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DIRECCION GENERAL TECNICA PETROLERA
PETROLEUM TRAINING PROGRAM
EVALUATION REPORT

Coopers & Lybrand
January 1986

PETROLEUM TRAINING PROGRAM EVALUATION REPORT

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ANNEX I - EVALUATION FORMS

DIRECCION GENERAL TECNICA PETROLERA
PETROLEUM TRAINING PROGRAM EVALUATION REPORT

The Petroleum Training Program for the personnel of the Direccion General Tecnica Petrolera, a department of the Ecuadorian Ministry of Finance, was carried out under a contract entered between Coopers & Lybrand and Bechtel National, Inc., effective September 1, 1985 through January 31, 1986. This training program was sponsored by USAID's Office of Energy - Bureau of Science and Technology in Washington and the USAID Mission in Ecuador.

This report contains the results of the training program evaluation executed during January 1986. In the following pages, we present project background notes; a description of DGTP's present situation and its impact on the training program; a description of the training program per se; and the results of the evaluation.

A. PROJECT BACKGROUND

The Direccion General Tecnica Petrolera (DGTP), first created in 1981 as a unit of the Public Credit Secretariat in the Ministry of Finance (MOF), was restructured in 1983 when a new organizational and functional charter placed DGTP as a unit directly responsible to the MOF. According to this charter, the main responsibility of DGTP is to carry out for the MOF all those functions related to the planning, execution, control, evaluation, and advisement of norms and regulations which guide all activities in the hydrocarbon, mining and energy sectors. In practice, DGTP's responsibilities have focused on the financial administration, control and analysis of net petroleum revenues for the Government of Ecuador and on the calculation of the portion of these revenues that shall be distributed among various recipient agencies, as specified by law.

Given the importance that the MOF places on the activities of DGTP as an integral element of the budgetary process for Ecuador's public sector, in 1983 the Public Credit Secretariat requested USAID's support of a training program for the professional staff of the DGTP.

In response, USAID contracted Arthur D. Little, Inc. to carry out a diagnostic survey to assess those training needs of DGTP that would enable it to perform its functional responsibilities in the area of financial administration of oil revenues. The results of this survey (carried out during November 1983), indicated that the A.D. Little team had identified four areas which, at the time, were considered critical to eliminate deficiencies in the skills of DGTP's staff. These areas were: petroleum engineering and industry operations; petroleum accounting; quantitative methods for petroleum-related analysis; and petroleum finance.^{1/}

To overcome these deficiencies, A.D. Little recommended carrying out a training program in two phases. The first phase would consist of a basic course in Ecuador in the identified four areas of need and open to the participation of the entire DGTP's professional staff. The second phase would consist of a program of job internships and short courses in the U.S. for a select group of DGTP's staff who would have demonstrated the best qualifications during phase one of the training program. In addition, the ADL survey anticipated a language problem since, in their opinion, the most effective course instructors and consultants that could carry out the program would have a limited knowledge of Spanish and the most updated literature would be in English. To overcome this problem, the ADL team recommended that DGTP

^{1/} Arthur D. Little, Inc., Petroleum Financial Administration Basic training Program for Direccion General Tecnica Petro-
lera, Ministerio de Finanzas. Final Report to: Office of
Energy, USAID, January 1984. Contract No. PDC-1406-I-2165-00,
Work Order No. 12.

staff receive intensive English training before the initiation of phase one.

Having accepted A.D. Little's recommendations, USAID's Office of Energy first contacted Coopers & Lybrand in January 1984 to explore the firm's interest, experience and capabilities to carry out phase one of the Training Program. In June 20, 1984, USAID's Office of Energy formally requested Coopers & Lybrand to submit a proposal for phase one, using an existing IQC. Said proposal was submitted to USAID on July 24, 1984.

Approximately in August 1984, Coopers & Lybrand was informed that the proposal was found to be responsive to the terms of reference. However, an impasse was reached since the necessary funding for this program was insufficient, making it necessary to wait until additional funds were appropriated under the upcoming FY 1985 budget. This coincided with the expiration of C&L's IQC contract in September 1984, thus forcing the Office of Energy and USAID's Mission in Ecuador to seek an alternative under which the training program could be undertaken.

An alternative was found, consisting of the inclusion of the DGTP's training program as a component of a larger energy project being carried out at the time by Bechtel National Inc. Thus, on June 7, 1985, C&L was requested by Bechtel to submit a proposal to carry out the program. On June 12, 1985, Coopers & Lybrand was informed that, given the dollar amount of this contract, USAID's contract office had determined that such contract should be awarded on a competitive bidding for which two more consulting firms were invited to submit proposals. Coopers & Lybrand resubmitted its proposal on June 17, 1985.

On August 26, 1985, Coopers & Lybrand and Bechtel National Inc., signed a contract which became effective on September 1, 1985, approximately 21 months after the ADL team submitted its recommendations for the training program.

The inclusion of the above project's background is necessary in order to better understand some of the changes that took place

within DGTP during the intervening time, the need to modify some aspects of the training program, and the important effects in the achievement of the originally intended objectives that were to be fulfilled in this program.

B. THE PRESENT SITUATION

As is common with any government or public sector institution, changes in their organization, functions and personnel occur continuously and the DGTP was no exception. From the time that the Public Credit Secretariat first requested USAID's assistance to DGTP, more than two years ago, a number of changes occurred, which had an important effect on the petroleum.

Recounting these changes is important for this evaluation because the recommendations contained in the A.D. Little report were formulated on the basis of conditions that no longer exist. The most important changes which occurred in DGTP, that had an effect on the training program were those related to its direction, personnel, and professional make-up.

1. Changes in DGTP Director

In the last two years the DGTP has seen three directors in charge of the overall direction of this MOF's unit. At the time of the A.D. Little survey of needs, the director of DGTP, Econ. Marco Salgado was an economist who had been with the Ministry of Finance for many years and with the Direccion for almost two years. Because of this experience, he was very cognizant of the training needs of the personnel under his supervision and thus he was instrumental in assisting the ADL team in the design of a training program which was appropriately related to the needs of the DGTP.

In early 1984, following a change in the Government, Econ. Salgado was replaced by Ing. Felix del Rosario, a civil engineer. The new director carried out changes in the professional staff which reflected his own views. Upon its first arrival to Ecuador, it was obvious for the C&L team that the DGTP was not adequately

staffed to fully discharge the responsibilities assigned to it. Without passing judgment on the organizational and functional deficiencies that DGTP was undergoing at that time, since this was not C&L's responsibility, it was apparent that many of the deficiencies encountered had arisen as a result of actions taken by the new director. Such actions were found to have an effect in the training program.

In January 1986, the DGTP experienced a new change on the top position. The new director, Dr. Eugenio Jaramillo, is an economist who brings approximately 20 years of experience with the Ministry of Finance and with the hydrocarbon sector. Although at this time it is too early to assess the magnitude of changes that will occur with the new director, it is clear that he has a mandate to correct the deficiencies existing in DGTP. However, and more important for the purposes of this evaluation, it is clear that such changes will have an effect on the overall training program as recommended by the ADL survey team.

2. Changes in Personnel and Professional Make-Up

To understand the overall effectiveness of phase one of DGTP's training program it is also important to review the changes that occurred in the personnel and professional make-up of the Direccion.

During 1984, DGTP experienced a fifty percent turnover rate which, for the most part, occurred at the time Ing. Del Rosario become director or soon thereafter. Any turnover rate this high is certainly due to produce disruptions in the daily activities of any institution even when the replacement personnel have the same qualifications as those who leave. In the case of DGTP, the effect was compounded by the fact that it completely changed the professional make-up and capabilities that were required to carry out the functions assigned to the Direccion.

When the A.D. Little survey of needs took place in 1983, the DGTP had a professional staff composed of seven economists including the director, two lawyers, two Licenciados in Public

Administration, and two petroleum engineers. Most of these had been with DGTP for at least two years and, with only one exception, they had all been working in the MOF for many years. Thus, the training program that was originally recommended to USAID was designed to meet the needs of this professional cadre, quite well better suited for carrying out the functions of DGTP.

When phase one of the training program was initiated, the Coopers & Lybrand team found that six of the seven economists had left DGTP and had not been replaced with professionals of the same educational background. Instead, DGTP had a professional staff consisting of two economists, one of which was new; two lawyers; four Licenciados of which two had graduated in Public Administration; one in Business Administration, and one in Banking; one high school teacher; four petroleum engineers of which three had just finished their studies; and one civil engineer who was the Director. It was clear then that this professional staff was not totally appropriate for our training program.

3. DGTP's Preparation for the Training Program

Although DGTP was fully cognizant that a training program was to take place, the time that transpired before the program actually started and the replacement of directors and personnel contributed to change the expectations as to what the program was to accomplish. A case in point was the mistaken belief of Ing. Del Rosario that the training program was to focus on computer and systems training. Likewise, there was a widespread feeling among the staff that all of them would eventually go to the U.S. to receive further training. As time went by, the training program became more a subject of speculation regarding whether or not it would occur.

The more visible effect arising from this situation was the failure of DGTP's professional staff to acquire a minimum acceptable knowledge of language skills as recommended by the ADL report and required as a pre-condition by USAID.

Following A.D. Little's recommendation, the Direccion contracted, through USAID, the services of CILDSE, a language training institute, which made arrangements to provide native English speakers as teachers. The English language instruction for DGTP's staff consisted of two six week courses carried out in March and November 1984. The instruction consisted of one hour classroom instruction on DGTP's premises five times a week. The staff was divided in two groups; one of them being more advanced. No textbooks were provided and the method of instruction was left up to the teachers. The courses emphasized grammar rules and vocabulary but in no way was the instruction appropriate to build up reading, writing, conversation, or comprehension skills that would enable DGTP's staff to be exposed to technical courses where the subject matter was taught in English.

C. THE TRAINING PROGRAM

1. The Training Program as Proposed by Coopers & Lybrand

The training program, as proposed by Coopers & Lybrand, followed closely the terms of reference provided by USAID, however it slightly differed from the ADL recommendations. The overall objective of the petroleum training program during phase one was to improve the revenue administration program of the DGTP and to increase its staff's ability to provide advice and information on issues which affect oil revenue. Towards this end, Coopers & Lybrand proposed to carry out a basic level training course in four subject areas: petroleum industry overview; petroleum accounting; petroleum finance and quantitative methods for petroleum-related analysis.

At the end of this basic training program the participants were to be able:

- to describe basic technology used in the petroleum industry; and to describe how the industry operates from the exploration to the marketing phase;

- to define basic accounting principles used in the petroleum industry, and to understand and analyze financial and other statements in terms of the implications for petroleum revenue administration;
- to define the terminology used in petroleum finance, and to apply basic skills to calculate financial information useful for petroleum revenue and policy analysis;
- to define, understand and apply quantitative methods to issues related to current and future DGTP responsibilities.

The main differences with the ADL recommendations are more of form rather than substance. Such differences focused on three aspects: course sequence, structure and length of instruction.

a. Course Sequence

The A.D. Little report recommended that the overall course sequence: (1) the petroleum engineering and industry operations course; (2) the petroleum accounting course; (3) the quantitative methods course; and finally, (4) the petroleum finance course. Pursuing an approach that would build upon the basis of previous knowledge imparted to the participants, Coopers & Lybrand estimated that a more logical sequence would be, to reverse the order of the two last courses. Therefore, the sequence followed in the training program included (1) the petroleum industry overview course (a somewhat different denomination than the course name assigned by A.D. Little but more appropriate to the objectives sought by the course); (2) the petroleum accounting course; (3) the petroleum finance course; and, (4) the quantitative methods course. This essentially allowed to expand some aspects taught in the finance course that referred to project analysis and use this base in the quantitative methods course to teach project analysis under conditions of risk and uncertainty, drawing heavily from profitability analysis, statistical inference and risk analysis--all topics included also in the last course.

b. Course Structure

The course structure recommended by the A.D. Little team for the petroleum industry overview and quantitative methods courses consisted of daily lectures requiring one instructor. The recommendations for the petroleum accounting and petroleum finance courses were however more complex. The two courses should have consisted of a period of daily lectures with the participation of all the DGTP staff. The course should also have included short workshops in which actual petroleum-related cases material pertinent to DGTP projects and operations would be analyzed, using the techniques taught during lectures. Following this, the instructors were to have conducted longer workshops to solve specific problems with the sole participation of those DGTP staff members directly responsible for the solution of the problems.

The way the courses were structured by Coopers & Lybrand followed a more practical approach. The courses consisted of daily instructions during a morning period and a problem solving period in the afternoon - both offered for the entire DGTP staff. For the first half of the courses, the problem solving period was dedicated to solve exercises and problems related to the topics taught in the morning lectures and, at the same time, to find ways of applying these to the routine functions of DGTP. For the second half of the course, a consultant joined the instructor and together provided practical problem solving of more advanced topics relating these to particular oil - related DGTP problems, to those encountered by other overseas oil companies and to the analysis of issues concerning the industry worldwide. Exposing the entire DGTP staff to all the problems, would allow them to gain a better appreciation of the nature of issues faced by their colleagues and an understanding of the need for coordinating among different DGTP departments according to the nature of the problem being solved.

c. Length of the Course

Another difference from that of the A.D. Little report was that of the length of the courses. As indicated in the referred report, the courses were to have the following durations: two weeks for the petroleum industry overview course; eleven weeks for the accounting course (of which eight were to be dedicated to lectures and short-duration workshops and three for longer workshops), eight weeks for the petroleum finance course (of which six were for lectures and short-duration workshops), and two for long-duration workshops; and three weeks for the quantitative methods course. In addition, the report did not specify the number of daily hours to be dedicated to the training program.

Given the objectives sought for the program as a whole, and for each course, Coopers & Lybrand determined (1) the longer the duration of courses, the more difficult it would be to maintain them at a basic level appropriate for all participants and (2), requiring the participants to attend the program for such lengths of time would result in diversion from their normal duties and become a disincentive for their continuous assistance. In view of this, the program was scheduled in the following way: one week for the petroleum industry overview course; four weeks for the petroleum accounting course; four weeks for the petroleum finance course and two weeks for the quantitative methods course. The program consisted of 6 daily hours of instruction, of which four hours in the morning (from 8:00 A.M. to 12:00) were scheduled for lectures and two hours (from 4:00 P.M. to 6:00 P.M.) were dedicated for the problem solving part of each course.

2. Coopers & Lybrand's Assessment of Needs

The initial task contained in our proposal called for an assessment of needs, which was carried out at the beginning of September, 1985. The assessment focused on the make-up of DGTP's personnel, and their educational background and skill capabilities in relation to their assigned functions. An additional objective was to evaluate the personnel's familiarity with the subjects to be taught as well as with the English language.

The assessment revealed the already discussed changes in DGTP directors; the substantial turnover in personnel and its effects on the professional make-up of the Direccion, and the extremely limited or non-existing English language capabilities. Our findings suggested that the situation encountered in DGTP by the A.D. Little team, and used to design the training program, was substantially different to that encountered by Coopers & Lybrand. In view of these findings, Coopers & Lybrand introduced the following changes in the petroleum training program:

a. Changes in the Course Outlines

Some changes were made in the originally suggested course outlines. These changes did not reflect elimination of topics suggested in the terms of reference, but rather they sought to reflect a more adequate sequency or reordering of topics that was appropriate to facilitate the gradual build-up of knowledge. In addition, in some cases, we introduced new topics considered important in providing the course participants with useful analytical tools.

b. Changes in Language of Instruction

Considering the limited English language capability of the course participants, Coopers & Lybrand adopted the following format for all courses, except the petroleum industry overview: lectures were to be delivered in Spanish while the problem solving sessions were to be bilingual. In practice, the bilingual sessions were carried out using simultaneous translation for all those sessions where the English-speaking instructor intervened. With respect to the petroleum industry overview course, this was maintained as proposed, that is, the lectures were carried out by an English-speaking instructor with the help of a simultaneous translator. However, the course delivery relied, to a great extent, on slide presentations and visual aids, as well as on material published in Spanish.

c. Changes in the Language of Materials

The limited English capabilities required that the course materials handed out to the participants be in Spanish requiring an added and unforeseen effort in our part to translate the material previously selected.

d. Changes in Instructions

In view of the language problem, Coopers & Lybrand also made some changes in instructors, affecting mainly the quantitative methods course.

3. The Four Courses

As already mentioned, the petroleum training program consisted of four courses. The following contains a description of each one:

a. Petroleum Industry Overview

The Petroleum Industry Overview course was carried out from September 30 to October 4, 1985. The course lecturer was Dr. Norman Page, a geologist who had been working in the oil industry for many years. The topics taught in this course are contained in the following course outline:

1. Introduction and Course Organization
2. General Geological Background
 - Basic principles of geology
 - Rock types - Igneous, Metamorphic and Sedimentary
 - Uniformitarianism
 - Law of superposition
 - Geologic time scale
 - The megastructure of the Earth - Plate tectonics
3. Petroleum Geology
 - Deposition of sediments - sands, shales, limestones
 - Origin of petroleum
 - Requirements of hydrocarbon entrapment
 - Methods of exploration

- Reserve calculations
 - Petroleum geology in Ecuador
4. The drilling rig
 - Rig contracts
 - Rig component systems
 5. Drilling operations
 - Site preparation and logistics
 - Rigin up
 - Drilling operations
 6. Well completion, production and servicing
 - Monitoring, testing and evaluating
 - Reservoir drive mechanisms
 - Well completion
 - Production testing
 - Well stimulation
 - Artificial lift
 - Secondary lift
 - Enhanced recovery
 - Well service and work over
 - Field treatment and storage
 7. Offshore operations
 - Offshore seismic
 - Types of offshore rigs
 - Production platforms
 - Support operations
 - Offshore production
 8. Oil Transportation
 9. Processing and Refining
 10. Marketing and distribution
 11. Exploration management and objectives
 - Strategic plan
 - Annual plan and three-year forecast
 - Project economics
 12. Risk and the oil industry
 - Exploration risk
 - Drilling risk
 - Development risk
 - Economic risk
 - Political risk

13. World reserves and production review
14. Forecasting the future - projections to 2000 AD
15. Suggested topics

The course participants were exposed to all of the above topics using approximately 350 slides which were accompanied by fairly detailed explanations and discussions with the course participants. In addition, each participant received the following material to complement the course and further their knowledge:

- Bill D. Berger/Kenneth E. Anderson Petroleo Moderno: Introduccion Basica a la Industria Petrolera, The Petroleum Publishing Co., 1980.
- Glossary of the Petroleum Industry/Glosario de la Industria Petrolera. Penn Well Publishing Company, 1982.
- Coordinating and Planning Department, Conoco Inc. World Energy Outlook Through 2000, April 1985.
- Exxon Corporation. The Upstream: A Guide to Petroleum Exploration and Production, December 1987.

The afternoon sessions were used for question and answer and problem solving periods.

b. Petroleum Accounting

The Petroleum Accounting course was offered from October 7 to November 1, 1985 with the participation, as instructor, of Mr. Jorge Grinpelc for the course lectures and of Mr. Neil Johnson for the consulting periods.

The course followed the course outline presented below:

1. Basic Accounting Course (Accounting for non-accountants)

2. Special Aspects in Accounting for the Petroleum Industry
3. Financial Statements: characteristics and Interpretation
4. Relationships Between Organization and Accounting
5. Cost Accounting
 - Methods for allocating direct and indirect expenses
 - Depreciation and amortization
 - Distribution of overhead departments
 - Product cost and service costs
 - Profit and loss statement
 - Standard costs and variance analysis
6. Specific Aspects for:
 - Exploration
 - Development
 - Refining
 - Pipelines
 - Transportation
 - Distribution
 - Services
 - Other
7. Sources and Application of Funds
 - Cash flow
 - Working capital
8. Data Management, Data Collection, Security
9. Workshops
 - Accounting interpretation and applications of petroleum laws, regulations, and contracts
 - Cost accounting
 - Amortization methods

For this course, Coopers & Lybrand prepared special text material which complemented with other informational materials distributed to the participants during lectures and during the problem solving periods. In addition, for a period of two weeks, Coopers & Lybrand made arrangements to have a computer IBM PC to analyze and solve a series of exercises related to cost accounting.

c. Petroleum Finance

The petroleum finance course was carried out from November 11 to December 6, 1985. Instructors for this course were Mr. Carlos Muraca for the lectures and Mr. Neil Johnson for the problem solving periods. The instructors implemented the following course outline:

1. Basic Principles in Business Decision making
 - Diminishing marginal benefits and increasing marginal cost
 - Time value of money
 - Risk and uncertainty
2. Basic Principles in Investment Evaluation
 - Choice among alternatives
 - Cash flow analysis
 - Risk and uncertainty
3. Methods for Evaluating Investments
 - Non-discounting methods
 - Payback
 - Average return on investment
 - Discounting methods
 - Net present value (NPV)
 - Present value index (PVI)
 - Internal rate of return (IRR)
 - Merits of discounting techniques
 - Limitations of discounting techniques
4. Practical Issues for Using Discounting Methods
 - Choosing the discount rate
 - Inflation
 - Forecasting future cash flows
5. Sensitivity Analysis
 - Methods
 - Limitations
6. Public vs. Private Investment Decisions
 - Financial rate of return
 - Economic rate of return
 - Social discount rate

The material distributed to the course participants included a series of reprints from several texts and were related to topics included in the outline.

d. Quantitative Methods

The quantitative methods course had a two week duration from January 6 to January 17, 1986. Ms. Maria Regina Levy presented her course lectures according to the following outline:

1. Data Analysis
 - Mean
 - Variance
 - Mode and medium
2. Basic Probability and Statistics
 - Probability concepts
 - Main probability distributions
 - Statistics concepts
 - Main sampling characteristics
 - Statistical inference
3. Regression Analysis and Forecasting
 - Statistic, estimate, estimator
 - Criteria for selecting an estimate
 - Two variable ordinary cast squares regression
 - Forecasting
 - Statistic inference
 - Limitations of regression analysis for forecasting
 - Multiple regression concepts
4. Risk Analysis for Project Evaluation
 - Methods for evaluating investments: review
 - Sensitivity analysis: review
 - Risk analysis methods
 - Analytic methods
 - Decision free analysis
 - Risk simulation methods
 - The risk analysis process
 - Special topics of risk analysis
 - Risk aversion
 - Risk diversification
 - Capital Asset pricing model
 - Public investment decisions
5. Models
 - Analytic models
 - Simulation models
 - Heuristic models

For this course, Coopers & Lybrand prepared a text consisting of conceptual explanation and a compendium of exercises.

4. Training Program Participants

The number of participants enrolled on each course was eighteen. Of these, only nine were regular employees of the DGTP and four were employees under temporary contract. Two participants were employees of the tax audit unit of MOF. The remaining three participants were not affiliated with any institution, however, they were invited to participate in the program by Ing. Del Rosario since he had planned to incorporate them to his professional staff.

As mentioned previously, the training program participants represented a diversity of educational backgrounds, experience and relevant knowledge. Likewise, the degree of participation varied both among the participants and courses as discussed in the following sections.

a. Educational Background

The activities and functions for which DGTP is responsible require mainly a thorough knowledge of accounting and finance, yet the Direccion had no accounting and or finance professionals among its staff. All those functions requiring the use of accounting and finance principles are performed by the staff as part of a mechanical process which is mastered by continuous repetition rather than knowledge and understanding of such principles.

It has been already pointed out that DGTP's staff represents a diversity of educational backgrounds. This diversity necessarily presented some problems for the instructors since the participants knowledge of a subject could vary from not even elementary to advanced and comprehensive, although this last depiction was more of an exception.

This situation required that the program be conducted starting at the most elementary level, under the assumption that most of the participants had never been exposed to these topics. For those who had been exposed in the past this would represent

refresher courses. This assumption proved correct for most participants in all of the courses with the exception of a group of recently graduated petroleum engineers who were very knowledgeable about the topics treated in the petroleum industry overview and quantitative methods courses.

b. Experience in DGTP

Of the eighteen participants, there were only six who had been with DGTP for more than one year. However, the experience of three of them was more related to legal functions. This leaves only 3 professionals with some experience in the functional fields of accounting, finance and quantitative methods. The rest of the participants had either been with DGTP for less than a year or did not belong to its staff. This little experience made it very difficult for the participants to relate the knowledge acquired to the requirements of their positions and their functional responsibilities.

c. Course Attendance

Coopers & Lybrand stressed from the beginning that course assistance would be one of the most important factors to be used for purposes of the program evaluation. To facilitate this we obtained the Director's commitment to see that his personnel would attend to classes without interruptions.

In practice, course attendance for the DGTP personnel was not all that regular. This was because a number of them were required by the Director to attend office matters at the expense of not attending lectures.

The first course, petroleum industry overview had the best record with an overall attendance of 98 percent. This average represents the number of all course absences to lectures divided by a denominator obtained by multiplying the number of participants times the number of sessions in the course. In retrospect, it can be said that the good attendance in this course was due to it being the first course as well as the shortest.

The petroleum accounting, petroleum finance and quantitative methods courses had an overall assistance record of 91, 89 and 87 percent respectively. However, specially in the last course, the actual attendance record was lower since, in many cases, participants would leave after attendance was taken. This problem was observed only with DGTP personnel. It should also be emphasized that all those participants that were not part of DGTP had an excellent record of attendance.

In conclusion, the attendance record shows that it was those participants who were not part of DGTP that took the most advantage of the courses.

D. EVALUATION RESULTS

1. Evaluation Methodology

The evaluation of the petroleum training program was a continuous process initiated at the beginning of the program. The methodology followed for verifying the effectiveness of the program consisted of two major components geared to provide all the necessary information. The first component consisted of data provided by the course participants through the use of several evaluation forms distributed at the end of each course. The subject addressed in these evaluation forms referred to the quality of the instructors, the course materials and the self-evaluation of improved subject knowledge. An additional form referring to the quality of the facilities was provided only once at the end of the first course, since the same facilities were used throughout the duration of the program. All these evaluation forms are included in Annex 1.

The second component of this evaluation consisted of the instructors' perceptions of attendance, subject knowledge, individual and overall participation and individual ability demonstrated by each participant throughout each course.

By using this methodology, we were aware of the potential weaknesses that it contained since, to a great extent, the infor-

mation obtained through the attendees' evaluation forms is subjective and could have been biased, therefore not reflecting the participants real opinion. This problem may have arisen especially when considering that the respondents were more interested in providing a positive impression in order to become selected for participation in the second phase of this training program. The degree to which this was a contributing factor for Coopers & Lybrand obtaining what can be qualified as very positive responses is not known. However, we believe that this potential weaknesses was minimized due to three considerations.

First, on the evaluation forms "name" was optional and many of the respondents chose not to include it. Thus, by remaining anonymous the respondent had an option to express an objective opinion. Second, approximately one third of the participants were not eligible for phase two of the project, thus they did not have a vested interest in providing biased information. Yet, the responses obtained on all forms were consistently positive. Finally, towards the end of the program, and after having examined the responses obtained with the forms for each course, each participant was interviewed individually in order to ascertain his opinions in reference to the training program, giving them an opportunity to comment on aspects that were not addressed in the evaluation forms.

All the information obtained by the process above described and that which was provided by the course instructors allowed us to assess the effectiveness of the overall training program as well as that of the individual courses.

2. Evaluations by the Participants

These results are based on the responses obtained for three of the courses namely petroleum industry overview, petroleum accounting and quantitative methods courses. The evaluation forms for the petroleum finance course were unavailable at the time of preparation of this report due to a postal strike in Argentina.

a. Facilities

The petroleum training project was held in the MOF's training center which made available a classroom for the duration of the project. In general, the facilities were rated as adequate for the purposes of training by the majority of the participants. In reference to specific aspects concerning the classroom, the respondents gave their opinion on space, illumination, acoustic and temperature. Opinions with respect to space were evenly divided between adequate and small*. The classroom illumination was found to be adequate for the great majority although, in the opinion of three participants, it was not sufficient. The acoustics were rated by half of the participants as excellent, with the rest expressing that it was adequate. Finally, room temperature was found to be high for a slight majority while the rest expressed that it was adequate. The most common complaint expressed by some of the participants referred to the desks and chairs not being comfortable enough.

All of the equipment requested by the instructors, e.g. overhead projectors, slide projectors, and other supplies were made available with the exception of a video projector which forced the cancellation of the presentation of a film related to the petroleum industry.

b. Instructor Evaluation

The form used in the evaluation of the instructors required the participants to give their opinions in respect to ten different aspects (where applicable) using a scale of one to five, with five being considered the highest score. The mean scores obtained for each course instructor are presented in Table 1 on the following page.

* In our opinion and comparing with other facilities that could have been made available, the size of the room was more than appropriate for the number of participants.

In general, the mean scores obtained for each one of the different aspects evaluated show that, in the participants opinion, the instructors demonstrated not only a high degree of professionalism but also that they were very well prepared to teach their respective subjects in an effective manner.

The instructor evaluation form also requested comments and suggestions, if any, about the instructors' performance. Although not everybody responded to this, those who did either expressed their satisfaction with the instructors or their desires for participating in other training course under the same instructors.

c. Course Material Evaluation

The materials prepared by Coopers & Lybrand and distributed to each participant were evaluated for their usefulness and effectiveness. The form used for this purpose consisted of two parts. The first referred to specific characteristics of the material distributed, which the course participants were requested to rate, again using a scale from 1 to 5. The mean scores obtained in reference to the material distributed in each course are shown in Table 2.

In this table, it can be noticed that, although generally high, the scores fall somewhat below the ones obtained in the evaluation of the instructors. This is to be expected since, in this case, the rating of the different aspects under evaluation was made on the basis of more objective factors (such as quality and topic coverage of the materials) that the course participants used. It is also interesting to note that the overall mean score for each course decreases according to the relevance of the subject matter to the nature of activities that are normally carried out by DGTP. For this reason, the overall mean score obtained in the evaluation of the petroleum accounting course is the highest since the accounting field has greater application in the normal activities of DGTP. Likewise, the overall mean score obtained in reference to the petroleum industry overview course

is the lowest since the course was much more technical in nature and, to an extent, not related to normal activities. It is also interesting to note that the specific characteristic having the lowest mean score in each course was related to the relevance of the materials to the individual job responsibilities. This is to be expected since different individuals have different assignments for which they are responsible, therefore, the relevance of the materials may or may not be adequate to help them carry out their functions. An specific example that can be cited is that of the DGTP lawyers who may have found that the materials for the petroleum industry overview or the quantitative methods courses were not too relevant to what they normally do, or that of the petroleum engineers who may have concluded that the accounting course material had limited applicability in the discharge of their assigned functions.

In addition, in this first part of the evaluation form the participants were requested to indicate which of the different topics treated in each course were either too detailed or too superficial. In this case it was observed that, in many cases, those topics that were considered as too superficial for some were too detailed for others, depending on whether or not the individual respondents were very knowledgeable or unfamiliar with the topics. However, a more common response was that the topics were very well balanced.

The second part of the questionnaire requested the course participants to express specific opinions related to those aspects of the course materials that were the most and least useful as well as other general comments related to the courses.

In reference to the petroleum industry overview course, the responses most frequently indicated that the most favorable aspects of the course materials were those related to the provision of current oil-related statistical information, the many examples discussed on issues and problems facing the industry and the books that we provided which, in their opinion, are very current and not available in Ecuador. With respect to the least

**TABLE 1 - INSTRUCTOR EVALUATION -
MEAN SCORES**

	<u>Petroleum Ind. Overview</u>	<u>Petroleum Accounting</u>	<u>Petroleum Finance</u>	<u>Quantitative Methods</u>
1. Course Planning and Preparation	5.0 <u>1/</u>	4.94 <u>2/</u>	4.92 <u>3/</u>	4.87 <u>4/</u>
2. Knowledge of the Subjects Treated	4.94	5.0	4.92	4.94
3. Enthusiasm	4.69	5.0	4.92	4.87
4. Coordination with Other Instructor	4.69	4.88	4.83	NA
5. Voice Projection	4.94	4.94	4.92	4.94
6. Adequacy in the Treatment of Topics	4.88	4.94	4.92	4.87
7. Effective Use of Audiovisuals	4.87	4.82	5.0	NA
8. Ability to Estimulate Participation	4.67	4.88	4.92	4.75
9. Ability to Maintain Discussion Focused on the Topics	4.69	4.94	4.92	4.81
10. General Impression	<u>4.88</u>	<u>4.94</u>	<u>4.92</u>	<u>4.86</u>
OVERALL MEAN SCORE	4.825	4.928	4.919	4.86

-
- 1/ Norman Page
2/ Jorge Grinpelc
3/ Neil Johnson
4/ M. Regina Levy

**TABLE 2 - COURSE MATERIAL EVALUATION -
MEAN SCORES**

	<u>Petroleum Ind. Overview</u>	<u>Petroleum Accounting</u>	<u>Petroleum Finance</u>	<u>Quantitative Methods</u>
1. Relevance of the Material to the Course Subject	4.69	4.94		4.94
2. Contribution of the Material to Achievement of Course Objectives	4.88	4.94		4.81
3. Treatment of the Topics by the Course Materials	4.40	5.00		4.81
4. Relevance of the Materials to the Individual Job Responsibilities	4.50	4.82		4.53
5. Clarity of the Subjects and Topics Contained in the Materials	4.88	4.94		4.88
6. Facility to Use the Material	4.67	4.88		4.88
7. Effectiveness of the Audiovisual Material Used in Lectures	<u>4.75</u>	<u>4.76</u>		<u>NA</u>
OVERALL MEAN SCORE	4.68	4.89		4.80

useful aspect, it was found that, while the majority of the participants did not express any opinions on this, there were three respondents who indicated that the least useful materials were those in English. In terms of other comments and suggestions, several participants stated that the course should have been of longer duration while others indicated that they would have preferred shorter lecture sessions.

All opinions obtained with reference to the petroleum accounting course expressed that the most useful aspects of the material provided were the large number of practical exercises that it contained and the series of accounting forms and examples of manuals that were also distributed. Several participants expressed that all the material constituted a very useful and readily available reference source. No opinions were given about the least useful aspects of the materials. With respect to other comments, the demonstration on the use of personal computers and their application in the accounting field elicited many requests for further training in computer courses and the use of computerized accounting systems. Among the suggestions there were several references to the need for more advanced courses in petroleum accounting. Finally, some of the participants expressed their preference for having both the lecture sessions and the problem solving and consultancy periods carried out solely in Spanish.

With respect to the quantitative methods course the evaluations indicate that the materials were clear, comprehensive, and well designed, constituting a good source of future reference. The most useful aspects were found to be the numerous examples applied to the petroleum industry, the application of statistical analysis methods to the industry and the large quantity of exercises, although there were three respondents who indicated that the material did not contain enough oil-related examples. Most of the participants also indicated that the duration of the course was too short, however at the same time, several indicated that, given the nature of the subject treated in this course, the sessions should not have been as long as they were. The most

frequent suggestions for improving the course were related to the use of computers in statistical analysis.

d. Self-Evaluation of Improved Subject Knowledge

An assessment of the improvement of subject knowledge achieved by each individual participant was carried out using an evaluation form consisting of a series of questions on different topics treated during the course.

The respondent was requested to indicate the degree of understanding that, in his opinion, he had achieved in the course. For this purpose a scale of one to five was used, where one indicated that no improvement was achieved on the particular topic and five indicated that, to the degree that a particular topic was taught, the participant had been able to understand and consequently expand his knowledge on the subject. The mean scores on each question, as well as the overall mean scores for the courses are shown in Table 3 on the following page.

As should be expected, the answers obtained and the mean scores derived from them indicate a wider variation in opinions. Thus, the somewhat lower mean scores obtained (in comparison to those obtained with the other forms) indicate the participants recognized that, in some cases, their knowledge in reference to a particular topic had not improved as much as it was expected or that the improvements were marginal. However, according to the responses obtained, in the majority of the cases, the indications were that substantial improvements were achieved.

The overall mean scores are also consistent with the expectations that improvements in knowledge are related to the participants' knowledge of the subject previous to the initiation of the courses, their own educational background and the types of activities that are normally carried out in their jobs. Thus, in support of this expectation, it can be seen that the lowest overall mean score was obtained in the petroleum industry overview course since the topics and, in general, the entire subject were entirely new for the majority of the course participants.

**TABLE 3 - SELF-EVALUATION OF IMPROVED SUBJECT KNOWLEDGE -
MEAN SCORES**

	<u>Petroleum Ind. Overview</u>	<u>Petroleum Accounting</u>	<u>Petroleum Finance</u>	<u>Quantitative Methods</u>
1. <u>1/</u>	3.94	4.76		4.56
2.	3.88	4.65		4.40
3.	4.47	4.65		4.32
4.	3.71	4.76		4.06
5.	4.53	4.65		4.25
6.	4.35	4.69		4.31
7.	4.18	4.65		--
8.	3.82	4.56		--
9.	4.06	4.47		--
10.	<u>--</u>	<u>4.56</u>		<u>--</u>
OVERALL MEAN SCORE	4.10	4.64		4.31

1/ The number of questions posed to the participants was different for each course. Since there were different for each course these questions are not included in this table, however, they are contained in the perspective form included in Annex 1.

The second lowest overall mean score was obtained in the quantitative methods course where the subject was not entirely new for most of the participants but, because these analysis techniques are not used, it constituted material that had been studied a long time ago and since forgotten. This certainly is not applicable to all topics since there was material that was new even for those who had a solid base in mathematics e.g., the engineers. Conversely, the highest overall mean score was obtained in the petroleum accounting course reflecting the fact that most of the participants had previous knowledge of at least the basic principles of accounting.

The overall results of this self-evaluation, however, indicate that, in general, the participants substantially improved their knowledge of the different topics treated in each course.

In reference to the evaluation results obtained for the petroleum finance course, which are not yet available, we can only say that, in general, they follow the same results as were discussed for the other courses. However, given the nature of the course and the relation that exists between this subject and DGTP's activities, the results should specifically be similar to those obtained for the petroleum accounting course.

3. Evaluations by the Course Instructors

As part of their responsibilities, the instructors were requested to carry out an evaluation of their courses, focusing on aspects related to subject knowledge of and progress achieved by the participants, preparation, participation, and attendance as well as on other aspects related to the subjects being taught and their relationship with the participants' ability to apply the knowledge imparted to their job responsibilities.

In evaluating their respective courses, the instructors filled out an evaluation form consisting of three parts which are discussed below.

The first part required the instructors to use the scale of 1 to 5 to rate four aspects related to previous knowledge of the course subject, preparation for lectures, participation in discussions and attendance. With respect to previous knowledge of the course subject, all the instructors coincided, rating this aspect as 2 on the scale. The meaning of this represents the instructors opinion that, initially, the general level of knowledge of the subjects by the participants was very elementary. This finding, as stated previously, had some effect on the courses because, in some cases, the treatment of topics had to be more general than anticipated and the pacing was slower, especially in the solution of the exercises. Preparation for lectures was rated by the instructors between 1 and 3, indicating that in most of the cases the participants demonstrated that they did not carry out their reading assignments. Participation in discussions also varied for each course and among participants since those who had more knowledge of the subjects under discussion were more inclined to ask questions and those who were not knowledgeable in general opted not to participate. Class attendance also received different ratings for each course reflecting the fact already discussed elsewhere that attendance decreased as time went by. For this reason this issue was rated excellent for the first course, acceptable for the second course, regular for the third and bad for the last course.

The second part of the instructors' evaluations consisted of requesting their opinions, based on their own observations of the course participants' performance, about the degree of achievement attained with regard to the course objectives. The first aspect required the instructors to indicate if the participants had demonstrated a basic understanding of the subject taught. In the instructors' opinion, this objective was partially achieved, with some demonstrating much understanding while others did not. However, they were not sure if the participants will be able to retain such understanding since in most cases their assigned job responsibilities do not require the application of concepts and methodologies learned.

The second aspect referred to the demonstration of a basic understanding of the relationship that exists between the topics examined and the petroleum industry. In this case, the instructors' opinions coincide in indicating that the course participants acquired sufficient knowledge to make them aware that all of the subjects had a great deal of applicability in the petroleum industry.

The third aspect treated in this part of the evaluation form requested the instructors' opinions concerning the degree to which the participants had demonstrated a basic understanding of the practical applicability of the topics taught to the discharge of their assigned responsibilities. The instructors indicated that, for the most part, the participants clearly understood that the subjects taught have much practical applicability to their individual responsibilities; however, they were all aware that there are limitations to such applicability, especially when considering that the effective use of all the subjects learned would require DGTP to obtain/acquire information and computing capabilities not presently available.

The fourth and final aspect about which the instructors were requested to give an opinion referred to the general capability of the personnel to carry out the responsibilities assigned to DGTP. On this point, the instructors agreed that this is a very difficult issue since the specific responsibilities assigned to DGTP or to the individuals are not clear. However, given the heterogeneity of educational backgrounds and generally low level of knowledge, it is doubtful that, even if the functional responsibilities were clearly specified, the capabilities of the personnel would be sufficient to allow them to carry out their functions efficiently and effectively.

The third part of the evaluation form consisted of requesting answers to three general questions. The first question was: which ones are the major deficiencies of the personnel with respect to the subjects taught and their application? The several answers obtained identified several deficiencies that are appli-

cable to each course. The most important was the fact that most of the personnel have educational backgrounds that are neither related to the subjects taught nor are they adequate to the functional responsibilities of DGTP. A second deficiency deals with the lack of sufficient experience on the job in that many of DGTP's staff were relatively new. A third deficiency refers to the lack of a clear definition of individual and departmental responsibilities within DGTP thus making it difficult for the personnel to apply any newly acquired knowledge. Finally, a fourth identified deficiency indicates that DGTP's current normal activities neither require the application of the analysis techniques taught in the course nor does it has the capability to adopt them in the near future.

The second question was: which are the priority areas that should be improved through training? The answers to this question all indicated that the courses offered are not sufficient to provide the necessary knowledge to DGTP's personnel. Therefore, there is strong opinion that more advanced courses are needed, especifcally in accounting and finance. However, this alone will not suffice. There is an urgent need for training the staff in the use of computers and computer applications.

Finally, in response to the question: what recommendations can you suggest to improve the technical competence of DGTP's staff?, the response was unanimous. The DGTP should first undergo a process of structural reorganization and definition of roles and responsibilities.

4. Overall Evaluation

In the opinion of the Coopers & Lybrand team, the major objective of the petroleum training program evaluation was to verify the achievement of two fundamental goals. The first was to assess the effectiveness of the training program per se in terms of its contribution to the participants acquiring an increased knowledge and understanding of specific subject themes. The second was to assess the effectiveness of the training pro-

gram in contributing to the DGTP not only to assure better prepared personnel but also to allow the Direccion to discharge its overall responsibilities in accordance with the mandates of its organic and functional charter. A related objective of this evaluation, as originally conceptualized, was to provide recommendations that would be helpful in the implementation of phase two of the training program as originally designed and recommended by the A.D. Little Team and accepted by USAID.

While we believe that the results of this evaluation should have addressed the objectives just cited, and in fact we were prepared to do so, we also believe that, given the situation DGTP is presently going through, these objectives have become somewhat irrelevant to the overall effect of the training program on DGTP. Three important considerations lend support to this conclusion.

First, the Direccion General Tecnica Petrolera experienced a change in Director effective January 6, 1986. While this occurrence should not have had any effect on the objectives sought by the program, assuming that there was going to be a continuation of normal activities, the fact is that the new Director brings with him a mandate to carry out fundamental changes which, when implemented, will alter the organization and its role, as well as the functional responsibilities assigned to its personnel.

Second, as an immediate consequence of this change, the new Director has seen it necessary to replace most of DGTP's personnel with other professionals who, in his view, are better prepared to discharge the new responsibilities assigned to the Direccion. Thus, in effect, many of the program participants are or will no longer be with DGTP.

Third, given the magnitude of the changes to be made in DGTP and the variety of issues and problems that the new Director will have to face and solve, if he is to successfully accomplish his mandate for introducing fundamental changes in DGTP, the issue of training for its personnel has become of secondary importance. In view of this, the new Director has expressed to Coopers & Lybrand his decision not to continue any further training activi-

ties, in effect closing any possibility for the implementation of phase two of the training program.

In view of the preceding, it can be concluded that the overall effectiveness of the petroleum training program on DGTP was extremely limited. This is not to say that the program itself was not effective or that it could not have contributed to improve the overall efficiency in the Direccion. This conclusion reflects rather that, because of the changes in personnel currently taking place in it, the DGTP is keeping among its staff only a few of those who participated in the training program, a situation that is worsened when considering that, from among those who continue in DGTP (and without detracting from those who made a concerted effort), only one participant demonstrated exceptional ability to learn and apply the knowledge imparted. All of the other participants who had distinguished themselves throughout the program are no longer with DGTP.

An assessment of the program's effectiveness on the individual participants, however, concludes that, in effect, the training program successfully achieved its goals. This conclusion is based on the results of the evaluation forms which were discussed earlier, the individual interviews with the program participants, and the perceptions of the evaluators.

The individual interviews with the program participants were a confirmation of the results obtained with the evaluation forms. The results of these interviews were consistent in indicating the following:

- The training program was well planned and implemented.
- In comparison with other training courses in which they participated, the petroleum training program was considered by far superior in terms of quality of subject coverage, materials and instructors.
- The participants were exposed to many topics which were unknown to them, especially with regards to practical application of the subjects to their assigned responsibilities as they were at the time.

- The participants were able to expand their knowledge of all four subjects, although they expressed reservations about the possibility of applying such new knowledge unless new systems and methodologies are adopted by DGTP.
- The instructors were all judged as excellent not only as teachers but also because of their breadth of theoretical and practical knowledge.
- The course materials were all of good quality by their content and depth of coverage, constituting an excellent source of reference.

For its part, the evaluation team also reached the conclusion that, at the individual level, the training program was successful in achieving the goals and objectives originally set.

It is the evaluators' belief that, in general, participants achieved the degree of proficiency that was intended for each course; that is, the participants were able to acquire a basic knowledge on the subjects taught and to relate this to the petroleum industry. However, this does not mean that they are fully prepared to apply all this knowledge since this would require further and more advanced and focused training. Instead, this means that they achieved the necessary knowledge to more effectively carry out many of the tasks that they had been assigned in DGTP. It should also be kept in mind that the degree of individual achievement varied among participants. Because of their educational background and the interest that each demonstrated during the program, we concluded that there was a small number of participants that most certainly did not achieve any progress. However, the majority of the participants who were interested in learning demonstrated that, in effect, they had benefited from the program by their active participation during lectures and their dedication to work on the assignments.

Finally, it should be noted that the program was carried out according to the pre-established schedule and that all the material and topics included in the program were satisfactorily covered.

5. Recommendations

Even though the conclusions drawn from the evaluation accurately describe the achievement of the objectives sought by the training program per se, it was also pointed out that the relative success of the program can not be considered as a contribution to enhancing the skill capabilities of DGTP. Furthermore, considering that the present Director has expressed his intentions to discontinue the training program, Coopers & Lybrand considers that any recommendations that could be made on the future of the training program, as conceived by the A.D. Little report, will not adjust to DGTP's present needs.

However, taking advantage of the opportunity that we had to come in close contact with DGTP, we have seen it appropriate to delineate a set of observations which, we believe, could be useful to improve the overall performance of DGTP.

The Direccion General Tecnica Petrolera is currently in a state of flux. Although the objectives of DGTP, as a unit of the MOF, were clearly conceptualized at the time of its creation, its past performance in achieving them indicates that, as a unit, it was not fully prepared to carry out its responsibilities. Although any new institution necessarily needs some time to translate its mandate into the actual performance of operational activities, since its creation the DGTP experienced a series of changes that did not allow it to mature and to find its proper role within the ministry and the other government agencies and institutions with which it should have been interacting. This situation has convinced the Ministry of Finance of the need to attempt to make new changes, again seeking to improve the overall performance of DGTP. For this purpose the MOF changed the Director, assigning the new one a clear mandate to correct the existing deficiencies.

In following his mandate, the new Director of DGTP has already taken some measures that are designed to allow the Direccion to carry out its most urgent functions while it is gradually steered toward a more appropriate role.

Currently, although a new organization structure has been adopted and new functional responsibilities have been assigned, it is the opinion of Coopers & Lybrand that this should be taken as temporary measures that will allow DGTP to function in a transition period, during which a series of actions should be implemented. Such actions should be encompassed within an overall program of institutional strengthening and technical assistance which could be financially supported by AID and/or the World Bank*, and which should result in the following:

- adoption of an organizational structure that is adequate to DGTP's overall objective and responsive to its functional needs.
- definition of DGTP's role and responsibilities in the hydrocarbon, energy and mining sectors and the inter-institutional relationships that should exist between DGTP and all those government agencies and enterprises that interact in those sectors.
- identification of all functional requirements that will allow the DGTP to carry out its activities and the adoption of work methodologies and operational systems that will be conducive to facilitate the efficient discharge of its assigned responsibilities.
- appropriate matching between the functional requirements and the staff's capabilities by including professionals with pertinent educational backgrounds and experience among DGTP's personnel.

According to the preceding, any further training activities for the DGTP staff should be considered, planned and implemented only as part of this overall institutional strengthening effort. This will insure that training activities will be focused and fully responsive to particular needs that may arise during DGTP's reorganization.

* It is our understanding that the World Bank has entered into an agreement with the GOE for a "Public Sector Technical Assistance" program. The institutional strengthening of DGTP surely would qualify for coverage under this program.

ANNEX 1
EVALUATION FORMS

PROGRAMA DE CAPACITACION DEL PERSONAL DE LA DGTP

EVALUACION DEL INSTRUCTOR

_____ / / a / / _____
Curso Fechas del Curso Nombre del Participante
(Opcional)

I. CALIFIQUE CADA UNO DE LOS SIGUIENTES ASPECTOS EN ESCALA DEL 1 AL 5, CONSIDERANDO 5 COMO LA MAS ALTA CALIFICACION. MARQUE CON UNA X LA CASILLA APPROPRIADA.

Nombre del Instructor: _____

		5	4	3	2	1
1. Planeamiento y preparación	01	<input type="checkbox"/>				
2. Conocimiento de la temática tratada	02	<input type="checkbox"/>				
3. Entusiasmo	03	<input type="checkbox"/>				
4. Coordinación con otro instructor	04	<input type="checkbox"/>				
5. Proyección de la voz	05	<input type="checkbox"/>				
6. Tratamiento adecuado de la temática	06	<input type="checkbox"/>				
7. Uso efectivo de audiovisuales	07	<input type="checkbox"/>				
8. Habilidad para estimular la participación	08	<input type="checkbox"/>				
9. Habilidad para mantener la discusión centrada en el tema tratado	09	<input type="checkbox"/>				
10. Impresión general	10	<input type="checkbox"/>				

COMENTARIOS Y SUGERENCIAS (sea específico): _____

PROGRAMA DE CAPACITACION DEL PERSONAL DE LA DGTP

EVALUACION DEL MATERIAL DE ESTUDIO DEL CURSO

Curso	/ / a / / Fechas del Curso	Nombre del Participante (Opcional)
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I. CALIFIQUE CADA UNO DE LOS SIGUIENTES ASPECTOS EN ESCALA DEL 1 AL 5, CONSIDERANDO 5 COMO LA MAS ALTA CALIFICACION. MARQUE CON UNA X LA CASILLA APROPIADA.

		5	4	3	2	1
1. Relevancia del material a la temática del curso	01	<input type="checkbox"/>				
2. Contribución del material de estudio al logro de los objetivos del curso	02	<input type="checkbox"/>				
3. Tratamiento de la temática en los materiales de estudio*	03	<input type="checkbox"/>				
4. Relevancia del material de estudio con las responsabilidades de su trabajo	04	<input type="checkbox"/>				
5. Claridad de lectura en los materiales de estudio	05	<input type="checkbox"/>				
6. Facilidad de uso del material de estudio	06	<input type="checkbox"/>				
7. Efectividad del material audiovisual usado	07	<input type="checkbox"/>				

* En el espacio provisto a continuación, indique aquellos temas que en su opinion fueron incluidos en el material de estudio de una manera "muy detallada" o "muy superficial."

Muy Detallados

Muy Superficial

II. COMENTARIOS Y SUGERENCIAS (sea específico)

1. El/los aspecto(s) más útil(es) del material de estudio del curso fue/fueron:

2. El/los aspecto(s) menos útil(es) del material de estudio del curso fue/fueron:

3. Otros comentarios relacionados a este curso: _____

4. Sugerencias para mejorar el curso: _____

III. BASADO EN SUS OBSERVACIONES ACERCA DEL DESEMPEÑO DE LOS PARTICIPANTES EN EL CURSO, RESPONDA LAS SIGUIENTES PREGUNTAS:

1. ¿Cuáles son las mayores deficiencias del personal respecto a la temática enseñada y a su aplicación? _____

2. ¿Cuáles son las áreas prioritarias que deberían ser mejoradas a través de cursos de capacitación específicos? _____

3. ¿Qué otras recomendaciones puede sugerir que conduzcan a una mejora en el nivel técnico del personal de la DGTP? _____

IV. OTRAS OBSERVACIONES Y RECOMENDACIONES

Firma del Instructor

Fecha

15

PROGRAMA DE CAPACITACION DEL PERSONAL DE LA DGETP
AUTO-EVALUACION DEL MEJORAMIENTO DE SUS CONOCIMIENTOS

Curso	Fecha del Curso	Nombre del Participante (Opcional)
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Instrucciones: AHORA QUE USTED HA COMPLETADO EL CURSO, EVALUE HONESTAMENTE EL NIVEL DE CONOCIMIENTO ALCANZADO DURANTE SU PARTICIPACION. USE LA ESCALA DEL 1 AL 5, CONSIDERANDO 5 COMO LA MAS ALTA CALIFICACION. MARQUE CON UNA X LA CASILLA APROPIADA.

	5	4	3	2	1
01 ¿ Aumentaron sus conocimientos sobre aspectos geológicos que determinan la ubicación de campos petrolíferos u de la explotación del petróleo ?	<input type="checkbox"/>				
02 ¿ Aumentaron sus conocimientos del proceso de perforación de pozos?	<input type="checkbox"/>				
03 ¿ Entiende mejor el proceso de recuperación de petróleo de un yacimiento?	<input type="checkbox"/>				
04 ¿ Aprendió usted la relación que existe entre los métodos u la incertidumbre del cálculo de las reservas?	<input type="checkbox"/>				
05 ¿ Tiene ahora un mejor entendimiento del concepto del riesgo en la industria del petróleo?	<input type="checkbox"/>				
06 ¿ Tiene una mejor apreciación de las diferentes fases de inversión en la industria del petróleo y del capital de inversión que se requiere en estas actividades?	<input type="checkbox"/>				
07 ¿ Mejoraron sus conocimientos de la distribución mundial de los pozos, de la producción de petróleo y de las reservas?	<input type="checkbox"/>				
08 ¿ Tiene ahora una mejor apreciación de las dificultades que existen en el pronóstico de la demanda y de los precios?	<input type="checkbox"/>				
09 ¿ Tiene ahora un mejor entendimiento de los factores que influyen las relaciones entre las compañías y el Estado?	<input type="checkbox"/>				
10	<input type="checkbox"/>				

OTROS COMENTARIOS PERTINENTES: _____

PROGRAMA DE CAPACITACION DEL PERSONAL DE LA DGTP
AUTO-EVALUACION DEL MEJORAMIENTO DE SUS CONOCIMIENTOS

Curso	/ / a / / Fechas del Curso	Nombre del Participante (Opcional)
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Instrucciones: AHORA QUE USTED HA COMPLETADO EL CURSO, EVALUE HONESTAMENTE EL NIVEL DE CONOCIMIENTO ALCANIZADO DURANTE SU PARTICIPACION. USE LA ESCALA DEL 1 AL 5, CONSIDERANDO 5 COMO LA MAS ALTA CALIFICACION. MARQUE CON UNA X LA CASILLA APROPIADA.

CONSIDERA UD. QUE EL CURSO HA APORTADO UNA MEJORA EN SUS CONOCIMIENTOS EN CUANTO A LOS SIGUIENTES ASPECTOS:

		5	4	3	2	1
1.- Principios Básicos que sustentan una organización eficiente y aplicabilidad a un modelo de organización petrolera.	01	<input type="checkbox"/>				
2.- Características de los procesos de Definición de Objetivos, Toma de Decisiones e Información Gerencial.	02	<input type="checkbox"/>				
3. Importancia y características de un sistema integral de Planeamiento, Presupuestos y Costos.	03	<input type="checkbox"/>				
4. Principios contables básicos e interpretación de la información Contable.	04	<input type="checkbox"/>				
5. Análisis exhaustivos de un balance a través de índices económico-financiero y ajuste por inflación.	05	<input type="checkbox"/>				
6. Modelo práctico integrado de presupuestos y costos standard para las etapas de planeamiento y control y análisis de variaciones, mediante desarrollo normal y en computador.	06	<input type="checkbox"/>				
7. Principios contables específicos aplicables a las etapas de exploración, producción, refinación, oleoductos y servicios.	07	<input type="checkbox"/>				
8.- Modelo de Estrategia de Planeamiento para el área de exploración y aprovechamiento de información estadística para la toma de decisiones.	08	<input type="checkbox"/>				
9.- Análisis de Inversiones para perforación de pozos exploratorios y de desarrollo.	09	<input type="checkbox"/>				
10.- Forma de aprovechar los computadores para mejorar la eficiencia empresarial. Características y utilización práctica de micro computadores.	10	<input type="checkbox"/>				

OTROS COMENTARIOS PERTINENTES: _____

PROGRAMA DE CAPACITACION DEL PERSONAL DE LA DGTP
AUTO-EVALUACION DEL MEJORAMIENTO DE SUS CONOCIMIENTOS

Curso	/ / a / / Fechas del Curso	Nombre del Participante (Opcional)
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Instrucciones: AHORA QUE USTED HA COMPLETADO EL CURSO, EVALUE HONESTAMENTE EL NIVEL DE CONOCIMIENTO ALCANZADO DURANTE SU PARTICIPACION. USE LA ESCALA DEL 1 AL 5, CONSIDERANDO 5 COMO LA MAS ALTA CALIFICACION. MARQUE CON UNA X LA CASILLA APROPIADA.

		5	4	3	2	1
1.- Importancia de utilizar conceptos de probabilidades y estadística para elaborar información para toma de decisiones.	01	<input type="checkbox"/>				
2.- Análisis de muestras que permitan conocer las características de la poblaciones de la. que provienen a través de la inferencia estadística.	02	<input type="checkbox"/>				
2.- Análisis de riesgo en proyectos de inversión que contribuyan a la toma de decisiones.	03	<input type="checkbox"/>				
4.- Análisis de información empírica, ajustándole con rectas de regresión por mínimos cuadrados que permitan su tratamiento y eventualmente proyección de datos.	04	<input type="checkbox"/>				
5.- Aproximación al cálculo de ganancias descontadas en proyectos de inversión, en base a probabilidades dadas.	05	<input type="checkbox"/>				
6.- Utilización de la Técnica de Arboles de Decisión para proveer de información a los niveles decisorios.	06	<input type="checkbox"/>				
	07	<input type="checkbox"/>				
	08	<input type="checkbox"/>				
	09	<input type="checkbox"/>				
	10	<input type="checkbox"/>				

OTROS COMENTARIOS PERTINENTES: _____

(13)