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R E P O R T N O. II

MEETING WITH GOVERNMENTAL

PERSONNEL

IN

VENEZUELA - EQUADOR - TRINIDAD - SURINAM

MARCH 17 - 31 1986

TO DISCUSS the

UNIDO/NORWAY MEETING

ON OFFSHORE PETROLEUM PRODUCTION, TECHNIQUES AND EXPERIENCE

VISIT DONE BY: UNIDO CONSULTANT BJØRN JOHANNESSEN
TMC A/S NORWAY

1. OBJECTIVES

The reason for my visit to the four countries:

- Venezuela
- Equador
- Trinidad and Tobago
- Surinam,

was to inform them about:

- The UNIDO/Norway meeting - August 20-24 1986
- The ONS

to get information about their interest to join the conference,
to inform them about how many participants that could be invited,
and the costs.

As a UNIDO consultant, I was also very interested in getting
information of the todays and tomorrows situation within the
field of oil exploration and information.

2. VENEZUELA

The following persons were met:

Dir Eduardo Santamaria, Coordinator, Materials and Technical Services, PETROLEOS DE VENEZUELA

Mr Louis A Ramos, Supervisor, Materials and Technical Services, PETROLEOS DE VENEZUELA

Both gentlemen were met at the premises of PDVSA (PETROLEOS DE VENEZUELA),

Av. Libertador La Campina, Apda 169, Caracas 1010 A, Venezuela

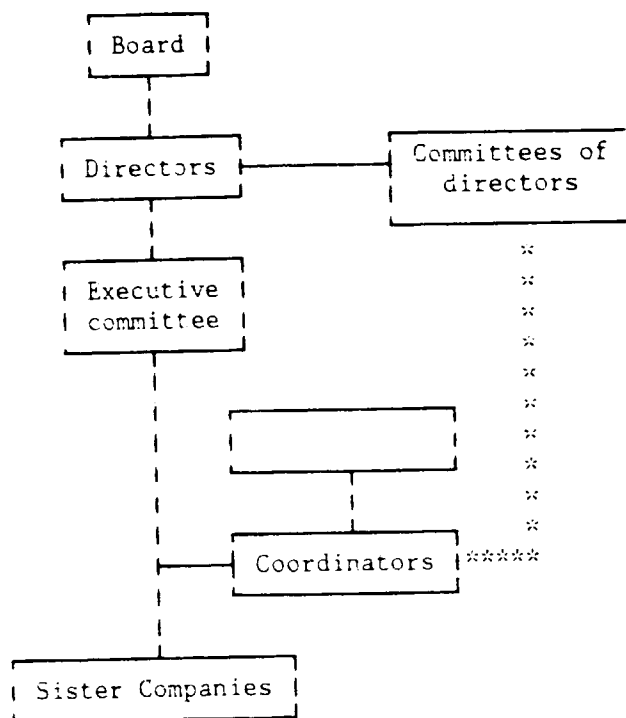
2.1 Summary of the meeting

Mr Santamaria expressed the great interest from Venezuela to join such a conference. Today the activity within the offshore exploration and production is rather low in Venezuela, because of lack of funds. After a meeting that lasted about 5 hours we agreed to the following conclusion:

1. Venezuela has great interest in joining the conference.
2. The official invitation should be sent to Dir Santamaria.
3. The invitation should highlight the following:
 - Main topics
 - Costs
 - Preparation of papers by the delegates from Venezuela
4. If possible would Venezuela like to send 5 participants to the conference and ONS. The last two should be technical experts to "back up" the other three. (3 paid by UNIDO, 2 paid by Venezuela.)
5. Venezuela would like to feel free to pay the costs for all 5 participants.
6. Venezuela would like to discuss joint-venture projects with Norwegian companies.
7. No comments to the main topics. All of them very interesting.
8. Venezuela has great interest in being informed about the activity in the North Sea, both technical and economical.

2.2 Today's situation

Pe De Ves has the following organization:



- Corpoven
- Lagoven
- Maraven
- Meneven

- Bariven Int purchasing.
- Inteven Research and development.
- Pequiven Petrochemical.

2.3 Exploration

The 1984 exploration program emphasized the discovery of new sources of light and medium crudes, condensates and non-associated natural gas. To this end, exploration expenditures totaled 1,079 million bolivars (\$187 million) and rig utilization averaged 7.21 rig-years. Major accomplishments include the shooting of 5,192 kilometers of seismic lines (4,021 onshore and 1,171 in the shallow waters of Lake Maracaibo) and the spudding of 28 new exploratory wells. By year end, 24 wells were completed, including seven spudded in 1983, and 11 wells were still being drilled. Of the 24 wells completed, 15 proved successful, six were suspended waiting for results and four were abandoned.

During the year, 826 million barrels of crude were added to proved reserves. Exploratory wells begun in 1984 and prior years

provided 753 million barrels of crude reserves, and an additional 73 million barrels were added to reserves through extension drilling.

The exploratory wells of the Orinoco Oil Belt contributed 604 million barrels to reserves. Natural gas reserves were increased by 10 billion cubic meters, of which associated gas accounted for nine billion.

Their principal crude discoveries were in the area of Apure, Lake Maracaibo and its western coast, where commercial quantities of light crude were identified. Discoveries of non-associated gas reserves were limited to the Maracaibo and Falcon regions in the west and Guarico in the east. They expect to intensify in 1985 and beyond, their search for light and medium crudes and condensates, while exploration for non-associated gas will be reduced, since the volume of gas discovered to date is expected to meet their future demand requirements.

EXPLORATION ACTIVITIES	1984	1983
Additions to Proven Reserves		
Crude Oil (Million Barrels)	753*	447
Natural Gas (Billion Cubic Meters)	10	8
Wells Spudded		
	28	53
Wells Completed		
	24	70
Average Number of Rigs		
	7	14
Length of Seismic Lines (Kilometers)		
	5,192	4,391

* Excluded from this volume are 73 million barrels recovered through extension drilling.

2.4 Production

The primary objectives of the 1984 production activities were to maximize the utilization of the production facilities and to provide increased operational flexibility to adjust to a variety of future market situations. Crude and condensate production averaged 1,799,000 barrels per day, of which heavy crudes accounted for 44 per cent. Natural gas liquids production amounted to 57,000 barrels per day. Natural gas production averaged 89 million cubic meters daily, of which 33 million were reinjected to maintain reservoir pressure.

Proven oil reserves increased by 8.5 per cent to 28,034 million barrels by year-end. Natural gas reserves grew by six per cent to 1.66 trillion cubic meters, excluding offshore resources.

Production activities during the year included the drilling and completion of 568 production wells and 43 injection wells.

During 1984, these drilling efforts totaled 28 rig-years, while repairing and reconditioning of 1,739 wells required another 38 rig-years. Venezuela's efforts in drilling and well maintenance enabled them to develop 516,000 barrels per day of new production capacity. This not only offset the natural production decline that occurred during the year, but also resulted in a slight increase in production capacity.

Capital expenditures for production in 1984 totaled 8,846 million bolivars (\$1.539 billion). Expenditures for the Long-Term Secondary Recovery Plan reached 1,066 million bolivars (\$185 million), of which 725 million bolivars (\$126 million) were invested in fluid injection projects and 341 million bolivars (\$59 million) in infrastructure for future projects. Secondary recovery activities contributed 105 million barrels to reserves, or the equivalent of an additional 20,000 barrels per day of production potential.

Completion of the West Urdaneta Field Development Project, in Lake Maracaibo, added significantly to the heavy crude production potential. In addition, they tested the HH-8 steam plant, one of the stages of the Bachaquero Field Development Project, also aimed at raising heavy crude production potential. In eastern Venezuela, commercial quantities of light and medium crude were confirmed in the Quiriquiri field. Construction of the Eastern Cryogenic Complex was 76 per cent complete by year-end. Work was progressing as planned and within budget for a December 1985 start-up. When complete, this installation will process 23 million cubic meters of gas per day to produce 57,000 barrels of natural gas liquids each day for export. During the year they began work on the Nurgas Project, a new 800-kilometer gas line with a 27 million cubic meter transport capacity. This trunkline will deliver gas from the large reserves in the Anzoategui and Guarico fields to satisfy the growing demand in the central and western regions of the country.

NATURAL GAS PRODUCTION
(Million Cubic Meters)

	1984	1983
Sales	10,540	8,480
Own Use by Industry*	7,120	7,300
Re-Injected	11,990	13,280
Flared	1,550	1,610
T O T A L	32,500	32,060

*Including refineries

INVESTMENT IN PRODUCTION
Million Bolivars/(Million \$)

	1984	1983
Maintenance of Crude Production Capacity	937(\$163)	800(\$36)
Increased Crude Potencial	2,399(\$417)	3,457(\$804)
Secondary Recovery	376(\$65)	273(\$63)
Development of New Infrastructure	1,999(\$347)	2,209(\$514)
Increased Non-Associated Gas Potencial	418(\$73)	154(\$36)
Gas Supply and Distribution	424(\$74)	161(\$37)
Gas Supply and Distribution	1,524(\$265)	1,312(\$305)
Orinoco Oil Belt Development	769(\$134)	992(\$231)
T O T A L	8,846(\$1,539)	9,358(\$2,176)

2.5 Orinoco Oil Belt

One of the fundamental objectives of the Industry is the development of the Orinoco Oil Belt. PDVSA's current operations in the Belt consist of research activities and selective development of certain fields.

In 1984, they completed a detailed analysis of the data obtained from the 1978-1983 exploration campaign and a final geological evaluation of the region. They proved the existence of 1.2 trillion barrels of oil reserves in place, of which more than 200 billion barrels could be recovered by primary production methods and extensive use of steam injection.

Production expenditures in the Orinoco Oil Belt amounted to 769 million bolivars (\$134 million) in 1984. These production activities were concentrated in two experimental blocks at Cerro Negro and in the Guanipa Development Plan. By year-end, the Cerro Negro blocks had a potential of 30,000 barrels daily. The Guanipa Development Plan was 70 per cent complete by year-end, with 13 flow stations and 290 kilometers of pipeline in place and 610 wells drilled, having a production potential of more than 100,000 barrels per day.

Steam soak tests continued in the Zuata-San Diego and Hamaca-El Pao areas and a steam soak pilot project, approved for the North San Diego sector, is expected to commence in 1986. These projects were designed to evaluate production parameters, such as well response time to various steam cycles and optimal well spacing. The data obtained from these projects will play a key role in determining the scope and dimensions of future development projects.

Research and experimentation conducted by INTEVEP in the Orinoco region involved areas such as heavy crude extraction and processing. This effort accounted for about 50 per cent of INTEVEP's

total activity during 1984. The Jobo pilot plant complex, being built by INTEVEP to study heavy and extra-heavy crude upgrading techniques, was 95 per cent complete at year-end.

2.6 Refining

In 1984 the refining sector concentrated its efforts to ensure the reliability, safety and efficiency of its operations in Venezuela and West Germany. Capital expenditures in the refining sector amounted to 664 million bolivars (\$115 million): 539 million bolivars (\$94 million) in Venezuela and 125 million bolivars (\$21 million) in West Germany. This represented a 108 million bolivars (\$19 million) reduction compared to 1983 expenditures and reflected the completion of various major projects. Amuay Refinery's asphalt plant modification was completed in 1984 for 64 million bolivars (\$11 million), boosting asphalt export capacity from 14,000 to 24,000 barrels per day. Work continued on Amuay's lube oil plant expansion, with completion scheduled for August 1985.

An important aspect of the PDVSA-Veba Oel Agreement was Venezuela's acquisition of a one-third share in the 140 barrel per day VCC (Veba Combi-Cracking) pilot plant in West Germany. Through our participation in this joint research program, PDVSA will acquire the rights to all resulting technological developments. A group of engineers from PDVSA affiliates is currently studying the feasibility of constructing a full-scale VCC plant in West Germany. Also under the terms of this agreement, we initiated an expansion of the Ruhr Oel delayed coking plant to 420,000 tons of coke per year, enabling the processing of an addition 17,000 barrels per day of Bachaquero 17° API crude.

REFINERY YIELD (Thousands of Barrels per day)

	1984		1983	
	Yield	%Yield	Yield	%Yield
CRUDE & OTHER FEEDSTOCKS	848.0	100.0	865.5	100.0
PRODUCTS				
LPG/Naphtha/Gasoline	271.1	32	272.8	31.5
Kerosene & Distillate	249.4	29.5	246	28.4
Residual (Low & High ZS)	266.1	31.4	280.5	32.4
Others	<u>34.3</u>	<u>4.0</u>	<u>31.9</u>	<u>3.7</u>
TOTAL	820.9	96.9	831.2	96.0

2.7 International Marketing

Venezuela fulfilled its export goals in 1984, despite the generally adverse conditions facing the international petroleum market. This achievement was made possible by (1) greater operational flexibility in their refining sector afforded by new conversion capacity; (2) a new commercial strategy to ensure their access to final consumers in international markets; and (3) established reputation as reliable suppliers.

In 1984, mainly due to reduced domestic demand, Venezuela increased crude and products exports by 17,000 barrels per day to 1,517,000 barrels per day, despite the OPEC decision to reduce Venezuela's daily production quota by 120,000 barrels during the last two months of the year.

As part of their agreement with Veba Oel, they supplied 100,000 barrels per day of crude to their Ruhr Oel refinery, which guaranteed access to the West German market. This agreement provided them with greater flexibility in the placement of their light and medium crudes, which were the grades most affected by the instability of the international market.

By following the objectives of the Commercial Policy in 1984, Venezuela succeeded in both the short-term strategy of generating more foreign exchange and their long-term strategy of broadening the participation in strategic markets for heavy crudes.

Venezuela's foreign exchange earnings improved with the strengthening of residual oil prices and the greater portion of light products in their export package. Light product exports registered an 11 per cent increase over 1983 volumes, and accounted for 250,000 of the 510,000 barrels per day of products exported from Venezuela in 1984. They increased their 1984 exports of heavy crudes by 135,000 barrels per day. This surge raised the heavy crude share of total crude exports to 72 per cent of 1,007,000 barrels per day in 1984.

The average price for Venezuelan crude and product exports rose from \$25.31 per barrel in 1983 to \$ 26.70 per barrel in 1984, despite the tendency for oil price deterioration worldwide. The three factors contributing to this overall increase were (1) the average price for Venezuelan heavy crude exports rose by \$2.52 per barrels from 1983 levels, (2) extra-heavy crudes registered increases ranging from \$0.14 to \$1.50 per barrel as of May 1984, and (3) light products constituted a greater portion of their export package. In August 1984, the San Jose Accord for energy cooperation in Central America and the Caribbean was renewed for its fifth year. Under the terms of this accord, Venezuela and Mexico contribute equal volumes of oil to the recipient countries. The total volume was reduced to 130,000 barrels per day in 1984 to reflect the actual demand requirements of the recipients.

Throughout the year the terms of payment remained unchanged. The San Jose Accord was amended, however, to grant preferential credit treatment to those countries purchasing goods and services from Venezuela and Mexico for major capital projects. The continued supply of petroleum under this accord is contingent upon the strict terms of payment established by the oil suppliers. At the beginning of 1985, it was agreed to suspend oil exports to San Jose Accord countries involved in a formal war in the region.

1984 CRUDE AND PRODUCT EXPORTS BY GEOGRAPHICAL AREAS

	% SHARE
United States	40
Europe	17
Aruba	12
Caribbean	8
Curacao	7
South America	6
Canada	4
Central America	3
Others	<u>3</u>
	100

1984 PETROLEUM EXPORTS (Thousands of Barrels per Day)

CRUDES		%SHARE
Light	116	11
Medium	101	10
Heavy	723	72
Reconstituted	<u>67</u>	<u>7</u>
Sub-total	1,007	100
PRODUCTS		
Residual - Low %S	35	7
Residual - High %S	192	37
Gasoline and Others	<u>283</u>	<u>56</u>
Sub-total	510	100
TOTAL EXPORTS	1,517	

2.8 Petrochemical

The operational and financial performance of the Venezuelan National Petrochemical Industry was substantially improved in 1984, exceeding budget estimates. For the fourth consecutive year, operations produced a positive cash flow, amounting to 1,015 million bolivars (\$139 million). The petrochemical industry was profitable and able to pay income tax for the first time in the 28 years since its inception. To appreciate the significance of this achievement, it must be stressed that 45 per cent of Pequiven's total revenues is derived from fertilizers and polyvinylchloride sold at cost in the domestic market.

The consolidated financial results for Pequiven and its affiliates, Nitroven, Petroplas and Plamaven, reveal a pretax income of 1,033 million bolivars (\$142 million). The exchange rate modification accounted for 439 million bolivars (\$60 million) of the above, with the balance generated by company operations. Net income amounted to 885 million bolivars (\$122 million). Only one affiliate, Plamaven, registered a loss in 1984. Plamaven's 10 million bolivars (\$1.37 million) shortfall resulted because the government subsidy was not sufficient to cover the acquisition cost of domestic and imported fertilizers sold to the agricultural sector.

Pequiven's participation in joint ventures, both in Venezuela and Colombia, also proved profitable in 1984. Pequiven's share of net income from these joint operations reached 108 million bolivars (\$14.8 million) in 1984, of which 85 per cent were generated by Venezuelan-based ventures. Monomeros Colombo Venezolanos, the Colombian venture, marked a record year for production and sales.

Better overall results would have been achieved had Pequiven not encountered operational problems and a restricted supply of feedstocks (natural gas, ethane and propane) to its El Tablazo olefins and fertilizer complex. The feedstock restrictions at El Tablazo were the result of technical difficulties experienced by some gas processing and compression units and the limited OPEC production quota adopted by Venezuela, which affected the production of oil-associated gas. Despite these problems, gross production for the petrochemical industry reached 1,776,700 metric tons, or 23 per cent greater than in 1983. Net production for Pequiven, excluding own consumption, rose 26 per cent to 1,236,700 metric tons in 1984. Fertilizers accounted for 58 per cent of net production, with the remaining 42 per cent consisting of industrial products, including ammonia.

Sales grew by 37 per cent to 1,507,300 metric tons, of which 66 per cent was destined for the domestic market and 34 per cent for exports. Sales receipts for 1984 totaled 2,435 million bolivars (\$335 million). In 1984, Pequiven was successful in controlling plant operating costs. In real terms, operating costs were less than in 1983, despite extraordinary maintenance requirements associated with raising the level of operable plant capacity.

Investment programs to recondition the Moron and El Tablazo complexes proceeded as planned. The most comprehensive project, the overhaul of the ammonia and urea plants at El Tablazo, is scheduled to be fully operational by December 1985. Capital expenditures for the entire industry dropped from 243 million bolivars (\$56.5 million) in 1983 to 221 million bolivars (\$30 million) in 1984, largely due to delays in acquiring imported materials and equipment.

The National Petrochemical Industry is now fully recovered and ready to undertake a new phase in its development: expansion of production facilities to meet growing internal demand for petrochemicals and fertilizers, and to generate foreign exchange. In 1984 Tequiven completed feasibility studies for a polypropylene plant (the only major plastic not produced in Venezuela) and a synthetic butadiene rubber plant under a joint venture arrangement with PETROQUISA, and affiliate of Brazil's PETROBRAS. Venezuela is also studying the possibility of increasing the export of natural gas through its conversion into petrochemical products for the international market.

PETROCHEMICAL SALES
(1,000 Metric Tons and \$ Million)

	1984		1983	
	1,000MT	\$ Million	1,000MT	\$ Million
INTERNAL MARKET				
Fertilizers	600.7	110.2	335.1	100.9
Industrial Products ⁽¹⁾	242.4	77.0	200.9	106.9
Olefins	150.4	65.1	92.7	53.6
Sub-total	993.5	253.3	628.7	261.4
EXPORTS				
Fertilizers	299.5	43.7	334.4	52.5
Industrial Products ⁽²⁾	202.1	34.9	124.2	22.0
Olefins	12.2	3.4	10.0	3.9
Sub-total	513.8	82.0	468.6	78.4
TOTAL	1,507.3	335.3	1,097.3	339.8

(1) Ammonia, Chorline, Soda, PVC, Sulfuric Acid & Others
(2) Ammonia

2.9 Materials and Technical Services

In 1984, the National Petroleum and Petrochemical Industry continued its policy to promote and stimulate Venezuelan engineering and manufacturing firms in order to develop a solid foundation of technical support, materials and services for the oil industry. Despite the unfavourable economics and other disadvantages often associated with this policy, the Industry made significant contributions to the Venezuelan private sector. During the year, the Industry maximized its use of Venezuelan engineering and technical expertise in many key fields, including specialized technical services, consulting, industrial and process engineering, project management, and the design and construction of facilities and equipment.

Purchase of materials, equipment and spare parts cost 7,085 million bolivars (\$1.23 billion) during 1984. Supplies manufactured in Venezuela accounted for 3,656 million bolivars (\$636 million) or 52 per cent of this total (the highest percentage since nationalization in 1976). Indirect imports acquired through the private sector amounted to 1,155 million bolivars (\$201 million). Inventory reductions and inter-affiliate exchange reduced the need for new purchases, while a greater portion of Venezuelan-made goods contributed to an overall saving of foreign exchange.

Venezuelan companies supplied 73 per cent of the Industry's service requirements. During the past few years, they have made a concerted effort to increase the number of contracts awarded to Venezuelan engineering and consulting firms. Technical services provided by foreign companies are now limited to projects involving technology or expertise beyond the capabilities of Venezuelan firms. In such cases, the foreign firm must provide the means to ensure the proper transfer of the technology to its Venezuelan counterpart.

In 1984, INTEVEP continued its program of evaluation and inspection of Venezuelan manufacturers for accreditation as suppliers of equipment and spare parts to PDVSA affiliates. Since 1978, INTEVEP has evaluated the capabilities and performance standards

MATERIALS AND TECHNICAL SERVICES (Millions of Bolivars)

	1984	1983	1982	1981	1980	1979	1978	1977	1976
Venezuelan Origin	3,656	2,859	4,415	3,760	2,700	2,400	1,450	970	490
Indirect Imports	1,155	1,111	2,200	2,210	1,640	1,360	650	420	280
Direct Imports ⁽¹⁾	<u>2,274⁽²⁾</u>	<u>2,718⁽²⁾</u>	<u>7,100⁽²⁾</u>	<u>3,770⁽²⁾</u>	<u>2,200</u>	<u>2,460</u>	<u>1,500</u>	<u>680</u>	<u>450</u>
	<u>7,085</u>	<u>6,688</u>	<u>13,715</u>	<u>9,740</u>	<u>6,540</u>	<u>6,220</u>	<u>3,600</u>	<u>2,070</u>	<u>1,220</u>

(1) THE PERIOD 1976-1980 INCLUDES DRILL RIGS, TANKERS AND PIPELINES AT A COST OF 1,850 MILLION BOLIVARS.

(2) INCLUDING THE FOLLOWING ITEMS:

	1984	1983	1982	1981
Drill Rigs	-	-	327	410
Tankers	55	599	311	650
Pipelines	<u>104</u>	<u>509</u>	<u>4,052</u>	<u>1,425</u>
TOTAL	<u>159</u>	<u>1,108</u>	<u>4,690</u>	<u>2,485</u>

QUALITY CONTROL EVALUATION OF THE VENEZUELAN MANUFACTURING INDUSTRY

Year	Product Categories Evaluated	Company Evaluations	Follow-up Assessments
1984	10	91	237
1983	18	147	194
1982	16	142	200
1981	12	128	175
1980	16	109	76
1979	9	69	-
1978	4	37	-
Total	<u>85</u>	<u>723</u>	<u>882</u>

CONTRACTED ENGINEERING EFFORT
(Thousand Man-hours)

	1984	1983	1982	1981	1980
Foreign Companies	452	1,230	3,100	2,532	3,383
National Companies	1,226	2,280	1,830	1,075	659
Total	1,678	3,510	4,930	3,607	4,042
Foreign Participation%	27	35	63	70	84
National Participation%	73	65	37	30	16

2.10 Control and Finance

Venezuela's financial results for the year were better than those of 1983, despite reduction of the crude production quota by 120,000 barrels per day in November 1984, and the weakening of the international petroleum market. To offset these negative aspects, a series of measures were undertaken by PDVSA to (1) reorient or postpone selected investment projects, (2) stabilize the workforce, and (3) reduce outlays of foreign exchange. In addition, they succeeded in exporting a higher-value package of petroleum products. Other factors influencing the financial results include (1) a decrease in the exchange rate from 4.30 to 6.00 bolivars per U.S. dollar on February 24, 1984, and (2) increases in the prices of oil products destined for internal market, effective March 14, 1984.

Net income for the Industry jumped from 7,582 million bolivars (\$1.684 billion) in 1983 to 14,828 million bolivars (\$2.579 billion) in 1984. The components of net income include operating profit, interest income, currency exchange gains, and retained export revenues from PDVSA affiliates (i.e., each affiliate must contribute ten per cent of its revenues from export sales to PDVSA).

Net cash flow from 1984 operations amounted to 20,203 million bolivars (\$3.519 billion), compared to the 1983 level of 11,037 million bolivars (\$2.571 billion). PDVSA earned \$15,343 million in foreign exchange in 1984 versus \$14,130 million one year earlier. Payments for goods and services in foreign exchange fell from \$1,535 million in 1983 to \$1,279 million in 1984.

Total revenues from domestic and export sales and overseas operations amounted to 95,422 million bolivars (\$16.619 billion) in 1984, against 64,019 million bolivars (\$14,914 billion) the previous year.

Export sales contributed 85,226 million bolivars (\$14.843 billion) to 1984 revenues, compared to 59,473 million bolivars (\$13,855 billion) in 1983. This increase was mainly the result of greater trading volumes and higher unit prices. In 1984, they exported 1,517,000 barrels per day of crude and products at an average price of \$26.70 per barrel, compared to 1983 exports of 1,500,000 barrels per day at an average price of \$25.31 per barrel. PDVSA's operating costs and expenses totaled 14,549 million bolivars (\$2.538 billion) in 1984, compared to 13,450 million bolivars (\$3.147 billion) in 1983. However, due to the 17 per cent inflation rate in Venezuela, this actually represented a cost reduction in real terms.

Tax payments by the Industry increased from 40,647 million bolivars (\$9.452 billion) in 1983 to 66,617 million bolivars (\$11.587 billion) last year. The 1984 tax reference price for exports, on which income tax is calculated, was \$33.38 per barrel, or 25 per cent greater than the actual sales price.

Capital expenditures were reduced to 11,634 million bolivars (\$2.024 billion) in 1984, from 13,298 million bolivars (\$3.093 billion) in the preceding year. Investments at year-end reached 5,187 million bolivars (\$902 million), including the revised maturity schedule of bonds for the national public debt. Shareholders' equity totaled 104,429 million bolivars (\$18.164 billion) in 1984, versus 88,716 million bolivars (\$20.688 billion) in 1983.

Total revenues from petrochemical operations reached 2,546 million bolivars (\$487 million) in 1984, against 1,500 million bolivars (\$350 million) in 1983. Expenditures and other costs, however, remained relatively unchanged: 2,095 million bolivars (\$288 million) in 1984 versus 1,561 million bolivars (\$363 million) the previous year. Greater domestic demand for petrochemicals, additional fertilizer sales stimulated by the government subsidy, and increased exports of urea and ammonia were the main contributors to higher revenues. Net income of 885 million bolivars (\$122 million), positive cash flow of 1,186 million bolivars (\$163 million), and tax payments of 148 million bolivars (\$20 million) all attest to the financial and operational stability of the Petrochemical Industry.

3. EQUADOR

In this country Miss Helle Marianne Vadmand, official Program Assistant of the UNIDO had done an excellent job, planning my meetings. She also collected me at the hotel and joined me during the two meetings held.

The following persons were met:

- Ing. Carlos E. Roman Lazo, CEPE, Corporacion Estatal Petrolera Ecuatoriana, Inglaterra 113, Casilla 5007-5008 Quito, Equador
- Ing. Edmundo Rojas Ruiz Same company and address as above.

3.1 Summary of the meeting

Both gentlemen met, were very much in favour of the conference and expressed thanks on behalf of their country to UNIDO, taking the initiative in arranging such a conference.

All the topics put up were of great interest, with special address to:

- Legislation
- Norwegian experience
- Maintenance
- Training

If possible they would like to join the conference with three persons.

The official invitations should be sent from UNIDO, Vienna, to Miss Vadmann, the UNIDO representative in Equador; these to be delivered to:

General Manager Carlos Romoleroux
CEPE, Inglaterra 113,
Casilla 5007-5008 Quito, Equador

3.2 Today's situation

Mr. Roman Lazo promised to send me information about the organization of CEPE as soon as possible.

Equador is today using between 3-4 million U.S. dollars in training and education of their own operation and maintenance people. If possible they would like to build up a training program that makes it possible to arrange "On-the-spot" training. Today, most of the training is done in the U.S.A.

Equador has a lot of specific projects where aid is needed. They hope that it is possible to discuss Joint Venture projects with Norway during the UNIDO meeting.

Today, their maintenance costs are \$1 per barrel and production costs \$3.40 per barrel.

4. TRINIDAD

In Trinidad I had two meetings; one with the Ministry of Energy and Natural Resources and one with AMOCO Trinidad Oil Company that has a Joint Venmture project with TRINTIPAC to produce oil.

The following persons were met:

- Chief Petroleum Engineer Rupert A. Mends
- Petroleum Inspector I Kenrick Caesar

Both from Ministry of Energy and Natural Resources
 P.O.Box 96
 Salvatori Building
 Port of Spain
 TRINIDAD AND TOBAGO

- Vice President
 Exploration and Production Len Darzow
- Construction Manager Geff Powers

Both from Amoco Trinidad Oil Company
 TATIL Building
 11 Maraval Road
 P.O.Box 714
 Port of Spain
 TRINIDAD AND TOBAGO

4.1 Summary of the meetings

4.1.1. With the Ministry

Mr. Mends had been in Norway once and had a great interest in knowing what was going on in the North Sea.

In his opinion, Trinidad had most interest in the following topics:

- Legislation
- Experience from the North Sea
- Marine Environment
- Maintenance
- Education and Training

If possible, Trinidad would like to join the conference with at least two persons, but they do not have the possibility of paying themselves.

4.1.2. With Amoco

Amoco was very interested in joining the conference. Personally, I am not quite sure that Amoco should be invited by UNIDO to participate, as they are a private multinational company.

4.2 Today's situation

Amoco is today operating 14 platforms and Trintipac four platforms. Within the Trinidad oil fields, it is only Amoco that is operating as an international company. Trinidad has two operating companies. Trintopec and Trintoc are working together onshore and Trinlopec is operating offshore. The production is about 167,000 barrels a day. Of these 80% comes from offshore.

Trinidad is looking for the possibility of producing equipment for the oil production and is today talking about the production of Well Heads.

They have made their own legislation, looking into the American and Mexican made.

Concerning education and training, Trinidad has an agreement with Venezuela (PDVSA). The first group was sent to Venezuela in 1983.

4.2.1. Copy of Information on the PETROLEUM INDUSTRY of
Trinidad and Tobago. June 1984.

HISTORICAL REVIEW OF THE PETROLEUM INDUSTRY OF TRINIDAD AND TOBAGO

The Early Years 1857-1929

The search for petroleum in Trinidad and Tobago began from as far back as 1857 when the Merrimac Company drilled for oil in the vicinity of the Pitch Lake; this first attempt to find oil in Trinidad was unsuccessful.

About 1865, Walter Darwent, a civil engineer from the United States, set up a company, the Paria Oil Company which drilled another dry hole at San Fernando. Later on in 1866, while attempting to recover tools from a second well which was being drilled at Aripere, twenty feet of oil bearing strata were encountered which tested oil at the rate of 2 1/2 barrels in seven hours. Commercial oil production did not begin until 1908.

Following the discovery of oil, several small companies were formed to prospect for this mineral, which led to the discovery and development of several oilfields at Pt. Fortin, Tabaquite and Barrackpore. As a result, by 1913-1914 the oil industry in Trinidad and Tobago was firmly established, with a production of one million barrels in 1914 supporting the employment of some 1,200 persons and with the construction of a small refinery at Pt. Fortin in 1912.

During the World War I period, new fields were discovered and developed and, because of the war conditions, a policy of maximum production from minimum footage was adopted. By 1919, refinery capacity had increased to 9,000 bopd, with a crude oil production of 2 million barrels per annum of which about 66% was refined locally.

The Years Development 1930-1968

With the end of World War I, capital and technology became available for the development of the industry, leading to a considerable amount of exploratory drilling and the introduction of various improved production techniques. Until this time drilling had been mainly to shallow depths because of a lack of proper machinery and drilling fluids. The "gusher", despite its wastefulness and danger to life and property, was still accepted as an inescapable consequence of drilling into a major oil deposit.

The depression years of the 1930's caused many of the less affluent companies to go under. This situation was aggravated by huge discoveries in Texas and Oklahoma which depressed world prices to 30 cents per barrel of crude. In some instances cargoes were sold on the U.S. Gulf Coast for as little as 10 cents per barrel.

Despite this, local crude oil production increased to 10 million barrels per annum by 1930-1931 and after a slight decline in 1933, rose steadily to approximately 22 million barrels in 1940. To cope with the increased oil production, refinery capacity increased to 28.5 million barrels per annum by 1940.

The labour force in the oil industry was not organized before the late 1930's and there was no steady employment. Rates of pay too were ridiculously low and there was rivalry between oil companies and sugar estates for the small group of skilled workers available at that time. In 1937, pay rates were increased, but this came too late to avoid the social upheaval in the oil industry which took place during that year.

It is interesting to note, that since 1857, over 150 companies have been registered to prospect for oil in Trinidad, while only 6 are at present actively engaged in the industry. Also as far back as 31st August, 1904, the Mines Department, the forerunner of the Ministry of Energy and Natural Resources, was instituted.

Over the World War II years, lack of finance and unavailability of equipment curtailed exploratory effort and, consequently, the increasing production trend steadily levelled off as production over these years averaged approximately 21 million barrels per year.

After World War II, the way was open to more exploratory drilling employing the improved scientific technology developed for the war. New equipment and developments in the fields of geophysics, geochemistry and chemistry were all applied in the search for oil, leading to the discovery of new and deeper-seated structures and the drilling and development of new fields.

The most significant result of these new technologies was the discovery of the Soldado Main Field in the Gulf of Paria in 1954, at a time when a declining trend in the country's oil production was evident.

The period 1955-1960 saw the rapid development of Soldado marine field and the discovery and development of several small land fields including Trinity, Inniss and the Moruga North and West fields. The contribution to the country's crude oil production made by the newly-discovered land fields, while reasonably significant was not able to offset the slight declining trend on land and it was the Soldado field which was responsible for the rapid increase in the country's crude oil production. Initial production from some of the wells completed in the Soldado field was of the order of 3,000 bopd, which compared with the average production per land well of 40 bopd.

The years 1961-1965 were years of very active exploratory effort which, with the exception of the discovery of the Navette field, Guayaguayare, were not very fruitful.

Commission of Enquiry

Government's concern about the future of the oil industry led to the appointment of a Commission of Enquiry into the Industry in 1963 which was required, among other things, to examine the situation and future prospects of the Industry in Trinidad & Tobago in the context of the economics of the World Oil Industry, and to make recommendations. After two years work, the Commission made comprehensive recommendations for the continued viability of the Industry.

Over the period 1966-1970, the discovery of the Barrackpore field coupled with the development of the Navette Field resulted in the record production of 65 million barrels of crude oil in 1967. The industry at this stage supported a labour force of some 13,979 persons.

This increasing crude oil production trend reached its peak in February 1968 and for the remainder of that year production continued to decline. The total production for 1968 nevertheless exceeded the previous high level set in 1967 when it attained a level of 66.9 million barrels.

Because of the general decreasing trend in British Petroleum's (BP) local oil production and the increasing production and labour costs in the Petroleum Industry in 1968, the BP company closed down its operations in Trinidad. This would have led to a serious economic and unemployment situation in the country; the government of Trinidad and Tobago took its first venture into the oil industry by purchasing, in partnership with the Tesoro Petroleum Corporation of the U.S.A., the producing assets of BP in Trinidad with the government having a majority participation of 50.1 per cent.

Petroleum Legislation 1969

Arising indirectly out of the recommendations of the Commission of Enquiry into the Oil Industry, the government in 1968, with the assistance of the U.N., undertook a seismic survey of the marine area between Trinidad and Tobago. The results of the survey, which were promising, were of interest to some 26 international oil companies which registered to be eligible for bidding for licences in the area. Results of the North Coast bidding led to the granting of exploration licences to Deminex-Agip, Phillips-Cleary-Apco, Occidental, Amerada Hess and the 565 Corporation, Oceanic-Santa Fe-Terra for an area in excess of 485,000 hectares. Each licence included provision for the Government's participation, varying from 15-25% on commercial discovery. Other terms of the licences included the return to Government of 50% of the acreage after 6 years, the other half being subject to renewal for 25 years. The area has since proven to be gas bearing.

As a result of the recommendations of the Oil Commission of Enquiry, a new Petroleum Act was proclaimed in December 1969 to

consolidate and amend the laws relating to petroleum so as to make better provision for exploration for and the development and production of petroleum, and all other related matters. The legislation was intended to give a boost to exploration, particularly in the marine areas. Also, Petroleum Regulations pursuant to the Act were passed in Parliament in 1970.

The East Coast Years

The first interest in the areas offshore the East Coast of Trinidad as a potential oil-producing area was expressed in 1953 when Dominion Oil Ltd. applied for and received a licence on 53,000 hectares. After doing some seismic work in the area the company surrendered most of its licenced area to the government without drilling any wells.

In January 1961, Pan American Trinidad Oil (PATO), together with Pure Oil Company and Sun Oil Company, was granted a licence over 810,000 hectares, 50% of which was later surrendered. PATO's partners later withdrew from the group and that company, which subsequently changed its name to Amoco Trinidad Oil Company became the sole licensess for the area.

Amoco Trinidad Oil Company completed their first exploratory well in January 1963, this well was a dry hole. The company made their first discovery of commercial quantities of gas and gas condensates in August 1968, in the well OPR-2. The SEG gas field, now called Cassia, the country's most prolific gas field was also discovered in 1968.

Oil production from the East Coast began in 1972. Since that time Trinidad-Tesoro has also produced oil in the area from acreage which was acquired by a farm-in from Dominion Oil Ltd. The East Coast area has, up to the present time, produced more than 450 million barrels of oil, reaching its peak production in 1978 at 140,000 bopd.

In December, 1973, the GOTT granted a concession to a consortium consisting of Texaco Trinidad Inc., Shell Trinidad Ltd., and Trinidad-Tesoro Petroleum Company Ltd. for a parcel of land referred to as the "Reversed L - Shaped block". This block comprises some 76,000 hectares off the East Coast of Trinidad in an area which was surrendered by Amoco under the terms of its licence.

Eight wells have been so far drilled in this area and after the surrender of the lower half of the block in December 1976, a commercial discovery was announced in February, 1977. As a result of this discovery, Government took its full participation option of 20% and the present shareholding in the block now stands with Trintoc having 50%, Trinidad-Tesoro - 20% and Texaco, the operator - 30%. The last well in this area discovered encouraging quantities of oil at the deepest level at which oil was ever encountered in Trinidad - 4570 m. This area is still to be developed commercially.

Trinidad and Tobago's oil industry has been affected by the drop in oil prices and declining production. Although there have been no major new finds since the East Coast discoveries, the country still has prospective areas in the deeper geological horizons on land and on the offshore continental slope - areas with water depths greater than 200 metres. The search for oil in these areas however, would be dependent on future oil prices, drilling costs and government's fiscal policies. It is also expected that secondary and enhanced oil recovery operation would be playing a greater role in prolonging the future of the industry which has produced more than 2.2 billion barrels since its beginning here in 1908.

PETROLEUM GEOLOGY OF TRINIDAD AND TOBAGO

Petroleum Activity in Trinidad is centered in two main regions:

- (1) The land areas in Trinidad
- (2) The marine areas around Trinidad

The island of Tobago is composed mainly of folded schists and phyllites consisting largely of metavolcanic material, outcropping in the mountainous northern part of the island. South of the Northern zone, there exists a belt of strongly sheared but relatively unaltered igneous rocks, including ultra-mafic and diorite intrusives along with andesitic and basaltic volcanics. Flat-lying, fossiliferous Upper Miocene - Pliocene sands and clays rest unconformably on the volcanics near the southwest end of the island, with coral limestone overlapping both igneous rocks and Upper Tertiary sediments.

Geologically, therefore, the genesis of the rocks comprising the island of Tobago would preclude the existence of an environment conducive to the generation and retention of hydrocarbons. A few unsuccessful shallow wells have been drilled in the southern third of the island and these have generally confirmed this hypothesis. Exploration for hydrocarbons has therefore been concentrated in the two regions listed above.

Land Areas In Trinidad

Morphologically, Trinidad falls into five distinct units which are closely related to the general geological structure. There are the three uplifted areas:

- i) The Northern Range
- ii) The Central Range
- iii) The Southern Range

The Northern Range is composed of an upfolded, upthrust region of relatively old, low-grade metamorphic rocks.

The Central Range is essentially an asymmetrical anticline with a strongly folded core of lower Tertiary and Cretaceous rocks. Onlapping Upper Tertiary rocks include reefal limestones.

The Southern Range is a line of low discontinuous hills separated by numerous faults. Much of the folding is of the strong diapiric type.

These uplifted areas are separated by the Northern Basin (Caroni Syncline) and the Southern Basin (Siparia-Ortoire Syncline). It is in these basinal land areas that exploration for hydrocarbons has been concentrated.

Northern Basin

The Northern Basin and axial parts are almost entirely obscured by terraces, alluvium and swamp deposits. To the south of the

geographic axis or on the northern flank of the Central Range structure, a line of en-echelon subsidiary anticlinal structures interrupt the flank - the Freeport, Mahaica and Sangre Grande anticlines. These structures have all been drilled in the exploration for hydrocarbons. Both the Freeport and Sangre Grande anticlines have yielded natural gas shows but these have not proved to be commercial discoveries. The Mahaica structure has, however, discovered small quantities of natural gas and is currently producing into the national gas pipeline system.

Southern Basin

Immediately south of the Central Range is a belt of steeply northward-dipping and in part strongly folded succession of Oligocene and Lower Tertiary beds sometimes referred to as the "Naparima Fold Belt". This belt terminates in an irregular line of sharp folds which in effect forms the northern edge of the Southern Basin. Along the rim of the basin a series of westward pitching folds occur and these have become the important oil-bearing structures of the southern and southwestern part of the island. They range from the Brighton structure to the Forest-Fyzabad anticline which, with its re-oriented continuation as the Pt. Fortin anticline is the most prolific oil-bearing structure, producing over 1,000 million barrels of oil. These structures continue eastward into the Penal-Barrackpore anticline and the Tableland and Balata anticlines. The former has produced over 90 million barrels of oil.

South of this fold belt are the Siparia-Ortoire Syncline and the Southern Range anticline. The largest structural element here is the Rock Dome-Herrera anticline which gives way towards the east to a series of en-echelon folds of Lizard Springs and Mayaro. Further to the south lies another trend of sharply folded structures from Guayaguayare to Moruga. The Guayaguayare field has a cumulative production of over 85 million barrels.

These structures contain the major oil accumulations in the island.

Marine Areas Around Trinidad and Tobago

The marine region around Trinidad and Tobago may be divided into four broad areas:

- (1) The North Coast Marine Area
- (2) The Atlantic Province (off the East Coast)
- (3) The Columbus Channel (off the South Coast)
- (4) The Gulf of Paria

North Coast Marine Area

The geology of this area reveals sedimentary deposits which thicken northwards and northwestwards from the North Coast of Trinidad. These sediments thin out and drape over a positive axis which trends Northeast-Southwest from the South Western tip

of Tobago to the North Eastern point of Trinidad. From this axis the sediments again thicken eastwards and to the South-East.

Exploration for hydrocarbons started in this area in 1966 with an aeromagnetic survey. This was followed by a marine seismic reflection survey in 1968 and several infill and more detailed surveys.

Approximately eighteen wells have been drilled with some success, in that some natural gas reserves have been discovered. There has, however, been no commercial production from this area.

The national oil company, Trintoc, and two consortia, Deminex-Agip-Tenneco (DAT), and Deminex-Agip-Tenneco-Occidental (DATO) still retain drilling concessions in the area.

The Atlantic Province

This area incorporates the entire continental shelf area off the East Coast of Trinidad and Tobago. Structurally, the area is divided by the extension of the Central Range eastwards into the marine area. The Central Range extension appears to have been an effective barrier against sedimentation from the south and the pattern of sedimentation north of it, seems to be similar to that of the Northern Basin.

This Northern area has been explored by seismic surveys and two unsuccessful wells have been drilled.

South of the Central Range Extension two major structural trends characterise the area. First, there are a series of Northeast-Southwest trending anticlines and Northwest to Southeast oriented growth faults. The anticlines are related to the regional East-Northeast trend of Eastern Venezuela. Associated with certain Northwest-Southeast trending faults are parallel roll-over anticlines. The sediments have in the main been deposited in the proto-Orinoco delta and range from a non-marine to a shelf environment.

Considerable amount of exploration activity has taken place in this area and this has led to the discovery of the three largest producing fields in Trinidad and Tobago at the present time-Teak, Poui and Samaan by the Amoco Oil Company Limited. Production from Teak so far is more than 180 million barrels, Poui more than 110 million barrels and Samaan more than 140 million barrels. Two consortia also holding concessions in this area are Trintoc/Trinidad Tesoro/Texaco and Texaco/Tenneco.

Columbus Channel

The area lies off the Southern Coast of Trinidad, that is, south of the Southern Range anticline, is synclinal in character and came into existence during the Pleistocene. Although the entire area underwent structural deformation in the Pleistocene, the Columbus Channel Syncline area was less intensely deformed. As a

result, the area is one of gentle dips and not many positive structural features.

Exploratory work has been limited, seismic results have not been of good quality and the few wells which have been drilled have proven to be unsuccessful.

The Gulf of Paria

The Gulf of Paria may be divided into two areas. A structural separation would result in the Los Bajos fault being used as the major feature and this is supported by the stratigraphy, in that north of the fault the main producing horizon is the Manzanilla formation while south of the Los Bajos fault, the major producing horizons are the Cruse/Forest/Morne L'Enfer formations.

The Northern part has been explored since 1959 with eleven wells being drilled between 1959 and 1964, six of them producing hydrocarbons. The second phase of exploration was post - 1971 and six wells were drilled with oil and gas being discovered. There were small quantities of oil produced in the first phase of exploration but none so far in the second phase. Texaco and Trintoc hold concessions in this area.

In the southern part of the Gulf of Paria, there exist three main producing fields, the Soldado Main Field, East Soldado Field and the North Soldado Field. Of the three only North soldado is north of the Los Bajos fault. The Main field was discovered in 1954, North Soldado in 1960 and East Soldado in 1964. These fields are the second largest producers of hydrocarbons at the present time having a total production of over 395 million barrels.

INDUSTRY PERFORMANCE 1983 - 1984

CRUDE OILProduction

Trinidad and Tobago's six operating oil companies produced an average of 159,800 bopd in 1983 and 17.1 million cubic metres of natural gas. The current oil production rate is approximately 164,000 bopd, with an average of 160,000 bopd for the first four months of the year.

There are 3140 producing wells with 11% of these being flowing wells. In addition there are 9000 idle and abandoned wells. All of the country's production comes from the Southern Basin where there are six operating companies and 14 producing areas comprising both onshore and offshore leases. The main producing fields are shown on the map of Trinidad and Tobago showing oil and gas fields.

The fields with the longest history of exploitation are the Guayaguayare and East Moruga fields on the South East Coast and Point Fortin field on the West Coast. These fields were established over seventy years ago. Notwithstanding the country's early record in petroleum exploitation, new field development is still continuing, though with increasing difficulty at finding oil-producing fields and with the tendency towards discovering natural gas fields. This difficulty in finding new oil producing fields and the fall in oil prices in 1983, contributed to the decline in oil production in 1983.

The decline in oil production which began in 1978 when oil production peaked at 230,000 bopd continued in 1983. A decline of 9.7% was registered in 1983 below the level attained during the previous year.

The country has since joined those countries which have increased fiscal incentives to encourage activity by operators, in an effort to offset production declines and to maintain a reasonable level of activity in the industry.

Oil production from Amoco's three producing fields, Teak, Samaan and Poui, has declined during the past few years from a 1978 peak of 140,000 bopd to 81,700 bopd in 1983. However, oil production is expected to reach 87,000 bopd in 1984, and increase of approximately 5% over the previous year's production. This production level should stabilize during the next five years, based on optimistic projection of an expanded exploration and development programme proposed following an indepth review of its future operations in Trinidad and Tobago. Natural Gas production, on the other hand, increased by 13% from the 1982 level to 13.7 million cubic metres to meet increase in the demand by local industries. This was largely due to the commissioning of Amoco's Cassia platform located off the south-east coast of Trinidad.

Trinmar Limited, a consortium of three companies - Trinidad and Tobago Oil Company (TRINTOC), Texaco Trinidad Inc. and Trinidad

Tesoro Petroleum Co. Ltd. - operating offshore, produced an average 37,135 bopd during 1983 and suffered a decrease of 2.2% from the average production level attained in 1982. This company operates three fields in the Gulf of Paria, which are the Soldado Main, North and East fields. Although normal levels of drilling activity were maintained in the East Soldado and North Soldado fields, production continued to show declines in this area.

Trinidad - Tesoro continued its aggressive thrust towards winning secondary oil from its land producing fields. The company installed two new steam generators and stepped up steam injection in its established schemes in Fyzabad, Apex Quarry, Guapo and Central Los Bajos fields. A total of 71 thermal wells was drilled during the year and thermal production averaged 8,000 bopd, 35% of the company's overall production. The company's fourth platform, the Trintes D, off the East Coast of Trinidad, has recently been brought on production and initial production averages 1,500 bopd from seven of the completed wells. It is expected that on completion the D platform will produce at about 3,000 bopd.

Texaco Trinidad Inc. averaged 11,200 bopd which represents a decline in its production output by 27.6% from last year's figure. The absence of development drilling activity and reduction in workovers resulted in a large number of idle wells.

The state-owned oil company, Trintoc, registered a 4.6% increase in production in 1983 over the previous year's level through the large number of wells that was completed and worked over during the year.

Finally, Premier Consolidated Oil Fields Limited, a small oil producing company in Fyzabad had a daily average production of just over 300 bopd.

Secondary oil recovery is expected to play a major role in the country's oil production efforts. Twelve new secondary recovery schemes are to be initiated this year bringing the total number of such schemes in the country to 45.

Exploration and Development Drilling

During 1983, producing companies in Trinidad and Tobago spudded 174 wells for a cumulative drilled depth of 184406m and at year's end the rig count was down to ten. Offshore drilling supported three rigs during the major part of the year. These figures manifest a slowdown in drilling activity during the year, when a comparison is made with the figures for 1982. In that year, a cumulative depth of 253775m was drilled with 232 wells being spudded.

Five exploratory wells were drilled during 1983 as compared to 17 drilled during the previous year.

In Amoco's Teak field off the south eastern coast of Trinidad, the company commenced the drilling of Teak E-16 in November. This well was completed in February of this year and produced oil at an initial rate of 2,000 bopd. Another well Teak E-16 has recently been completed with an initial rate of 2,400 bopd.

Trinmar completed its drilling activity on Platform 23 in the North Soldado field, and commenced drilling on Platform 24 where the drilling of S-568 is currently being undertaken. With respect to exploratory drilling in the South West Soldado area, encouraging results were obtained from the test on the first well drilled, S-532. Two other wells have since been drilled to delineate the extent of the reservoir.

The most recent well drilled there, S-567, which was drilled in April of this year, flowed at an initial rate of 600 bopd. Trintoc completed drilling two exploratory wells on land and is considering the drilling of an 5,500m exploratory well to test the hydrocarbon bearing potential of the Cretaceous horizon, a zone which has not been fully explored in this country.

Trinidad Tesoro, a company in which the Government of Trinidad and Tobago has 51.1% equity interest, drilled 99 wells during 1983 with 71% of these being thermal wells.

Texaco Trinidad Inc. tested one gas well in the company's Block 1 lease in the Gulf of Paria, while Premier Consolidated Oil fields Limited drilled 5 wells in Fyzabad to shallow depths of 100m.

Reserves

The decline in exploratory drilling activity in 1983 as well as the decrease in crude oil prices contributed to the deterioration of the country's crude oil reserve position. At the end of last year, proven oil reserve mounted to 489 million barrels. Probable reserves of the order of 400 million barrels have been identified, this figure including undeveloped gas condensates and commercially exploitable heavy oil reserves.

REFINING AND PETROCHEMICALS

Two export-oriented refineries exist in the country. One, owned by Texaco, has a rated distillation capacity of 220,000 bopd and is located at Pointe a Pierre, the other is an 85,000 bopd refinery owned by Trintoc, which is located at Pt. Fortin. These refineries have both felt the negative impact of the current downturn in the world economy and their combined throughput has fallen from a high of 455,000 bopd in 1972 to the present level of 74,000 bopd.

Refinery activity during 1983 declined to 74,461 bopd from an average level of 150,975 bopd in 1982. This 50.7% decline occurred because no crude oil was imported for refining during

the year and, also, during that period there was a reduction in the volume of indigenous crudes which are refined locally. During 1983, Texaco maintained a daily average throughput of 61,890 barrels per calendar day, a decrease of 38.7% when compared to the figures of the previous year.

The production of petrochemical intermediates from the Texaco refinery amounted to 423,103 barrels in 1983, this was a 49.2% reduction from the 1982 figure.

Trinidad and Tobago, with anhydrous ammonia production of 1,202,016 metric tons in 1983, became the world's second largest exporter of ammonia in that year as all of its ammonia production was exported. The 1983 figure was a 36.7% increase over the 1982 production level. Total production figures for urea, ammonium sulphate and sulphuric acid for 1983 were 56,568 tons, 32,928 tons and 31,458 tons, respectively.

NATURAL GAS

Production

Natural gas production in Trinidad and Tobago has increased steadily over the past ten years and averaged 17.3 million cubic metres per day (605 MNSCFD) during 1983. This trend is a direct result of the development of the energybased industries located at Point Lisas. Further increases in production rate is expected as demand for natural gas continues to grow.

The major supplier of natural gas is Amoco Trinidad Oil Company. This company operates two gas fields off the East Coast of Trinidad, one of which was commissioned last year. The new Cassia platform is significant for the natural gas industry since Cassia wells drilled to date have proven to be prolific producers. The national oil company, Trintoc, operates a small gas field on land. Most of the remaining gas is produced as associated gas during normal oilfield operations.

Utilization

Overall utilization of produced gas is 14.0 million cubic metres per day (490 MMSCFD) or 81% of total production. The major consumers of natural gas are the fertilizer manufacturers, Trinidad and Tobago Electricity Commission and the oil companies themselves.

Although the use of natural gas increased during the 1970's so did the flaring of this resource. The government commissioned two offshore compressor platforms in 1982 to minimize the flaring of associated gas. The compressed gas is piped into the sales line and sold to the consumers.

Natural gas is received by consumers via an integrated transmission network which is supervised by the National Gas Company. This company is currently expanding the system to a capacity of over 28 million cubic metres per day (1,000 MMcf/d).

Reserves

Only a small portion of the country's natural gas reserves has been exploited thus far, as several large gas fields which have been discovered in the East Coast and North Coast Marine Areas remain undeveloped. Present gas reserves are estimated at 0.5 giga cubic metres (18.0 tdf).

ECONOMIC PROFILE OF TRINIDAD AND TOBAGO

Trinidad and Tobago is a small twin-island nation situated in the Caribbean Sea at the mouth of the Orinoco river and 11 kilometres off the north-eastern coast of Venezuela at the closest point. The islands which together have a total surface area of approximately 5130 sq. kilometres are the southernmost of the archipelago of islands that lie in the Caribbean Sea and have a population of approximately 1.1 million.

Historically, the economy of Trinidad and Tobago was based on the production and export of traditional agricultural crops viz. cocoa, coffee, sugar cane. Organized manufacturing activity was introduced for the first time in the mid-fifties as the then Government embarked upon a programme of economic diversification and transformation.

Increasingly however, and particularly since the early seventies, the economy has been dominated by the petroleum sector. Within the past decade, the petroleum industry has contributed approximately US \$9.9 billion (about 60 per cent) of total Central Government revenues. The industry is also the major earner of foreign exchange and makes the most significant sectoral contribution to G.D.P. Additionally, the petroleum sector accounts for over 60 per cent of visible trade.

The largesse generated by the petroleum industry between 1974-81 has enabled the country to embark upon a revitalized industrialisation programme based this time on heavy industry and sophisticated processing technology of an energy intensive nature, utilizing the country's most abundant petroleum resource, natural gas, both as a fuel and feedstock. The results of the new industrialisation programme have included the establishment of a large industrial complex at Point Lisas, in Trinidad. This complex, located midway off the southwest coast is serviced by adequate infrastructure including a new electric power plant, deep water harbour and a natural gas supply pipeline. To date, the industries established there are producing cement, fertilizers and iron and steel products and this has led to a considerable widening of the country's export base.

The percentage contribution of the other non-oil sectors to the overall level of economic activity has declined sharply in recent years such that whereas in 1973 the non-oil sectors contributed 75 per cent to Central Government Revenues, their contribution decreased to 37 per cent and 52 per cent in 1981 and 1982, respectively.

In 1984 however, the economy of Trinidad and Tobago is nearing the end of a decade-long boom generated by petroleum. As international oil prices soften and the nation's oil reserves begin to decline, the economy is expected to undergo a period of readjustment. Already, the rate of growth of public expenditure has decreased and the Government has begun to turn towards the non-oil sectors to fill the gap created by the decline in the fortunes of the oil industry. More rigid foreign reserve

budgeting is now in effect as the Government moves to conserve and achieve better utilization of the country's foreign exchange reserves.

The higher level of economic activity generated by the increased reserves from the petroleum industry contributed to relatively low levels of unemployment (an average of about 10%) throughout the second half of the seventies. The downturn in the economy however has begun to take effect and the level of unemployment now stands at about 12 per cent of the labour force.

ADMINISTRATIVE AND LEGAL FRAMEWORK

The petroleum industry of Trinidad and Tobago is administered by the Ministry of Energy and Natural Resources. The political head of the Ministry is the Minister of Energy and Natural Resources who, like other Ministers of the Government, is a member of the Cabinet, the principal policy making body in the country. The administrative head of the Ministry is the Permanent Secretary who is a member of the public service.

The permanent staff of the Ministry consists of 239 employees, 62 at the professional and senior administrative level and 177 at the technical and clerical level.

The offices of the Ministry are at two locations, one at 4th Floor, Salvatori Building, Frederick Street, in the nation's capital Port of Spain, and the other, closer to the major oil producing areas in South Trinidad viz; 70-76 Pointe-a-pierre Road, San Fernando. The San Fernando office is responsible mainly for monitoring and supervising the Technical Division which oversees all exploration, production, refining and related activities. The Head of this division is the Chief Petroleum Engineer. The Energy Planning Division is headed by the Director of Energy Planning and its responsibility lies primarily in the areas of planning, policy formation and implementation.

The principal legislative or legal instruments regulating the operations of the petroleum industry in Trinidad and Tobago are the Petroleum Act (Act No. 46 of 1969) and the subsequent Petroleum Regulations of 1970. These set out in detail the legal and administrative framework and guidelines for the operations of the petroleum industry.

The Ministry (then Petroleum and Mines) was created in 1962.

KEY ELEMENT OF ENERGY POLICY

Since the attainment of constitutional independence in 1962, the Government of Trinidad and Tobago has defined, in a number of official statements and public documents, key elements of its policy with regards to the ownership, exploration, development, production and utilization of the country's petroleum resources.

The major areas of policy that have been identified are as follows:

(i) Ownership

In 1972, the Government of Trinidad and Tobago formally announced that no new 100% foreign owned enterprises will be allowed in the key sectors of the economy and that national participation involving new foreign firms must be of meaningful (equity) proportion. By 1974 therefore, in all new licences granted for the winning and production of oil and gas, a condition was included such that Government had an option of a meaningful share of equity in the licensed area upon the declaration of commercial discovery. Government has also extended this policy to the newly established energy-based industries i.e., those which utilize gas/or oil as feedstock or that require large quantities of gas and/or oil as fuel.

(ii) Exploration, Development and Production

The Petroleum Act of 1969 and the subsequent regulations set out the general, technical, work and financial obligations of a licensee. These obligations are the minimum conditions under which licensees are expected to conduct their operations and are based on the premise that operators will "..... carry out (their) operations with due diligence and act (at all times) in accordance with sound petroleum industry practice" The Ministry of Energy and Natural Resources itself was established to administer the Act and to ensure that such obligations are in fact met.

(iii) Utilization

Over the past decade, the Government of Trinidad and Tobago has developed a clear policy with regard to the utilization of its petroleum resources, particularly natural gas. In general, the petroleum resources, mainly crude oil, are to be disposed of so as to provide the maximum revenues to the country.

With natural gas the emphasis is somewhat different. In 1975, the government formally endorsed the policy of using natural gas as a "trigger" for the process of industrial development. In order to facilitate this kind of utilization, the Government embarked simultaneously on the establishment of a massive industrial estate with the attendant infrastructure. The result of this policy measure has been the establishment of a number of industries producing mainly fertilizers and iron and steel products.

(iv) Pricing

The pricing of petroleum in Trinidad and Tobago may be dealt with under three sub-heads:

a. Crude Oil - The pricing structure of crude oil for tax purposes is based on a representative basket of OPEC and non-OPEC crudes and the use of official posted prices. The final price is adjusted for freight, interest charges and quality differentials. This pricing policy is compatible with and supports the OPEC pricing structure while guaranteeing the maximization of revenues from crude oil export.

b. Petroleum Products - At the onset of the dramatic increase in oil prices in 1973/74 and because of the resulting windfall in fiscal revenue, the Government of Trinidad and Tobago, like those of most other oil exporting nations, adopted a deliberate policy to make available to the population the products of the nation's petroleum resources at extremely low and highly subsidized prices. The principal objectives of this domestic retail pricing policy was to provide as direct a benefit as possible to the population from the increased fiscal revenue accruing from the domestic oil industry and to hold down transportation costs.

However, as international oil prices continued to rise and the population began to receive other benefits of the oil-generated economy boom, the burden of the subsidy also became greater. Within recent years, as prices began to decline and the country entered a period of economic adjustment, the Government was moved to bring domestic prices more in line with international market prices. The result is that by January 1984 the element of subsidy was removed on the retail price of all petroleum products on the domestic market with the exception of L.P.G.

c. Natural Gas - In 1975, Government in one of its major policy decisions in respect of natural gas stated that it would be the sole purchaser (at well-head), transporter and seller of natural gas in Trinidad and Tobago. The purchase price is based on the principle that it should yield to the producer a reasonable return on investment. The transportation tariff is now being finalized.

In respect of the selling price, there is in fact a range of prices to different consumers based on a categorization of users into utilities, small industrial users, large industrial users, industries established under Government's energy-based industrialisation programme and export fuel.

(v) Marketing

The domestic marketing of all petroleum products is undertaken by state-owned agencies. The National Petroleum Marketing company is responsible for the domestic marketing of liquid petroleum products while the National Gas Company is responsible for the domestic sales of natural gas. International marketing of crude and products is undertaken by the producing and refining

companies respectively, while a number of companies are engaged in international bunkering.

(vi) Refining

The Government of Trinidad and Tobago is committed to the maintaining of adequate refining capacity in Trinidad and Tobago. Because of the downturn in the international refining industry, Government is now seeking to rationalize and possibly upgrade existing capacity. Additionally, Government is seeking to utilize more fully whatever capacity that remains operational after rationalization.

(vii) Conservation

Particular attention has been paid in current years to the conservation and fuller utilization of natural gas in Trinidad and Tobago. In view of the critical role identified for natural gas in the future, Government has managed to reduce the volumes of natural gas flared by the installation of low pressure gas collection and compression facilities offshore in the East Coast.

(viii) Fiscal Policy

The fiscal policy for the oil industry is based on the need to ensure, by the taxes collected, that the financial benefits from the production of petroleum in Trinidad and Tobago accrue to the people of the country. The fiscal package also includes incentives to ensure that the companies continue to invest, explore for and produce oil and gas.

PRODUCTION ARRANGEMENTS

Trinidad and Tobago uses broadly two systems in order to promote the development of its oil and gas production potential. These are as follows:

- (a) The Concession or Licensing Arrangement
- (b) Production Sharing Contracts

The concession or licensing arrangement has been in place since the start of the petroleum industry in the Twentieth Century and is today still existent, particularly in the case of those licensees who held licences prior to independence in 1962. Licences are issued to both national and non-national companies and are therefore of varying ownership structures ranging from 100% foreign ownership to 100% state ownership and joint-venture partnerships. In addition, some of the licences contain a provision for government participation upon the declaration of commercial discovery.

Production Sharing Contracts were issued for the first time in 1974 on the basis of the Peruvian type production sharing arrangements, wherein shares of production are allocated to the Government and the company prior to the determination of costs which are to be met out of the company's share. These contracts have since been restructured so as to meet the provisions of the double taxation Treaty with the United States so as to allow the income tax portion to be identifiable as part of the company's share.

Over the past two decades, acreages have been given out under the licence system or the Production Sharing Contract on the basis of international competitive bidding, in which the minimum requirements of the state are stipulated in the relevant Competitive Bidding Order. Current Government policy has tended to favour Production Sharing Contracts rather than straightforward licences.

PETROLEUM TAXATION

The collection of petroleum taxes and the administration of the related provisions of the petroleum tax regulations of Trinidad and Tobago are undertaken by the Oil Audit Section of the Inland Revenue Department of the Ministry of Finance and Planning. This agency is headed by an Assistant Commissioner of Inland Revenue who is a public servant.

The relevant legislative instruments governing the taxation of businesses carried on in the course of petroleum operations are the Petroleum Taxes Act of 1974 and the Petroleum Taxes (Amendment) Act of 1981. The Acts cover persons or entities engaged in production, refining and marketing of crude oil, natural gas and petroleum products.

Under the 1974 Act, taxes were calculated on the basis of tax reference prices determined by the Minister of finance. Other provisions of that Act were:

- (i) A rate of petroleum Profits (Corporation) Tax of 47 1/2% of taxable income for production and marketing operations respectively; in 1975 these rates were increased to 50%.
- (ii) The disaggregation of petroleum operations into three categories for the purpose of taxation as follows:
 - (a) exploration and production;
 - (b) refining; and
 - (c) marketing,

even though the same entity may carry on more than one such business.

In the case of refining business, the basis of taxation was the imposition of a throughput tax at initial rates of US \$0.10 and US \$0.15 per barrel for light and full refining respectively.

The provisions of the 1974 Act were reviewed in 1980/1981 and effective January 1, 1980, the following provisions were included:

- (i) A reduction in the rate of corporation tax to 45% on all petroleum operations - production, refining and marketing, bringing the rate of petroleum profits tax in line with the rate chargeable on all other economic activity in Trinidad and Tobago;
- (ii) Crude and product prices for taxation at the actual arms length prices verified by a Permanent Inter-Ministerial Petroleum Pricing Committee specifically established for that purpose;
- (iii) The imposition of a Supplemental Petroleum Taxes on production activity at the rates of 60% and 35%

of gross income for marine and land operations respectively;

- (iv) The imposition of a supplemental tax on refining activity at the rates of US \$0.05 and US \$0.02 per barrel for full and light refining respectively;
- (v) The supplemental taxes treated as a deductible expense in computing the Corporation Tax payable.

In addition, a whole new range of investment incentives was introduced to induce exploration activity, to stimulate production of heavy oil, and production from marginal fields. Some of these allowances are:

- (a) production allowances;
- (b) enhanced oil recovery allowances;
- (c) accelerated depletion allowances;
- (d) exploration allowances; and
- (e) allowances for tangible and intangible expenditure.

An investment allowance was also granted for capital expenditure incurred in respect of the acquisition cost of refinery plant and machinery.

Subsequent adjustments were made to the provisions of the Petroleum Taxes Act in 1981, when the rates of supplemental refinery tax were reduced to US \$0.00 for all refining and, in 1983, when the rate of supplemented tax on land production was reduced from 35% to 15%. Simultaneous with the latter adjustment, a decision was also taken to expand the schedule of items used in enhanced oil recovery activity that would qualify for enhanced oil recovery allowance. The Government is currently reviewing the tax and incentive regime in respect of marine oil production.

Fiscal revenue is also derived from the collection of royalty on petroleum production. The existing rates are 15%, 12 1/2% and 10% of the field storage value of crude oil and TT \$0.53 per 1000 cubic metres for natural gas.

Over the ten year period 1974-1983, the Government of Trinidad and Tobago collected approximately TT \$19 billion in Taxes from the oil producing companies operating in Trinidad and Tobago.

In 1975 the Government of Trinidad and Tobago decided that the National Petroleum Marketing Company (N.P.M.C.) should be the sole marketer of petroleum products (except natural gas) on the domestic market.

N.P.M.C. supervises a network of 215 service stations and obtains the bulk of its supplies from the two domestic refineries at Pointe-a-pierre and Point Fortin.

Retail prices on the domestic market are fixed by Legal orders issued by the Minister of Energy and Natural Resources. The

components of retail prices are the ex-refinery cost of the product, handling charges, wholesalers' margin, retailers' margin and excise duties.

For most of the period 1974-1983, the retail prices of petroleum products on the domestic market were heavily subsidised but in recent years the Government has moved to eliminate the element of subsidy in the prices and to make the prices comparable to international market prices. Of the products utilized within the domestic economy, today only Liquified Petroleum Gas (L.P.G.) bears any element of subsidy in the pricing structure.

ENERGY CONSUMPTION PATTERN

Three major energy forms are consumed in Trinidad and Tobago, viz. liquid petroleum products, natural gas and electricity (generated from natural gas). Over 99 per cent of the national energy needs is supplied from petroleum resources, all of it indigenous except for very small quantities of liquified petroleum gas and gasolene that may be imported when certain refinery units are temporarily out of production.

Between 1980-83, final consumption in Trinidad and Tobago increased by approximately 40 per cent. Current average per capita energy consumption is approximately 12 barrels of oil equivalent (boe) as against world energy demand per capita which was 9.8 boe in 1982 and that for the LDC's which was only 2.4 boe.

Presently, natural gas accounts for the largest share, 44 per cent, of all energy utilized. (This percentage share for natural gas excludes natural gas used as refinery gas, in secondary recovery operations, as a chemical feedstock and as the primary energy form for all electricity generation). The dominance of natural gas in the energy consumption scenario results largely from the establishment of the export-oriented, energy-based industries.

The structure of liquid petroleum product consumption is skewed towards the major transportation fuels, gasolene and gas oil, which together account for approximately 60 per cent of total internal consumption of liquid petroleum products. In fact, the consumption of these transportation fuels alone grew at an average annual rate of approximately 8 per cent between 1979-82.

The attached tables provide the details of final energy consumption by product in Trinidad and Tobago for 1980-83.

FINAL ENERGY CONSUMPTION PER CAPITA

	Tons of Oil Equivalent	Barrels of Oil Equivalent
1980	1.19	8.56
1981	1.37	9.86
1982	1.64	11.80
1983	1.66	11.94

FINAL ENERGY CONSUMPTION 1980-1983
(000's Tons of Oil Equivalent)

	1980	1981	1982	1983
Natural Gas	485.78	630.38	626.81	802.95
L.P.G.	39.53	42.87	44.92	51.49
Gasolene/Naptha	331.47	353.43	382.59	415.73
Kerosene/Tur. Fuel	83.03	87.48	86.13	51.64
Diesel/Gas Oil	171.39	189.87	219.34	207.42
Heavy Fuel	43.07	32.60	31.32	74.30
Electricity	148.26	173.60	213.37	217.41
Total	1312.53	1510.23	1804.48	1820.94

FINAL ENERGY CONSUMPTION
(Original Units 000's)

	1980	1981	1982	1983
Natural Gas (Mcf)	19,674	25,015	32,810	31,863
L.P.G. (bbl)	425	461	483	554
Gasolene/Naptha (bbl)	2,717	2,897	3,136	3,353
Kerosene/Tur. Fuel (bbl)	615	648	638	412
Diesel/Gas Oil (bbl)	1,233	1,366	1,578	1,495
Heavy Fuel (bbl)	301	228	219	519
Electricity (MWhr)	1,724	2,019	2,481	2,528

Source: Ministry of Energy & Natural Resources.

ENERGY-BASED INDUSTRIES

The profile of the energy sector of Trinidad and Tobago is not complete without reference to the energy-based industries. These are identified as those industries which either use energy, in the form of natural gas or liquid products, as their principal feed stock or are themselves large users of energy as fuel.

Most of these industries were established during the second phase of the country's industrialization programme which was facilitated by the increased revenues from crude oil export in the mid-seventies. These industries are all located in the vicinity of, or within the Point Lisas Industrial Estate where they are adequately served with the most modern infrastructure consisting of electric generating capacity exceeding 640 megawatts, deep water port facilities with sophisticated loading and unloading aids and 1000 MMcf/d capacity natural gas pipeline system that originates from the marine gas fields off the East Coast of Trinidad.

The principal of these industries are three fertilizer producing facilities with a combined productive capacity of approximately 3850 metric tons per day, an iron and steel plant with a maximum annual production capacity of 900,000 metric tons of direct reduction of iron ore, 650,000 metric tons of billets and 600,000 metric tons of wire rods, a 1200 metric ton per day methanol plant, a 1620 metric ton per day urea plant and a cement plant, the capacity of which is expected to be 24,000 metric tons per day by year end.

The Ministry of Energy and Natural Resources is located at:

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The principal officers of the Ministry of Energy and Natural Resources are:

Mr T.M. Boopsingh	(Engineer)	- Permanent Secretary
Mr H.C. Hinds	(Engineer)	- Special Adviser
Mr R.A. Mends	(Engineer)	- Chief Petroleum Engineer
Mr H.C. Toney	(Engineer)	- Director, Energy Planning
Mr F. Look Kin	(Engineer)	- Senior Energy Analyst
Mr W. De Govia	(Engineer)	- Asst. Chief Petroleum Engineer
Mr K. Haynes	(Geologist)	- Chief Geologist
Ms L. Harris	Accountant)	- Comptroller, Petroleum
Ms L. Stephenson	(Barrister-at-law)	- Senior State Counsel
Ms C. Shadrack	(Administrator)	- Administrative Officer V
Ms P. Benson	(Librarian)	- Librarian

5. SURINAM

In Surinam I had one meeting with representatives from the State Oil Company of Surinam and Surinam Drydock and Shiblog Co Ltd. together.

The following persons were met:

Mr. Groenfeld National Planning Office
POB 172 Paramaribo

Mgr. Exp. and Drilling R. Bergerac
Geologist A.G. Ho-Len-Fat

both from the State Oil Company of Surinam,
Gravensberghstr. 18, Paramaribo

and Naval Architect Van Berkel, f.H.

Surinam Drydock and Shiblog Co Ltd
Saramacca str. 33/35
P.O. Box 1846 Paramaribo

5.1 Summary of our meeting.

All the participants expressed their great interest of the conference in Norway. They also asked me to inform UNIDO about help to start projects not only within the oil industry, but also other types of industry.

Surinam hopes to get an official invitation to the UNIDO conference, so that people sent there can have the possibility of learning from other countries' experience.

5.2 Today's Situation

Surinam has found some oil offshore. They are planning to start drilling of their first well in April this year, continued by 4 other wells. Today Surinam has a small onshore production of oil, approximately 1800 barrels a day.

The participants of the meeting suggested our UNIDO conference to be called UNIDO/Norway Offshore Petroleum Production Conference.

5.3 Other Information

During my stay in Surinam I met a lot of interesting people and it looked to me that a great amount of help, both technically and economically, to start projects of different types was needed badly.

Surinam has proper quality of clay for porcelane production and quartz sand for glass production that could be used. In my opinion, small types of industry should be started, and to know

what types of industry that would have the greatest chances of success, a pilot-project should be made.

I also met a Dutchman that had recently sent a telex to UNIDO, asking for help in order to make some tools out of wood for the American market. In his company, he produces different types of furniture. Up to 70 % of the materials had to be thrown away, because of production techniques that were a little too old-fashioned. I put forward a few ideas that should give him the possibility of saving maybe 40-50 % of this.

I was quite impressed by the people I met and really hope it is possible for UNIDO to make something for these people. I am quite sure that much of the experience we have from small scale industry in Norway could be used.

- Fishing
- Metalworking
- Glass production
- Pottery production
- etc.

6. CONCLUSION

UNIDO should, as soon as possible, send an official invitation to the countries visited in the names of the persons expressed by telex April 2.

A meeting should also be arranged in Oslo as soon as possible, to settle the final arrangements of the meeting in August 20 - 24.

Drammen, April 2. 1986

Bjørn Johannessen