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**Final Report to
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**Petroleum Financial Administration .
Basic Training Program**

**FOR
DIRECCION GENERAL TECNICA PETROLERA
MINISTERIO DE FINANZAS
GOVERNMENT OF ECUADOR**

FINAL REPORT

**PETROLEUM FINANCIAL ADMINISTRATION
BASIC TRAINING PROGRAM
FOR
DIRECCION GENERAL TECNICA PETROLERA
MINISTERIO DE FINANZAS
GOVERNMENT OF ECUADOR
QUITO, ECUADOR**

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EXECUTIVE SUMMARY

This report presents the findings of a diagnostic survey of the Directorate of Petroleum Analysis in the Ministry of Finance of the Government of Ecuador. Arthur D. Little, Inc. performed this survey in Quito under the sponsorship and coordination of USAID/Washington.

The objective of this survey is to assess the training needs of this Directorate so as to enable it to perform its increasing responsibilities in financial administration of oil revenues. The diagnostic team carried out a series of intensive interviews with managers in many institutions in the Ecuadorian government, such as CEPE and the Central Bank, and a private oil company--Texaco. As a result of these interviews, the diagnostic team established the role of the Directorate within the financial administration process.

Intensive interviews also were carried out with the staff of the Directorate. The team was able to assess the present and future responsibilities of the staff, and match their present skill levels with those responsibilities.

Drawing on the findings of both sets of interviews, the diagnostic team was able to identify several critical areas where training is needed to eliminate deficiencies in the skills of the Directorate's staff. These areas include:

- petroleum engineering and industry operations;
- petroleum accounting;
- quantitative methods for petroleum-related analysis; and
- petroleum finance.

The team recommends a specific basic training program to meet these needs. First, a basic course and workshop program will be held in Ecuador. Its curriculum will cover all four of the areas of need identified above. Second, a program of job internships and special short courses in the U.S. will be made available to selected Directorate personnel. A language problem was identified, and an intensive English facility course should be taken by Directorate staff before the recommended training program described above is started.

The final product of this basic training program will be a DGTP staff with enhanced skills with which to understand and analyze the important components of oil revenues to the GOE, their distribution, and their implications for the Government budget.

1.0 INTRODUCTION

The Sub-Secretary for Public Credit of the Ministry of Finance (MOF) of the Government of Ecuador (GOE) has requested USAID to provide technical training services to the staff of the Direccion General Técnica Petrolera (DGTP); prior to September 16, 1983 this group was named the Direccion General de Asesoría Petrolera. The purpose of this report is to identify the key areas in which DGTP needs these services, and to suggest programs and methods through which AID can supply those services to DGTP.*

The DGTP was formed in 1981 to perform financial management functions related to:

- the existing contracts of GOE with Texaco, City Investing, and GOE's national oil company, Corporacion Estatal Petrolera Ecuatoriana (CEPE); and
- the new contracts which will result from GOE accepting bids from private international oil companies under the new licensing law.

DGTP has been performing its responsibilities related to the existing contracts, and now is organizing itself under the direction of Econ. Salgado to expand upon those responsibilities

* A listing of the abbreviations used in this report is in Appendix A.

and to be able to perform its new responsibilities related to the potential new contracts. In this organization process, the DGTP also has been assigned additional responsibilities related to the existing contracts. As a result the present and future operations of DGTP need to be reviewed to assess what capabilities the unit needs to meet its objectives, and how those capabilities should be organized and directed.

Arthur D. Little, Inc. (ADL) has been requested by AID/Washington to undertake an initial diagnostic survey of the responsibilities and capabilities of DGTP, and to assess the unit's requirements for training. This assessment will include recommendations of specific programs where applicable. AID/Quito has sponsored similar training internships with the U.S. Internal Revenue Service for several staff members of the Direccion General de Rentas (DGR)*, which has tax collection responsibility for the GOE. This AID "Revenue Generation" assistance has been well-received by DGR and that successful experience prompted Subsecretario Sanchez Orejuela to seek similar assistance for DGTP.

The ADL team, composed of Mr. F. Cort Turner (Vice President-International Energy Economics) and Dr. James L. Paddock (Senior Consultant--Energy Economics), visited Quito in November 1983 to carry out this assignment. The AID Mission in Ecuador requested Mr. Alberto J. Sabadell (Energy Officer) of AID/Washington

* DGR is under the Sub-Secretaria de Rentas y Administracion General.

to coordinate the activities of the ADL team in Ecuador. Mr. Sabadell, who is fluent in Spanish and knowledgeable of Latin American sensitivities, played a key role in facilitating the success of this diagnostic study. The findings and recommendations of that study are reported here.

2.0 PURPOSE OF DIRECCION GENERAL TECNICA PETROLERA

The purpose of DGTP is financial administration and analysis of net petroleum revenues to GOE. DGTP currently receives basic, often provisional data on revenues, e.g., sales, taxes, and royalties, and costs, e.g., production, distribution, and transportation, as generated and processed by other institutions within GOE. The relationships of these other institutions are discussed below. Until recently DGTP has been responsible only for:

- processing this data;
- reconciling it on a quarterly basis with actual costs and revenues;
- calculating the distribution of the net to various recipient agencies as specified by law;
- providing statistical support to the Minister of Finance who sits on the Board of Directors of CEPE;
- aiding DGR in its income tax audit function; and
- interpreting and cataloging the various GOE laws and regulations relating to the hydrocarbon sector.

The reason these functions are performed in the MOF by DGTP is that these net funds flows are critical to the national budget as administered by MOF. However, no funds flow through DGTP nor does it generate basic data. The calculations performed by DGTP serve as both a cross-check on other agencies and the reconciliation to actual funds movements.

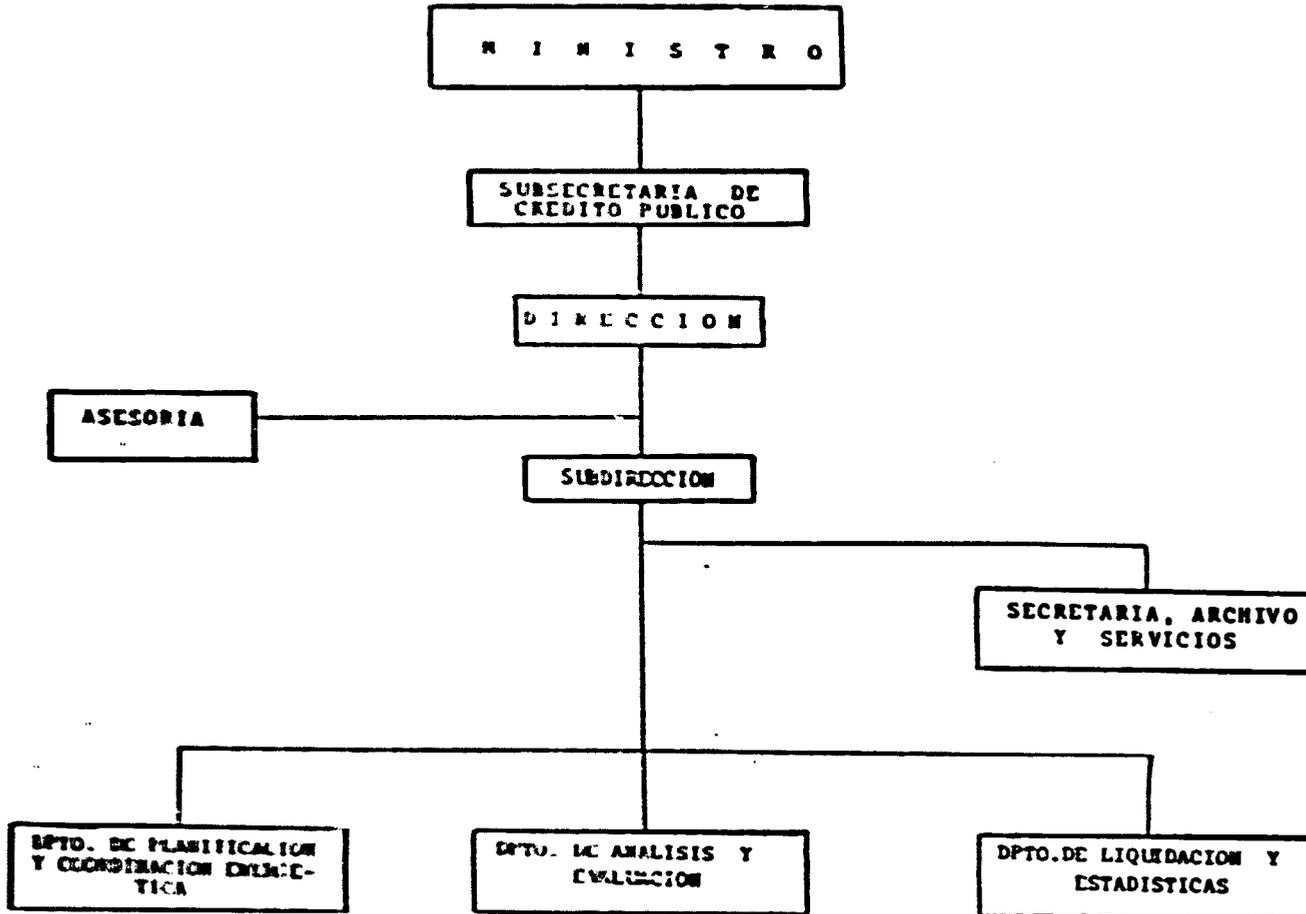
The current organizational structures of MOF and DGTP are shown in Figures 1 and 2. As shown in Figure 1, DGTP is located within the Subsecretaria De Credito Publico, which is one of the four primary operating Subsecretarias within the Ministry of Finance. As shown at the bottom of Figure 2, the DGTP unit is composed of three primary operational groups:

- the Department of Energy Planning and Coordination;
- the Department of Analysis and Evaluation; and
- the Department of Collections and Statistics.

Two service support groups also within DGTP are:

- an Advisory Group; and
- the Secretarial, Archive, and Support Services Group.

Fig. 2. ORGANIGRAMA ESTRUCTURAL DE LA DIRECCION GENERAL TECNICA PETROLERA



DGTP is headed by the Director General, Econ. Marco Salgado Recalde, who reports directly to the Sub-Secretario de Crédito Publico, Econ. Diego Sanchez Orejuela. Econ. Salgado is an economist with many years of experience in MOF. He is responsible for overall operational management and policy formulation of DGTP and its relation to MOF. He also represents the Minister of Finance on the Board of Directors of CEPE. Econ. Salgado is advised by an Asesoría group coordinated by Econ. Juan Jaramillo Zuniga, and Econ. Eduardo Acosta Bravo. Econ. Jaramillo also now heads the Department of Planning and Coordination which is discussed below. Econ. Acosta is a tax advisor for DGTP, responding to tax and fiscal questions from the operating departments in DGTP. He also assists Econ. Jaramillo with planning and future operational problems.

The Sub-Director of DGTP is Econ. Luis Flores Guzman who reports to Econ. Salgado. Econ. Flores is an economist with a number of years experience in MOF and recently was promoted to this Sub-Director position from his position as head of the Department of Planning and Coordination in DGTP. His responsibility is operational management of the three operating groups and one support services group in DGTP. This support services group is headed by Mrs. Gloria de Herrera, and is responsible for secretarial, cataloging and support services to DGTP. The three operational groups are discussed below.

2.1 Department of Energy Planning and Coordination (DEPC)

The formalized responsibilities of this group are as follows:

- a. To perform legal, economic, and financial studies on subjects of concern to MOF relating to the hydrocarbons, mining, and energy sectors.
- b. To perform research on key elements and other variables relating to the calculation of taxes and tax rates relating to hydrocarbon activities.
- c. To prepare draft accords and decrees relating to legal regulations that govern the hydrocarbon sector with respect to both MOF and other public organizations in order to make more efficient the administration of income from the hydrocarbon sector.
- d. To study and coordinate with the Department of Analysis and Evaluation new alternatives that will generate income to the COE.
- e. To assist and advise the MOF representative to the Board of Directors of CEPE on any business relating to MOF and the CEPE Board, or any other public agency.
- f. To coordinate with the Direccion General de Organizacion y Sistemas (in MOF) the implementation and follow-up of the automation of revenues generated by the hydrocarbon sector.
- g. To prepare reports on all aspects related to OPEC and its special funds.

h. To inform DGTP about the legal aspects, functioning, and activities of the diverse domestic and international organizations relating to the hydrocarbon and energy sectors.

The responsibilities performed by DEPC in practice fall into two categories: (1) legal; and, (2) economic and financial. Most of this Department's work relates to (1) legal, in which the staff combs through, condenses, indexes, and summarizes all legal aspects of GOE petroleum legislation so as to make this information immediately available to the other operating groups in DGTP. This summarizing process is done for both existing contracts and the potential new ones. DEPC then analyzes and critiques all this legislation in order to respond to operational questions from the other DGTP groups, as well as MOF in general.

Based on this compendium of information and analytic understanding of petroleum legislation and regulations, DEPC represents MOF in discussions with other Government agencies and Congress with respect to new petroleum laws, regulations, and contracts. This function of DEPC also serves as a policy input to the Minister of Finance (or his delegate) who serves on the CEPE Board. Some of this work by DEPC is carried out at the ministerial level while other is directly between the various agencies' operating groups.

The smaller portion of DEPC's staff time is spent in area (2) economics and finance. This work deals with the economic and financial aspects of future implications of changes in hydrocarbon-related aspects such as tax rates, prices, and

contracts. The other DGTP departments deal with the immediate operational aspects of those changes, while DEPC studies the projections and future implications for concerns such as DGTP operations, funds flows, and private oil companies (e.g., Texaco).

DEPC is currently headed by Econ. Juan Jaramillo Zuniga. He is an economist with a number of years of experience in MOF. His responsibility is to supervise the group and its projects. The three staff members of DEPC are:

(1) Lic. Neptali Méndez, a senior lawyer (law school degree) with fifteen years experience in MOF. His responsibilities include documentation and analysis of laws, and preparation of legal documents.

(2) Dr. Mario Mayorga, a junior lawyer (law-school degree) who has some work experience as well as a degree in statistics and banking. His responsibilities include legal assistance to the MOF delegate on CEPE's Board, plus keeping updated on all legal aspects of the hydrocarbon industry.

(3) Lic. Estuardo Moncayo a new member of the group who has a degree in public administration and has worked in the personnel office of MOF. His responsibilities include advising the MOF delegate to CEPE's Board on organizational changes in CEPE.

2.2 Department of Collections and Statistics (DCS)

The responsibilities of this group are as follows:

- a. To provide the information needed by the other DCTP operating departments in order to perform their respective functions.
- b. To establish the amounts of oil company taxes collected, and to determine their distribution to the various recipients according to GOE laws.
- c. To establish the amounts of export revenues earned by CEPE and to determine their distribution.
- d. To establish the appropriate share to GOE according to law of the increases in oil prices.
- e. To determine the amounts of GOE taxes due from internal domestic market sales of petroleum products.
- f. To gather and maintain statistics on volumes of production and sales of crude oil and products to both the domestic and international markets.
- g. To design and implement a computer system to control the profits' data of the oil sector.
- h. To maintain statistics on interest rates and their effects and consequences on prices of oil sold on a cash or term basis.
- i. To develop statistics, including funds' flows and oil volumes, for public release on the hydrocarbon sector with respect to OPEC and other international information.

The responsibilities performed by DCS in practice conform

fairly well with the formal list. This data collection, processing, and analysis is necessary for the treasury function in MOF to know its cash flow expectations and oil revenue distributions for national budgeting and payout purposes as relates to both domestic and international sources.

DCS is headed by Econ. Nancy de Zapata, an economist with many years of experience in MOF in several different phases of tax revenue collection and analysis. Her responsibility is to supervise the group and its projects and operating functions. The two staff members of DCS are:

(1) Lic. Luis Zarate, who has nine years experience including some as a computer systems analyst, and has studied electrical engineering, computer science, and public administration. His responsibilities include implementation of the tax revenue collections and disbursements functions.

(2) Sr. Felipe Velasco, who is relatively new to the department and is currently finishing his studies for his petroleum engineering degree. His responsibility is to assist in carrying out the tax revenue functions of DCS.

This department uses an IBM 370-138 computer which soon will be replaced by an IBM 4341 with two megabytes of memory.

2.3 Department of Analysis and Evaluation (DAE)

The formalized responsibilities of this group are as follows:

a. To analyze and evaluate the results of investments financed with resources related to the production and commercialization of hydrocarbons.

- b. To analyze the unit costs of production of oil companies and all other key elements of those companies which affect the calculation of the taxes related to hydrocarbon activities.
- c. To analyze and evaluate all elements and variables which affect the final price structure to consumers of petroleum products.
- d. To analyze and evaluate "periodically" the income of all different phases (production to tax collection) of the oil sector.
- e. To perform periodic evaluations of the internal market behavior of oil products, and suggest policies for rationalization (i.e., making more efficient) of consumption.
- f. To study and analyze the documentation sent by international organizations relating to energy, mining, and petroleum activities.
- g. To report on the variations in oil prices experienced in the international market for petroleum products.
- h. To report on the changes experienced by activities in exploration, commercialization, transportation, and industrialization of hydrocarbons, and their effects on income to GOX.
- i. To report on the information and reports on CEPE activities that are submitted to the MOP delegate on the CEPE Board.

The responsibilities actually performed by DAE conform closely to those outlined above. However, at the present time the DAE staff is only able to implement most of these responsibilities in a relatively mechanical and limited fashion. This is because of the very ambitious nature of many of these responsibilities, the small number of DAE staff, and the lack of needed skills, particularly cost accounting, among DAE staff.

The majority of the work currently performed by DAE staff includes:

- cooperation in analysis of the data, calculations, and methodology used by DCS to reconcile retentions and distributions;
- analysis of cost data from the oil companies in order to understand their effect on income to GOE; and
- planning DAE's future operations so as to accomplish the rest of its assigned responsibilities.

DAE is headed by Econ. Gilda de Figueroa, an economist with three years of work experience as a stock analyst, four years with other groups in MOF, and four years with DGTP. She also spent some time in the U.S. Her responsibilities include supervision of DAE work projects and staff, coordination of DAE activities with the legal analyses performed in DEPC, and planning for meeting DAE's responsibilities.

The two staff members of DAE are:

- (1) Ing. Manuel Lescano, who has completed all the course work for a petroleum engineering degree, has taken a number of

special MOF courses, and has eight years work experience in DGR. He has been with DGTP for nearly two years and his responsibilities include petroleum production cost analysis and general statistical analysis.

(2) Econ. Vicente Frias, who has completed all the course work for an economics degree, has taken a number of special MOF courses, and has eight years work experience in DGR. He has been with DGTP for less than two years and his responsibilities include accounting analyses to determine the effect of production costs on income to GOE.

3.0 SURVEY METHODOLOGY AND INTERVIEWS

The goal of this survey is to identify training needs for the staff of DGTP. The survey was conducted by the ADL team in association with Mr. Sabadell of AID/W. The process involved considerable interviewing of key people in DGTP and other GOE agencies and institutions involved in the financial administration of GOE's oil revenues. The objectives of these in-depth interviews are:

(1) to obtain an understanding of the process of oil revenue administration within GOE, and to understand the organizational structure and relationships which implement that process; and,

(2) to understand the present and future role and responsibilities of DGTP, and its personnel skill requirements and present staffing.

The following is a chronological description of the interviews conducted. All meetings included Mr. Sabadell, Mr. Turner, and Dr. Paddock unless otherwise noted. The findings and implications of the interviews are discussed later.

November 8

Morning: - Met at AID with Mr. Carl Duisberg (Regional Energy Officer) and Mr. Paul Fritz (Deputy Director) of AID. Discussed the study's overview, and received a briefing on Ecuador and the GOE.

- Met at MOF with Econ. Salgado, Econ. Flores, Econ. de Figueroa, and Econ. Jaramillo. Discussed the study's objectives and overview, and how we intended to carry it out. Discussed other agencies with whom we should talk. Received a briefing on role of DGTP and objectives for future.

Afternoon: - Met at U.S. Embassy with Mr. Paul Trivelli, the Economics Officer. Discussed the energy situation in Ecuador, and GOE and company officials whom we should talk to.

- Organized meetings for next day and rest of week.

November 9

Morning: - Met at MOF With Econ. Salgado, Econ. Jaramillo, Econ. de Figueroa, and Econ. Flores. Discussed DGTP operations, functions, and responsibilities. Discussed old and new contracts and how DGTP monitors tax collections and disbursements. Discussed mechanics of contracts.

Afternoon: - Met at MOF and continued above discussion.

- Met at Ministry of Natural Resources and Energy with Ing. Rodrigo Ceron of Direccion Nacional de Hidrocarburos (DNH). Discussed their working relationship with DGTP and the role of DGH in the GOE financial system.

- Met at CEPE with Dr. Eduardo L. Polit, Legal Assistant to the Managing Director of CEPE. Discussed relationship of CEPE and DGTP. He recommended we talk to Econ. Luis Aparicio Burbano, Subgerente Administrativo of CEPE.

November 10

Morning: - Met at Texaco with: Mr. E.L. (Bill) Johnson, Sub-Manager of Texaco; Dr. Rodrigo Pérez P., Legal Counsel to Texaco; Econ. Jorge E. Guerra, Controller of Texaco; and Ing. Edwin Saa, operations assistant to Bill Johnson. Discussed the relationships of Texaco to all GOE agencies, including DGTP. Discussed financial administration of Texaco contract and mechanics of formula.

- Met at the Central Bank of Ecuador (ECB) with: Sr. José Enriquez L., Director of Hydrocarbon Administration; Sr. Luis Erazo Cano, Director of Studies; and Sr. Patricio Guarderas R., Department Chief. Discussed role of ECB in GOE hydrocarbon revenue administration, and relationship of ECB with DGTP.

Afternoon: - Met at AID with Mr. Leo Garza, Division Chief. Discussed objectives of survey, and future training for DGTP staff.

- Met at MOF with Econ. Salgado, Econ. de Zapata, Econ. Flores, and Econ. Jaramillo. Discussed work plans of DGTP departments, calculation mechanics of contracts, domestic and international prices, and costs. Discussed responsibilities and objectives of DGTP and relevant training needs.

November 11

Morning: - Met at MOF with Econ. Salgado and department heads. Continued discussion of DGTP's role, operations, and contract administration.

Afternoon: - Met at CEPE with Econ. Burbano. Discussed CEPE's relationship with DGTP, and other GOE agencies. Also discussed exports, imports and foreign exchange implications of CEPE's operations.

Note: From this point on, Mr. Turner had returned to the U.S. and Mr. Sabadell and Dr. Paddock continued the interviews.

November 14

Morning: - Met at MOF with Econ. Salgado, Econ. Jaramillo, Econ. Flores, and Econ. Bolivar Costales G., Director of Training in MOF. Discussed training and programs in MOF. After Econ. Costales left, discussed departments of DGTP and personnel staffing them, and training needs.

November 15

Morning: - Met at MOF with Econ. Salgado, Econ. de Figueroa, and Econ. Flores. Discussed facilities of MOF for seminars, and previous in-house MOF training programs. Discussed objectives, role, and operations of DAE. Also discussed the backgrounds of DAE staff and their training needs.

Met with Econ. Eduardo Acosta Bravo of DGTP's Asesoría and discussed his responsibilities and background.

Continued discussion with Econ. Salgado and Econ. Flores and discussed overall objectives, plans, and needs of DGTP.

Outlined a training program format and received Econ. Salgado's commitment to a program.

This meeting concluded the formal interviewing process. The remainder of the time was spent writing a draft report, briefing AID officials on the findings and recommendations, and discussing the recommended training program with DGTP managers.

Throughout the interviewing process most participants were quite open and willing to discuss the role and needs of DGTP. All the comments were very positive in their support for in-depth training for DGTP staff.

All those interviewed, both in other government agencies and private companies, felt DGTP clearly needed additional training in order to play a more important and contributory role in GOE financial administration. Most of those interviewed stressed petroleum industry and technical knowledge, and cost accounting as the two most critical training needs. For example, the managers of Texaco stressed the positive role of DGTP and the contributions to the overall financial administration process that DGTP could make if only its staff had more advanced training in petroleum operational concepts and accounting. Immediate benefits for example, could be in the reconciliation of withheld revenues, and the identification of weaknesses and inequities in application of the contract formula. A better-equipped DGTP staff could recommend changes in the process to ameliorate these problems.

DGTP staff were extremely open and cooperative during our meetings with them. They recognize many of their skill deficiencies and enthusiastically seek a training relationship with AID. Econ. Salgado is prepared to make his staff available for the type of training program outlined in Section Six of this report, and has already initiated an English language program inquiry.

4.0 FINANCIAL ADMINISTRATION OF PETROLEUM REVENUES IN ECUADOR

The process of financial administration of petroleum revenues in GOE is complex and involves a number of different institutions, both public and private. The process is characterized by data and statistics flows, funds flows, and policy formulation at a number of levels. The administration of taxes and royalties on existing GOE contracts with CEPE, Texaco, and City Investing encompasses one set of interactions. Planning for the implementation of the potential new contracts encompasses another. In this section we briefly describe this process and each of the major actors within it. We then focus on the role of DGET in this process and define its needs for carrying out its responsibilities.

Corporacion Estatal Petrolera Ecuatoriana (CEPE). This is the state oil company and is responsible for domestic exploration, development and production, both alone and with the two consortia (Texaco and City Investing). Also responsible for all domestic and some foreign sales of crude and products. Within CEPE the Unidad de Contratacion Petrolera analyzes the whole contract procedure (new and old).

Ministry of Natural Resources and Energy (MNRE). This Ministry is responsible for relating with and monitoring the hydrocarbon sector and the operations of CEPE. Within MNRE is the Comision Asesora Politica Petrolera which is primarily administrative and

sets the OPEC reference price, and the Direccion Nacional de Hidrocarburos (DNH). The DNH has a number of important responsibilities including financial audit of companies' production, costs, volumes and prices, calculation of the parameters for input into the Texaco and City Investing tax and royalty formulas, and setting of internal oil product prices.

Central Bank of Ecuador (ECB). This bank receives information from DNH and uses it to withhold taxes and royalties on exports of crude. ECB then distributes those revenues to the GOE recipients as specified by law.

Superintendant of Companies. This government organization controls the legal aspects of private companies and monitors their financial condition.

Ministry of Finance (MOF). The MOF is responsible for monitoring all revenues which flow through the national budget, including petroleum revenues. In addition to DCTP as described above, within MOF is the Treasury which is ultimately responsible for proper distribution of oil revenues (actually distributed by ECB, acting as an agent), the Presupuesto which coordinates the national budget, and the Direccion General de Rentas (DGR) which is the ultimate authority for tax revenue collection and audit.

The operating relationships and activities of DCTP within the financial administration process are direct with DNH of MNR, ECB, Texaco, and DGR in MOF, and indirect with CEPE. The role, responsibilities, and objectives of DCTP in this process were

described above. In this section a brief description of DGTP's interactions with these other institutions is presented and discussed. That description combined with DGTP's operating responsibilities provides the basis for identifying the training needs of DGTP.

It is useful to divide oil sales into two general groups, export and internal market. The financial administration process for each is somewhat different. The process for existing contracts is discussed first.

4.1 Existing Contracts

Export Sales. The revenues received from crude oil sales into the international market by CEPE, Texaco (uses the transfer price to Textrad) or City Investing are deposited into a respective dollar account at ECB. For each of these shipments, DNH calculates provisional (uses average of last three months) parameters reflecting:

- volume
- transport price
- API
- cost of production
- minimum price of sale (greater than or equal to the OPEC reference price set by Comision de Precios del Petroleo in MNRE).

These parameters are telexed to ECB, with copies to DGTP and the relevant oil company. ECB then uses these to determine, provisionally, the amounts to be withheld from the company for

taxes and royalties and, in the case of CEPE net over cost (plus allowed profit) reimbursement according to formulas specified by law. This withholding amount must be deposited in ECB within 20 business days after the sale. ECB then distributes these provisional funds according to the distribution structure specified by law.

When DCS receives its copy of the parameters from DNH it makes note of the shipment, but does not make provisional withholding calculations.

At a later point in time the actual parameters (liftings and price) for each shipment are sent to DGTP by the oil company. While some parameters are fixed for a period of time others vary from the provisional ones for each shipment, e.g., API or selling price. DCS then makes the formula calculations for each shipment using the actual parameters so as to get the actual withholding amount. On a quarterly basis, DCS sends these actual withholding numbers to ECB which then uses them to reconcile the company's account (provisional to actual). These actual amounts also are reported to DGR for later use in company income tax auditing. DGR has the responsibility for determining the "final" numbers. DCS also calculates the actual distribution segments and reports that information to ECB, and the Treasury and Budget Office. All these calculations in DCS are performed on an IBM 370-138 computer accessed from a terminal in the DCS office.

Internal Sales. A process similar to that for exports is followed for internal sales by CEPE and the Consortia. These calculations also are performed by DCS. However, on domestic sales CEPE also collects three sets of taxes:

- the 6% sales tax
- additional sales tax for diesel, turbodiesel, and residual oil
- all production taxes

CEPE sends a monthly report on these collections to DCS and DGR. Based on the internal shipment data, DCS then verifies these collections for DGR. CEPE receives a fixed amount for cost reimbursement on internal sales; this amount is currently being renegotiated between CEPE and DGTP.

4.2. New Contracts

For the potential new contracts the process described above for existing contracts will hold in principle but with the following modifications that affect DGTP. Law 101 as written states that ECB will continue the calculations for the new contracts but DGTP is drafting a change to that law which would specify DGTP as the unit which calculates the provisional retentions and distributions rather than ECB.

When this change is accepted, DGTP will receive the provisional parameters from DNH directly. DGTP will perform both the provisional and reconciliation (based on actual parameters)

calculations and transmit the retention and distribution amounts to ECB, which will act only as a disbursing agent, and to the Treasury, the Budget Office, and DGR in MOF.

In order to establish this same process modification for the existing contracts, DEPC has drafted the following which are required for the change:

- authorization by the Ecuadorian Congress to modify the Texaco contract; and
- a Presidential directive to modify the City Investing contract.

4.3. Responsibilities of DCTP

The financial administration process discussed above is the method by which DCTP meets its primary operational responsibilities -- those related to determining and monitoring oil revenue flows within COE. These operations are handled primarily by DCS and are mechanical in essence. A set of training needs is identified to meet these requirements. However, a second major set of responsibilities entrusted to DCTP is the general analysis of legal interpretations and applications, planning for future operations, analysis and evaluation of all the relationships and parameters involved in the operational process, input to policy formulation, and support for the MOF delegate on CEPE's Board. This broader analytic set of responsibilities is implemented by DEPC and DAE, in cooperation with the Advisor Group, and essentially involves DCTP in a role of negotiating for

the national interest with private companies and public agencies. To meet these responsibilities requires a quite complex analytic framework and set of methodologies. The following example questions which must be addressed by DEPC and DAE are illustrative of these responsibilities as they relate to the critical operational functions performed by DCS.

- How should unit costs of production be determined? What depreciation/amortization methods should apply to different types of investments? These concepts are important because, for example, they affect the operations of CEPE in the internal market.
- What is a "proper" rate of profit on investments in Ecuador by CEPE? How should assets be revalued? What are the criteria for investment classifications as opposed to operating expenses? How should negotiations with CEPE be carried out? What are modern project evaluation techniques?
- What is the incentive structure for CEPE operations inherent in the existing legal and regulatory system. For example, does CEPE as an organization have an incentive to over-invest and/or over-spend?
- Can the present Ecuadorian tax system be simplified and made more efficient? Is there a more effective method for revenue distribution? What biases exist in the current system of financial administration which favor different

parties at the expense of others? For example, in a time of rising costs and falling prices, what are the effects on margins of the use by DNH of a historical three-month moving average for setting the cost parameter?

- How can answers to the above questions be implemented within the petroleum legal structure? What do they imply for policy input and formulation at the Ministerial level?

As before there is a set of training needs which are identified to enable DGTP to meet this second set of responsibilities.

5.0 TRAINING NEEDS OF DGTP

The major recent changes in the financial administration responsibilities and role of DGTP imply a broader set of required skills and training needs than would have been the case previously. In addition, the training needs identified must be directed toward both the present and future requirements of DGTP as it develops its broader scope of activities.

Characteristics of DGTP's training needs can be classified along two dimensions:

- Structural objective
- Underlying discipline

The needs related to the structural objective can be decomposed into operational and organizational. Skills needed to

meet operational objectives cut across several underlying disciplines such as accounting, legal, and statistics. Skills needed to meet organizational objectives similarly cut across underlying disciplines such as legal, general management, and finance. Underlying disciplines in this context are those practical fields needed to accomplish DGTP's mission and may in turn be based on a combination of more basic disciplines. The matrix in Figure 3 illustrates these relationships, including some examples in the matrix cells. For example, to meet operational objectives such as retentions determination, particular DGTP staff need cost accounting and tax accounting skills; to meet organizational objectives such as negotiations with CEPE, certain DGTP staff need legal interpretive and petroleum project investment evaluation skills.

The interviews conducted by the team were quite comprehensive in their coverage of the role of DGTP in the financial administration process, the operational and organizational objectives of DGTP, the underlying disciplines and skills needed to enable DGTP to meet those objectives, and the respective skill levels of the present DGTP staff. Based on an analysis of the findings of these interviews, ADL recommends a training program for DGTP staff which will supply the following general knowledge areas and specific skills:

FIGURE 3. MATRIX OF DGTP TRAINING NEEDS

<u>UNDERLYING DISCIPLINE</u>	<u>STRUCTURAL OBJECTIVE</u>	
	<u>Operational</u>	<u>Organizational</u>
Accounting	<ul style="list-style-type: none"> - cost accounting skills - tax accounting skills 	
Economics		
Finance		
Legal		- legal interpretation skills
Petroleum Engineering		- petroleum project evaluation skills
Petroleum Industry Operations		
General Management		
Language		
Quantitative Methods		

1. Petroleum Accounting

- Basic concepts as applied to both private and public sector entities.
- Cost accounting with emphasis on:
 - methods of allocating direct and indirect expenses, and overhead;
 - depreciation and amortization methods, including unit of production (UOP); and
 - investment versus expense criteria determination.
- Petroleum accounting methods and conventions.
- Tax accounting versus economic value accounting.
- Sources and uses of funds analysis.
- Conceptual implications of different accounting systems for organizational behavior.
- Accounting interpretation and application of petroleum laws, regulations, and contracts.

2. Petroleum Engineering and Industry Operations

- Basic terminology and concepts.
- Exploration, development, and production processes.
- Geologic basis.
- Drilling and related operations.
- Investment analysis.
- Concession and contract analysis.
- Analysis of petroleum laws and regulations.

- Overview of world oil supply and demand.
- Commercialization including transportation, distribution, and marketing.

3. Petroleum Finance

- Basis in microeconomics.
- Rate of return determination for both private and public investments.
- Investment and project evaluation with special emphasis on present value techniques.
- Funds flow analysis, forecasting, and planning.
- Simulation modeling and sensitivity analysis.

4. Quantitative Methods for Petroleum-Related Analysis

- Statistics.
- Discounting techniques.
- Data management.
- Computer operations and systems.

To meet these training needs and make them effective for DCTP staff, a combination of special courses, workshops, job internships, and academic programs is required. The elements of this combination as relate to each of the four knowledge areas is discussed below in Section Six, as are specific recommendations for a training program, including time-phasing. The basic courses and workshops will all be held in Ecuador for all the DCTP staff. A few selected members of that staff will be sent to the U.S. for specific short courses, job internships, and academic programs. Some job internships may be available in Ecuador.

6.0 RECOMMENDED TRAINING PROGRAM

ADL recommends a training program which is general and basic in scope with specialized components for the development of particular skills. This type of program:

- is relevant for the several management and staff levels in DGTP, thus allowing all DCTP professional staff to participate; and
- is relevant for current and near-term operational and analytic objectives of DGTP.

This program meets all the knowledge and skill areas discussed in the previous section. These areas and methods of training are outlined below followed by a time-phasing diagram in Figure 4. In the program structure discussion we suggest types of institutions and individuals, with some specific examples, that are possibilities for accomplishing this program. A more detailed, firm specification of institutions and individuals to implement this recommended program is not an objective of this diagnostic survey.

6.1 Basic Training Program in Ecuador

Implementation

Two critical ingredients are needed for this training program to be effective--coordination and language facility. We recommend a Training Program Manager be identified who will coordinate that portion of the program held in Ecuador. That individual should be:

- familiar with all the knowledge areas and sources of their training and consultancy;

- familiar with the needs of DGTP and sensitive to their objectives;
- a proven project manager; and
- one who has some facility with Spanish.

This Manager will be responsible for program design, staffing, coordination, and implementation.

The English language facility of most of the DGTP staff is quite limited. However, the most effective teachers and consultants for this program likely will have limited Spanish facility; also, the modern components of each knowledge area have been developed in English. We feel English is critical and thus we recommend DGTP staff receive intensive English speaking, writing, and comprehension skills (e.g., pass the TOEFL exam) before the major portions of the Training Program are undertaken. We estimate this intensive language training to take approximately four months.

Training Program Structure

The program is structured to provide a basic understanding of the subject area, then to develop particular skills, and finally to match participants with relevant advanced work including special courses, internships, and academic programs.

Petroleum Engineering and Industry Operations. The Program would begin with an introductory course on basic petroleum terminology and concepts. All DGTP staff would attend. This would be taught primarily in Spanish at first by a person who is preferably fluent in both languages. The teacher would make clear

the English terminology as well. The petroleum course would then lead into the exploration, development and production processes phase, and finally the commercialization phase, all as discussed in Section Five of this report. These latter two phases would be taught primarily in English by a person fluent in both languages. These three phases would be covered over a two week period. These courses could be taught by oil company personnel, e.g., Texaco or CEPE, or by consultants.

Petroleum Accounting. This course would address in sequential fashion the areas outlined above in Section Five. This course would be taught in English and all DGTP staff would attend. It would begin after completion of both the English language course and the Petroleum Engineering and Industry Operations course. This course would be taught by persons familiar with modern accounting practice in both the private and public sectors, and familiar with petroleum-related accounting conventions. Thus at least two lecturers are likely to be involved. The primary source for these lecturers would be international public accounting firms or possibly major oil companies. The public accounting firms do teach in-house courses on specialized subjects, and would be particularly useful for all but the basic concepts portion which may best be taught by an academic. Lecturers fluent in both languages would be sought. Part of this course curriculum would include two short workshops in which actual petroleum-related "case" material relating to DGTP projects and operations would be analyzed by applying the accounting techniques learned. In particular, one of

these workshops would focus on cost accounting, and the other on amortization methods. The course would be taught over a two month period.

Finally, after completion of this accounting course, several areas within DGTP operations would be identified in which the lecturers would conduct longer workshops on specific problems. These specialists would work directly with the DGTP staff members and involve them directly as counterparts in the problem analysis. These specialists would have petroleum accounting experience, and could be drawn from public accounting firms, major oil companies, or relevant consulting firms. The term of these workshops would be over a three week period, and two or three project areas would be examined.

Quantitative Methods for Petroleum-Related Analysis. This course would be taught in English in Ecuador upon completion of the accounting course. This quantitative methods course would be taught by an academic, or possibly a consultant. The duration would be over a three week period.

Petroleum Finance. This course would be taught in English and scheduled after both the accounting and quantitative methods courses have finished. The course would extend over a six-week period. The course curriculum would include two short workshops, one dealing with an actual DGTP problem area "case" related to rate of return determination and project investment evaluation; and the other with funds flow analysis, forecasting and simulation, and sensitivity analysis.

Finally, similar to the accounting module, two project areas related to the finance course short workshops would be identified and two specialists would teach longer workshops at the completion of the course. These workshops would span a ten day period during which the specialists would work with DGTP counterpart staff who would be directly involved in the problem analysis.

6.2 Training Program in U.S

When the basic training program in Ecuador is completed, several DGTP staff members would be sent to the U.S. for various internships and short courses.

For additional petroleum industry training two members of DGTP staff would be selected to participate in three month job internships with oil companies. Two other staff members of DGTP would be selected to participate in a more formal petroleum industry program of academic quality. This program would provide a more thorough overview of the petroleum industry and deal in depth with its key elements. Such courses exist, e.g., the ADL Petroleum Management Program (three months) attended in the past by CEPE staff.

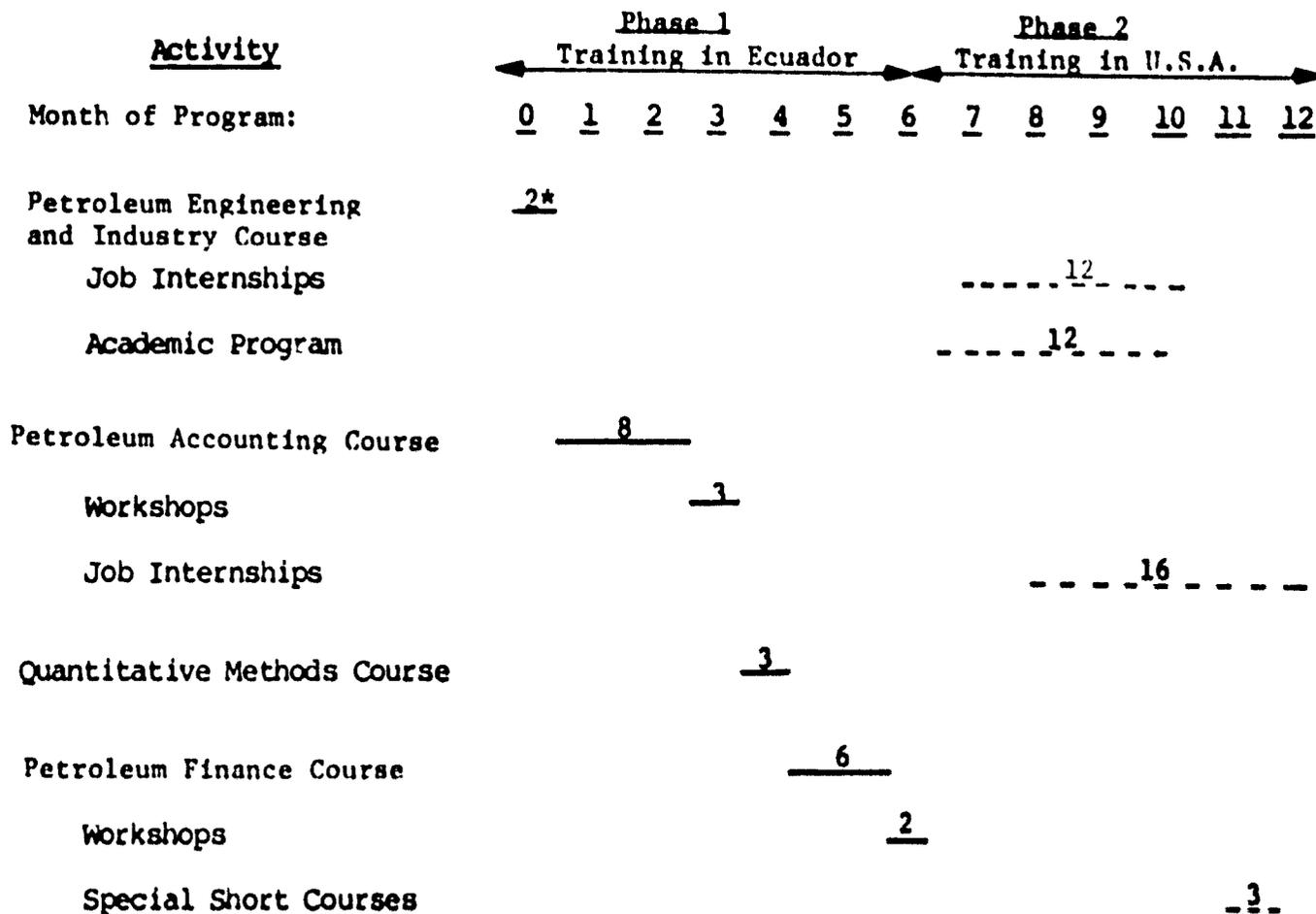
For additional accounting training two DGTP staff members would take internship programs with the accounting or controller's departments in major oil companies.

For additional finance training two DGTP staff members would take special short finance and modeling courses in the U.S. For example, three one week Summer courses on these subjects are taught at M.I.T.'s Sloan School.

7.0 CONCLUSIONS

The final product of this Training Program will be a DGTP staff with enhanced skills with which to understand and analyze the important components of oil revenues to the GOE, their distribution, and their implications for the Government budget. On completion of all phases of this recommended Training Program, these professional staff members of DGTP will be able to take on more responsibilities if the DGTP office enlarges to meet all its assigned objectives. The staff trained under this Program also would have the capacity to perform in-house training for new DGTP personnel.

Figure 4. Time-Phasing of Basic Training Program **



Legend: _____ = Period of course and workshop activity in Ecuador.

----- = Period of job internships, special short courses, and academic programs in the U.S.; scheduling of these would depend on DGTP staff availability.

* Numbers above line indicate number of weeks for that respective program.

** This program will begin only after successful completion by DGTP staff of an English language proficiency program.

APPENDIX A

List of Abbreviations

- ADL = Arthur D. Little, Inc.
- AID = Agency for International Development (U.S.A.)
- CEPE = Corporacion Estatal Petrolera Ecuatoriana
(Ecuadorian National Petroleum Corporation)
- DAE = Departamento de Analisis y Evaluacion
(Department of Analysis and Evaluation in Ministry of Finance)
- DCS = Departamento de Liquidacion y Estadisticas
(Department of Collections and Statistics in Ministry of Finance)
- DEPC = Departamento de Planificacion y Coordinacion Energética
(Department of Energy Planning and Coordination in Ministry of Finance)
- DGR = Direccion General de Rentas
(Directorate of Tax Collection in Ministry of Finance)
- DGTP = Direccion General Técnica Petrolera
(Directorate of Petroleum Analysis in Ministry of Finance)
- DNH = Direccion Nacional de Hidrocarburos
(National Directorate of Hydrocarbons in Ministry of Natural Resources and Energy)
- ECB = Banco Central del Ecuador
(Central Bank of Ecuador)
- IIE = Institute of International Education
- IRS = Internal Revenue Service (U.S.A.)
- MNRE = Ministerio de Recursos Naturales y Energéticos
(Ministry of Natural Resources and Energy)
- MOP = Ministerio de Finanzas
(Ministry of Finance)