machinery and equipment are 25 years old and not operating satisfactorily. Fire fighting and pollution control facilities are grossly inadequate and need to be reinforced. THIS WORK SHOULD BE DONE IMMEDIATELY AS THE TANK FARM IS IN IMMINENT DANGER OF BEING COMPLETELY DESTROYED. A comprehensive modernisation programme of DICOL's facilities is essential to improve its overall operational efficiency and reduce cost. A provisional list of work required is given in Annexe 5 but will be improved upon and costed in the Expert Engineer's report which is being produced separately. Intensive training programmes in various fields are also recommended to improve awareness and overall efficiency.

The World Bank report (annexe 3 reference 2) has classed the Depot as being defective, carelessly operated and having a lack of qualified people and spares. The next two sections culled from earlier reports and verified on site will underline this opinion.

A. Terminal Facilities

The terminal facilities consist of a new marine installation built by DICOL at a cost of US$2.3 Mn which should be commissioned early this year (photographs 1 - 5). The installation consists of:

(a) Jetty
- LOA 145 M maximum
- DWT 10,000 maximum (Entrance channel may be limited to 6000 DWT)
- DRAFT 8 M maximum

(b) Pipelines
- 4 x 6 inch diameter product discharge
- 1 x 4 inch diameter LPG discharge
- 1 x 4 inch diameter fresh water supply

All storage tanks are cone roof tanks and fitted with vents. The tanks have been provided with single block valve segregation. Eight tanks are 27 years old, two tanks are 20 years old and a further two tanks are 13 years old (table 5). In 1988 two 2000 m3 tanks were installed but are not yet operational. The main tank farm is clustered with 12 tanks without safe spacing between tanks nor spillage retaining walls (photograph 9). All twelve tanks have not been recalibrated from the day they were commissioned.

There is one truck loading platform with four loading arms. Only one truck can be loaded at a time. The loading arms are some 25 years old. There are 5 loading pumps, 4 motor driven and 1 diesel driven. These pumps can also be used for intertank transfers. All the pumps and drives are about 25 years old and many of them are not in working order (photograph 11). There are three drum filling points.

The fire fighting facilities consist of:

- A tube well with a motor driven pump.
- Two pumps, one diesel driven and the other motor driven to pump water to the fire water storage tank.

- The diesel driven fire fighting water pump.

- The foam disbursing system.

- Fire Extinguishers.

All the facilities provided are 25 years old or more and most of them are not in working condition.

Oil pollution control consists of one oil separator with a bay and skimmer. There are four elevated slop tanks for oil separation and collection. A motor driven pump is provided to pump oil from the sump at the separator to the slop tanks. A motor driven pump is also provided to pump slop oil from slop tanks to the tanker. Since these pumps are not in working condition, the oil separator at present is not in operation.

Machine shop facilities are not available even for small repairs of the general facilities. Only repair/maintenance of retail outlet pump meters are carried out in the depot at present.

There are no laboratory testing facilities. Samples from the tankers unloading are sent to Portugal for analysis. Sales of the products are halted until the results are telexed back to DICOL. A site for a laboratory exists (Figure 1) but no hard currency is available to fit it out and train the technicians needed.

A small filling station exists inside the depot (Figure 1). Originally it was used exclusively for DICOL transport but has now been extended to a variety of state clients. Its prime advantage over the service stations in town, who only accept cash, is that is supplies on credit. For safety reasons alone this facility should be transferred outside the depot. Whether the proposed new filling station (photograph 8) is ready or not this service inside the depot should be halted immediately. In addition access to the depot should be strictly limited in terms of cars, lorries and people (photograph 7).

A small garage exists inside the depot (figure 1). Originally, like the filling station discussed above, it was used exclusively for DICOL transport but has been extended to a variety of governmental cars. The lack of hard currency for spare parts has meant that few of these cars have been repaired over the years. At the time of the survey only one car was being worked on. Photographs 14 - 17 show these cars littering up the depot. They should be removed immediately. Because of the small fleets size of DICOL it is economically unlikely that a fully equipped repair garage is necessary. Little more than general maintenance seems financially justified.

B. Terminal Operation

The jetty, at the new marine installation, is suitable for night berthing. All the facilities have not yet been completed. As a result the onshore pipelines are still in use with a single hose connection (photograph 4). The jetty will be in full operation when all the pipelines and firefighting facilities are completed.

Out of the 5 loading pumps provided at the truck loading facilities, only the diesel driven (Kero/ATF Service) is in operation and that too

not [illegible]. The other 3 motor driven pumps are inoperative. A portable pump is provided to load gas oil. Gasoline is loaded by gravity. The motor control centre is not operative and is dismantled. Two filters essential for ATF loading are not operative, instead filters fitted on the trucks are used. The loading arms are in poor condition. No meters are provided and trucks are loaded to a fixed point in the loading hatch. At the drum filling facilities, out of 3 filling points only one is operating (diesel) although it is leaking at the assembly filling valve. At the other 2 filling points, the assembly filling valves are dismantled. As a result Gasoline and Kerosene are filled by gravity.

C. Drum Manufacturing Plant

The drum manufacturing plant capacity has dropped considerably from the rated capacity of 350 drums/shift to less than 150 drums/shift due to the following:

- One of the 2 seam gas welding machines is not in operation. Moreover, the second machine was also not operating due to non-availability of oxygen gas.

- One of the 2 top and bottom covers sealing machines is not operating.

In addition the machines that are operating (28 years old) are not dependable.

Drum sheets cut to size and the end covers with bungs and fittings are imported.

Currently the country's requirements are 150 drums per day. Ten percent of drums are used by DICOL for product transportation. The remaining 90% are sold to outsiders of which approximately 60% are used for storage and transportation of petroleum products.

D. Fire and Pollution Control

The inspection indicates that fire fighting facilities are not satisfactory and adequate due to the following:

- The 2 pumps, one diesel driven and the other motor driven, to pump water from tube well to the fire water storage tank are inoperative and dismantled. Presently DICOL is dependent upon a nearby brewery (CICER) for fire water supply.

- The diesel driven fire fighting water pump is not reliable.

- The foam disbursing system is not operating.

- Water cannons are not provided.

- Power supply is unreliable, but no emergency diesel generator is provided (photograph 13). As a result, a total power cut during the tank farm fire of 3rd September 1988 delayed the fire fighting efforts by about 15 minutes. The fire was caused by using a pump without an explosion proof motor inside the tank farm to pump gasoline from tank to tank. Tanks 30

and 308 were totally destroyed (photograph 10).

During this fire most all of the extinguishers were used. They remain empty as the Fire Brigade station is unable to refill them due to a lack of hard currency to repair their machine.

The pollution control facilities have been ineffective for the last 7 years as the pump which transfers oil from the sump to the slop tanks is inoperative and dismantled. The bay is full of oil and is a potential fire hazard (see also Photograph 12).

E. Road Tanker Fleet

Product distribution regionwise is hampered by shortages of road trucks. DICOL has not been able to maintain its fleet of old trucks in good working condition due to lack of spare parts. Due to foreign exchange shortage DICOL purchases used trucks to maintain its fleet.

F. Airport Facilities

The airport has 4 underground storage tanks of 50 cubic meters each (Photograph 18). These tanks are supplied by road tanker from DICOL's main depot. In turn the tanks load the specialised Service Air Trucks which refuel the airliners on the runway (Photograph 19). The fleet comprises (Photographs 20 - 21):

- 2 road tankers (only 1 operational)
- 3 service air trucks (only 1 operational)
- 1 trailer

Table 8 shows typical air traffic movements for 1989. Apart from the lack of parts to maintain some back up transport at the airport the principal facilities seem adequate, however the expert engineer's report should be consulted for more detail. Unlike the other two depots this facility appeared well run, most likely due to the extensive training in Portugal of the airport staff (16 in number).

VII REHABILITATION OF GUINEGAZ FACILITIES

The storage facilities consist of 4 horizontal cylinders of 50 tones each and 2 spheres of 250 tones each (photographs 22 and 23). This represents a total capacity of 700 tones

There are 5 filling points in the bottling plant (photograph 24). Its capacity is 1000 cylinders per shift which represents approximately 4,000 tones per year's bottling capacity. Guinegaz has some 3,000 x 13 kg cylinders and 500 x 55 kg cylinders.

Guinegaz has a tube well with a pump (motor driven) for pumping water into a storage pit. There are 2 pumps, one diesel driven and the other motor driven, to pump water from the pit to cool the storage vessels whenever required. Guinegaz has provided fire extinguishers, but no other fire fighting facilities.

Defects observed in the depot confirm those of earlier surveys viz:

- The storage area is surrounded by tall grass and weeds which makes approach to the storage area difficult and poses a potential fire hazard.
- Fire hydrants and water cannons are not provided.
- The storage is very close to the terminal boundary fence and does not have the safe distance of 90 m even though vacant land is available around the fencing.
- The water drawoff lines from the spheres were severely corroded.
- Antifreeze valves necessary for safety are not used on the storage vessels.
- In the filling plant, no leak tests of filled cylinders are carried out.
- Spare cylinder valves are not available to replace leaky valves.
- There are no laboratory facilities provided to check the quality of LPG.
- Both the diesel driven and motor driven pumps for pumping water to cool storage vessels are inoperative.
- Most of the LPG cylinders have dents and showed signs of external corrosion.

This plant should not be allowed to operate without providing adequate fire fighting facilities as normal industry practice.

Annexe 6 lists the provisional technical requirements and recommendations.

VIII SUBSTITUTE FUELS

The Expert Engineer will report on the promotion of substitute fuels principal in the use of fuel oil to replace diesel. The conversion of the brewery CICER's boilers and generators had already been suggested in earlier reports.

Considerable scope for energy saving seems possible. As oil imports are equivalent to 85% of exports, all savings are welcome.

If DICOL could ensure a regular supply of fuel to the power company and if the power company could ensure a regular supply of electricity to their clients much less diesel would be consumed for power generation. The frequent interruptions in supply have spawned numerous private generators. It has been estimated that 6% of the power generated is from private generators which have 30 - 45% of the country's capacity. More efficient power generating plus the removal of the need to hoard supplies would produce considerable savings.

A secure supply of gasolene would also reduce hoarding.

Considerable progress has been made by DICOL in reducing losses. Losses in 1983 of 17% gasolene and 20% kerosene dropped to 8% for both in 1987. Diesel and Jet Fuel losses are held to 1% which is within allowable limits for similar size operations in the tropics. The still considerable difference between losses of gasolene/kerosene compared to diesel/jet fuel indicate that pilferage is also a cause of product loss. DICOL should consider more stringent sanctions and the management should adopt a more questioning approach when such losses are discovered.

As the jetty and depot facilities are improved especially with individual product lines and pumps, spillage and transfer losses will be greatly reduced. The rehabilitation of meters, improved gauging procedures and proper record maintenance/reconciliations will also reduce wastage.

The adoption of higher and more economic prices would save fuel. Less fuel would be smuggled out of the country. The insistence on payment for petroleum supplied would greatly reduce the misuse and squandering of products which are virtually given free.

IX FUTURE PROJECTS

The DICOL and Guinegaz managements see a number of areas for expanding sales. Unfortunately with both companies losing money simple expansion of sales may only increase the loss and as such be uneconomic.

If the companies are allowed to adopt the financial changes detailed in this report then many of the proposed projects would become economic.

If the companies continue to be run as at present only those projects involving sales for hard currency should be considered. Even with this proviso, to ignore the deflating currency and the parallel/market rate of exchange will ensure that almost all of these proposals are rejected on economic grounds.

A. Regional Depots

The geography of Guinea Bissau (map 2) shows the large area of river deltas and a number of islands. The coastline is crossed by rivers forming deep estuaries making surface transportation difficult and costly to operate. 85% of the population lives within 20 kilometres of a navigable waterway.

During the rainy season, the rainfall is heavy and the south and east of the country are not accessible by road due to flooding of low lying areas and so cannot be supplied with petroleum products. As a result a project is being considered to set up a number of small depots in the south of the country supplied by boat.

Table 7 shows that only 10% of the National Sales occur in the south and east regions while annexe 4 indicates that these same regions contain 44% of the population. The scope for growth is evident, but storage capacity at 173 360 litres (less than 1% of the national total – see tables 5 and 6) will be a limiting factor. The problem for development policy is not so much of limited natural resources as one of mobilising the resources which exist. Only about 5 – 7% of a potential 250 000 tones per year fish catch is achieved, while the area devoted to farming and commercial forestry could probably be trebled. Production of groundnuts, sugar and tropical fruits could be substantially increased and the country's mineral and energy resources have barely been tapped.

The project proposes the transport of petroleum products in bulk by barges using existing jetties to four new depots

DEPOT	REGION	STORAGE CAPACITY IN M3 DIESEL	GASOLENE	KEROSENE	PRINCIPAL ACTIVITY
Xime	Batafa	300	150	150	Agriculture
Catio	South	300	150	150	" and fishing
Bolama	South	200	100	100	Agriculture

Bubaque	Islands	200	100	100	Tourist/fishing

The facilities proposed are

- one self propelled barge 100 - 150 DWT capacity
- truck loading facilities at each location
- fire fighting facilities at each location
- drainage and pollution control facilities at each location

The Consultant Engineer is to investigate further the likely costs. The rescheduling of the project has not allowed sufficient time to asses the financial justifications of this potentially beneficial project, nor the ones which follow.

B. Airport Sales

The demand at Bissau airport exceeds supply by over 33% (table 14). This loss of sales is particularly regrettable as most of the sales would be in hard currency.

The price of jet fuel is much higher in Guinea Bissau (28 cents/litre official exchange rate) than Portugal at 18 cents/litre. Nevertheless for a round trip from Lisbon to Bissau it is operationally safer and cheaper to refuel in Bissau rather than leave Lisbon carrying sufficient fuel for the round trip. As table 8 shows a secure supply of fuel at the airport would ensure weekly sales of 46000 litres (44% of the current potential).

The price of jet fuel at Dakar is not known but was stated to be much higher than in Guinea Bissau. Were the differential cost sufficiently great and a regular supply at the airport ensured, together with adequate back up facilities then airlines might be tempted to reschedule routes out of Senegal and into Guinea Bissau. The time available did not allow the potential market to be assessed.

C. Shipping Fleet Sales

A considerable fleet of vessels fish in the coastal waters of Guinea Bissau. To refuel may require a costly voyage to Dakar. A service ship from the Canaries lies offshore supplying diesel at a reported cost of $180/tone. DICOL could economically supply diesel at $111 so the sales potential exists. Facilities at the jetty would be required and other bunkering services might be needed

- food and water
- crew change facilities
- communication facilities
- ships fuel

D. Butane Sales

As has already been mentioned in Section VII sales of Butane are

restricted to the depot. The use of existing DICOL service stations as sales points would lead to increases in sales if the bottle neck of the small number of butane cylinders in circulation was removed.

E. Drum Sales

DICOL management see considerable scope for increasing sales of drums by producing a range suitable for a variety of uses other than petroleum product storage eg fruit.

X INFRASTRUCTURE

The closeness of the DICOL and Guinegaz depots, their common facilities, the small size of both operations all suggest the absorption of Guinegaz into DICOL.

The supply of petroleum products has been sheltered from the opening up of the economy so far. In August 1986 the private sector was permitted to engage freely in the importation of any goods with the exception of petroleum products. At the Round Table conference held in Geneva on 4 - 5 July 1988, Mr Santos, head of the Bissau delegation and commerce minister, reiterated the government's absolute determination to pursue the programme which consists in liberalisation, privatisation and a reform of public enterprises.

The privatisation of DICOL would be the most radical and rapid way of turning the company into the independent, profitable operation this report envisages.

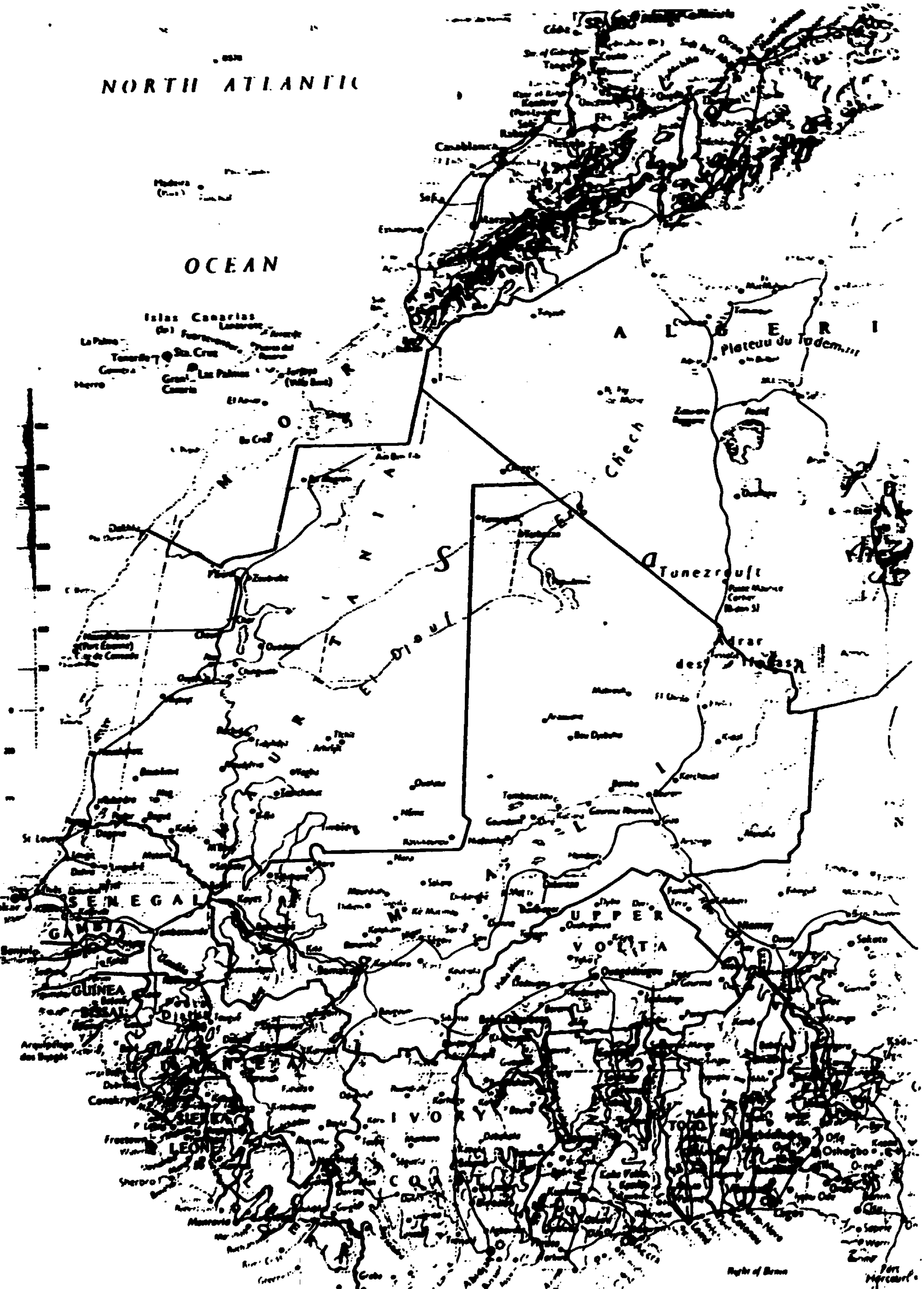
Should this option be unacceptable at present then the next best solution is the installation of an experienced management team. These managers should have line authority and not be taken on as advisors like the present Petrogal managerial assistence.

With either system of management serious thought should be given to streamlining DICOL's operations by hiving off the drum making plant and shutting down the garage repair facilities.

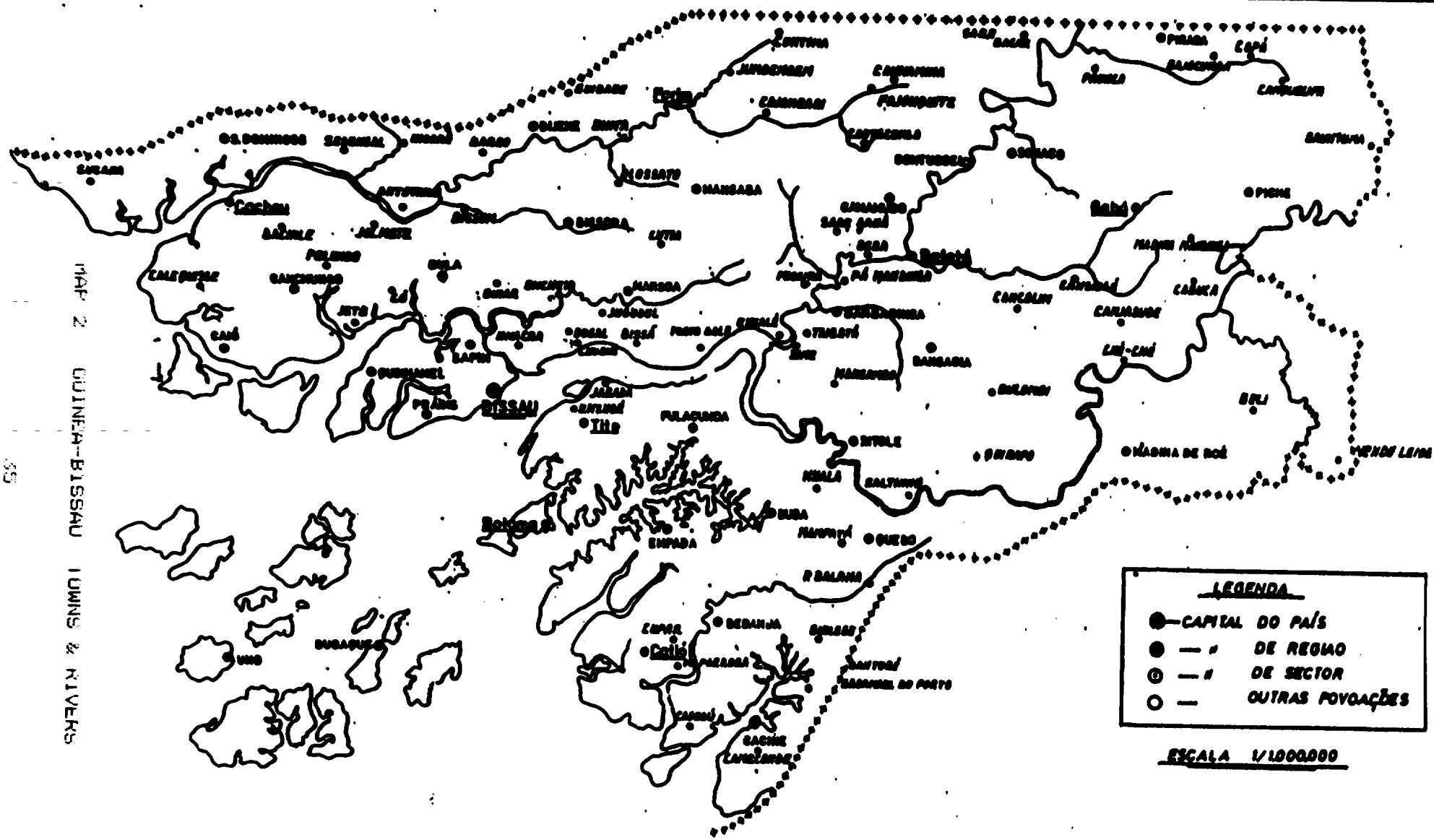
The expert engineer will give more detailed assessment of the training required but in essence it consists of

- handling of tankers and jetty management
- storage, handling and transportation of petroleum products
- oil and gas conservation and loss reduction
- oil and gas metering, sampling and gauging
- oil and gas accounting
- fire and safety and general housekeeping
- supervision and management.

With either alternative the monopoly positions of DICOL and Guinegaz should be removed opening up the market to competition.



MAP 1 LOCATION OF GUINEA-BISSAU IN WEST AFRICA



MAP 2 GUINEA-BISSAU TOWNS & RIVERS

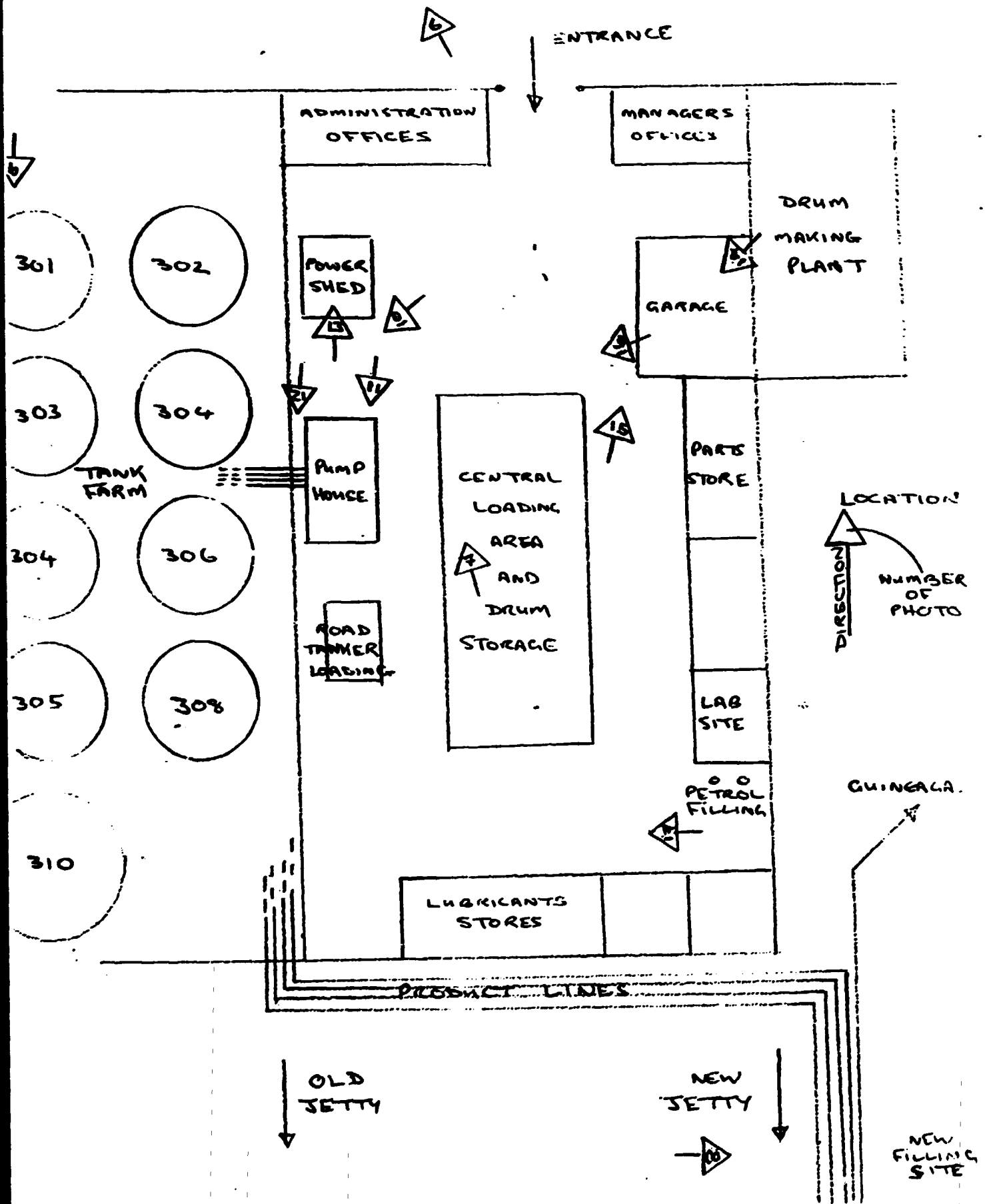
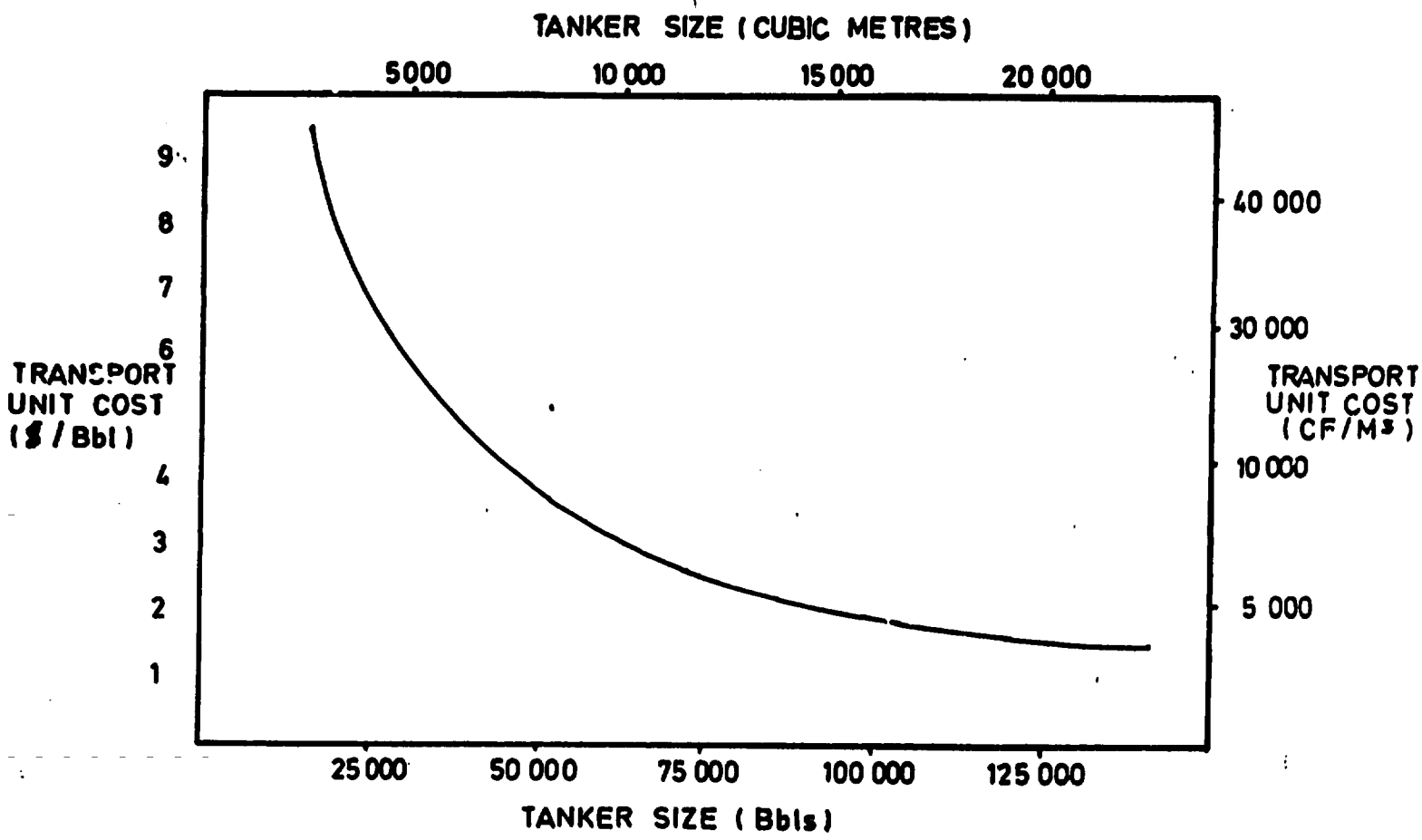


FIGURE 1 SKETCH OF DICOL S DEPOT

Figure 2

GRAPH OF TANKER SIZE VERSUS UNIT TRANSPORT COST



DIESEL SALES

1977-1988

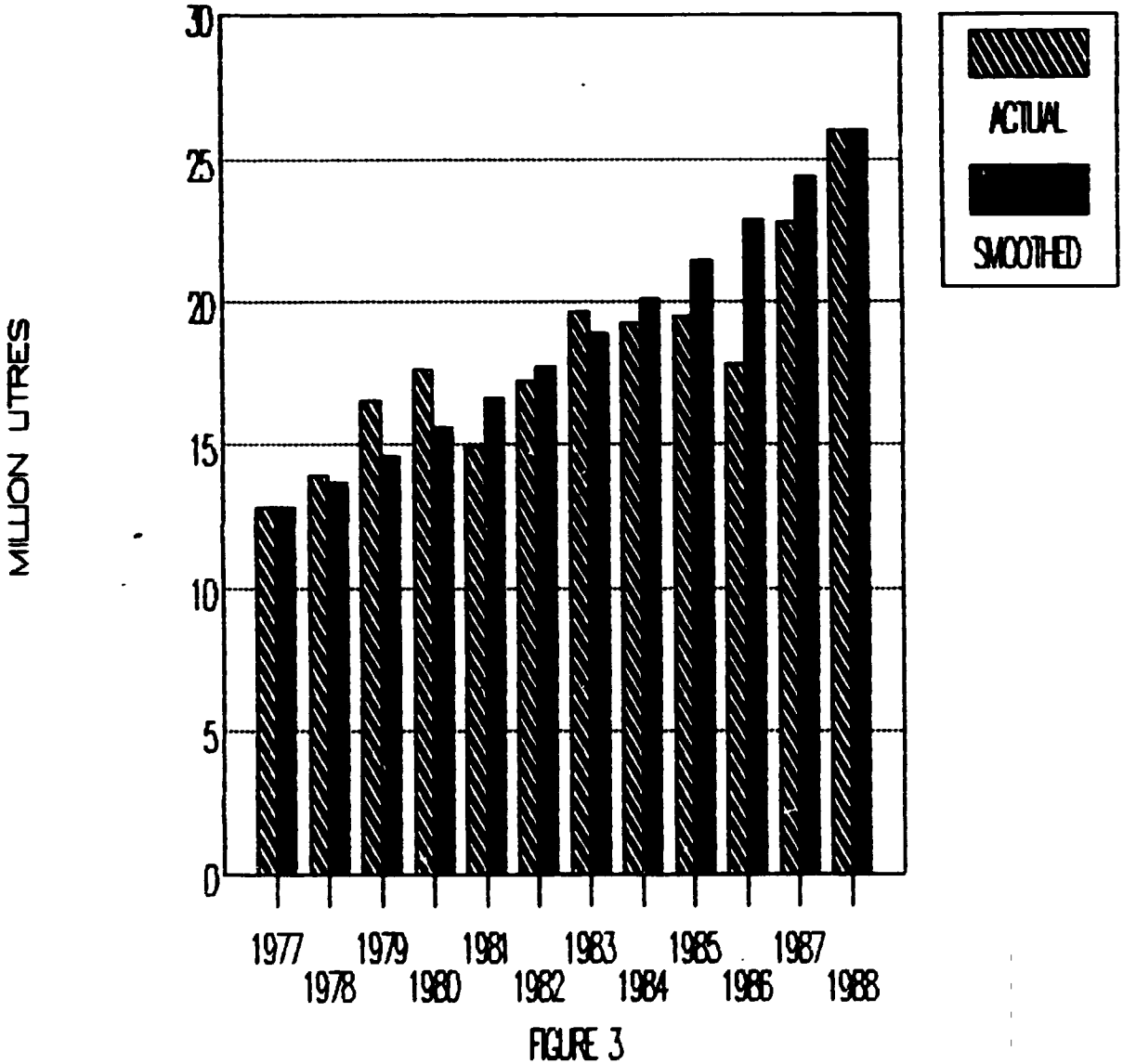


FIGURE 3

GASOLENE SALES

1977-1988

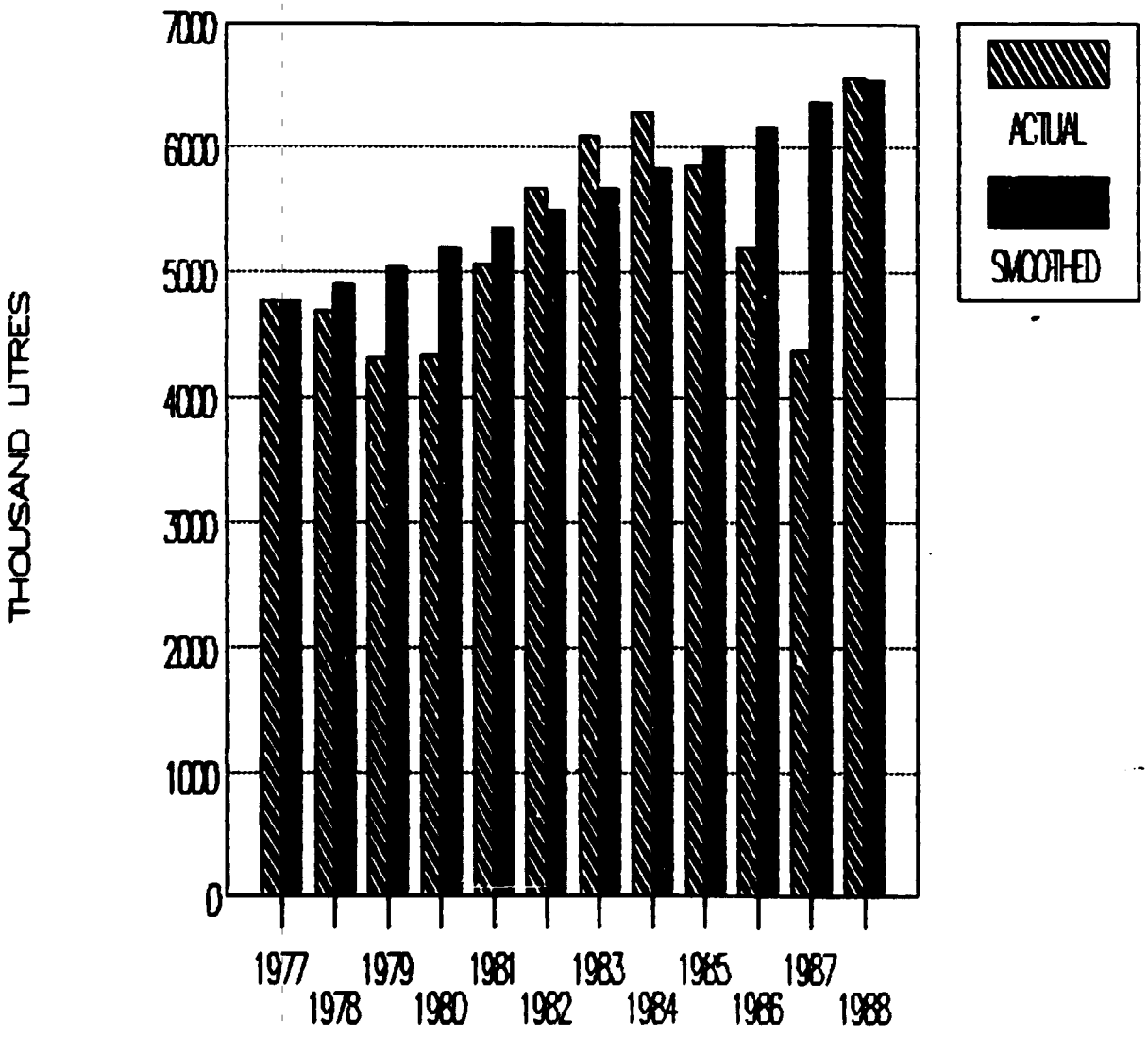


FIGURE 4

JET A1 SALES

1977-1988

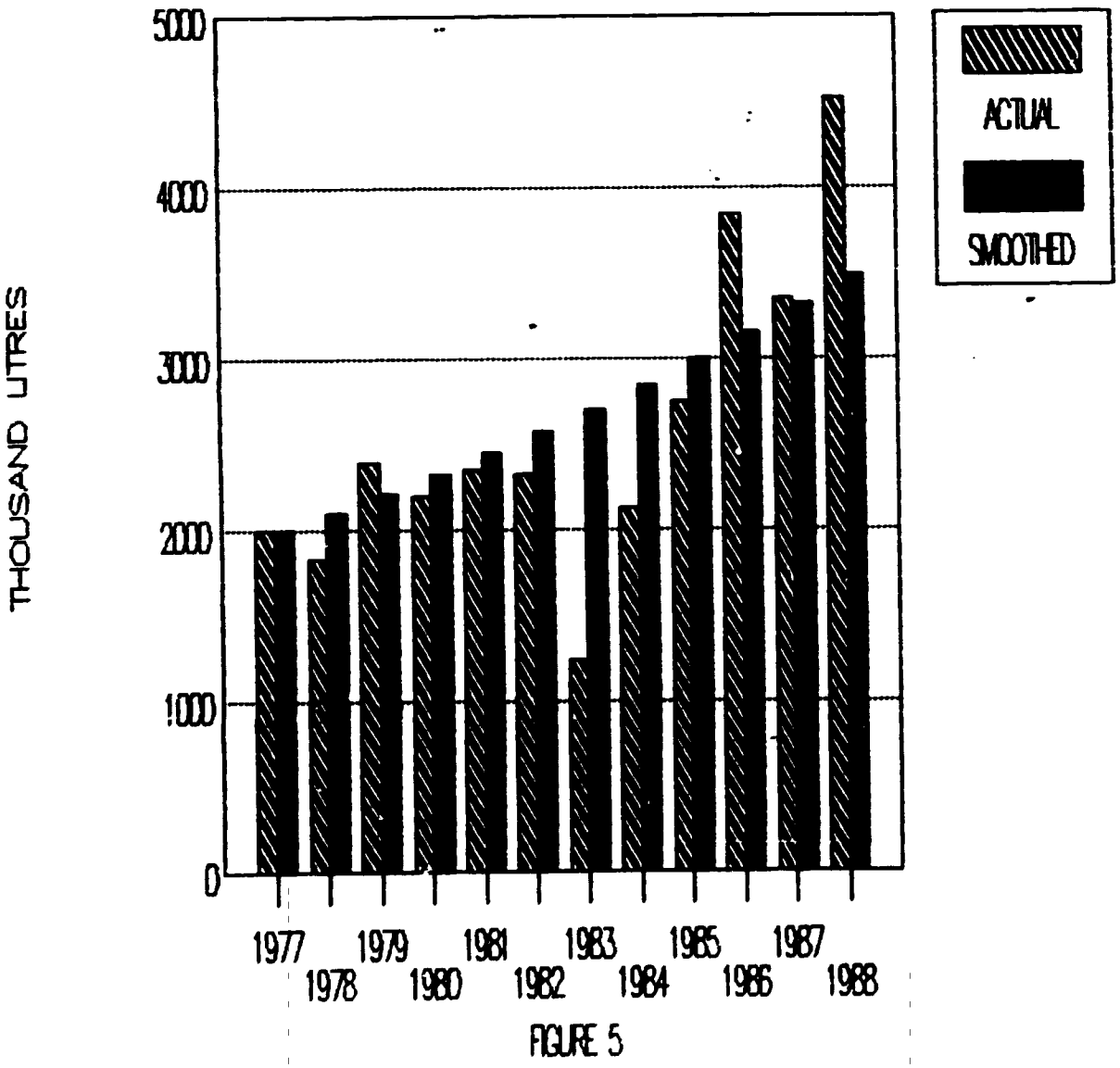


FIGURE 5

KEROSENS SALES

1977-1988

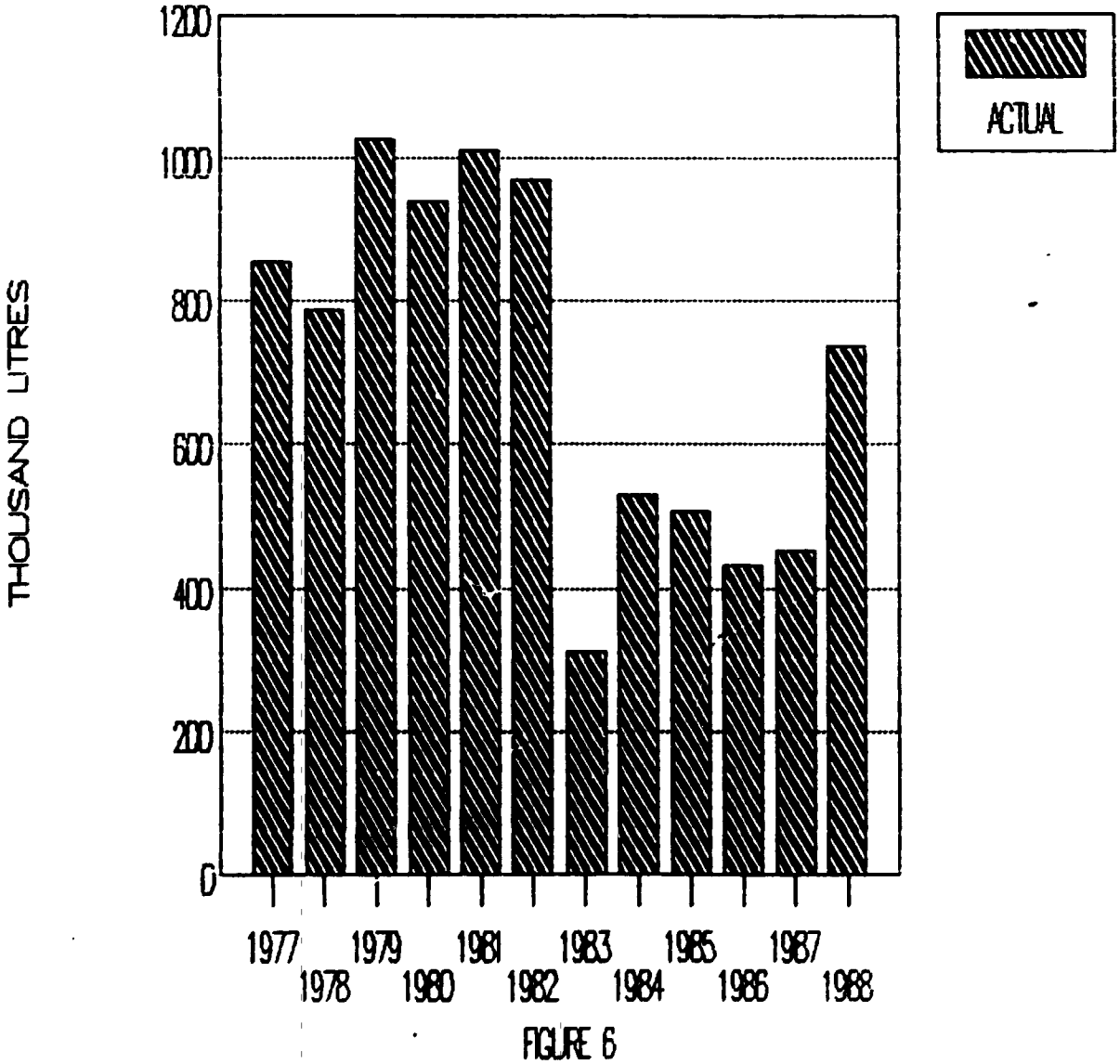


FIGURE 6

Table/Quadro 1

CONSUMPTION OF PETROLEUM PRODUCTS

(Consumo de Productos Derivados de Petroleo)

1977 - 1988 (000m3)

	Gasoleo (Diesel)	Gasolina Normal	Gasolina Super	Jet Al	Gasolina de Aviao	Petroleo	Total
1977	12.872	3.172	1.600	1.998	.307	.856	20.801
1978	13.965	2.512	2.186	1.834	.397	.786	21.680
1979	16.527	2.820	1.490	2.398	.160	1.027	24.422
1980	17.672	2.214	2.124	2.191	.162	.939	25.302
1981	14.930	2.508	2.563	2.358	.104	1.010	23.473
1982	17.267	2.834	2.848	2.327	.140	.968	26.384
1983	19.658	1.630	4.461	1.240	.150	.310	27.442
1984	19.222	2.440	3.852	2.122	.242	.530	29.105
1985	19.534	1.509	4.349	2.746	.137	.506	28.781
1986	17.851	.752	4.451	3.844	.045	.433	27.376
1987	22.799	0	4.374	3.355	0	.454	30.952
1988*	26.036	0	6.553	4.517	0	.735	37.841
% ano	+ 6.6		+ 2.9	+ 7.7	-	- 1.4	+ 5.6

* Estimado

Tonelado Gasoleo	=	1.191 m3	=	7.8 U.S Barrels
Tonelado Gasolina-Normal	=	1.347 m3	=	8.5 U.S Barrels
Tonelado Gasolina-Super	=	1.352 m3	=	8.5 U.S Barrels
Tonelado Jet Al	=	1.253 m3	=	7.9 U.S Barrels
Tonelado Gasolina de Aviao	=	1.364 m3	=	8.6 U.S Barrels
Tonelado Petroleo	=	1.240 m3	=	7.8 U.S Barrels
Tonelado Media	=	1.195 m3	=	7.5 U.S Barrels

Table/Quadro 2

CONSUMPTION OF LUBRICANTS AND BUTANE

1980 - 1988 (TONES)

	LUBRICANTS	BUTANE
1980	29	600
1981	83	600
1982	297	600
1983	277	600
1984	364	600
1985	377	600
1986	637	600
1987	358	600
1988	NA	600

Table/Quadro 3

IMPORTS OF PETROLEUM PRODUCTS

(Importacoes de Productos Derivados de Petroleo)

Tonelados 1988

NAVIO/CAMIAO	DATA DE DESCARGA	GASOLEO (DIESEL)	GASOLINA (SUPER)	JET AL	TOTAL
CAMIAO CISTERNA	19 ABRIL	177	-	-	177
NAVIO SAVE	27 ABRIL	3885	859	991	5735
NAVIO FIRST CARRIER	23 JUNIO	2818	1070	1849	5737
NAVIO TOMDE 1	26 JUNIO	1971	-	-	1971
NAVIO PETRO-PYLE	8 JULIO	3795	-	-	3795
CAMIAO CISTERNA	11 NOVEMBRO	207	-	-	207
NAVIO ASMA	22 NOVEMBRO	2832	-	-	2832
CAMIAO CISTERNA	10 DECEMBRO	-	25	-	25
NAVIO NAPETCOT	15 DECEMBRO	502	626	-	1198
T O T A L		16187	2650	2840	21677

VOLUME MEDIA DAS DESCARGAS NO BARCOS (AVERAGE SHIPS LOAD) 6 x 3545 TONELADOS

VOLUME MEDIA DAS DESCARGAS NO CAMIAOS (AVERAGE LORD SHIPMENT) 3 x 136 TONELADOS

Table/Quadro 4

CONSUMPTION OF PETROLEUM PRODUCTS BY SECTOR

	DIESEL	GASOLENE SUPER	JET A1	KEROSENE	TOTAL
ELECTRICITY GENERATION	29	-	-	-	29
TRANSPORTATION - ROAD	16	14	-	-	31
- SEA	1	-	-	-	1
- AIR	-	-	7	-	7
INDUSTRY	8	2	-	-	10
CONSTRUCTION	6	-	-	-	6
FISHING	1	1	-	-	2
AGRICULTURE	2	2	-	-	4
GOVERNMENT	3	1	-	-	4
ARMED FORCES	1	2	1	-	4
DOMESTIC	-	-	-	2	2
T O T A L	63	22	8	2	100

Table/Quadro 5

STORAGE CAPACITY

(CAPACIDADE DE ARMAZEMAGEMS)

M3 FEBRUARY 1989

	GASOLEO	GASOLINA (SUPER)	JET A1	PETROLEO	TOTAL	DATE INSTALLED
DICOL DEPOT						
RESERVATORIO						
300			800		800	1962
301		800			800	1962
302			800		800	1962
303		800			800	1962
304			800		800	1962
305			800		800	1962
307			800		800	1962
309	800				800	1962
310		1600			1600	1969
311				1600	1600	1969
312	2170				2170	1976
313	6500				6500	1976
T O T A L	9470	3200	4000	1600	18270	
CONSUMO 1988	26036	6553	4517	735	37841	
MESES DE CAPACIDADES	4.4	5.9	10.6	26		
AEROPORTO	-	-	200	-	200	
ESTACOES DE SERVICIO (11)	143	152	-	-	295	

NOTE: TANKS 306 AND 308 DESTROYED IN 3 SEPTEMBER 1988 TANK FARM FIRE

Table/Quadro 6

FILLING STATION STORAGE

(Capacidade de Armazemagems dos Postos de Vendas)

February 1989 Litres

	Gasoleo/Diesel	Gasolina/Petrol Super	Gasolina/Petrol Normal
Centro/Capital			
Alto Crim	9840	9840	5000
Ronda	9840	9840	5000
Avenida	5000	5000	8000
Norte			
Canchungo	30000	30000	10000
Bula	5000	16000	-
Farim	10000	5000	-
Sul			
Buba	16000	5000	-
Catio	30000	10000	10000
Bubaque	10000	-	10000
Leste			
Bafata	8500	8500	-
Gabu	8500	5000	-
Total	142680	104180	48000
		152180	

Table/Quadro /

REGIONAL SALES ESTIMATE

(EXPRESSED AS PERCENTAGE OF COUNTRY'S TOTAL SALES)

	GASOLINE	GAS OIL	KEROSENE/ JET FUEL
	%	%	%
BISSAU			
EX TERMINAL	34.0	80.5	86.0
EX CITY	50.0	8.0	–
SUB TOTAL	84.0	88.5	86.0
NORTH REGION			
CANCHUNGO	3.0	0.5	
BULA	2.0	0.5	
FARIM	1.0	0.5	
SUB TOTAL	6.0	1.5	4.0
SOUTH REGION			
CATIO	1.0	2.5	
BUBA	0.5	1.5	
BUBAQUE	0.5	0.5	
SUB TOTAL	2.0	4.5	4.5
EAST REGION			
BAFATA	5.0	3.0	
GABU	3.0	2.5	
SUB TOTAL	8.0	5.5	5.5
GRAND TOTAL	100.0	100.0	100.0

Table/Quadro 8

AIR TRAFFIC MOVEMENTS

AIRLINE	FREQUENCY	DESTINATION	FUEL REQUIRED (LITRES)
AIR SENEGAL	WEEKLY - MONDAY	DAKAR	1000
GAMBIA AIR SHUTTLE	WEEKLY - TUESDAY	DAKAR	1000
AIR BISSAU (TAGB)	WEEKLY - WEDNESDAY	DAKAR	3500
GAMBIA AIR SHUTTLE	WEEKLY - THURSDAY	DAKAR	1000
AIR SENEGAL	WEEKLY - FRIDAY	DAKAR	1000
AIR BISSAU (TAGB)	WEEKLY - SATURDAY	DAKAR	3500
AIR BISSAU (TAGB)	WEEKLY - TUESDAY	LISBON	21000
AIR PORTUGAL (TAP)	WEEKLY - THURSDAY	LISBON	25000
AIR BISSAU (TAGB)	WEEKLY - WEDNESDAY	CANARY ISLANDS	5000
AIR BISSAU (TAGB)	WEEKLY - THURSDAY	CAPE VERDE	3000
AIR BISSAU (TAGB)	WEEKLY - SATURDAY	CHARTER	3500
	WEEKLY FLIGHT TOTAL		68500
AEROFLOT	MONTHLY		20000
CUBANA	BI MONTHLY		124000
	MONTHLY FLIGHT TOTAL		144000

POTENTIAL WEEKLY SALES = 68500 + 144000/4

= 104500 LITRES

SELECTED PLANE SPECIFICATIONS

MANUFACTURER	TYPE	RANGE KM	FUEL CAPACITY L
LOCKHEAD	TRISTAR 500	9900	119000
AIRBUS	310 - 300	9200	68270
BOEING	737	3300	23600
BOEING	727	3700	30600

Table/Quadro 7

PRODUCT PRICE MAKE UP

(PRECOS DE DERIVADOS DE PETROLEO)

1 FEBRUARY 1989 PESOS/LITRO

	GASOLEO (EAGB)	GASOLEO	GASOLINA SUPER	GASOLINA NORMAL	JET A1	PETROLEO
CUSTO CIF LANDED COST	193	193	226	219	221	221
IMPOSTOS TAXES	0	29	490	477	45	78
CUSTOS DICOL CHARGES	68	68	68	68	68	68
MARGEM PROFIT MARGIN	9	10	66	66	41	33
PRECO NO CONSUMIDOR	270	300	850	830	375	400

Table/Quadro 10

PRODUCT PRICES

(EVOLUCAO DOS PRECOS TABLEADOS)

(1980 - 89 PESOS/LITRO)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
GASOLEO (EAGB)	9	NA	11	14	18	36	36	182	244	270
GASOLEO	11	NA	15	20	40	58.3	58.3	200	275	300
GASOLINA SUPER	23.6	NA	32	40	80	113	113	350	605	850
GASOLINA NORMAL	22	NA	30	38	76	107	107	340	590	830
JET A1	19	NA	19	19	55	78	78	230	315	375
GASOLINA DE AVIAO	19.2	NA	30	NA	70	99	99	500	-	-
PETROLEO	15	NA	17.3	23	46	64	64	225	325	400
CAMBIO $										
OFFICIAL	33.8	37.3	39.9	41.2	105	165	204	650	850	1360
PARALELO	170	NA	NA	NA	206	300	NA	800	NA	1800

Table/Cuadro 11.1

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)

JANUARY 1988

Date	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
1						HOLIDAY
2						SAT
3						SUN
4	3379	518	824	1328	7449	
5	3356	519	765	1328	7363	
6	3333	515	765	1328	7300	
7	3317	509	757	1328	7209	
8	3304	508	738	1328	7181	
9	SEMANA 1	C O N S U M O		D O	S E M A N A	SAT
10	78	12	126	0	689	SUN
11	3301	506	698	1328	6760	
12	3231	505	658	1328	6685	
13	3198	500	658	1328	6907	
14	3179	499	658	1328	6800	
15	3165	497	658	1328	6733	
16	SEMANA 2	C O N S U M O		D O	S E M A N A	SAT
17	168	9	40	0	138	SUN
18	3133	497	658	1328	6622	
19	3111	495	577	1328	6515	
20						NO DATA
21	3076	494	577	1328	6395	
22	3049	494	577	1328	6342	
23	SEMANA 3	C O N S U M O		D O	S E M A N A	SAT
24	112	3	121	0	403	SUN
25	3021	494	537	1328	6219	
26	2993	494	476	1328	6110	
27	2964	484	396	1328	5984	
28	2944	484	396	1328	5885	
29	2919	481	376	1328	5788	
30	SEMANA 4	C O N S U M O		D O	S E M A N A	SAT
31	132	16	201	0	513	SUN

* STOCK BELOW SAFETY LEVEL

Table/Cuadro 11B

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)

FEBRUARY 1988

Date	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
1	2889	478	336	1328	5706	
2	2866	476	316	1328	5591	
3	2843	475	276	1328	5478	
4	2825	472	236*	1328	5372	
5	2808	472	196*	1328	5316	
6	SEMANA 5	C O N S U M O	D O	S E M A N A		SAT
7	109	6	140	0	472	SUN
8	2780	472	196*	1328	5234	
9	2756	472	196*	1328	5160	
10	2713	469	181*	1328	5041	
11	2686	469	181*	1328	4957	
12	2666	468	181*	1328	4884	
13	SEMANA 6	C O N S U M O	D O	S E M A N A		SAT
14	142	4	18	0	438	SUN
15	2632	468	178*	1328	4796	
16						NO DATA
17	2613	467	139*	1328	4728	
18	2593	462	139*	1328	4611	
19	2574	460	139*	1328	4508	
20	SEMANA 7	C O N S U M O	D O	S E M A N A		SAT
21	92	11	62	0	377	SUN
22	2540	457	116*	1328	4419	
23	2519	457	116*	1328	4336	
24	2492	447	99*	1328	4223	
25	2467	447	99*	1328	4127	
26	2440	446	99*	1328	4032	
27	SEMANA 8	C O N S U M O	D O	S E M A N A		SAT
28	203	12	17	0	469	SUN
29	2337	445	99*	1328	3950	

* STOCK BELOW SAFETY LEVEL

Table/Cuadro IIC

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)

MARCH 1988

	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
Date						
1	2305	445	99*	1328	3882	
2	2275	445	99*	1328	3752	
3	2263	440	99*	1328	3662	
4	2234	439	99*	1328	3555	
5	SEMANA 9	C O N S U M O	D O	S E M A N A		SAT
6	106	17	0	0	528	SUN
7	2231	428	99*		3428	
8						NO DATA
9	2209	424	99*	1328	3266	
10	2188	424	99*	1328	3116	
11	2165	423	99*	1328	3001	
12	SEMANA 10	C O N S U M O	D O	S E M A N A		SAT
13	87	14	0	0	584	SUN
14	2144	414	99*	1328	2844	
15	2117	413	99*	1328	2788	
16	2099	412	99*	1328	2685	
17	2066	404	99*	1328	2586	
18	2035	401	99*	1328	2410	
19	SEMANA 11	C O N S U M O	D O	S E M A N A		SAT
20	136	16	0	0	546	SUN
21	2008	398	99*	1328	2298	
22	1971	388	99*	1328	2203	
23	1951	387	99*	1328	2091	
24	1917	385	99*	1328	2001	
25	1892	380	99*	1328	1884	
26	SEMANA 12	C O N S U M O	D O	S E M A N A		SAT
27	146	23	16	0	535	SUN
28	1862	375	83*	1328	1763	
29	1821	366	63*	1328	1679	
30	1788	364	63*	1328	1567	
31	1762	357	23*	1328	1455	

* STOCK BELOW SAFETY LEVEL

Table/Quadro 11D

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)
APRIL 1988

	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
Date						
1	1726	346	23*	1328	1345	
2	SEMANA 13	C O N S U M O	D O	S E M A N A		SAT
3	179	35	60*	0	494	SUN
4	1683	340	23*	1258	1269	
5						NO DATA
6	1640	329	23*	1258	1107	
7	1599	322	23*	1258	1050	
8	1563	317	23*	1258	965	
9	SEMANA 14	C O N S U M O	D O	S E M A N A		SAT
10	156	26	0	70	400	SUN
11	1527	314	23*	1258	869	
12	1511	311	23*	1258	784*	
13	1475	304	23*	1258	683*	
14	1447	303	0*	1258	650*	
15	1415	300	0*	1258	603*	
16	SEMANA 15	C O N S U M O	D O	S E M A N A		
17	146	15	23	0	266	
18	1381	299	0*	1258	655*	+52,000 L
19	1356	299	0*	1258	568*	AFTER TANK TRANSFER
CAMIAO CISTERNA DO BP SENEGAL CON 209500 LITROS GASOLEO						
			104889 NO DEPOT			
			102400 NO CLIENTES			
			2211 NO QUEBRAS			
20	1324	289	0*	1258	526*	
21	1302	289	0*	1258	631*	
22	1277	287	0*	1258	583*	
23	SEMANA 16	C O N S U M O	D O	S E M A N A		
24	131	14	0	0	239	
25	1250	285	0*	1258	523*	
26	1224	275	0*	1258	470*	
27	1188	273	0*	1258	417*	
28	1172	273	0*	1258	326*	
29	1150	272	0*	1258	253*	
30	SEMANA 17	C O N S U M O	D O	S E M A N A		
	131	18	0	0	424	

* STOCK BELOW SAFETY LEVEL

Table/Cuadro 11E

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)
MAY 1988

Date	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
1						SUN
2	1119	267	0*	1258	99*	
TANKER SAVE FROM BP SENEGAL CONTAINING 5735 METRIC TONS						
	1151	-	1211	-	4560	
3	2213	267	1185	1258	4444	
4	2197	265	1185	1258	4302	
5	2187	257	1185	1258	4172	
6	2151	251	1185	1258	4053	
7	SEMANA 18	C O N S U M O		D O	S E M A N A	SAT
8	179	18	58	0	780	SUN
9	2091	249	1153	1258	3879	
10	2069	249	1134	1258	3736	
11	2052	239	1114	1258	3617	
12	2015	239	1114	1258	3501	
13	1995	233	1094	1258	3382	
14	SEMANA 19	C O N S U M O		D O	S E M A N A	SAT
15	154	21	80	0	695	SUN
16	1937	228	1073	1258	3184	
17	1906	220	1052	1258	3074	
18						NO DATA
19	1886	219	1011	1258	2999	
20	1866	216	971	1258	2861	
21	SEMANA 20	C O N S U M O		D O	S E M A N A	SAT
22	105	21	157	0	461	SUN
23	1832	207	916	1258	2723	
24	1808	206	881	1258	2561	
25	1789	202	860	1258	2438	
26	1756	194*	821	1258	2316	
27	1740	193*	781	1258	2174	
28	SEMANA 21	C O N S U M O		D O	S E M A N A	SAT
29	124	14	181	0	693	SUN
30	1708	193*	735	1258	2030	
31	1688	16*	720	1258	1874	

* STOCK BELOW SAFETY LEVEL

Tabela/Quadro III

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)
JUNE 1988

	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
Date						
TRANSFERENCIA DO JET RT NO PETROLEO 1258000 L						
1	1667	1271	640	0	1699	
2	1652	1263	580	0	1522	
3	1624	1254	542	0	1390	
4	SEMANA 22	C O N S U M O	D O	S E M A N A		SAT
5	116	198 (1)	193	0	804	SUN
6	1592	1253	542	0	1226	
7	1564	1244	542	0	1045	
8	1538	1243	542	0	934	
9	1518	1243	519	0	773*	
10	1501	1243	518	0	625*	
11	SEMANA 23	C O N S U M O	D O	S E M A N A		SAT
12	135	25	35	0	662	SUN
13	1457	1228	507	0	564*	
14	1429	1223	477	0	489*	
15	1396	1213	418	0	429*	
16	1375	1213	398	0	371*	
17	1353	1212	378	0	325*	
18	SEMANA 24	C O N S U M O	D O	S E M A N A		SAT
19	143	16	129	0	289	SUN
20	1314	1212	378	0	275*	
21	1293	1212	337	0	191*	
22	1270	1201	317	0	159*	
23	1255	1201	297	0	120*	
24	1237	1201	297	0	73*	
25	SEMANA 25	C O N S U M O	D O	S E M A N A		SAT
26	127	11	81 (2)	0	1278	SUN
TANKER FIRST CARRIER FROM		B P SENEGAL		CONTAINING		METRIC TONS
	1436	190	2056	0	3307	5737
27	2623	1391	2491	0	2304	
28	2599	1390	2451	0	1908	
29	2581	1390	2396	0	1757	
TANKER TOMDE 1 FROM		B P SENEGAL		CONTAINING		METRIC TONS
	0	0	0	0	2292	1971
30	2561	1390	2336	0	3812	

* STOCK BELOW SAFETY LEVEL
1 ABNORMALLY HIGH - PROBABLY SOME STOCK WRITTEN OFF
2 ESTIMATED

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)
JULY 1988

	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
Date						
1	2535	1391	2281	0	3607	
2	C O N S U M O	N A	S E M A N A	2 6		SAT
3	114	0	251	0	989	SUN
	READJUSTMENT				+280	
4	2509	1396	2240	0	3887	
5	2478	1394	2214	0	3739	
6	2450	1292	2214	0	3608	
7	2422	1391	2214	0	3429	
8	2405	1389	2214	0	3278	
9	C O N S U M O	N A	S E M A N A	2 7		SAT
10	153	9	32	0	62	SUN
TANKER PETRO-PYLE FROM BP SENEGAL				CONTAINING		METRIC TONS
	0	0	0	0	4465	3795
11	2356	1387	2208	0	8290	
12	2318	1386	2078	0	8160	
13	2302	1386	2058	0	8034	
14	2789	1384	1997	0	7909	
15	2239	1377	1997	0	7836	
16	C O N S U M O	N A	S E M A N A	2 8		SAT
17	156	12	213	0	435	SUN
18	2200	1375	1995	0	7855	
19	2167	1374	1915	0	7770	
20	2156	1373	1895	0	7689	
21	2146	1373	1835	0	7507	
22	2121	1367	1885(1)	0	7381	
23	C O N S U M O	N A	S E M A N A	2 9		SAT
24	130	11	200	0	666	SUN
25						NO DATA
26	2070	1364	1795	0	7189	
27	2052	1362	1755	0	7090	
28	2024	1362	1735	0	6973	
29	1997	1358	1714	0	6857	
30	C O N S U M O	N A	S E M A N A	3 0		SAT
31	95	7	142	0	419	SUN

* STOCK BELOW SAFETY LEVEL (1) ADJUSTMENT UP?

Table/Cuadro III

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)

AUGUST 1988

Date	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
1	1975	1357	1653	0	6770	
2	1952	1357	1610	0	6687	
3						NO DATA
4	1931	1357	1590	0	6591	
5	1901	1356	1550	0	6479	
6	C O N S U M O	N A	S E M A N A	3 1		SAT
7	116	3	103	0	387	SUN
8	1859	1354	1550	0	6383	
9	1840	1352	1510	0	6280	
10	1793	1351	1510	0	6197	
11	1772	1349	1490	0	6077	
12	1749	1345	1490	0	6044	
13	C O N S U M O	N A	S E M A N A	3 2		SAT
14	135	12	60	0	441	SUN
15	1724	1342	1490	0	5942	
16	1838	1349	1469	0	5872	
17	1698	1342	1469	0	5872	
18	1668	1339	1469	0	5692	
19	1649	1334	1449	0	5582	
20	C O N S U M O	N A	S E M A N A	3 3		SAT
21	115	10	41	0	442	SUN
22	1609	1332	1449	0	5500	
23	1590	1331	1415	0	5388	
24	1564	1330	1395	0	5287	
25	1540	1329	1355	0	5204	
26	1534	1325	1355	0	5092	
27	C O N S U M O	N A	S E M A N A	3 4		SAT
28	95	8	135	0	524	SUN
29	1514	1324	1314	0	4976	
30	1500	1324	1314	0	4860	
31	1469	1322	1294	0	4772	

* STOCK BELOW SAFETY LEVEL

Tabla/Quadro III

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)

SEPTIEMBER 1988

	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
Date						
1	1443	1322	1275	0	4690	
2	1431	1321	1275	0	4620	
3	C O N S U M O		N A S E M A N A	3 5		SAT
4	97	3	57	0	449	SUN
5	1417	1321	1257	0	4527	
6	1407	1321	1257	0	4509	
7	1373	1321	1257	0	4370	
8	1357	1321	1215	0	4287	
9	1342	1318	1215	0	4125	
10	C O N S U M O		N A S E M A N A	3 6		SAT
11	96	3	66	0	492	SUN
12	1321	1318	1191	0	4035	
13	1298	1318	1176	0	3918	
14	1296	1316	1156	0	3799	
15	1256	1316	1116	0	3651	
16	1243	1312	1096	0	3549	
17	C O N S U M O		N A S E M A N A	3 7		SAT
18	107	6	116	0	558	SUN
19	1214	1312	1075	0	3477	
20	1100	1311	1035	0	3357	
21	1166	1310	1016	0	3264	
22	1153	1309	1016	0	3138	
23	1138	1307	1016	0	3028	
24	C O N S U M O		N A S E M A N A	3 8		SAT
25	104	6	59	0	574	SUN
26	1110	1306	1016	0	2903	
27	1089	1306	1016	0	2808	
28	1077	1304	976	0	2718	
29	1052	1302	917	0	2636	
30	1030	1295	917	0	2572	

* STOCK BELOW SAFETY LEVEL

Table/Quadro 11J

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)

OCTOBER 1988

Date	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
1	C O N S U M O	N A	S E M A N A	3 9		SAT
2	102	14	154	0	441	SUN
3	1008	1292	862	0	2462	
4	995	1292	821	0	2369	
5	972	1289	761	0	2276	
6	958	1289	721	0	2202	
7	938	1285	701	0	2140	
8	C O N S U M O	N A	S E M A N A	4 0		SAT
9	104	9	162	0	415	SUN
10	904	1283	700	0	2047	
11	870	1283	681	0	1930	
12	850	1283	663	0	1959 (1)	
13	837	1283	603	0	1883	
14	817	1281	603	0	1794	
15	C O N S U M O	N A	S E M A N A	4 1		SAT
16	109	8	117	0	351	SUN
17	795	1275	5 3	0	1696	
18	771	1275	543	0	1593	
19	745	1273	523	0	1515	
20	706	1273	482	0	1431	
21	673	1272	482	0	1333	
22	C O N S U M O	N A	S E M A N A	4 2		SAT
23	148	11	120	0	365	SUN
24	647	1264	463	0	1331	
25	625	1264	442	0	1141	
26	607	1261	422	0	1062	
27	581	1261	403	0	990	
28	571	1257	403	0	916	
29	C O N S U M O	N A	S E M A N A	4 3		SAT
30	106	9	81	0	544	SUN
31	541	1255	382	0	787*	

* STOCK BELOW SAFETY LEVEL (1) READJUSTMENT UP

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)
NOVEMBER 1988

	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
Date						
1	522	1254	383	0	753*	
2	475	1247	362	0	688*	
3	473	1247	362	0	649*	
4	462	1245	362	0	615*	
5	C O N S U M O	N A	S E M A N A		4 4	SAT
6	105	12	20	0	249	SUN
7	436	1243	362	0	538*	
8	423	1242	362	0	500*	
9	406	1242	344	0	455*	
10	387	1233	324	0	416*	
11	375	1230	324	0	385*	
ROAD TANKERS FROM BP SENEGAL CONTAINING						METRIC TONS
	0	0	0	0	243	207
12	C O N S U M O	N A	S E M A N A		4 5	SAT
13	87	15	59	0	402	SUN
14						NO DATA
15	349	1228	303	0	379*	
16	344	1222	303	0	311*	
17	339	1213	303	0	300*	
18	326	1210	303	0	214*	
19	C O N S U M O	N A	S E M A N A		4 6	SAT
20	52	19	0	0	225	SUN
21	297*	1209	303	0	154*	
22	284*	1209	303	0	129*	
23	269*	1206	303	0	96*	
TANKER ASMA FROM BP SENEGAL CONTAINING						METRIC TONS
	0	0	0	0	3254	2832
24	262*	1205	303	0	3259	
25	254*	1204	282	0	3128	
26	C O N S U M O	N A	S E M A N A		4 7	SAT
27	75	10	21	0	423	SUN
28	222*	1199	282	0	2985	
29	214*	1198	262	0	2803	
30	198*	1198	242*	0	2682	

* STOCK BELOW SAFETY LEVEL

Table/Quadro III

EXISTENCIAS/DEPOT STOCK LEVELS (000 LITRES)

DECEMBER 1988

Date	GASOLINA (super)	PETROLEO (kerosene)	JET A1	JET RT Cubano	GASOLEO (diesel)	COMMENTARIOS
	300	200	250	na	800	Safety Stock
1	191*	1195	162*	0	2539	
2	179*	1191	142*	0	2384	
3	C O N S U M O	N A	S E M A N A	4 8		SAT
4	61	12	140	0	764	SUN
5	161*	1187	142*	0	2221	
6	149*	1184	102*	0	2017	
7	147*	1176	102*	0	1908	
8	122*	1174	82*	0	1817	
9	115*	1171	82*	0	1677	
10	C O N S U M O	N A	S E M A N A	4 9		SAT
11	82	18	58	0	679	SUN
ROAD TANKER FROM BP SENEGAL CONTAINING 25 METRIC TONS SUPER						
	11 (PLUS 33 DELIVERED DIRECTLY TO CLIENTS)					
12	123*	1169	82*	0	1542	
13	104*	1167	61*	0	1443	
14	89*	1167	41*	0	1326	
15	72*	1164	41*	0	1144	
16	63*	1162	41*	0	1058	
TANKER NAPETCOT 1 FROM BP SENEGAL CONTAINING 1198 METRIC TONS						
	935	0	0	0	598	
17	C O N S U M O	N A	S E M A N A	5 0		SAT
18	123	15	41	0	620	SUN
19	935	1154	41*	0	1520	
20						NO DATA
21						NO DATA
22	842	1139	0*	0	1134	
23	790	1136	0*	0	997	
24	C O N S U M O	N A	S E M A N A	5 1		SAT
25	174	19	41	0	630	SUN
26	761	1135	0*	0	890	
27	732	1135	0*	0	829	
28	715	1125	0*	0	787*	
29	691	1124	0*	0	726*	
30	653	1120	0*	0	642*	
31	C O N S U M O	N A	S E M A N A	5 2		SAT
	148	18	0	0	334	

* STOCK BELOW SAFETY LEVEL

Table/Quadro 12

NUMBER OF DAYS OF RESTRICTED SALES

MONTH	GASOLENE	KEROSENE	JET A1	DIESEL
JAN				
FEB			26	
MAR			31	
APR			30	19
MAY		5	2	2
JUNE				18
JULY				
AUG				
SEPT				
OCT				1
NOV	10		1	23
DEC	21		31	4
TOTAL	31	5	121	67

Table (illegible) 13 WEEKLY SALES (000 LITRES)

MONTH	WEEK	GASOLINE	KEROSENE	JET A1	DIESEL
JAN	1	78	12	126	689
	2	168	9	40	138
	3	112	3	121	403
	4	132	16	201	513
FEB	5	109	6	140*	472
	6	148	4	18*	438
	7	92	11	62*	377
	8	203	12	17*	469
MAR	9	106	17	0*	528
	10	87	14	0*	584
	11	136	16	0*	546
	12	146	23	16*	535
APR	13	179	35	60*	494
	14	156	26	0*	400
	15	146	15	23*	266*
	16	131	14	0*	239*
	17	131	18	0*	424*
MAY	18	179	18	58*	780*
	19	154	21	80	695
	20	105	21	157	461
	21	124	14*	181	693
JUNE	22	116	198(1)	193	804
	23	135	25	35	662*
	24	143	16	129	289*
	25	127	11	81	1278*
JULY	26	114	0	251	989

*STOCK BELOW SAFETY LEVEL (1) ANOMALOUS FIGURE

MONTH	WEEK	GASOLINE	KEROSENE	JET A1	DIESEL
JULY	27	153	9	32	62
	28	156	12	213	435
	29	130	11	200	666
	30	95	7	142	419
AUG	31	116	3	103	387
	32	135	12	60	441
	33	115	10	41	442
	34	95	8	133	524
SEPT	35	97	3	57	449
	36	96	3	66	492
	37	107	6	116	558
	38	104	6	59	574
OCT	39	102	14	154	441
	40	104	9	162	415
	41	109	8	117	331
	42	148	11	120	365
	43	106	9	81	544
NOV	44	105	12	20	249*
	45	87	15	59	402*
	46	52	19	0	225*
	47	75*	10	21	423*
DEC	48	61*	12	140*	764
	49	82*	18	58*	679
	50	123*	15	41*	620
	51	174*	19	41*	630
	52	148	18	0*	334*

Table (Appendix) 14

DEMAND FOR PETROLEUM PRODUCTS 1988 (000 LITRES)

	DIESEL	GASOLENE	JET A1	KEROSENE
WEEKLY SUPPLY	501	122	81	13
NORMAL WEEKS	40	47	33	50
WEEKLY DEMAND (DURING THESE WEEKS)	522	125	108	13
SHORTFALL %	4.2	2.2	33.3	0

DEMAND FOR PETROLEUM PRODUCTS

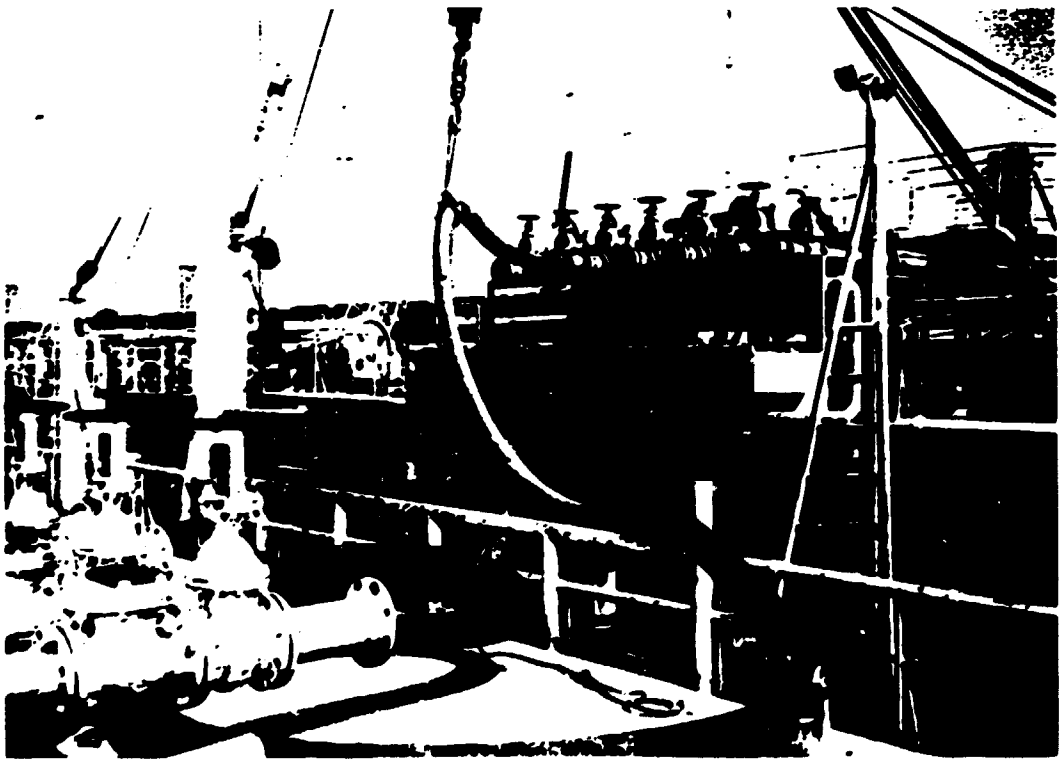
1988 - 1998 (000LITRES)

	SUPPLY	1988 %	DEMAND	GROWTH RATE %	1989	1990	1991	1998
DIESEL	26036	4.2	27130	6.6	28921	30829	32864	51407
GASOLENE	6553	2.5	6717	2.9	6912	7112	7318	8940
JET A1	4517	33.3	6008	5.2	6320	6649	6995	9974
KEROSENE	735	0	735	2.0	750	765	780	896
TOTAL	37741		40590	5.7	42903	45355	47957	71217
DICOL FORECAST	38000				42600	46600	49500	NA

1. THE OLD JETTY - DESTROYED (DICOL DEPOT IN THE BACKGROUND)

2. THE NEW JETTY - OPERATIONAL (DICOL DEPOT ON THE LEFT, [illegible] ON THE RIGHT

3. TANKER LOADING LINES - ONE FOR EACH PRODUCT PLUS A WATER LINE - NOT YET OPERATIONAL



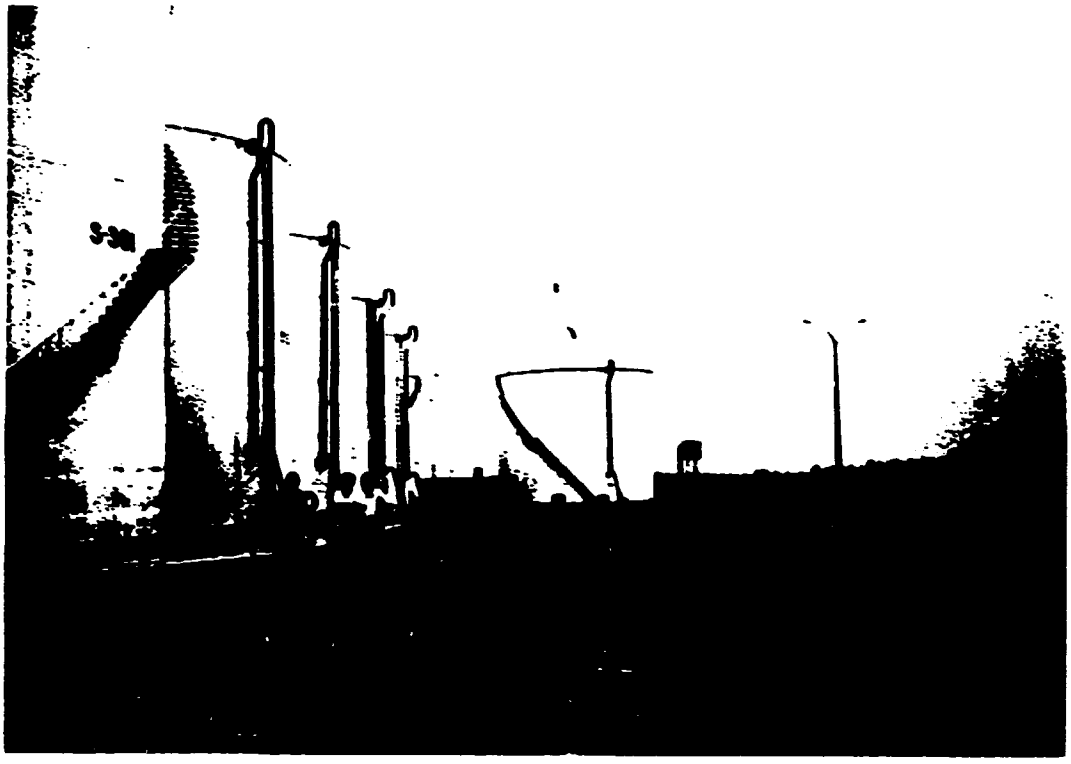
4. TANKER UNLOADING USING A SINGLE LINE

5. TONDE I UNLOADING AT THE NEW JETTY - 30 JANUARY 1989

6. DISTRESS SUPPLY BY ROAD TANKERS FROM SENEGAL - 30 JANUARY 1989

7. FILLING DRUMS INSIDE DICOL DEPOT - NOTE: NUMBER OF ON LOOKERS
TRANSFER PUMP
OVERHEATED
FILLING FROM A ROAD
TANKER

8. SITE OF PROPOSED FILLING STATION - OUTSIDE DEPOT

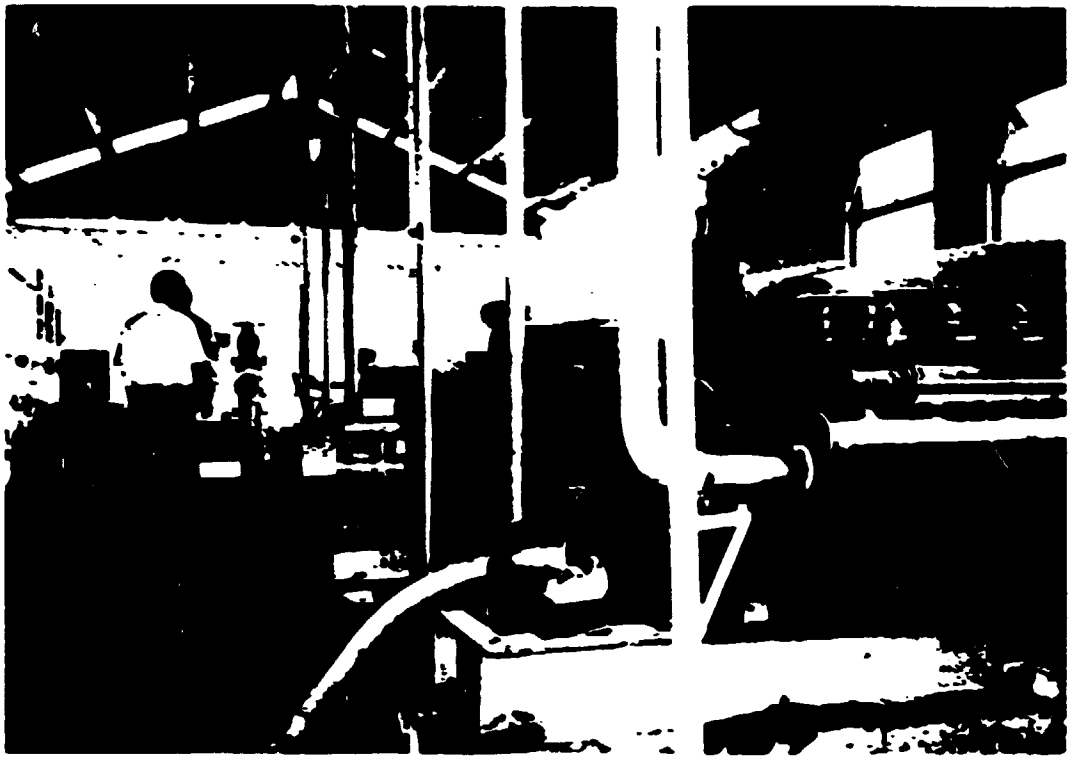


9. DICOL TANK FARM - NOTE CLOSENESS OF TANKS AND LACK OF INDIVIDUAL SPILLAGE RETAINING WALLS

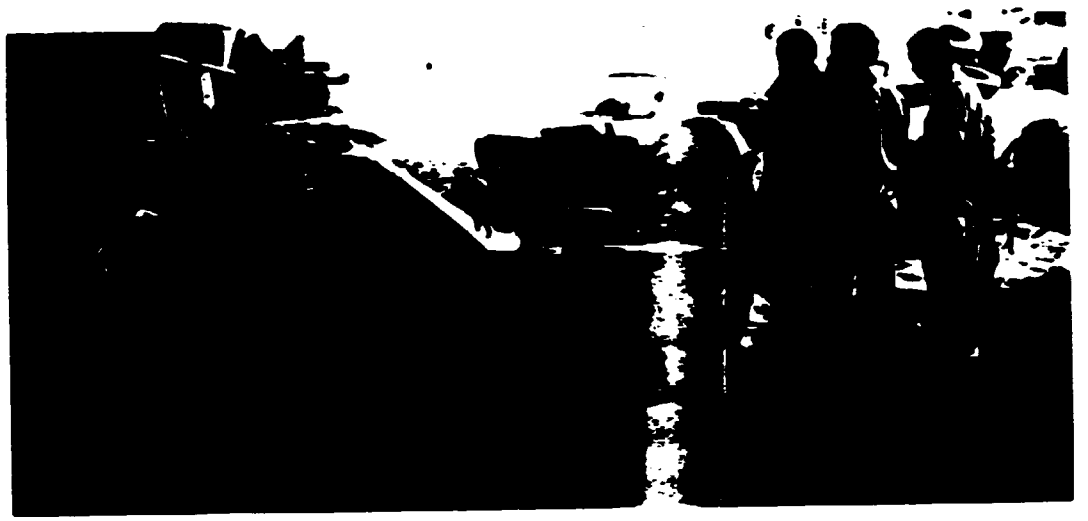
10. DICOL TANK FARM - TRANSFER PUMP HOUSE - NOTE UNSUPERVISED WELDING NEAR DESTROYED TANKS 306 AND 308 ALSO NEAR SPILLAGE AREA SHOWN IN PHOTOGRAPH 12

11. TRANSFER PUMP HOUSE - 4 OUT OF 5 PUMPS BROKEN DOWN

12. TRANSFER PUMP HOUSE - FLEXIBLE TUBING BEING REPEATEDLY RECONNECTED DUE TO LACK OF INDIVIDUAL PRODUCT PUMPS - NOTE FUEL SPILLAGE



GENERATOR SHED -- ALL 3 GENERATORS BROKEN DOWN



14. BROKEN DOWN/ABANDONED CARS - INSIDE THE GARAGE

15. BROKEN DOWN/ABANDONED CARS - OUTSIDE THE GARAGE

16. BROKEN DOWN/ABANDONED CARS - IN FRONT OF THE LOADING AREA

17. BROKEN DOWN/ABANDONED CARS - OUTSIDE THE STORES

18. AIRPORT UNDERGROUND STORAGE TANKS - NOTE VENTS AND SAMPLING POINTS

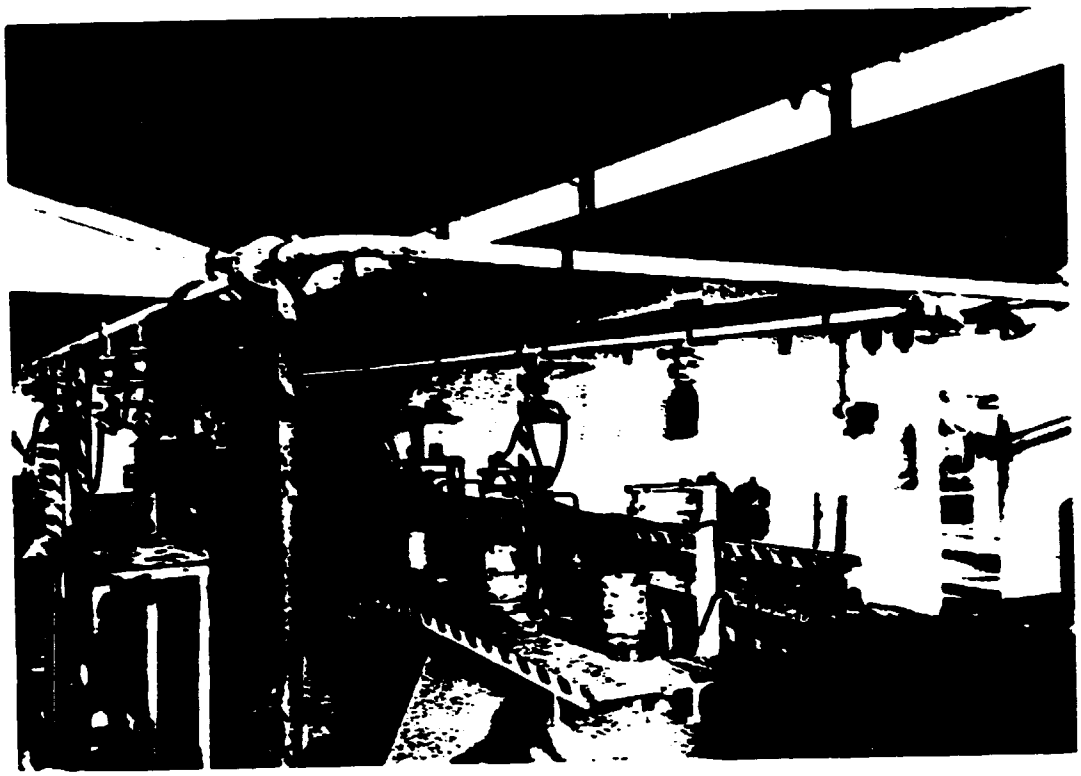
19. AIRPORT UNDERGROUND STORAGE TANKS AND LOADING FACILITIES

20. LOADING FLEET - TRAILER,
FUEL TRUCK (BROKEN DOWN),
SERVICE AIR TRUCK

21. LOADING FLEET - SERVICE AIR TRUCK (BROKEN DOWN)
SERVICE AIR TRUCK (BROKEN DOWN)
FUEL TRUCK

22. GUINEGAZ DEPOT - STORAGE CYLINDERS 50 TONES EACH
NOTE DEAD GRASS FIRE HAZARD

23. GUINEGAZ DEPOT - STORAGE SPHERES 250 TONES EACH
NOTE DEAD GRASS FIRE HAZARD



24. BOTILE FILLING PLANT

Annexe 1

STUDY DIARY

9 Jan 1989	Flight from Spain (11.00) to Vienna (18.00)
10 Jan 1989	Briefing from UNIDO
11 Jan 1989	Briefing from UNIDO Flight from Vienna (14.00)
12 Jan 1989	Arrive in Bissau (01.00) Briefing from UNDP Commence reviews of earlier studies
13 Jan 1989	Briefing from Ministry of Industry and Natural Resources
14 Jan 1989	Saturday
15 Jan 1989	Sunday
16 Jan 1989	Briefing from DICOL Data Collection at DICOL
17 Jan 1989	Data Collection at DICOL
18 Jan 1989	Commence Data Analysis. 6 tables sent for typing
19 Jan 1989	Arrival of Expert Engineer on Study. Briefing
20 Jan 1989	National Holiday
21 Jan 1989	Saturday
22 Jan 1989	Sunday
23 Jan 1989	Survey DICOL depot
24 Jan 1989	Survey DICOL depot
25 Jan 1989	Survey Airport Installations
26 Jan 1989	Non arrival of Third Team Member Telex sent to UNIDO Commence Briefing from PETROGUIN
27 Jan 1989	Survey DICOL depot garage and stores Commence Report Drafting
28 Jan 1989	Saturday
29 Jan 1989	Sunday
30 Jan 1989	Briefing from GUINEGAZ and Depot Survey
31 Jan 1989	Brief UNDP on Preliminary Conclusions Complete Data Collection at PETROGUIN

1 Feb 1989	Brief DICOL on Preliminary Conclusions Brief Ministry on Preliminary Conclusions Typing returned
2 Feb 1989	01.30 started return journey 23.30 arrived Mallorca
3-27 Feb 1989	Report Preparation, equivalent to 7 days

BUDGETED DAYS	31
Travel	2.5
Weekend)	
)	9
National Holiday)	
UNIDO Briefing	1.5
Study and Report Preparation	21
TOTAL DAYS	34

Annexe 2

PERSONS PROVIDING TECHNICAL ASSISTANCE

Government of Guinea Bissau

A.J. Afonseca	- General Manager of Energy, Ministry and Natural Resources

UNDP

Dr. Kone Diabi	- Deputy Resident Representative
V. Traore	- Administration Manager
J. Tuit	- UNCDF Programme Manager
J. Becker	- DTCD Geologist

Petroguin

A. Cardosa	- Director
C. Batista	- Head of Administration

DICOL/Petrogal

C. Gomes Junior	- General Manager
A. Serra Garcia	- Aviation Division
C.A. Bayan Ferreira	- Economist
J. Dias	- Finance Administrator

Guinegaz

A. Correia	- General Manager

UNIDO

Dr. B. Diallo	- Formerly Head of Guinea-Bissau Desk
Dr. Derrough	- Project Back Stopping Officer
H. Baba-Ahmed	- Consultant Engineer

Other

J. van Maanen	- British Consul
N. Lehman	- Technical Officer - Swedish Telecom
R. Martin	- Aviation Division - Bureau Verites
G.G. Oba	- Economic Officer - USA Embassy
I. Iencalla	- Representative - World Bank

Annexe 3

LIST OF RELATED REPORTS AND DATA REFERENCES

1. Rapport de Mission de Programmation de L'ONUDI en Guinee-Bissau - 13-14 Janvier 1986 - UNIDO (F)

2. Guinea-Bissau Issues and Options in the Energy Sector - August 1984 - UNDP/World Bank (E)

3. DICOL - Relatorio e Contas - Exercicio de 1987 (P)

4. Country Brief - Guinea Bissau - November 1988 - World Bank (E)

5. Rapport Industriel de l'Entreprise Publique - DICOL - January 1989 - Louis Berger, International Inc USA (F)

6. Guinea Bissau - Supply and Distribution of Petroleum Products - October 1988 - S.L. Kikeri, Consultant, World Bank (E)

7. Os Precos dos Productos Derivados dos Petroleo na Republica da Guinea-Bissau - December 1985 - Petrominas (P)

8. Etude du Secteur d'Electricite en Guinea Bissau - October 1987 - Societe Generale pour l'Industrie - Luxembourg (F)

9. Boletin Oficial - 31 Mayo 1982 - Republica de Guinea Bissau (P)

10. Boletin Oficial - 30 Dezembro 1983 - Republica de Guinea Bissau (P)

11. Boletin Oficial - 5 Octubro 1985 - Republica de Guinea Bissau (P)

12. Boletin Oficial - 13 Junho 1988 - Republica de Guinea Bissau (P)

13. Country Profile - Guinea Bissau - 1987-88. The Economist Intelligence Unit (E)

14. Country Report - Guinea Bissau - November 1988 - The Economist Intelligence Unit (E)

15. Country Report - Guinea Bissau - October 1987 - Osterreichische Landerbank (E)

16. Job Description XP/GBS/88/064/11-01 Petroleum Engineer (E)

17. Job Description XP/GBS/88/064/11-02 Petroleum Economist (E)

18. Job Description XP/GBS/88/064/11-02/A/J - 13424 Petroleum Economist (E)

Annex 4

BASIC COUNTRY DATA

Land Area: 36,125 km2

Population: 907,000 (mid-1987 est)

By Region (April 1979 date of last census):

		%
Sector of Bissau	109 486	14
Region of Bijagos	57 724	7
Region of Bafata	117 202	15
Region of Bolama	25 713	3
Region of Buba	35 360	5
Region of Cacheu	134 108	17
Region of Gabu	105 500	14
Region of Oio	137 595	18
Region of Tombali	54 526	7
TOTAL	777 214	100

Trend of External Trade ($ mn)

	1982	1983	1984	1985	1986	1987	1988
Exports fob	11.8	8.6	17.4	11.6	9.6	16.5*	21.7*
Imports fob	61.5	58.4	60.1	59.5	52.7	48.8*	58.9*
Trade Balance	-49.7	-49.8	-42.7	-47.9	-43.1	-44.1	-43.4
Cover Rate (%)	19	15	29	11	18		
Development Assistance Grants	48.5	43.6	45.1	44.5	NA		
External Debt	163.4	194.8	214.0	254.8	NA		
External Debt at a % of GNP	99	120	165	190	NA		

* estimated

Annexe 5

DICOL - COMPENDIUM OF DETAILED TECHNICAL RECOMMENDATIONS

Urgent Safety Facilities

Replace the diesel driven fire water pump.

Replace the foam dispensing facilities.

Install emergency generator set.

Replace the 2 water pumps with motors for pumping water from the well to fire water storage tank.

Provide sufficient number of water cannons to augment fire fighting facilities. Provide them at the jetty also.

Depot Improvement

Recalibrate all storage tanks and implement gauging procedure at various points to control losses.

Replace all 5 product loading pumps out of which one is diesel driven and the others are motor driven.

Replace motor control centre.

Replace two Jet Fuel (ATF) filters.

Replace 5 truck loading arms.

Provide meters with totalisers at each loading arm.

Replace the oil sump pump with motor at the oil separator.

Provide laboratory facilities for critical tests of products.

Provide workshop facilities to carry out maintenance of the terminal facilities.

Drum Making Plant

Replace all 3 drum filling valves.

Replace the inoperative gas welding machine with electric welding machine.

Replace the inoperative leak test machine.

Replace the end covers sealing machine.

Provide sheet cutting machine to enable import of steel rolls instead of cut sheets to reduce cost.

Future Projects

Jetty Pump for fishing boat service

Review need for trucks for product transportation.

Depots in the Province

One self propelled barge suitable for petroleum transportation (gasoline, kerosene and diesel) with 100 - 150 DWT capacity

Storage depots with the following storage capacities at the proposed locations:

Locations	Gasoline	Diesel	Kerosene
Xime	150	300	150
Catio	150	300	150
Bolama	100	200	100
Bubaque	100	200	100

Truck loading facilities

Fire fighting facilities

Pipeline connection between the jetty and the depot

Drainage facilities with an oil catcher for pollution control

GUINEA - COMPENDIUM OF DETAILED TECHNICAL RECOMMENDATIONS

Procure land around the storage area to provide 90 m safe distance from fence.

Cut the grass near the storage area and spray weed killer or asphalt and maintain the area clean all the time.

Replace the corroded water drawoff lines from the spheres.

Replace valves on storage vessels with antifreeze valves. Three for each sphere and cylinder (total 18).

Leak test the filled cylinders in water trough.

Provide laboratory facilities in the proposed DICOL's laboratory to test for copper corrosion and LPG sampling.

Replace the 2 water pumps one of which is diesel driven and the other motor driven.

Provide adequate fire fighting facilities with 4 water cannon.

Provide 3,000 x 13 kg cylinders and 500 x 55 kg cylinders to replace existing damaged cylinders and to increase sales.

Provide 4 x 10 tone trucks for transportation of cylinders inland.

Provide spare cylinder valves, 2000 for 13 kg cylinders and 200 for 55 kg cylinders.

Provide cylinder repair kit.