FULL COSTING IN THE PETROLEUM INDUSTRY AND ITS IMPLICATIONS FOR ACCOUNTING PRINCIPLES AND PRACTICES

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# FULL COSTING IN THE PETROLEUM INDUSTRY AND ITS IMPLICATIONS FOR ACCOUNTING PRINCIPLES AND PRACTICES

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# CHAPTER I

## INTRODUCTION

One of the problems in a study of accounting methods or practices is the determination of the origin of accounting practices. By what authority are some practices deemed "good" or acceptable, and other practices discarded as not being acceptable? How, really, do accounting practices develop?

The position taken in this study is that the practices used in accounting have developed in response to environmental factors rather than from a logical or rational extension of accounting theory. Accounting for financial affairs was done long before theories were developed to explain things that had been done or that were being done. Littleton, indicating accounting's origin as a response to known needs, stated that changes in accounting can be explained in terms of the forces current at the time of the change.[1] Bevis expressed much the same thought in saying that corporate financial accounting has evolved from the social and economic environment.[2]

Much recent discussion of accounting theory and accounting principles has hailed the use of the deductive approach

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[1]A. C. Littleton, Accounting Evolution to 1900, 2nd ed. (New York, 1966), p. 362.

[2]Herman W. Bevis, Corporate Financial Reporting in a Competitive Economy (New York, 1965), p. 1.

to the formulation of accounting principles.[3] The purpose of such theory development has been given as the molding or directing of accounting practice. The Accounting Research Studies, undertaken by the American Institute of Certified Public Accountants, have studied several areas within accounting and have included specific recommendations on matters of theory. In some cases the Accounting Principles Board of the American Institute of Certified Public Accountants has followed the recommendations of the theoreticians and has made pronouncements with respect to specific matters of practice. In other cases the Board has considered the recommendations to be "too radically different" to be followed by the accounting profession.[4] An additional indication of the Board's reluctance to maintain a theoretical position contrary to feelings within the profession is that Opinion No. 2 of the Board was retracted when the practicing accountants in the profession and the Securities and Exchange Commission did not agree with the results obtained in its use.[5]

Practice in the accounting profession continues to develop in response to needs and objectives rather than

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[3]Delmer P. Hylton, "Current Trends in Accounting Theory," The Accounting Review, XXXVII (January, 1962), 22; Eldon S. Hendriksen, Accounting Theory (Homewood, Illinois, 1965), p. 1; Harvey T. Deinzer, Development of Accounting Thought (New York, 1965), p. 105.

[4]"Statement by the Accounting Principles Board" (New York, April 13, 1962).

[5]"Accounting for the Investment Credit," Opinions of the Accounting Principles Board, No. 4 (New York, 1964), p. 21.

through the deductive process of moving from the "ought" to the "is." Goldberg has avoided the question of the genesis of accounting practice by indicating that one service possible in an empirical study of accounting would be the bringing to light of the influences which do in fact affect accounting practices, and that this knowledge could add to the proof or disproof of much of the doctrinal writing in accounting today.[6]

A recent emergence of an accounting practice has been the development of full costing in the petroleum industry. Within recent years, several companies in the petroleum industry have adopted the practice of capitalizing all of the costs of exploration and development as the carrying value of whatever hydrocarbon deposits are found. The capitalization of all costs is done regardless of the results of any specific venture. While there are other aspects, the main arguments are that exploration is carried on for the purpose of finding reserves and that all parties engaged in the exploration for oil and gas realize that only a portion of the outlays will ever result in the actual discovery of hydrocarbons. When it is expected that a certain amount of unfavorable results will occur in the quest for hydrocarbon reserves, the total amounts expended must be recovered from the production of whatever reserves may be found.

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[6]Louis Goldberg, An Inquiry Into the Nature of Accounting (Menasha, Wisconsin, 1965), p. 77.

Several factors have encouraged accounting practices in the petroleum industry to be ultra-conservative. The location and production of hydrocarbons involve high risk and large amounts of capital. Out of the great amounts of money expended in the search for hydrocarbons, only a small percentage will be applicable to actual discovery of specific reserves. Most expenditures will be on efforts that are nonproductive, or where results of the effort indicate an absence of hydrocarbon reserves. The extent of the risk in the development phase of the petroleum industry is indicated by the fact that in recent years the chances of drilling a wildcat and discovering a significant field are only about one in fifty-nine.[7]

High capital requirements and a relatively high degree or risk have tended to make those within the industry cautious regarding the carrying value of oil reserves. Costs of the unsuccessful wells have generally been treated as losses and have been recognized as such in the financial statements. Values in excess of the amounts expended in discovery of the reserves are not recognized until such time as the reserves have been produced and sold. Conservative accounting practices have generally been the rule in the petroleum industry.

The treatment of expenditures for tax purposes has also influenced financial accounting practices. Most of the

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[7]American Petroleum Institute, Petroleum Facts and Figures, 1967 Edition (New York, 1967), p. 19. A significant field is one that is defined as having more than one million barrels of oil reserves or more than six million cubic feet of gas reserves.

expenditures made in the search for hydrocarbons are subject to immediate deduction for federal income tax purposes. Some companies have followed the conservative approach of treating most items as deductions for financial purposes as well as for tax purposes in order to avoid the additional record keeping that would be required in handling expenditures differently for tax and financial purposes.

The adoption of an additional method or practice of accounting has created problems for the petroleum industry, the accounting profession, and financial analysts. The capitalization of all costs incurred in the finding of hydrocarbon reserves, which has come into use only fairly recently, is called the full cost method or sometimes the total cost method of accounting. While the method is not widely popular in terms of the number of companies that are using it, its adoption is growing and the method is apparently considered to be "generally accepted."[8]

A problem exists in determining the causes and effects of an additional practice coming into use at this time within the petroleum industry, which already has a wide diversity of accounting practices. Primary concern of this research has been the determination of the factors which have led to the emergence of the full cost method as an acceptable method of accounting for certain of the costs within the petroleum industry and the determination of the effects upon the

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[8]See Chapter II, p. 17.

reported earnings and the statement of financial position of the corporation. Through an examination of the reasons for and the effects of the use of the full cost method it has been possible to see some of the implications for both the petroleum industry and the accounting profession.

In connection with the economics of the industry, the advocates of full costing contend that even though the value of the reserves cannot be recognized in the financial statements under present accounting practices, these statements should at least indicate the total costs involved in the discovery of the reserves. Those favoring the use of the full cost method of accounting for the finding costs in the industry contend that statements prepared under the full cost concept are more meaningful in that a greater degree of comparability is present between companies and between years for the same company. Proponents of full costing also contend that the earnings as indicated in the financial statements are more realistic in that a more accurate picture of the earning capacity of the concern is given and that the earnings do not reflect fluctuations resulting from nonoperating factors.

The accounting profession is faced with the situation of an additional alternative among practices which are used. In the search for a more meaningful method of presentation of financial statements, the development of the full cost method of accounting for finding costs is advanced by its

proponents as the most desirable method of accounting to use in the presentation of financial data with respect to the petroleum industry. Changes to full costing have implications not only for the petroleum industry and the accounting profession, but for other industries as well. Perhaps full costing will result in a more realistic presentation of the financial data in cases where some fairly large amounts of capital are required and there is a long lapse of time before the full recovery of costs, and some profit, can be expected. Research and development expenditures are usually material, and require long cost recovery periods.

## Significance of the Study

The study of the full cost method of accounting for finding costs in the petroleum industry is significant because it offers a unique opportunity to examine an emerging accounting practice and will indicate some of the reasons for a shift in the reporting practices of a portion of the industry. The importance of the emergence of the method is shown by the fact that a significant portion of the 1967, as well as the 1966, Oil and Gas Accounting Institute was devoted to presentations on and discussion of the subject of full cost accounting in the petroleum industry.[9] The topic is of

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[9]Second Annual Institute on Oil and Gas Accounting (Dallas, Texas, September 22-23, 1966), and Third Annual Institute on Oil and Gas Accounting (Dallas, Texas, September 21-22, 1967), sponsored by the Southwestern Legal Foundation of Southern Methodist University.

current interest to the petroleum industry as well as to those outside the industry.[10] Perhaps the greatest indication of the interest shown in this method or practice of accounting within the petroleum industry is that the American Petroleum Institute is expected to undertake a research study of this method of accounting in the near future.[11]

The financial effect of adoption of the full cost method is also considered significant in that there is very definitely a change in the reported earnings of the firms adopting the method and a further change in the statement of financial position of the same firms. Significant to this study are determination of the changes in the financial statements and the reasons for management desiring the effects of adoption of the full cost method.

## Hypotheses

In making a study of the adoption of the full cost method of accounting in the petroleum industry, particularly in attempting to determine the reasons and effects of the adoption, primary and secondary hypotheses are

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[10] James F. Cole, "Rates of Return and Full Cost Accounting in the Oil Industry," The Canadian Chartered Accountant, LXXXIX (September, 1966), 202. One of the national public accounting firms has published a booklet on the subject for purposes of study and discussion: Arthur Andersen & Co., Accounting for Oil and Gas Exploration Costs (Chicago, 1963).

[11] Letter from Robert H. Stewart, Director of Finance and Accounting, American Petroleum Institute, February 29, 1968. A copy of this letter is included in Appendix A.

(1) The shift to full costing in the petroleum industry is caused by changes in the financial and economic environment of the petroleum industry, and primarily in the following:

(a) There has been an increase in the issuance of stock to the public by many companies in the industry.

(b) There are real and potential increases in governmental regulation in the petroleum industry.

(c) Security analysts have influenced a change toward full cost accounting in the petroleum industry.

(d) The general maturity of the industry has caused some consideration of the full cost method.

(e) There has been a desire on the part of management to raise and smoothen reported income.

(2) The full cost method of accounting for finding costs in the petroleum industry is the logical response to these causes because

(a) It increases income in the short run, particularly for the growing or developing companies.

(b) There is a tendency to smoothen income in all cases, to eliminate unusual fluctuations in income which are the result of the level of exploratory activity.

(c) It increases the carrying value of the properties.

To have some reasonable basis for determination of the validity of the hypotheses, an examination was made of the environment of the industry in recent times. Also necessary

were examinations of both the influences exerted on the petroleum industry by governmental and other groups and data relative to specific firms within the industry which have actually changed to full cost accounting.

While the total environment of the industry is important, the factors having some degree of influence up through the points of production and sale of the hydrocarbons are considered the most relevant. The increasing difficulty of the location of hydrocarbons, the escalating costs involved, and the demand-supply relationships pertaining to the crude hydrocarbons are part of the environment under consideration.

Influences are exerted upon the petroleum industry from many different sources. Governmental agencies have influenced the industry in many cases. Financial analysts have indicated a desire for more uniform reporting within the industry. Yet, the greatest influences exerted upon the petroleum industry are those imposed in the financial community by stockholders, potential stockholders, and others who might be considered as sources of capital for the industry. For purposes of this study, consideration of those exerting influence upon the petroleum industry has been limited to governmental agencies, some financial analysts, and the general financial community.

## Organization

The scope of the paper, the methods of research, and some of the limitations of the study are presented in the next chapter. Chapter III includes a discussion of

conventional accounting in the petroleum industry. The nature and definition of full cost accounting and the extent of usage of the full cost method are discussed in Chapter IV, as well as some of the arguments advanced for and against the full cost method. The material in Chapter V deals with the reasons for the companies changing to the full cost method of accounting for finding costs within the petroleum industry. The specific effects upon the financial statements of a company changing to this method of accounting are examined in Chapter VI. The findings of the study are summarized in Chapter VII and some conclusions are drawn with respect to the reasons behind and effects of adoption of the full cost method of accounting; discussion in the final chapter also deals with the need for additional research in the area of full cost accounting in the petroleum industry.

# CHAPTER II

## SCOPE AND METHODS OF RESEARCH

### Basic Assumptions

Basic to this study is the assumption that existing accounting is a function of and develops from prior accounting practice and in response to changes in the economic environment. This is contrary to some views that practice develops through logical reasoning from accounting theory.[1]

Some basic assumptions exert influence over the accounting that is done regardless of the particular method of accounting that is followed. The idea that a concern will remain in business is basic to the accounting process as is the assumption of an economic entity whose business transactions can be accounted for separately on some meaningful basis. A stable monetary unit is assumed for purposes of accounting measurements even though the validity of this assumption is at times subject to question. For accounting

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[1]For example, see the following: Maurice Moonitz, The Basic Postulates of Accounting (New York, 1961), p. 6; Robert T. Sprouse and Maurice Moonitz, A Tentative Set of Broad Accounting Principles for Business Enterprises (New York, 1962), p. 55; Eldon S. Hendriksen, Accounting Theory (Homewood, Illinois, 1965), p. 1; Delmer P. Hylton, "Current Trends in Accounting Theory," The Accounting Review, XXXVII (January, 1962), 22; A. C. Littleton, Structure of Accounting Theory (Menasha, Wis., 1953), p. 139; W. A. Paton and A. C. Littleton, An Introduction to Corporate Accounting Standards (Ann Arbor, Mich., 1940), p. 5.

information to be useful, the information must be timely. The use of time periods is generally considered necessary in accounting. Accounting is concerned with an identifiable entity that will remain in business. Measurements will be made of the entity for various periods of time through use of a stable monetary unit.

The purposes of accounting measurements are generally assumed to be the determination of financial position at a particular point in time and the recognition of accomplishment of the concern over a period in time. The measure of accomplishment, or of net accomplishment, implies a causal relationship between the efforts of the concern and its accomplishments. For the accounting measurements to have any meaning, a proper matching of the efforts of the concern and of the corresponding accomplishments is necessary. The revenues are generally considered to be the accomplishments of the firm, and efforts are the costs incurred in the production of the revenues, or those costs that can be matched with the revenues of the firm. Under these concepts, the net accomplishment, or net income in the case of an accounting measurement, of the firm is considered the economic contribution of the particular firm.

The rather broad limitations of accounting theory arise from the fact that theory specifies what is to be done, but not the specific manner in which the measurements are to be made. There are at times alternative methods available for

the handling of certain or similar types of transactions. Where alternatives exist, the owner-manager group has the most direct influence on the accounting methods to be used. With net income being a measure of the economic contribution of the firm and of the effectiveness of management, the accounting practices will generally move in the direction which will best serve the interest of the owner-manager group if there is permissible latitude in the choice of the practices followed.

The fact that the communication of financial data serves a useful purpose must also be assumed without specific proof. The nature of the communication and the degree of usefulness are dependent in part upon the use to which the communication will be put by the statement user. One of the possible uses is as a measure of managerial efficiency of the concern doing the reporting. It is assumed that the trend or rate of growth and the degree of fluctuations of the business will be used in measuring the effectiveness of management of a concern.

## Definition of Terms

Some of the following definitions are general within the petroleum industry, and some are specific within this study. For the sake of clarity, however, the following definitions have been followed throughout the remainder of the study.

Conventional accounting practices are meant to be those conservative practices followed by the majority of the firms within the petroleum industry whereby only costs relating to

particular reserves are capitalized.[2] All other costs, not readily identifiable with specific reserves, are charged to expense within the year in which they are incurred. Thus, under conventional practices, very few exploratory costs will be capitalized; delay rentals will be charged to expense as paid or incurred; none of the general and administrative costs will be included in capitalized costs; and none of the dry hole costs will be capitalized, but rather will be charged to current income.

Full cost accounting, or total cost accounting as it is sometimes called, involves the capitalization of all exploration and development costs without regard to the success of any particular venture. There is usually a portion of the general overhead capitalized as pertaining to exploration and development operations. Costs to be capitalized do not include production expenses and other operating expenses relating to the current production of income. Under the full cost method, depletion charges which provide for the systematic amortization of the investment are determined on a company-wide or on a geographic basis such as the North American Continent, through reference to the portion of the total estimated reserves that have been produced in the current period. This method of determining depletion charges is, in effect, a composite unit-of-production method.

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[2]American Petroleum Institute, Report on Certain Petroleum Industry Accounting Practices 1967 (New York, 1967), p. 10.

Exploration and development costs include such items as land acquisition costs, lease bonuses, geological and geophysical expenses, scouting expenses, and usually a portion of expenses of the field or land office. The costs of drilling wildcat or strictly exploratory wells are included in this category as are the costs of dry holes. The costs that are included encompass all of the costs incurred by an oil company in acquiring leases, in exploring, and in developing them. In some cases these costs are referred to as "finding costs" or as "pre-production costs."[3]

Hydrocarbon reserves refer to the deposits of crude oil, natural gas liquids, and natural gas in place and in their natural or usual form. They are not to include the hydrocarbons which are the result of shale beds or other deposits, the extraction of which is under research in the petroleum industry at the present time. The recovery of the hydrocarbons from shale deposits is more closely related to mining than to conventional operations in the oil industry involving the drilling of wells. At the present time, the method of full cost accounting is applicable only to the usual oil industry operations.

Reference to major oil companies means those companies, roughly thirty-two in number, which are included in the annual

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[3]W. B. Coutts, Accounting Problems in the Oil and Gas Industry (Toronto, 1963), p. 22.

financial analysis of petroleum companies as made and published by the Chase Manhattan Bank.[4]

Generally accepted accounting principles are those principles which have substantial authoritative support. Support can be in the form of an opinion of the Accounting Principles Board of the American Institute of Certified Public Accountants, but such can exist without their approval.[5] For purposes of this study, it will be assumed that this outside authoritative support exists where the principle or practice is used by several companies and appears to be allowed by the accounting profession.

## Approach Followed in Research

In order to determine the effects of a change to the full cost method, and to examine possible reasons for companies making the change to full costing, information was requested from companies in the petroleum industry, and particularly the companies which had actually changed to full cost accounting. Most information was obtained through use of questionnaires which were sent to firms in the petroleum industry.

The initial questionnaire asked whether the company had considered the full cost method of accounting, if the company

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[4]Chase Manhattan Bank, N. A., Financial Analysis of a Group of Petroleum Companies (New York, 1955 through 1966).

[5]American Institute of Certified Public Accountants, Special Bulletin--Disclosure of Departures From Opinions of Accounting Principles Board (New York, 1964).

now used the method, if the company expected to change to the method, and the reasons for acceptance or rejection of the full cost method by the company.[6] The first questionnaire was primarily concerned with the stated reasons for a change to the full cost method. The stated reasons were considered to indicate some of the causes for companies making a change to the full cost method of accounting.

Additional information of a financial nature was requested in a second questionnaire that was sent to companies known to be using the full cost method of accounting.[7] The second questionnaire was concerned with the effects upon the financial statements of a change to the full cost method. The information requested dealt with items that were capitalized under the full cost method but which would have been expensed under the conventional practices. The difference between the amounts capitalized which normally would have been expensed, and the depletion applicable to the cumulative total of these capitalized amounts, approximates the difference in the earnings which would be reported under conventional and full cost methods of accounting. The difference obtained in this manner may not be exact in all cases, but the error would be so small that it would be immaterial for purposes of this study.

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[6] Initial questionnaire is included in Appendix A.

[7] The additional questionnaire is included in Appendix A to this study. A listing of companies known to have adopted the full cost method of accounting was obtained from one of the national public accounting firms.

In a few instances these same types of data were obtained on the basis of interviews with oil company personnel. Some information was also obtained through examination of annual reports of various companies that had adopted the full cost method of accounting. In view of the limited disclosure in the annual reports, the information obtained was generally limited to the stated reasons for adoption of the full cost method and the difference in reported earnings for one year as the result of adoption of the full cost method. Even this was not always given, however. Only in two annual reports were data sufficient so that the effects of use of the full cost method over a period of several years could be considered.

In addition to data obtained from companies which have changed to full costing, information was also obtained from sources outside the companies involved. Published data dealing with the subject of full cost accounting are very limited.[8] Accordingly, the examination of published materials was more concerned with the establishment of the environment of the petroleum industry within the time period that various companies made the change to full cost accounting. Specific data was obtained which pertained to the degree of success achieved in the drilling of wildcat wells, trends in prices

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[8]References dealing to any extent with the subject of full cost accounting in the petroleum industry are limited to Arthur Andersen & Co., Accounting for Oil and Gas Exploration Costs (Chicago, 1963); W. B. Coutts, Accounting Problems in the Oil and Gas Industry (Toronto, 1963); Stanley P. Porter, Petroleum Accounting Practices (New York, 1965).

for crude hydrocarbons, some of the demand-supply relationships, rates of return on assets and on invested capital, number of shares outstanding in companies in the industry, and data regarding some of the pressures faced by the petroleum industry. Information was obtained from outside the companies themselves to determine why some of the changes in the industry have taken place, to gain a general understanding of the environment of the industry, and to foresee possible future trends in the petroleum industry.

Other sources were sought for information or materials that might have a bearing on the subject of this study. These included letters of inquiry to each of the major national public accounting firms, to the Securities and Exchange Commission, to the Federal Power Commission, to the American and New York Stock Exchanges, to the American Institute of Certified Public Accountants, to the American Petroleum Institute, and to several of the large national brokerage firms.

The information obtained from the different sources has been analyzed in an attempt to support, or to reject, the hypotheses that have been stated with respect to this study in Chapter I. Disscussion of the data obtained occurs in Chapters V and VI.

## Selection and Response of Companies

At the outset this study limited its analyses to companies having their sites in either the United States or

Canada. One of the reasons for this restriction was to eliminate problems associated with international accounting--such as an even greater lack of a recognized group of generally accepted accounting principles than is the case in the United States and Canada. The limitation was also made because of the availability of sufficient data from companies in these areas. The data should prove valid since 32 per cent of the total world production of oil and gas takes place in these areas;[9] and a great deal of the production outside of these areas is done by companies having their home site in the United States.

Choice of companies to contact for information in the United States was made through use of the API Directory 1967[10] and a listing of companies known to be using the full cost method of accounting.[11] The API Directory 1967 lists the Officers, the Board of Directors, and the Committees of the American Petroleum Institute for 1967; a total of 138 individuals are listed as the Board of Directors, and these individuals represent approximately 100 companies or entities which are associated with the petroleum industry.[12] The list

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[9]World Oil, International Outlook Issue, CLXV (August 15, 1967), 35.

[10]American Petroleum Institute, API Directory 1967 (New York, 1967), pp. 6-12.

[11]A listing of companies known to have adopted the full cost method of accounting was obtained from one of the national public accounting firms.

[12]American Petroleum Institute, API Directory, pp. 6-12.

of United States companies known to be using full cost accounting included 24 companies, 5 of which were also included on the API list. To the above groups were added 4 companies which, as indicated by industry sources, were considering the full cost method. After eliminating companies whose operations were not considered relevant, the remaining companies were contacted.

Since one of the aims of the study was to determine the effects of a change in accounting methods upon the published financial statements of the corporation, consideration was placed only on the publicly-held corporations primarily concerned with the exploration for, and production of oil and gas. Accordingly, of the 100 companies included in the API Directory 1967,[13] restrictions were made for the following reasons: (1) 23 companies were eliminated because they were independent producers and not answerable to a group of stockholders, (2) 4 companies, because of being known subsidiaries of other companies that were contacted, and (3) 26 companies, which were gas pipelines or well servicing firms, because of not being directly associated with the exploration and production of petroleum. A total of 70 companies in the United States were questioned. Replies received from 49 of these companies amounted to a 70 per cent response.

No particular bias resulted from the elimination of certain of the companies whose officials were included on the

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[13] Ibid.

Board of Directors of the American Petroleum Institute. Results for independent producers would probably be the same as for any other company adopting the full cost method. However, data are not generally available from independents since only a single owner, or a small group of owners, need be satisfied. Use of publicly held corporations assured greater access to the information.

A further justification for the use of the publicly held companies is that the operations are usually extensive enough so as not to be unduly influenced by a single venture. Data for subsidiaries is included with information from the parent company in consolidated statements, and no loss of accuracy results from not sending questionnaires to these few companies.

Selection of Canadian firms was made through use of the section of the Canadian Oil Register dealing with oil and gas producers, developers and explorers.[14] A total of 435 Canadian companies are included in this section. Questionnaires were sent to all companies having, or appearing to have, production of more than 50,000 barrels per year. A total of 58 questionnaires were sent to Canadian companies; 43 replies amounted to a 74 per cent response.

From the responses received and from the previously obtained data on companies which used the full cost method, it was determined that there are 55 companies in the

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[14]C. O. Nickle Publications Co. Ltd., Canadian Oil Register 1967-1968 Edition (Calgary, 1967), pp. 3-121.

petroleum industry known to be using the full cost method of accounting for finding costs. Within this group of 55 companies, there are several parent-subsidiary relationships which report on a consolidated basis. Combining these, there are 48 reporting entities known to be using the full cost method. Specific data for more than two years with respect to costs, income and other factors, was obtained from 15 companies out of this group, which represents detail information from 31 per cent of those reporting entities known to be using the full or total cost method of accounting. Through an examination of annual reports, it was possible to obtain limited information dealing with two years or less on an additional 17 companies within this group. Specific data were also obtained from 2 companies which have considered the full cost method of accounting but which have not adopted the method at this time. The causes for adoption of the method and the effects of use of the method, as determined from the data obtained, are discussed in later chapters.

## Limitations of Approach

The major limitation of the approach used in this study deals with the coverage available. Additional resources of organization and funds are required to obtain a complete coverage of the petroleum industry both in the United States and in Canada on the subject of full cost accounting. It was pointed out that the American Petroleum Institute will probably undertake a research study of the full cost method of

accounting in the fairly near future.[15] There is no reason to believe that wider coverage of companies within the petroleum industry would change any of the conclusions reached in this study.

The only possible improvement through wider coverage is the determination of the extent of usage of the full cost method in the industry. Based on various data, even though the absolute number of companies using the full cost method would probably be greater, there is still only a small percentage of the publicly held companies that have adopted the full cost method of accounting for finding costs within the petroleum industry.[16]

Wider coverage of data would probably not alter the reasons for companies adopting the full cost method. It is possible that some additional reasons would be given for making the change to full costing. However, the major reasons would remain the same. Sufficient agreement was evidenced on one of the major reasons, and the other possible reasons are substantiated by the effects of the use of the method.

An additional limitation is present in the approach used in this study; it is not meant to be statistically correct. No consideration was given to sample size or to a random

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[15]See Appendix A.

[16]American Petroleum Institute, Report of Certain Petroleum Industry Accounting Practices 1965 (New York, 1965); Graham Hodgson, "Controversy Rises Over New Reports," Calgary Albertan, May 20, 1966; "Sunny Side Up," The Wall Street Journal, November 27, 1967.

method of selection. Rather, the entire population determined to be using this particular method of accounting was selected since the purpose of the research was to study the effects of a specific method of accounting. The same rationale applied to determination of the possible reasons for adoption of the full cost method, since the same population is involved. Further, reasons for a change to the full cost method are subjective in nature and not subject to quantification.

## Limitations of Data

The major limitation of the obtained data is the non-availability of data of an extended period of time, in view of the relative newness of the full cost method. However, sufficient data were obtained to substantiate the conclusions reached in other chapters of this study. The effects of the use of the full cost method as determined through the use of hypothetical data were subsequently verified through reference to data involving actual companies. There is no reason to believe that additional data would change the effects of the use of the full cost method of accounting. Additional coverage should only serve to verify further these findings.

Variations can occur among companies in the effects on the financial statements. Variations occur because of the differences in levels of exploration and production. Except in the rare case where the exploration is severely curtailed or eliminated, which is discussed later in the study, these

variations are of magnitude only. The general effects should remain the same.

The reasons for adoption or rejection of the full cost method are subjective in nature, and accordingly are not capable of proof. Conclusions in this area are not based entirely on facts, but rather include inferences drawn from answers on the questionnaires and the effects noted on the financial statements.

The various data were not entirely comparable, since the degree of application of the full cost method will vary, just as it does with conventional practices. Some of the companies make full use of the method including a completely retroactive application of full costing and an entire tax deferral; these companies, however, are definitely in the minority. Other companies do not apply the tax deferral and still others will apply neither the tax deferral nor the retroactive application of the method. There are occasional minor differences in the nonproductive costs to be capitalized, but these are not material and do not present any real problem. The majority of the companies using the full cost method do so without either the retroactive application or the tax deferral. Deferred taxes and the retroactive application, when used, were eliminated so that the data would be comparable for all practical purposes.

## Summary of Methods and Scope

The study undertaken of the full cost method of accounting for finding costs within the petroleum industry was basically empirical in nature. Very little work done on the method has been made public. Published data has been examined to establish the environment within which the change to full cost accounting has taken place. Information has been sought from companies within the industry on the basis of questionnaires, a limited number of interviews, and examination of annual reports with respect to the reasons for adoption or rejection of the method and the actual effects of a change to the full cost method. The companies that were contacted accounted for more than 60 per cent of the Free World production of oil and gas.[17] Conventional accounting practices are discussed in Chapter III and serve as a basis for comparison with full cost accounting which is discussed in Chapter IV. The causes and effects of changes to the full cost method are discussed in later chapters.

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[17]Chase Manhattan Bank, Financial Analysis 1966, p. 6.

# CHAPTER III

## CONVENTIONAL ACCOUNTING IN THE PETROLEUM INDUSTRY

### Accounting in General

Accounting has been recently defined as the identification, measurement, and communication of economic data so as to permit informed judgments by users of the data.[1] Paton and Littleton state that "it is the task of accounting to make the most truthful and significant measurements possible of the continuous flow of business activity."[2] Measurement of business activities is a complex process which requires the use of certain concepts, principles, or practices. The applicability of basic concepts does not depend upon the particular method of accounting being used by the firm or industry.

The purpose of this chapter is to discuss some of the basic concepts of accounting and the conventional accounting practices of the petroleum industry. Discussion in this chapter is not intended as an in depth discussion of accounting theory, but instead, as a general base against which comparisons can be made for the full cost method of accounting. The

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[1]American Accounting Association, A Statement of Basic Accounting Theory (Evanston, Illinois, 1966), p. 1.

[2]W. A. Paton and A. C. Littleton, An Introduction to Corporate Accounting Standards (Ann Arbor, Michigan, 1940), p. 11.

basic concepts of accounting have major significance in the determination of periodic net income.

One of the purposes served by the periodic determination of net income is that the net income figure gives some measure of the efforts and accomplishments of the firm, with the net income being a reflection of the concern's ability to use effectively the resources that are entrusted to it. As such, the net income figure becomes one of the most significant measures of managerial efficiency.[3] Corporate responsibilities are of concern not only to the owners of the enterprise but also to groups of present and prospective investors, creditors, and governmental bodies. The determination of periodic net income helps to assess the fulfillment of the corporation's public responsibilities.[4]

An adequate rate of return over a period of time serves to indicate the capable use of capital by a corporation. Paton and Littleton feel that capital should be employed by those firms and managements that most successfully use it.[5] Financial statements which indicate effective management of a concern aid in the attraction of capital. Whether net income is actually a valid measure of managerial efficiency is not

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[3]Norton M. Bedford, Income Determination Theory, an Accounting Framework (Reading, Mass., 1965), p. 91. Also Paton and Littleton, Corporate Accounting Standards, p. 10.

[4]Paton and Littleton, Corporate Accounting Standards, p. 3.

[5]Ibid.

important. If investors and others believe that the measure is valid, capital will flow to those firms indicating favorable earnings. Income differences or incorrect determination of income can result in a misallocation of resources.

Not all of the basic concepts of accounting are discussed. However, concepts of a going concern, an identifiable entity, realization, matching, and cost expiration are pertinent to an examination of the subject of the full cost method of accounting in the petroleum industry.

## Going Concern

The assumption that the firm will remain in business, and not go out of business in the forseeable future, is as basic to accounting practice as to accounting theory.[6] Business managers must view their operations as a continuing process. In today's highly technical, complex world, business operations must be planned long in advance. Production facilities generally last for relatively long periods of time. Capital also, is committed for relatively long periods of time. Current labor contracts cover periods of two or more years. These, and other, requirements of the business world demand that business management regard business operations as a continuing process. In the measuring and reporting of business activity, accounting must also assume an indefinite continuation of operations.

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[6]Paul Grady, Inventory of Generally Accepted Accounting Principles for Business Enterprises (New York, 1965), p. 27.

## The Entity Concept

Economic activity is engaged in by identifiable entities which constitute centers of interest and which are logical units of accountability. An individual can conduct several businesses in his own name and can make an accounting on the basis of total operations. However, a more meaningful and useful reporting can be made on the basis of the commercial enterprise or entity. A separate business entity does not require that the entity be of any particular type, but only that it be identifiable and that it constitute a unit of accountability. The economic data may be gathered from several sources, but without the limiting factors of an entity, the data would have little meaning. Paton attributes the identifiable business entity as being one of the basic assumptions in accounting.[7] In viewing the business entity, comparisons can be made with other entities; and analyses can be made with respect to differing periods of time.

## The Realization Concept

Accountants say the realization concept is refraining from recognizing increases in value, both the results of productive efforts and of holding activities as well, until such time as the increases have actually been realized. "Presently accepted tests for realization require receipt of a current (or liquid) asset capable of objective measurement in a market

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[7]W. A. Paton, Accounting Theory (New York, 1922), p. 472.

transaction for services rendered."[8] When applied to the petroleum industry, the realization concept requires that the hydrocarbons be already produced and sold to an outside party and further that the proceeds be in cash or currently receivable in cash.

Realization also requires that there be objective and determinable facts. In the extractive industries, natural resource deposits which have been discovered are sometimes thought of as inventories of the producing companies. As inventories, these assets constitute the most important assets of the company. Arguments are sometimes advanced that the actual discovery of the mineral deposit constitutes recognition of a substantial part of the value ultimately to be obtained by the company from its production and sale.[9] The major problem in use of discovery value involves the determination of the value and the quantity of the reserves in the ground.

## Matching of Revenue and Expense

A completely accurate figure of the net income from the business activity is possible only at the time that the concern ceases to do business and is liquidated. However,

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[8]American Accounting Association, 1964 Concepts and Standards Research Study Committee--The Realization Concept, "The Realization Concept," The Accounting Review, XL (April, 1965), 314.

[9]Stanley P. Porter, Petroleum Accounting Practices (New Yorк, 1965), p. 20, and American Accounting Association, Statement of Accounting Theory, p. 78.

the matching of revenue and expense will allow the determination of a satisfactory portrayal for periodic net income. The matching of revenue and expense is probably the greatest single problem that occurs in accounting; this difficulty exists regardless of the type of business that is under consideration.[10] Paton and Littleton indicate that the primary problem of accounting is the division of the stream of costs incurred between the present and the future in the process of measuring periodic net income.[11] A proper allocation of costs is a prerequisite to the matching of effort and accomplishment within the activities of the firm. In the matching situation, costs are an indication of the efforts expended while the revenues are an indication of the accomplishments of the firm.[12] For the most part, all costs incurred in the operation of a business are for the ultimate purpose of producing revenues. The expenditures, until disposed of by one means or another, are assets of the firm.

The problem of matching is of associating costs and revenues. If there is some reasonable expectation of ultimate revenue as the result of making the expenditure, the costs may be deferred and later charged to the revenue stream when there is deemed to be a causal relationship between the

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[10]Rufus Wixon, ed., Accountants Handbook, fourth ed. (New York, 1960), p. 17.

[11]Paton and Littleton, Corporate Accounting Standards, p. 67.

[12]Ibid., p. 15.

expenditure and the revenue.[13] Identification of the causal relationship is difficult; it is in this area that opinions differ in determining which costs should be deferred and subsequently charged to the income stream. The major problem in the controversy over full cost accounting is one of matching. How should the finding costs be charged to the income from the production of hydrocarbons? Full costing takes one view in the charging of costs to the revenues, while the conventional practices use a different manner of matching. Specific points on conventional practices are covered in detail later in this chapter, and the full cost practices are discussed in the following chapter.

## Expiration of Costs Through Loss

The matching concept does not imply that all costs will ultimately contribute to revenues of the firm. Rather, it is recognized that some of the costs incurred may never contribute to revenues.[14] Costs will expire by one of two methods: the costs incurred can contribute to revenues, or the costs incurred can expire without any value or compensation to the firm.[15] If there is no expectation of revenue in the current or future periods as the result of making the expenditure,

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[13] Ibid., p. 74.

[14] Porter, Petroleum Accounting Practices, p. 301.

[15] Ibid., p. 21.

the costs incurred should be recognized as losses in the current period.

The net income of a firm is considered to be a measure of managerial efficiency or of the contribution of the firm. Net income is not what management chooses to say that it is; but instead, it is the result from the proper matching of revenues and expenses of the firm, and there are different ways of matching basically the same types of costs within the same basic industry. Essentially the controversy between conventional and full cost methods of accounting involves the matching of finding costs in the petroleum industry to the revenues from the production of hydrocarbons.

Management is accountable for the activities of a business. With the separation of ownership and operation of the businesses, management has control over the business and all of the assets used in the business. Net income indicates the results of operations for the firm, and the financial statements convey information on the results to all interested parties for the petroleum industry, just as in other industries. The petroleum industry itself and the use of the conventional accounting practices within it are examined next.

## The Petroleum Industry

Innumerable activities take place in the oil business prior to the time that the customer drives up to the pump. The nature and extent of these activities are varied and

extremely interesting; and yet, few of the customers of the oil companies are aware of the tremendous complexity of this vital component of our economy.[16] The following diagram serves to indicate some of the major activities of the petroleum industry.

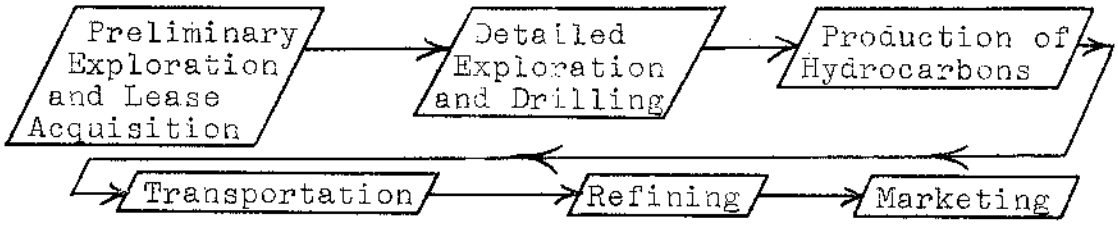


Fig. 1--Major activities of the petroleum industry

A brief discussion of the varied aspects of the petroleum industry greatly aids in an understanding of the business environment within which financial accounting must function.

## Nature of the Quest for Oil

A great many activities are involved in the petroleum industry. Individual companies specialize in one or more of the activities called for in the locating, producing and ultimate marketing of petroleum products. Yet, a brief mention of each of the major activities in the industry is necessary to see the extremely broad scope of the oil and gas business.

A company engaged in finding and developing oil and gas reserves must determine the geographical area within which

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[16]For an enlightening discussion of many aspects of the oil business, see Max W. Ball, This Fascinating Oil Business (New York, 1940).

exploratory activities will be carried out; specific geographic areas are sometimes termed "areas of interest." The actual area of interest is determined by every conceivable method: use of geological and geophysical techniques for preliminary surveys, the presence of another company, or a successful test well on the general geological structure.

Once the general area of interest is determined, the company will obtain leases within the area; a lease permits the oil company to conduct exploration and development activities in the search for hydrocarbons. The acquisition of leases involves company land men, lease brokers, and others whose purpose it is to acquire leases. The company will, in many cases, bid in open competition for the right to operate on government lands which may be within the interior or offshore, but within the continental limits of the country. The lease acquisition activities, by their very nature, precede by a lengthy period of time the actual drilling operations.

Additional exploratory work is required once the company has acquired leases. The mere acquisition of leases in an "area of interest" does not assure the presence of oil, or even that the company will drill a well. Before a transaction of such magnitude is undertaken, additional work and information are necessary. Detailed geological information is required in order to locate the most logical place for the drilling of an exploratory well. Once the drilling site is determined, the necessary equipment is moved to the location

and actual drilling operations are begun. The drilling of the well can be done either by company personnel or by an independent drilling contractor. Aside from the risk involved in finding or not finding hydrocarbon reserves in commercial quantities, there is considerable risk in just trying to drill a hole into the depths of the earth, which hole may vary from several hundred feet to around five miles in depth. Once drilling operations are begun, however, they will usually continue around the clock until the well is completed as a producer or is abandoned as a dry hole. The procedures are very complex and involve continual evaluation and testing to determine the possibility of a formation holding oil or gas in commercial quantities and whether or not a completion attempt is justified. If the well is completed as a producer the company moves into the development and production phases of operations.

The presence of some hydrocarbons in the area is at least known once the company has moved into the development phase of operations. Development, however, involves much the same risk as does exploration, though not to as great of an extent. Even in a development well, considerable risk is involved in the drilling of a well several miles into the earth's crust. At the development stage, much remains in terms of geological and other efforts, to delineate the boundaries of the hydrocarbon deposit. Ultimate boundaries are often established through the drilling of several

nonproductive wells. Regardless of the methods used to determine the field boundaries, development continues until such point as sufficient wells exist to extract the natural resources efficiently and effectively.

During and after the development stage, production is begun under the appropriate federal and state regulations, and hydrocarbons are produced in the form of oil, gas, or gas liquids. Once produced, the hydrocarbons are sold to various parties for further processing or storage; a royalty is remitted to the landowner, with the producer keeping the remainder. At this point the producing operations are complete, and this is the limit of activities engaged in by the producing company.

Other activities in the oil and gas industry include transportation of both crude and refined products, refining of the hydrocarbons into an untold number of products, and the marketing of the various products of the industry. The transportation, refining, and marketing operations are not incorporated in this study but are only mentioned to trace through the range of activities carried on within the petroleum industry and to establish the climate for specific accounting practices.

## Costs Involved in Locating Reserves

Definitions of the costs involved in locating hydrocarbon reserves have been established (See Ch. II, p. 16), but it is necessary to go beyond those general meanings to

ascertain some of the differences between the conventional practices of accounting and the full cost method of accounting in the petroleum industry. Since most of the discussion of accounting methods in the petroleum industry is concerned with rather broad categories of expenditures, these categories will be used rather than detailed classifications necessary for internal accounting purposes. The categories include pre-drilling exploration costs, lease acquisition and maintenance costs, intangible drilling and development costs, and the depletion method used in amortizing these costs.

The pre-drilling exploration costs include the broad geological and geophysical costs or expenses prior to the drilling operations. At times these pre-drilling costs are capitalized and at times they are not, without very much logic behind the decision except that it may follow the tax provisions with respect to exploration costs.

Lease acquisition costs are concerned with two general categories of expenditures. The first category of expenditures includes the general overhead of the land department and part of the expenditures of general management; there is no practical way to identify individual overhead expenditures with the acquisition of any specific lease. The second type of acquisition cost is readily identifiable with specific properties. The lease bonus is paid to the landowner with respect to a specific property. Both the general and the specific lease acquisition costs are amounts expended in the

obtaining title to, and perfecting the title of, the rights to explore and develop hydrocarbon reserves that underlie certain surface areas.

Lease maintenance costs are almost self-explanatory; after the title to leases, concessions, or other legal subdivisions has been acquired, the maintenance costs are those necessary to retain the leases for the company. Lease maintenance costs are usually limited to the annual rentals paid the landowner, but other costs as specified in the lease agreement may be present.

Intangible drilling and development costs include all those expenditures that in and of themselves have no salvage value but which are necessary in the actual drilling of a well.[17] These include the clearing and location work in preparation for the actual drilling, the drilling, testing, perforating, fracturing, and other costs that are necessary in drilling a well and in completing it for production. However, the intangible drilling and development costs do not include the equipment costs that are also necessary in the completion of a well.

Equipment costs, while of a development nature, are not included in the above categories. These are amounts expended for any tangible equipment such as pipe, rods, pumping units, and tank batteries that may be necessary for the productive

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[17]Arthur Andersen & Co., Oil and Gas Federal Income Tax Manual, ninth edition (Chicago, 1966), pp. 65-66.

operations of the lease but which, for the most part, can be removed from the lease and have a real salvage value.

Depletion, which is merely the method of determining the amortization of capital costs as pertaining to the mineral deposits, is usually determined through use of a unit-of-production method; the reserves produced are related to the total hydrocarbon reserves available. The ratio of reserves produced to the reserves available for production is applied to the total unrecovered costs to determine the charge for depletion.

## Risk in the Oil Business

Risk is the presence of considerable uncertainty with respect to the outcome of undertaken activities. In this sense, risk is particularly significant to the petroleum industry. The discussion which follows concerns exploratory drilling and development activity.

Success of exploratory drilling--Progress has been made in the application of the tools of statistical decision theory to drilling decisions,[18] but risk cannot be eliminated from exploratory and development efforts in the petroleum industry. For the petroleum industry as a whole, it is possible to determine with some degree of accuracy the cost per foot of producing wells or the cost per barrel of crude

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[18] C. Jackson Grayson, Jr., Decisions Under Uncertainty: Decisions By Oil and Gas Operators (Boston, 1960).

oil reserves. The average number of dry holes per producing well also may be figured. For the industry as a whole, the various data have not fluctuated too widely; trends in relative success, profitability, and costs may be ascertained. Because the industry averages are available, it would appear that the situation could be considered risk and not uncertainty since there may be some element of measurable probability attached to the outcomes.[19] However, industry averages or probabilities cannot be applied to a single company; "the very nature of the discovery process means that results are highly erratic and that no formula can be used to guess ultimate recovery related to expenditures in particular periods of time."[20] Risk for individual companies cannot be overlooked; "the mere listing of 'ifs' . . . is enough to show that exploring for oil and gas is not an exercise in known probabilities, but means investing in the face of considerable uncertainty."[21]

These industry averages are really not very comforting; individual firms will do better or worse than the industry averages. In the year 1967, there were 5,250 exploratory

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[19]Frank H. Knight, Risk, Uncertainty and Profit (Boston 1940), pp. 19-20.

[20]Richard J. Gonzalez, "Petroleum Statistics--Uses and Limitations," The Oil and Gas Journal, LXIV (October 3, 1966), 115.

[21]Stephen L. McDonald, Federal Tax Treatment of Income From Oil and Gas (Washington, D. C., 1963), pp. 42-43.

wells drilled on untried, unproven acreage.[22] Within the petroleum industry, these wells are technically referred to as "new-field wildcats." Of these 5,250 efforts, only 562 resulted in producing wells.[23] Of all the new-field wildcat exploratory wells attempted, even after all the geological and geophysical efforts of the companies involved, 89.3 per cent of the wells were dry. Even if hydrocarbons were present, they were not in sufficient quantities to be put into production. The following data show the relative risk and success of exploratory activity in the United States.

TABLE I

RELATIVE SUCCESS OF U. S. EXPLORATORY DRILLING, 1958-1966*

| Years | New-Field Wildcats | |
|---|---|---|
| | Dry Holes Per Producer | Percentage of Wells Successful |
| 1958 | 7.84 | 11.31 |
| 1959 | 8.11 | 10.98 |
| 1960 | 8.83 | 10.18 |
| 1961 | 8.27 | 10.78 |
| 1962 | 7.63 | 11.58 |
| 1963 | 7.54 | 11.70 |
| 1964 | 8.46 | 10.56 |
| 1965 | 8.69 | 10.32 |
| 1966 | 8.70 | 10.31 |

*Source: American Petroleum Institute, Petroleum Facts and Figures, 1967 Edition (New York, 1967), p. 17.

[22]"Forecast and Review," The Oil and Gas Journal, LXVI (February 5, 1968), 148.

[23]Ibid.

The percentage of successful wells has decreased over the years involved. The success of the venture depends not only on the presence of hydrocarbons, but also on the nature and quantity of the hydrocarbons.

Development drilling--Risk is not limited to the exploratory phase of the activities in the petroleum industry; risk occurs in the development phase of operations as well. Even at the development stage of operations, where known deposits of hydrocarbons are present, there is a relatively high degree of risk. In 1967, the number of development wells drilled which turned out to be dry amounted to 5,869, which amounted to one out of every four development wells attempted.[24]

A discussion of risk only in terms of the number of successes or failures loses much meaning. When costs are included, even though the costs are based on estimates, the tremendous significance of risk in the petroleum industry comes into focus. With a 1.69 per cent degree of success,[25] and a well cost of $131,000,[26] an expenditure of approximately $7,750,000 would be required to locate a significant

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[24]"Forecasts and Review," The Oil and Gas Journal, LXVI (February 5, 1968), 148.

[25]American Petroleum Institute, Petroleum Facts and Figures, 1967 Edition (New York, 1967), p. 19. Indicates percentage of new-field wildcats resulting in discovery of one significant field.

[26]Henry J. Struth, "Rising Costs, Low Prices Are Discouraging Crude Oil Search," World Oil, CLXIV (May, 1967), 148.

field by the drilling of new-field wildcats.[27] Even at a top price of $3.00 per barrel, a great deal more than one million barrels of oil would be required to recover the gross amounts expended in the location of the field.

Risk has influenced the accounting practices followed in the petroleum industry; high capital requirements and a relatively high degree of risk have tended to make those within the industry cautious in the carrying value of assets which have been discovered. Conservative accounting practices are meant to include those situations in which sales, revenues, and income are not anticipated, but all liabilities or losses are recorded even though definite amounts may not be determinable.[28] Conventional accounting has tended to follow conservative accounting practices in the petroleum industry.

### Conventional Accounting in the Petroleum Industry

Conventional accounting practices in the petroleum industry include those accounting practices which are now, and have been, followed by the majority of the firms in the industry. These practices are outlined in a report prepared by the American Petroleum Institute.[29] The accounting practices

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[27]A significant field is one that is defined as having more than one million barrels of oil reserves or more than six million cubic feet of gas reserves. See The American Association of Petroleum Geologists Bulletin, LI (June, 1967), 991.

[28]Paul Grady, Inventory of Generally Accepted Accounting Principles for Business Enterprises (New York, 1965), p. 36.

[29]American Petroleum Institute, Report on Certain Petroleum Industry Accounting Practices 1967 (New York, 1967).

in the oil industry have generally been conservative, but petroleum industry accounting involves a great deal more than mere conservatism.

## Conservatism

Accountants and accounting have traditionally been conservative in the approach to financial matters. The extent of this conservatism is indicated by the adage that accountants should provide for all possible losses, but should anticipate no gains. Conservatism may or may not be desirable, but conservative accounting practices are predominant in the petroleum industry today.[30] Actual practices in the petroleum industry tend to be ultraconservative in nature, and in some cases this has gone beyond any resemblance to sound accounting principles.[31] It is the view of the American Petroleum Institute that conventional accounting practices in the petroleum industry must be considered in light of the large capital requirements and the high degree of risk present in the petroleum industry.[32]

The petroleum industry requires very large amounts of capital, and the location and production of hydrocarbons does

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[30]American Petroleum Institute, Report of Certain Petroleum Industry Accounting Practices (New York, 1965), p. 15.

[31]C. Aubrey Smith and Horace R. Brock, Accounting for Oil and Gas Producers (Inglewood Cliffs, N. J., 1959), p. 77.

[32]American Petroleum Institute, Report of Accounting Practices 1965, p. 14.

involve a high degree of risk. Only a small percentage of the funds expended in the search for hydrocarbons will be applicable to the actual discovery of specific reserves. The greater portion of the expenditures will be on ventures that are nonproductive or on test results indicating a lack of hydrocarbon reserves. The large capital requirements and the relatively high degreee of risk have influenced those in the petroleum industry to be cautious in the carrying value that is shown for discovered assets. Losses have generally been recognized as soon as it is known that the ventures are nonproductive. Moreover, increases in value which are the result of discovery have not been recognized until the minerals produced from these discoveries have been produced and sold.

Risk in the petroleum industry is not the only factor influencing conservative accounting. Treatment of expenditures for tax purposes has also had bearing on financial accounting practices. Most of the expenditures made in the search for hydrocarbons are subject to immediate deduction for federal income tax purposes. Companies have sometimes treated them as deductions for financial as well as tax purposes to avoid the duplicate records that are otherwise necessary.

Operational considerations have occasionally influenced financial accounting to follow the conservative practices of treating expenditures as expenses when incurred. Exploration

budgets are generally dependent upon the amount of cash that is available for use in the concern. In order to have close control over operations of the concern, some managements desire that the income statements come as close as possible to reporting income on the cash basis. However, the extreme nature of cash basis reporting is not realistic for financial reporting purposes.

Conservative accounting practices in the petroleum industry are the result of several influences, and it is not possible to attribute conservatism to any single factor. Merely stating that accounting in the petroleum industry is conservative is not sufficient; the actual practices need to be examined.

## Accounting Practices in the Petroleum Industry

A breakdown of types of costs incurred in the exploration and development phases of oil operations is necessary in discussing conventional accounting practices. These include expenditures for pre-drilling, for lease acquisition and maintenance, and for intangible drilling and development. The amortization of these costs through depletion is significant in petroleum accounting. It has generally been the practice to expense the pre-drilling exploration costs under the premise that the exploration costs have been incurred as necessary, recurring costs of staying in business.

Exploration costs may cover a far greater area than will be acquired, or that will ever be found to be productive.[33]

Concerning the acquisition and maintenance of leases, the handling of the costs depends to a large extent on the requirements for federal income tax purposes.[34] The federal income tax laws, and their application by the Internal Revenue Service, are perhaps the most important determinant of accounting policy in the petroleum industry.[35] This is certainly true in the area of accounting for lease acquisition and maintenance costs. On undeveloped properties, the initial amounts paid to acquire the leases are treated as capital in nature with the maintenance costs; annual rentals, property taxes, and other recurring costs are treated as expenses in the period in which they are incurred. If the lease is abandoned, the costs that attach to it are recorded as an abandonment loss under the conventional accounting practices. If production is obtained, however, the costs are transferred to producing leasehold costs and are then subject to depletion.

The manner of handling intangible drilling and development cost in the petroleum industry under the conventional practices depends almost entirely upon the results of the drilling activity. These costs are generally capitalized if

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[33]Porter, Petroleum Accounting Practices, p. 24.

[34]Ibid., p. 25.

[35]Smith and Brock, Accounting for Oil and Gas, p. 71.

they are applicable to a successful well; but the intangibles are expensed if they are applicable to a dry hole.[36]

Amortization of the producing leasehold costs and the capitalized intangible drilling and development costs is another area in which there are differences in accounting methods. Most of the depletion methods relate the units produced to the total estimated reserves that are available. The differences which appear between methods are in the determination of the basic operating unit and in the reserves to be used. The majority practice in the petroleum industry is to use the basic lease as the property unit and to determine reserves on the basis of the developed or proven reserves.[37] Reserves do not include the probable reserves which are applicable to the areas not fully developed and which may at times be used for purposes of financing and of mergers or sales of companies. While the producing leasehold costs and intangible drilling and development costs are generally kept separately, a unit-of-production method of depletion is usually applied to both of these capitalized amounts to arrive at the depletion for the period.

These practices concerning major expense categories are considered conventional accounting. Individual accounting practices in the petroleum industry have not always developed

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[36]American Petroleum Institute, Report on Accounting Practices 1965, p. 25.

[37]Ibid., p. 30.

from sound theoretical framework alone, but instead have emerged from various influences. The large capital requirements and a high degree of risk have tended toward conservatism in accounting practices; tax laws concerned with the implementation of policies rather than adequate accounting have also influenced accounting toward conservative practices. These and other particular influences will be discussed in more detail in Chapter V.

There is no implication that conventional practices are right, but merely that they are followed by the majority of firms in the petroleum industry.[38] There are, of course, a diversity of practices in the petroleum industry. The presence of other accounting practices complicates the use of reports issued by companies in the industry.

## Reporting in the Petroleum Industry

The significance of reporting in the petroleum industry was indicated in the opening remarks of Andrew R. Cecil before the Second Institute on Oil and Gas Accounting:

> As to the oil industry, nearly three million persons--one in every seven shareholders in the nation--own stock in oil companies. At the end of 1964, shares in these oil companies had a market value of $79.4 billion, accounting for 12 per cent of the market value of all publicly available corporate stock.
>
> In the accountants [and ultimately in management] of oil companies is vested the responsibility

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[38]The present accounting practices in the petroleum industry are outlined in: American Petroleum Institute, Report on Certain Industry Accounting Practices 1967 (New York, 1967).

> of providing accurate and meaningful statements to the shareholders, prospective shareholders, the federal and state governments, as well as internal management. With so many involved, some degree of conformity in the technique of reporting is obviously desirable. But conformity is especially hard to attain in the oil industry with its unique complexity.[39]

The relative magnitude of the exploration and development expenditures is an indication of the significance of financial reporting. In 1966, the major oil companies made capital and exploration expenditures of $8.4 billion with exploration and development costs accounting for $4.2 billion of this total.[40] In the same year, the total net income for the major group was $4.9 billion.[41]

A proper financial reporting on the activities of a firm and the accountability of its management are as applicable to the petroleum industry as to any other industry. Since the petroleum industry has a high risk factor and a greater requirement for capital,[42] a convincing argument could be advanced that proper reporting is more essential than in other industries; regardless of the argument given,

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[39]Andrew R. Cecil, "Opening Remarks," Oil and Gas Accounting: Financial Analysis and Reporting, ed. A. C. Ernst (New York, 1966), pp. 1-2.

[40]Chase Manhattan Bank, Financial Analysis 1966, p. 27.

[41]Ibid., p. 24.

[42]Douglas H. Eldridge, "Rate of Return, Resource Allocation and Percentage Depletion," National Tax Journal, XV (June, 1962), 211. Indications in this article are that the petroleum industry requires 50 per cent more capital than do other industries.

an adequate reporting of financial information is required of the petroleum industry. These reports should be appropriate, should have adequate disclosure, should include environmental information, should be consistently applied, and should have a certain uniformity of practice.[43] In the area of fair reporting, the use of alternative accounting practices presents a major problem. No indications could be found of any individual or group advocating complete rigidity of the accounting methods; recommendations have been made for some conformity to general principles, with deviations from the preferred industry practices being indicated.[44]

The use of alternate accounting practices does not always produce diverse results. The study undertaken by the American Petroleum Institute did not show any significant lack of comparability among companies,[45] even though the data was requested in areas where differences in accounting practices were known to exist. The apparent comparability can be explained in part by the fact that the thirty-two companies involved were quite similar in operations, maturity, and size. As a group, these companies accounted for more than one-half of the crude oil production in the United

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[43]American Accounting Association, Basic Accounting Theory, p. 7.

[44]G. Keith Funston, "Financial Reporting for the Investor," unpublished address before the Executive Committee of the American Petroleum Institute, February 2, 1967.

[45]American Petroleum Institute, Report of Accounting Practices 1965, p. 13.

States.[46] Further explanation of the apparent comparability among these companies is given by Porter:

> Variations in the accounting treatment accorded apparently similar transactions are common to all phases of the accounting for petroleum exploration, development and production operations. Differences resulting from these variations may each have a significant and material effect for a small and/or non-integrated producer, but in the matter of comparison between major companies most of these differences will not materially affect the financial statements.[47]

Within the petroleum industry in the past, the feeling had been that alternative accounting practices were necessary to achieve proper reporting.

> In the oil industry it is neither feasible nor desirable . . . to set up a system of accounts or a standard for all companies in the industry. Competing managements have different ideas as to what policies and methods will produce the best results. Within the limits of generally accepted accounting principles there are differences of opinion from one management group to another as to the propriety of alternative accounting procedures and methods of recording similar transactions.[48]

These particular arguments given in 1954 appear to be more against absolute rigidity of accounting procedures than the arguments in favor of alternative methods. The really significant alternatives, which deal with the manner of the handling of production payments and exploration and development costs, have come into use since 1954.

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[46] Ibid.

[47] Porter, Petroleum Accounting Practices, p. 322.

[48] American Petroleum Institute, Outline of Petroleum Industry Accounting (New York, 1954), p. 11.

The use of alternative methods for basically the same type of transactions has been questioned. Norr, a financial analyst, has questioned why there are three methods of accounting for intangible drilling and development costs and for production payments.[49] These same opinions were voiced by Leonard Spacek, former head of a national public accounting firm, when he said that it was absurd that his firm should certify the statements of three major oil companies as being prepared in accord with generally accepted accounting practices when each accounts for drilling costs in a different manner and each method can make a drastic difference in the net income reported.[50]

The use of these alternatives presents one of the major problems of reporting in the industry; alternative methods may not be necessary to the extent that they exist at the present time. The possibility of defining preferred industry practices is voiced by Porter:

> There would appear to be no sound reason why the petroleum industry could not overcome the major hurdles to establishing a consensus as to the one most logical method of handling each of the important accounting problems peculiar to the industry.[51]

The elimination of significant variations in the accounting methods used in the petroleum industry would allow better

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[49]David Norr, "Investment Analyst's Views of Financial Reporting," Financial Executive, XXXIV (December, 1966), 25.

[50]"A Matter of Principle Splits CPAs," Business Week, MDCCVIIC (January 26, 1963), 56.

[51]Porter, Petroleum Accounting Practices, p. 324.

reporting within the industry. Consistent application of preferred industry practices would allow valid interperiod and intercompany comparisons to be made.

### Summary of Conventional Accounting

Those accounting practices followed by the majority of firms within the petroleum industry constitute conventional accounting. Conservative in nature, these practices encourage the recognition of losses as soon as determinable. Revenues or income, on the other hand, should not be recognized until they have been realized in a market transaction. The conservative nature of petroleum industry accounting has generally been attributed to the high risk and large capital requirements of the industry; moreover, tax practices and operational considerations have also influenced the conservative petroleum accounting.

Details of conventional accounting practices in the petroleum industry are readily available.[52] A summary of the conventional practices by major types of costs that are incurred in the exploration and development operations will serve to indicate the nature of conventional accounting. For the most part, the pre-drilling exploration costs are expensed within the industry. Lease acquisition costs are

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[52] Smith and Brock, Accounting for Oil and Gas; Robert H. Irving, Jr. and Verden R. Draper, Accounting Practices in the Petroleum Industry (New York, 1958); Robert E. Waller, Oil Accounting--Principles of Oil Exploration and Production Accounting in Canada (Toronto, 1956); Porter, Petroleum Accounting Practices.

considered capital in nature; the carrying costs applicable to leaseholds are generally considered an expense of the period in which they are incurred. Intangible drilling and development costs are capitalized if applicable to a producing well, but are expensed if the well is dry. Finally, depletion is usually computed on a unit-of-production method but the basic operating unit is held to the basic lease.

Proper reporting in the petroleum industry is as necessary as in any other industry. Proper reporting includes appropriateness, disclosure, environmental information, consistency, and uniformity. The use of alternative accounting methods can present serious problems in financial reporting. Among the major companies, the use of alternative accounting methods does not always produce significant differences; for the smaller and/or non-integrated company, drastically different results from the same basic transactions may be produced. The determination of preferred industry practices might be possible; the problems of alternative practices might then be eliminated. The full cost method of accounting, as one of the more significant alternative accounting practices in the petroleum industry, is discussed in the following chapter.

# CHAPTER IV

## FULL COST ACCOUNTING IN THE PETROLEUM INDUSTRY

The full cost method of accounting for finding costs differs significantly from conventional accounting practices. Primary differences between the methods occur in the treatment of major expenditure classifications. Conventional practices were discussed in the preceeding chapter; the purposes of discussing the full cost method in this chapter are (1) to aid in understanding the method, (2) to allow some comparisons with conventional practices, and (3) to serve as a base for the examination in later chapters of the causes and effects of a change to the full cost method.

### Full Cost Accounting

Basically the full cost method of accounting in the petroleum industry involves the capitalization of the full or total costs that are incurred to find hydrocarbon reserves. Under the full cost method, the pre-drilling exploration costs, the lease acquisition and maintenance costs, and the intangible drilling and development costs are all capitalized whether or not they are applicable to specific hydrocarbon reserves that have been found. A portion of the general overhead of the company is applicable to exploration and development activities and is usually included in

the amounts capitalized. A very few firms capitalize a portion of interest charges in much the same manner as interest on construction.

The existence of a maximum amount of costs which can be capitalized under the full cost method is generally recognized in the petroleum industry. Beyond a certain limit, the accumulation of costs cannot be said to constitute assets of the firm; the limit generally specified is the total fair market value of the remaining reserves that are held by the concern at the date that the financial statements are prepared.[1] The determination of the fair market value presents problems, however, since there is no definite procedure for establishing it. The discounted cash flow pertaining to future operations is sometimes used; prices used in recent sales or purchases of reserves in place are also used as an indication of the fair market value.[2] The problem of establishing the fair market value of the reserves is further compounded by the fact that hydrocarbon reserves are usually a mixture of oil, gas, and gas liquids. Some manner of equating them into a common unit is necessary in order to value the reserves and to serve as a basis for the computation of charges for depletion.

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[1]Arthur Andersen & Co., Accounting for Oil and Gas Exploration Costs (Chicago, 1963), p. 5.

[2]Walter E. Plumhoff, "Accounting for Oil and Gas Exploration Costs--The Full-Cost Concept," unpublished address given at the Third Annual Institute of Oil and Gas Accounting (Dallas, Texas, September 21-22, 1967).

Depletion, or the gradual wasting away of the deposit of natural resources through production, is recognized in the accounts as the amortization of leasehold and intangible costs. Depletion is usually computed by means of application of a unit-of-production method; this involves determination of the ratio of reserves that have been produced during the year to the total of reserves held at the beginning of the year, plus any additional reserves discovered during the year. The ratio of production to reserves is then applied to the total unrecovered cost of the reserves to determine the depletion charge. The charge for depletion relates the cost of the reserves to the production of the same reserves.

Differences in the depletion expense between conventional and full cost methods of accounting arise partly because of amounts considered cost of reserves and partly because of the property unit used. Under conventional practices, the ratio of production to reserves is generally determined for each individual lease. Under the full cost method of accounting the property unit is generally considered to be the entire operations of the company and the ratio of production to reserves is determined for the entire company. Under conventional practices, the depletion charge depends upon specific ratios and costs of individual leases; but under the full cost method, the depletion charge is based upon broad averages. However, all depletion charges under the full cost method are not comparable since not all companies follow the

company-wide basis for determination of the property unit. Those who have discussed full cost accounting have recommended differing property units to be used in the determination of the charge for depletion. These property units range from a pool or geological area to use of a managerial area of interest, up to the widest unit--that of the entire operations of the company involved.[3]

In summary, the full cost method of accounting involves the capitalization of all of the costs connected with the discovery of hydrocarbon reserves. The costs are capitalized whether or not they are applicable to the actual discovery of specific reserves. There is a limit, however, on the amount of costs which can be capitalized as the cost of reserves; this limit is the total fair market value of the reserves held by the concern. The costs of the reserves are amortized against income from the production of the reserves generally through a unit-of-production method of depletion. The unit of property for purposes of depletion computations under the full cost method is usually a large geological or geographical area; the computed charge is a broad average.

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[3]The pool or geological area is discussed by Stanley P. Porter, Petroleum Accounting Practices (New York, 1965), Chapter 15. The managerial area of interest is recommended by W. B. Coutts, Accounting Problems in the Oil and Gas Industry (Toronto, 1963), Chapter 7. Use of company wide operations is recommended by Arthur Andersen & Co., Accounting for Oil and Gas Exploration Costs (Chicago, 1963), Chapter VI.

## Extent of Use of Full Cost Accounting

Determination of the actual extent of the use of the full cost method of accounting for finding costs is not possible without a complete survey of the petroleum industry. However, precise figures for the actual extent of usage of the method are not needed in order to examine the full cost method of accounting in the petroleum industry. Also, a complete enumeration of companies using the method is not necessary to draw conclusions with respect to the reasons for use of the method and the effects of the use of the method. The companies contacted in connection with this study accounted for more than 60 per cent of the Free World production of oil and gas,[4] which amounts to a sufficient coverage for valid conclusions with respect to the method.

A survey of the petroleum industry conducted in connection with this research established that there are fifty-five firms known to be using the full cost method in the petroleum industry at the present time. No evidence could be found of any company using the full cost method of accounting prior to the latter part of 1959. Even though the full cost method is being considered and adopted primarily by non-integrated, non-major companies,[5] the increasing adoption of the method

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[4]Chase Manhattan Bank, N. A., Financial Analysis of a Group of Petroleum Companies 1966 (New York, 1966), p. 6.

[5]Letter from Walter Mickleson, Chief Accountant, Division of Corporation Finance, Securities and Exchange Commission, December 11, 1967. A copy of this letter is included in Appendix A.

is of significance. The years of adoption of the full cost method by companies are indicated in the following table:

TABLE II

YEAR OF ADOPTION OF FULL COSTING BY OIL COMPANIES*

| Year | Companies Adopting Full Cost Accounting |
|---|---|
| 1959 | 1 |
| 1960 | 1 |
| 1961 | 1 |
| 1962 | 2 |
| 1963 | 6 |
| 1964 | 19 |
| 1965 | 11 |
| 1966 | 3 |
| 1967 | 2 |
| Unable to ascertain. | 9 |
| Total | 55 |

*Source: Corporate annual reports and Moody's Industrial Manuals, 1959 through 1967.

While the full cost method is not widely accepted in terms of the number of companies which have adopted the method, its use in the petroleum industry has been growing. An examination of some of the arguments advanced for and against the method aids in understanding the importance of full cost accounting in the petroleum industry.

## Pros and Cons of Full Cost Accounting

Prior to the actual examination of some of the specific arguments advanced on the subject of full cost accounting, the positions taken on the subject within the petroleum

industry and the accounting profession should be set out. There is no consensus of opinion with regard to the use of the full cost method of accounting; some firms or companies and some agencies appear to be in favor of the method, while others oppose it. Probably the strongest recommendation for use of the full cost method of accounting is given by the public accounting firm of Arthur Andersen & Co., in its publication on the subject of accounting for oil and gas exploration costs.[6] In a research study, Coutts states his recommendations of the full cost method quite succinctly:

> All expenses incurred in the process of exploring for oil and gas and developing for production those reserves found (pre-production expenses) should be capitalized as part of the cost of the reserves discovered so that these costs may be matched against the ultimate proceeds of sale.[7]

The majority of the major public accounting firms will certify to statements prepared on the basis of full cost accounting in the petroleum industry. The Securities and Exchange Commission has not stated any position with respect to use of

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[6]Arthur Andersen & Co., Accounting for Oil and Gas Exploration Costs (Chicago, 1963).

[7]W. B. Coutts, Accounting Problems in the Oil and Gas Industry (Toronto, 1963). This work is published by The Canadian Institute of Chartered Accountants, but is not a pronouncement of that body. Rather it is a research study much the same as the Accounting Research Studies undertaken and published by the American Institute of Certified Public Accountants. In this work, Coutts advocates use of full capitalization of all costs prior to production. These costs are subsequently depleted on the basis of a property unit that coincides with managerial areas of interest.

the method.[8] The Federal Power Commission, on the other hand, has rejected the method as not being properly supported.[9] Other groups or agancies have not taken any position with respect to the method--the New York Stock Exchange,[10] the American Stock Exchange,[11] the American Institute of Certified Public Accountants,[12] and the American Petroleum Institute.[13] In an address before the Third Annual Institute of Oil and Gas Accounting, O. L. Luper, member of the Accounting Principles Board of the American Institute of Certified Public Accountants, indicated that the Board would probably issue an opinion on extractive industry accounting in the latter

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[8]Letter from Walter Mickleson, Chief Accountant, Division of Corporation Finance, Securities and Exchange Commission, December 11, 1967. A copy of this letter is included in Appendix A.

[9]Letter from Arthur L. Litke, Chief Accountant, Federal Power Commission, April 17, 1968. A copy of this letter is included in Appendix A.

[10]Letter from Morton B. Solomon, Executive Assistant, New York Stock Exchange, January 25, 1968. A copy of this letter is included in Appendix A.

[11]Letter from E. Stanley Peck, Jr., Director, Division of Securities, American Stock Exchange, March 6, 1968. A copy of this letter is included in Appendix A.

[12]Letter from Reed K. Storey, Director, Accounting Research Division, American Institute of Certified Public Accountants, January 5, 1968.

[13]Letter from Robert H. Stewart, Director, Division of Finance and Accounting, American Petroleum Institute, February 29, 1968. A copy of this letter is included in Appendix A.

part of 1968, sometime after the accounting research study on extractive industries is published.[14]

More than recommendations are required for the understanding of full cost accounting. It was hypothesized that the shift to full costing in the petroleum industry is caused by changes in the financial and economic environment. The change then, is not the result of theoretical arguments for or against the method. The theoretical arguments are used as the basis for making judgements on the acceptability of the method of accounting from the point of view of sound accounting theory. Yet, general acceptance in practice, as opposed to theory, is the significant criterion. General acceptance in practice (Chapter II, p. 17), has been established by the fact that the majority of the major public accounting firms will certify to the use of the method, and accordingly, there is substantial authoritative support for full cost accounting in the petroleum industry.

An examination is given of some of the specific arguments used both by proponents and opponents of full costing to facilitate a more complete understanding of the method.[15]

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[14]O. L. Luper, "Current Activities of the Accounting Principles Board," unpublished address at Third Annual Institute of Oil and Gas Accounting (Dallas, Texas, September 21-22, 1967).

[15]Arguments for and against full costing are given primarily in three sources and will not be cited for each of the arguments advanced in this chapter. The sources are: Arthur Andersen & Co., Accounting for Oil and Gas Exploration Costs (Chicago, 1963); W. B. Coutts, Accounting Problems in the Oil and Gas Industry (Toronto, 1963); and Stanley P. Porter, Petroleum Accounting Practices (New York, 1965).

Many of the arguments are more concerned with environmental factors than with theory. These factors are discussed in more detail in the following chapter. The arguments generally used, by both the proponents and opponents of the full cost method, can be grouped into the broad topics of financial considerations, improved reporting, cost type regulations, and problems of implementing full costing.

## Financial Considerations

Practically all of the problems facing a production company, just as other companies and other industries, are at some point financial in nature. However, not all of the financial considerations are relevant to the subject of full cost accounting in the petroleum industry; consideration of the cost of reserves, of tax influences, and of the allocation of resources are pertinent to the subject of full costing.

Cost of reserves--Perhaps the strongest argument advanced for the full cost method of accounting is the one based on the total cost of the reserves. While there is little relation between specific exploration and development expenditures and the revenues ultimately to be realized, the expenditures are necessary. A company does not enter into a business for the purpose of incurring losses; rather, funds are spent under the knowledge that some of the attempts will

be unsuccessful and will ultimately be abandoned.[16] Non-productive exploration expenditures, or expenditures that cannot be identified with specific reserves found, are an inevitable part of the total costs of acquiring productive assets in the petroleum industry. Since all of the expenditures are necessary in the location of hydrocarbon reserves, companies that advocate the full cost method state that all costs should be capitalized as the cost of whatever reserves that are found. These companies contend that capitalizing all costs required to find reserves more realistically reflects the cost of the company's proven oil and gas reserves.

Proponents of the full cost method of accounting point to the fact that the economics of the industry require that the revenue from the production of the company's reserves must return to the company the cost of the successful attempts, the cost of the unsuccessful attempts, and a profit, if the concern is to remain in business. Coutts stresses the relationship of all costs to the reserves which are found:

> Although there is no physical or technical relationship between many pre-production costs (especially dry holes and abandoned properties) and the oil and gas reserves ultimately discovered, there is, nevertheless, a very real rational relationship between them arising from the fact that the reserves cannot be found without incurring these costs.[17]

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[16]Petroleum Accountants' Society of Western Canada, "Study of Full Cost Accounting," unpublished committee report (Calgary, not dated).

[17]Coutts, Accounting Problems in Oil and Gas, p. 24.

The advocates of full costing further say that the conventional practices of charging unsuccessful exploration costs to current income results in an understatement of financial income. McDonald, as an economist, shares in this view:

> To charge current unsuccessful exploration costs to current production is, in a successful, growing firm, to understate current income by an amount equal to the excess of expensed outlays over that portion of past unsuccessful exploration outlays economically attributable to current production. . . . in a growing firm it does understate current income by charging against current receipts costs that are in excess of those economically attributable to such receipts.[18]

The arguments in favor of full costing that are based on the economic facts of the industry do have merit; all costs must be recovered through the productive efforts of the concern. When management evaluates results, the success or failure of the exploratory efforts is not related solely to the costs of successful attempts, but refers to the total amounts expended to locate reserves.

Capitalization of the total amounts expended can result in serious problems under certain conditions. During a period of unsuccessful efforts with a young or growing company, the total amounts capitalized as cost of reserves could very well exceed the value of the reserves. If such a case were to exist, the company would be suffering a loss each time it produced a barrel of oil or a cubic foot of gas.

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[18]Stephen L. McDonald, Federal Tax Treatment of Income from Oil and Gas (Washington, D. C., 1963), p. 23.

Users of the full cost method state that there should be a ceiling on the amount of costs which should be capitalized. Any amounts in excess of the limit (the fair market value of company held reserves) should be recognized as losses. However, do the losses occur at the time the unsuccessful venture is completed, or at such time as the costs of all unsuccessful ventures and successful ventures exceed the fair market value of all the prior successful ventures? If the latter is used as would be the case in full costing, the nonproductive costs incurred in the drilling of one dry hole might be classified as an asset, while the costs incurred on the very next well, also a dry hole, might be classed a loss.

Opponents of the full cost method contend that the nonproductive exploration expenditures represent losses and not assets of a concern. The general view in the petroleum industry has been that while the economists and theoretical accountants would be in favor of capitalizing all costs, realism calls for capitalizing only those costs relating to specific reserves.[19] The opponents of the full cost method agree that the total amounts of successful and unsuccessful exploratory efforts are required to locate hydrocarbon reserves. However, they do not agree that the cost of the reserves is represented by the total of expenditures. Rather, the amounts applicable to the actual discovery of reserves

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[19]G. Aubrey Smith and Horace R. Brock, Accounting for Oil and Gas Producers (Inglewood Cliffs, N. J., 1959), p. 174.

represents the cost of assets held; only these amounts can be expected to benefit future periods.

While the hydrocarbons reserves represent the major assets of a company and must be considered in determining the value of a company, the realization of these values depends upon much more than the reserves themselves, specifically upon the producing and marketing of the reserves.[20] The opponents of full costing maintain that nonproductive exploration expenditures are losses and should be charged against current income as incurred. Their position is based upon the facts that such expenditures will not benefit future periods and are a normal recurring cost of operations.

Either side of the full cost controversy has strong arguments with respect to the cost of reserves. Proceeds from the sale of hydrocarbons must return to the concern the amounts expended on both the successful and the unsuccessful ventures, if the concern is to remain in business. Yet, the nonproductive exploration expenditures cannot be expected to benefit future periods. Because of the nature of the oil business, however, the nonproductive exploration expenditures are normal, expected, recurring expenditures.

Tax influence--Arguments which consider the tax influence of full cost accounting are voiced entirely by the opponents of full cost accounting. Basically the two

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[20]Porter, Petroleum Accounting Practices, p. 299.

arguments used against full costing are that its use in the petroleum industry will result in more taxes being paid and that certain income tax benefits will be lost.

One of the effects of a change to full cost accounting, which is discussed in detail in Chapter VI, is that there is an increase in the carrying value of the properties; there will be a similar increase in the owner's equity. Where state income or franchise taxes are based partly on the book value of assets employed or on the owner's equity, a change to the full cost method of accounting would result in a definite increase in the taxes paid.

Opponents of the method contend that the capitalization of nonproductive exploration costs under the full costing could result in the compulsory capitalization of these same expenditures for tax purposes.[21] Difficulties are often encountered in convincing the taxing authorities that a particular item should be considered a deduction for income tax purposes when the item has not been so treated for financial reporting purposes.[22] Proponents of the full cost method dismiss this argument by saying that the possible loss of deductions applies only to a portion of the geological and geophysical expenditures. The deductibility of the major

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[21]Arthur Andersen & Co., Accounting for Oil and Gas, p. 22. Wayne W. Harpster, "Total Cost Accounting for Petroleum Exploration Costs," Management Controls, XII (August, 1965), 161.

[22]Harpster, "Total Cost Accounting," p. 161.

nonproductive exploration cost, the intangible development cost on dry holes, is provided by statute and is not concerned with the treatment for financial reporting purposes.[23] Sources within the industry indicated concern over the possible loss of tax incentives to the petroleum industry as the result of handling certain expenditures differently for financial and tax purposes.

Allocation of resources--One of the purposes of the periodic determination of net income is a reflection of the ability of a concern to use effectively the resources that are entrusted to it. Bedford terms this a measure of managerial efficiency.[24] Opponents of full costing argue that the use of the method can result in a mis-allocation of resources to an unsuccessful firm:

> Total cost accounting tends to obscure unsuccessful drilling programs. . . . In fact, disastrous drilling programs could be sustained for a number of years (until the aggregate capitalized costs equalled fair value) without disclosure in the financial statements. While the success of drilling activities is not necessarily disclosed under the present method of accounting, it does tend to highlight unsuccessful exploration since the costs are charged to operations currently.[25]

The use of the broad averages inherent in the use of full cost accounting does tend to obscure or delay recognition of

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[23]Arthur Andersen & Co., Accounting for Oil and Gas, p. 22.

[24]Norton M. Bedford, Income Determination Theory, an Accounting Framework (Reading, Mass., 1965), p. 91.

[25]Harpster, "Total Cost Accounting," p. 161.

results from operations. However, the proponents of the full cost method contend that use of the conventional accounting practices can result in a mis-allocation of resources; they argue that the mis-allocation could occur where a successful company might report losses because of a high level of exploration and an unsuccessful company might report attractive profits through depletion of its reserves without replacing them.[26]

The arguments based upon the economic considerations of the cost of reserves, the tax influence, and the allocation of resources are important in consideration of the full cost method of accounting. However, the economic considerations do not stand alone as an argument either for or against the full cost method of accounting. The effects of the method on reporting are also significant.

## Improved Reporting

Both sides of the full cost controversy argue that the use of their method of accounting will result in better financial reporting. Primary arguments advanced by the proponents and opponents of full costing are concerned with the reported earnings, the costs of current production, the carrying value of assets, and the comparability of the reported results.

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[26]Arthur Andersen & Co., Accounting for Oil and Gas, p. 19.

Reported earnings--Conventional advocates point to the fact that full cost accounting does not represent a conservative accounting practice. Smith and Brock state that because of the element of uncertainty, conservatism has played a large part in accounting policy in the oil and gas producing industry.[27] Conservatism for its own sake is no guide to acceptable accounting practices, but it has been regarded as conservative to recognize losses as soon as possible.

In consideration of full cost accounting, conservatism has deeper implications than merely the capitalizing of losses as the cost of assets. The use of the method has effect on the published financial statements of companies in the industry. Opponents of the full cost method state that the balance sheets of companies using full costing are materially overstated as the result of the capitalization of costs from which there is no expectation of future revenue. The opponents also feel that full costing tends to overstate income as the result of capitalizing the nonproductive exploration costs. One speaker indicated his view of the overstatement of income by saying, "I have yet to read the statements of a company that has changed to full costing that has shown a decline in earnings. . . . In fact, in some cases, the increase in earnings . . . is very substantial."[28]

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[27]Smith and Brock, Accounting for Oil and Gas, p. 77.

[28]D. N. Walker, unpublished paper presented at 13th Annual Western Canada Conference on Financial Management and Petroleum Accounting, Banff, Alberta, Canada, May 18-21, 1966, p. 2.

Others regard the use of the full cost method with a certain amount of skepticism and state that the use of the method is not a service to the industry.[29] Several of the respondents to questionnaires used in this research indicated that in their opinion, the financial statements prepared under the full cost method were not conservative, meaningful, or proper. Some of the respondents did not recognize the method as being generally accepted.

Arguments are frequently heard that the method used does not have to be conservative and that the choice of the method is not of primary importance if it is used consistently. Consistency in itself is not enough to give meaning to the financial statements. The method used may make little difference over the life of the concern, and there may be little difference in reported income after a number of years, providing the exploration level and the production level remain fairly constant. The amounts spent on exploration do not remain the same, however. The differences in reported earnings, even assuming the method is applied consistently, are material for small or non-integrated producers.[30] Proponents of the full cost method are emphatic in their arguments that use of the full cost method improves financial reporting by providing a more effective matching of costs and revenues,

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[29]L. J. Richards, "Top Management Views the Accounting Function," Oil and Gas Accounting: Financial Analysis and Reporting, ed. A. C. Ernst (New York, 1966), p. 55.

[30]Porter, Petroleum Accounting Practices, p. 322.

since the total costs of finding hydrocarbon reserves are charged against the revenues from the production of those reserves. With earnings tied almost exclusively to the production and sale of hydrocarbons instead of the discovery of the reserves, the proponents of the full cost method feel that there is a closer relationship between current sales and current earnings.

On the other hand, the opponents of full costing contend that a mis-matching of revenues and expenses occurs as the result of capitalizing losses; they believe the nonproductive exploration costs do not represent assets and cannot be considered income producing properties. Opponents of the method state that the nonproductive exploration costs should not be amortized against income in the future but should instead be recognized as losses as soon as it is possible to determine that the results are unsatisfactory in terms of the location of hydrocarbon reserves. The nonproductive exploration costs should be charged against current income, not because they are related to current revenues, but because they have been incurred in the normal course of business and they hold no known future value.

Use of the full cost method calls for the application of deferred tax allocation procedures, discussed in detail in Chapter VI. If nonproductive exploration expenditures will be of benefit to future periods, the effects should be reduced by any possible current tax benefit. Opponents of

the full cost method state it is illogical to contend that all costs are the cost of finding reserves, and at the same time to allow the current reduction in income taxes as the result of such expenditures to flow on through to income. Opponents of full costing feel that the failure of the majority of companies using full costing to apply tax deferral procedures eliminates the contention that full costing results in a more proper matching of income and expense.

For decision-making purposes, it is necessary to be able to make comparisons as between time periods and among companies. Management, of course, can obtain any financial information it desires; stockholders and other outsiders, however, must rely upon the external reports for their informational needs. In investment and other financial matters, every decision must be considered relative to alternative decisions.

Those favoring the full cost method feel that more meaningful statements are possible as the result of better comparison bases. The elimination of fluctuations in income attributable to the exploratory activities allows better interperiod comparisons within a company and at the same time, better intercompany comparisons. Proponents of full costing further contend that use of the method allows more valid intercompany comparisons within and without the petroleum industry.

Opponents state that the lack of uniform application of the full cost concept does not increase the comparability of reported earnings for companies using the method. Opponents of full costing further contend that the introduction of an additional method of accounting makes comparisons within the industry even more difficult than would normally be the case.

Current cost of production--Determination of the current cost of production is closely related to the matching of income and expense. Those in favor of full cost accounting believe that previously incurred exploration costs are a part of the expense of current production. The current exploratory costs, which will not result in production for perhaps a lengthy period of time, are not a cost of current production. Coutts things that none of the arguments in favor of immediate expensing are strong enough to reject the matching principle; he asserts either that advocates of immediate expensing of nonproductive costs are confused as to the real assets of oil companies or have decided that proper income determination is impossible.[31]

Proponents of full costing contend that current exploratory costs do not apply to current production but rather are applicable to reserves that will be produced in the future. They feel a more meaningful reporting will result from the elimination of the irregularities in financial

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[31] Coutts, Accounting Problems in Oil and Gas, p. 25.

reporting which are the result of current exploratory activity and which should be charged to future production found as the result of that activity. The advocates of full costing maintain that the charges to current production are not proper under conventional practices. A corporation may be highly successful in terms of finding new reserves and increasing the total value of the company; yet, because of charging a significant portion of the current exploratory activities to income as dry hole costs, etc., the company may report a loss for financial accounting purposes. Capitalizing of nonproductive exploration expenditures rather than charging these items to current operations is essentially the normalization of income. These effects are most noticeable in the smaller growing companies.

Opponents of full costing recognize that the cost of current production involves the amortization of previously incurred costs plus any losses incurred. They contend that the previously incurred costs included only those costs applicable to specific properties containing hydrocarbon deposits; the nonproductive exploration costs are losses, not assets, since they will not benefit future periods. As losses, the nonproductive exploratory costs should be charged off against the current period's income.

Carrying value of assets--Opponents of the full cost method do not recognize nonproductive exploration expenditures as being subject to deferral as assets. They contend that

since there is no expectation of future revenue as the result of the nonproductive expenditures, capitalization of these costs results in a material overstatement of asset values.

Advocates of the full cost method feel that the balance sheet will show the total cost of the reserves that are held by the company, not just a part of the unrecovered costs attributable to the successful ventures. Since the hydrocarbon reserves are the major assets of an oil company, the proponents of full costing feel that the total cost of these assets should be shown on the financial statements for purposes of information and comparison.

A research study is presently being conducted by the American Institute of Certified Public Accountants of accounting practices in the extractive industries. In a preliminary report, Robert E. Field, director of the study, indicates that certain recommendations will be made with respect to the accounting and reporting practices of the petroleum industry.[32] The preliminary recommendations include the immediate expensing of prospecting costs, the deferral of exploration costs only if reserves are found, and the deferral of development costs only if applicable to specific reserves. While the study is not complete at the present time and will not be the official position of the American Institute of

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[32]Robert E. Field, "A Report on the AICPA Survey of Accounting Practices in the Extractive Industries," Oil and Gas Accounting: Financial Analysis and Reporting, ed. A. C. Ernst (New York, 1966), p. 188.

Certified Public Accountants, the preliminary report is worthy of consideration. The full cost concept is not consistent with any of the recommendations; the recommendations are, in fact, arguments against the full cost method of accounting. Increased comparability of financial statements and improvements in financial reporting are necessary not only for investors, but for regulatory purposes as well.

## Cost-Type Regulation

There is a possibility of regulation of the price of crude oil and natural gas liquids at sometime in the future.[33] Proponents of the full cost method of accounting believe that this method would be preferable in the event of possible added regulation. If costs are to be considered in the determination of prices for hydrocarbons, then it is necessary that all of the costs be considered. By capitalizing nonproductive exploration costs, the producer can reflect all of the costs in his rate base.[34] If the costs are not included in the accounting records, it is unlikely that they will be allowed as part of the rate base. By inclusion of the total costs, the oil company should be allowed to recover these costs as well as to earn a "fair rate of return" on its unamortized costs.

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[33]Donald E. Kliewer, "Could It Mean Further Control," World Oil, CLXIV (May, 1967), 7.

[34]S. D. Williams, "Accounting for Exploration Costs," Oil and Gas Accounting: Financial Analysis and Reporting, ed. A. C. Ernst (New York, 1966), p. 188.

The primary argument against the use of the full cost accounting, in view of the possibility of additional regulations under the jurisdiction of the Federal Power Commission or other agencies, is that in use of full cost accounting, one is assuming that it is possible to determine the cost of the reserves that are found. Within the industry there is a fairly predictable relationship between the number of wells drilled, total footage drilled, and the total reserves added. "It has not been demonstrated, however, that such a relationship exists for any individual company, and therefore the total costs of an individual company cannot logically be related to total reserves."[35] With or without the ability to relate total costs and total reserves, an increase in the regulation of the petroleum industry is possible for the future. Some of the immediate problems with respect to full cost accounting are concerned with the implementation of full costing.

## Problems of Implementing Full Costing

As far as can be determined, arguments dealing with practical aspects of full cost accounting are exclusively against use of the method.

Complete adoption of the full cost method of accounting requires a retroactive change to the inception of the firm's activities. In any company in existence for some period of

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[35]Porter, Petroleum Accounting Practices, p. 302.

time (or one which has undergone several mergers and acquisitions), the problems of a retroactive change become almost insurmountable. There is definitely a practical problem in the restatement of the amounts involved for the larger, more mature companies. If a retroactive change were to be made for the larger companies, there would be little, if any, difference in the reported income figures. Porter and others indicate the lack of difference in larger companies.[36] Adoption of the full cost method without a retroactive application leads to an immediate increase in the earnings, and yet there is no increase in the carrying value of the properties. Earnings are relieved of nonproductive costs, but the total cost of the reserves held is not shown. Adoption of full costing without retroactive application would apparently cast doubt on the validity of the method, since one of the advantages cited is that the carrying value of the assets represents the total costs involved in finding the reserves that the company holds.

Record keeping requirements would be increased through the adoption of full cost accounting. While it is true that depletion computations and many of the costs would be maintained in rather broad categories, it is also true that detailed records must be maintained for legal, tax, and analytical purposes. This argument against full costing is

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[36] Ibid., p. 322.

really rather weak; the additional records required for the full cost method are not extensive.

Some aspects of depletion or of amortization of the unrecovered costs give rise to problems that are also concerned with the economics of the industry and effects on reporting. Determination of the property unit for purposes of depletion computations presents one of the most significant arguments against the adoption of full cost accounting. What is the unit of property to be? The depletion or amortization charge is supposed to match the costs with the revenues. There is assumed to be some causal relationship between the revenues and the expense of producing those revenues. It has not been established that such a relationship exists on a company wide basis, although this might be possible where a company has directed all its efforts to only one area.[37] There is little relationship between the efforts in foreign operations and those of domestic operations.[38] The same rationale can be applied to inland exploration and offshore exploration, and the same lack of specific relationship exists between one field and another. Use of the full cost method of accounting requires the use of a company wide unit of property, but some concede that it may be desirable to separate domestic and foreign operations.[39] Others feel

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[37] Ibid., p. 302.

[38] Ibid.

[39] Arthur Andersen & Co., Accounting for Oil and Gas, p. 32.

that the managerial areas of interest should determine the property unit.[40] Opponents of the full cost method believe that the lack of consistency among companies using the full cost method invalidates some of the arguments made for its use.

Arguments against the use of the full cost method which are based on practical considerations are not the major arguments either for or against use of the method. The problems involved in implementing full costing must be given consideration but are not the determining factor in adoption of the full cost method.

### Summary of Full Cost Accounting

In recent years more than fifty wildcats have been drilled for every one discovery that the industry considered commercially profitable. Large amounts of capital are necessary in the exploratory phase of operations in the petroleum industry. Reporting on the expensive, high risk ventures of the petroleum industry has not been completely satisfactory. Difficulties in reporting arise from the alternative practices that are followed and from the fact that conventional practices have tended to expense everything that is not directly identifiable with the discovery and development of specific reserves. Proponents of the full cost method (in use since 1959) think that the use of alternative practices

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[40]Coutts, Accounting Problems in Oil and Gas, p. 28.

or the very conservative practices does not result in proper financial reporting.

The full cost method of accounting, or the total cost method as it is sometimes called, is a method of accounting for finding costs of hydrocarbon reserves in the petroleum industry. It involves capitalizing all productive and non-productive costs incurred in finding oil and gas reserves. Included in the amounts capitalized are costs of lease acquisition and maintenance, of pre-drilling exploration, of intangible drilling and development costs (whether the well is a producer or dry), and a portion of the general overhead costs of the concern. As oil and gas are produced, these costs are charged to income through use of a unit-of-production method of depletion. Generally depletion is computed on the basis of a company wide unit of property; however, the property unit in some cases may be continental or political boundaries, or areas of management interest, or geological boundaries of the natural resources.

Since the purpose of this study is to examine this relatively new method of accounting, several of the arguments advanced in support of each of the major practices have been given. The strongest argument in favor of adoption of the full cost method of accounting for finding costs is that the method is in accord with the economic facts of the petroleum industry. The cost of the hydrocarbon reserves is the sum total of expenditures that have been made in locating those

reserves; a more effective matching of effort and accomplishment results from charging a portion of the total costs against revenue production. Arguments against the use of the full cost method rest also on economic and reporting considerations. Opponents of the method maintain that capitalization of losses is not proper since the nonproductive expenditures do not represent assets which will benefit future periods and that full costing tends to obscure results of operations and financial position through the capitalization of losses and the use of broad averages. Use of the method, they contend, will result in a misallocation of resources within the industry.

Arguments for or against full costing have convincing merit. The method is in use, and while not widely used it is significant that at least forty-eight reporting entities have adopted the full cost method of accounting for finding costs in the petroleum industry. Some of the possible reasons for these companies' adoption of this method are discussed in Chapter V.

# CHAPTER V

## POSSIBLE REASONS FOR ADOPTION OF FULL COST ACCOUNTING

There are various possible reasons for petroleum companies to change to the full cost method of accounting for finding costs. The reasons are not, for the most part, attributable to influences within the companies themselves, but rather, are due to changes in the financial and economic environment of the entire petroleum industry.

A change from one method of accounting to another requires a decision on the part of management. The precise reason or cause of the change can never be known since the decision is based upon reasons known only to the corporate managers deciding to make a change in accounting methods. Thus, the real cause for making the change in methods is not subject to objective verification. Instead, inferences must be drawn from interrelationships of the stated reasons and the environmental factors facing the petroleum industry.

### Stated Reasons for Adoption of Full Cost Accounting

Whenever possible, the stated reasons for adoption of the full cost method of accounting were obtained directly from the companies; in connection with this research, questionnaires were sent to the financial officers of various

companies in the petroleum industry.[1] Since some companies known to be using the full cost method of accounting did not reply to the questionnaire, the returned questionnaires were supplemented where possible by an examination of the annual reports of the companies concerned. The usual reasons given in annual reports for adoption of the full cost method are that it offers a more desirable reporting through more satisfactory matching of revenue and expense and that it more accurately determines asset costs. Some companies have stated that it eliminated the undesirable effects of exploration programs. There were, of course, some companies from which no reasons for a change could be obtained. Lack of information on the reasons for making a change in accounting methods is attributable to the facts that not all of the companies replied to the questionnaires and that the annual reports were not available on all companies using the full cost method.

Table III summarizes the reasons given for adoption of the full cost method by thirty-nine of the forty-eight reporting entities known to be using the full cost method of accounting for finding costs in the petroleum industry. Most of the companies replying indicated several reasons for changing to the full cost method.

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[1]A copy of this questionnaire is included in Appendix A.

TABLE III

STATED REASONS FOR ADOPTION OF FULL COST ACCOUNTING*

| Reason Given | Number Giving This Reason |
|---|---|
| Cost of reserves are indicated by the total of such costs incurred in finding such reserves. | 27 |
| To aid in statement comparability between firms and industries. | 4 |
| Majority of non-integrated, non-major firms are using the method. | 2 |
| Avoid showing fluctuations or losses because of exploratory activities | 14 |
| Improve reporting through more accurate matching of revenue and expense | 25 |
| Pressure of financial analysts | 2 |
| Other reasons given. | 4 |

*Source: Questionnaires and corporate annual reports

Considering the answers and the failure of some companies to reply, it is not possible to state that a certain percentage of the companies changed because of a particular reason. The reasons most often cited for adopting the full cost method closely follow the major theoretical arguments given for use of the method. It may also be important that at least seven of the entities making the change to full costing merely stated that such was done, and did not give any reasons for making the change. The reasons given are not significant in

themselves, since the reasons given may or may not be the real cause for a change in the accounting methods of the corporation. It is also necessary to examine environmental factors, and ultimately even the results of a change, before any conclusions can be drawn regarding the reasons for the change.

## Environment of the Petroleum Industry

The success of a business organization and its continuing operation depends, at least in part, upon the ability to meet the demands imposed by its surroundings. Continued and increasing earnings are used by owners and others as the ultimate test of the success of a company. The climate faced by the petroleum industry today includes increasing costs within the industry, decreasing finds of hydrocarbons, demand-supply relationships, and the objectives of the investors.

### Increasing Costs Within the Industry

Increasing costs refers to an absolute increase in costs, or to an increase in costs relative to the price of the commodity. Within the past several years, costs in the petroleum industry have increased both on an absolute basis and on a relative basis. While the selling prices for raw hydrocarbons have increased, the costs of production have increased at a greater rate. The merging of the costs and sales prices could ultimately result in even additional problems for the marginal production company.

In the following table are given the costs for exploration and development expenditures which include amounts for leases and certain overhead charges and which accordingly will differ from estimates including only cost of the well:

TABLE IV

EXPLORATION AND DEVELOPMENT EXPENDITURES--YEARS 1955 AND 1960 THROUGH 1966*

| Year | Total Cost Per Well | |
|---|---|---|
| | Crude Oil | Natural Gas |
| 1955 | $ 86,272 | $ 88,000 |
| 1960 | 102,075 | 114,000 |
| 1961 | 101,680 | 116,000 |
| 1962 | 103,000 | 114,000 |
| 1963 | 107,500 | 111,000 |
| 1964 | 108,400 | 119,000 |
| 1965 | 109,000 | 117,500 |
| 1966 | 107,000 | 129,200 |

*Source: Data on crude oil from Henry J. Struth, "Rising Costs, Low Prices Are Discouraging Crude Oil Search," World Oil, CLXIV (May, 1967), 148. Data on natural gas from Henry J. Struth, "What the Cost-Price Squeeze Is Doing to Natural Gas Producers," World Oil, CLXIV (June, 1967), 142.

As indicated in this table, the cost of the wells increased significantly during the period under consideration, with a greater increase in cost being attributable to natural gas wells. Struth, a petroleum consultant, contends that this dramatic increase is due to the progressively greater depth at which new gas reserves are being found.[2]

[2]Henry J. Struth, "What the Cost-Price Squeeze Is Doing to Natural Gas Producers," World Oil, CLXIV (June, 1967), 139.

The production cost in relation to the sales price of the commodity is also a significant factor in the increasing costs of the oil industry. In the following figure, costs and selling prices of later years are expressed as a percentage of the same figures for 1955:

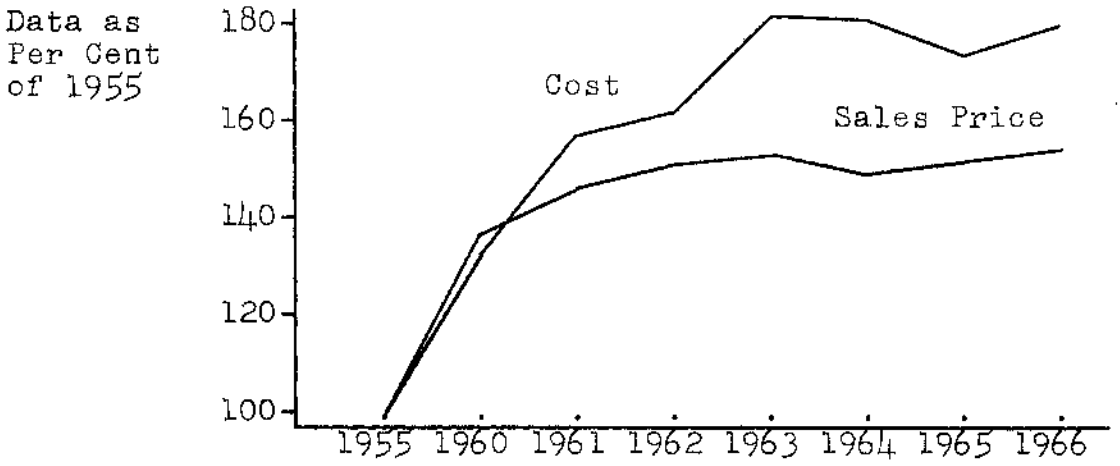


Fig. 2--Comparison of sales price and ultimate unit cost of natural gas with data expressed as a percentage of 1955 sales price and unit cost.

Source: Henry J. Struth, "What the Cost-Price Squeeze Is Doing to Natural Gas Producers," World Oil, CLXIV (June, 1967), 142.

While the chart shows data for natural gas only, the figures for crude oil exhibit the same basic pattern even though the increases in both costs and prices have not been so great.[3] For most of the period under consideration, the per unit costs increased by a greater percentage than did the selling prices of the raw hydrocarbons. If only rising costs and

[3]Henry J. Struth, "Rising Costs, Low Prices Are Discouraging Crude Oil Search," World Oil, CLXIV (May, 1967), 148.

declining prices for the raw products were considered, earnings determined as a rate of return on capital employed would have declined as well.

Earnings as a rate of return on invested and borrowed capital in the petroleum industry have been increasing moderately since the large decrease during and immediately after the Suez Crisis of 1956 and 1957. Even with the increases, however, the rate of return for the petroleum industry is not back to the level of 1956 and previous years. The following figure indicates earnings as a rate of return on invested and borrowed capital for the major oil companies over the past several years:

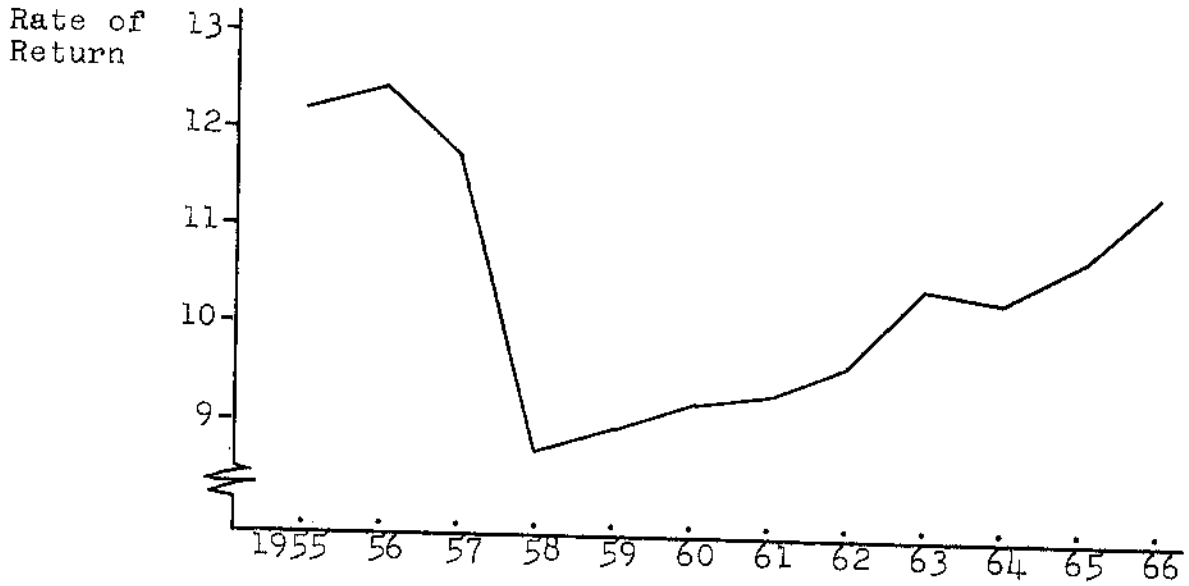


Fig. 3--Earnings of major oil companies expressed as a rate of return on invested and borrowed capital--Years 1955 through 1966.

Source: Chase Manhattan Bank, N. A., Financial Analysis of a Group of Petroleum Companies (New York, 1955 through 1966).

The Chase Manhattan Bank indicates that an increasingly larger share of earnings is coming from other than the production side of the petroleum industry.[4] Of course, earnings from other sources are not available to the non-integrated production company.

In the exploration and production phases of the petroleum industry, costs have increased in recent years both in absolute terms and in relation to the selling price of the raw hydrocarbons. This increase can be attributed to overall rising labor costs and to increases in the cost of the materials and contract work. An additional reason for the rise in costs is the increasing difficulty of locating hydrocarbon reserves at greater depths, in colder areas of Canada and Alaska, and at offshore locations.

## Decreasing Finds of Hydrocarbons

In terms of exploration and production of hydrocarbons, part of the increases in ultimate costs of the raw products is caused by the progressively more difficult task of finding hydrocarbon reserves. Those in the industry contend that a decrease in profit potentials accompanies the rising cost of products:

> During 1956-65, however, many factors combined to decrease profit prospects on new investments. These included reduced geological opportunities in well-explored areas, . . . and less attractive prices to

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[4]Chase Manhattan Bank, N. A., Financial Analysis of a Group of Petroleum Companies 1966 (New York, 1966), p. 10.

> producers. . . . Economic exploration opportunities have declined particularly for smaller operators.[5]

Unless the producing oil company can continually find new reserves in amounts sufficient to replace or increase the amounts of reserves held, the company may be producing itself out of business. Most of the domestic areas have been well explored and companies are finding it necessary to extend operations in order to locate sufficient quantities of new reserves. New exploration is taking place in deeper strata, in colder areas of Canada and Alaska, and in offshore areas.

In spite of advanced technology in the petroleum industry, the number of new-field wildcats required to find one significant discovery has also increased:

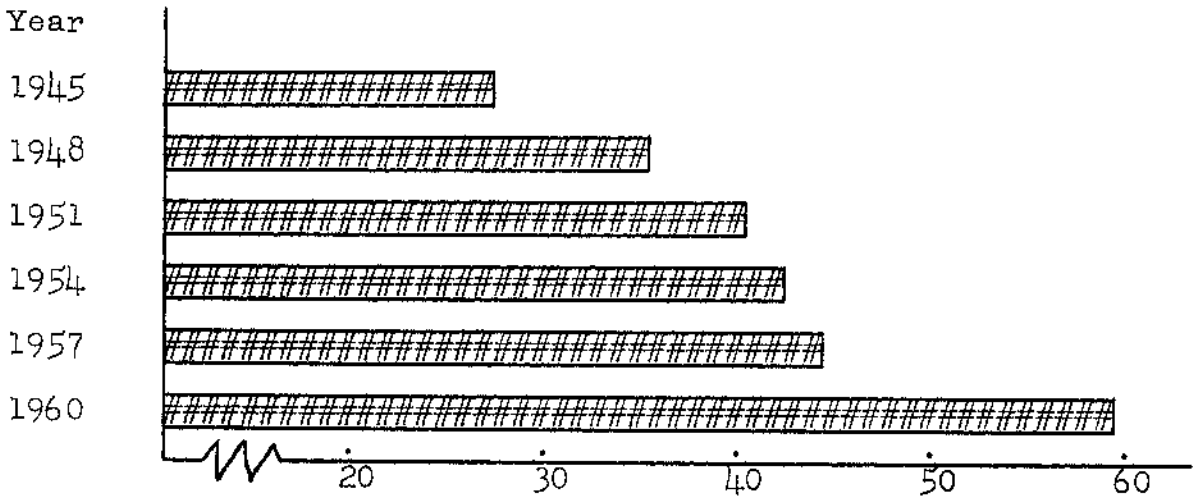


Fig. 4--Number of new-field wildcats required to find one significant discovery--1945 to 1960.

Source: American Petroleum Institute, Petroleum Facts and Figures, 1967 Edition (New York, 1967), p. 19.

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[5]"NPC Blames Long Drilling Slump on Deteriorating Profit Prospects," The Oil and Gas Journal, XLV (February 6, 1967), 49.

The implications of the increasing difficulty of locating new reserves are significant; the environment of the petroleum industry has become increasingly more complicated and the risks have increased. Risks, however, are unavoidable.

> The risks are many. Despite the petroleum industry's great technological and scientific advances in almost all the energy sources, there are no absolutes, and especially in the case of gas and oil we will still be dealing in areas of relative uncertainty.[6]

When the location of reserves is more difficult and the capi- requirements are greater,[7] the potential demand for products should be examined to determine the justification for continued exploratory efforts in the petroleum industry.

## Demand-Supply Relationships

There are numerous implications in the demand-supply relationships in the petroleum industry. Through a comparison of production and additional new reserves, it is possible to determine whether or not reserves are being replaced.

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[6]Edward C. Borrego, "Free World Oil Demand May Triple in 35 Years," World Oil, CLXI (December, 1965), 108.

[7]Increasing capital requirements are partly attributable to the increasing costs of greater depths. Moreover, the petroleum industry requires more capital than practically any other industry. The greater capital requirements are substantiated by the fact that of the industries included, the petroleum industry has had among the lowest sales per dollar of capital employed for several years in the "Survey of 500 Corporations," Fortune, annual issues. For all aspects of the petroleum industry, approximately 50 per cent more capital is required than in other industries. See Douglas H. Eldridge, "Rate of Return, Resource Allocation and Percentage Depletion," National Tax Journal, XV (June, 1962), 211.

Projections of the demand-supply relationships indicate the potential growth of the industry and the capital requirements necessary to attain that growth. Projections of demand-supply relationships will not be developed in this section, since they are more than adequately prepared by the research departments of some of the major industry publications,[8] by financial institutions, and by companies within the industry. Rather, some of the data concerned with demand and supply in the industry is presented to establish a pattern of sustained growth in the past, and what the industry believes to be needed growth in the future.

The long-range prospects for the petroleum industry are for continued growth. Energy needs have been growing at an annual rate of 4 1/2 per cent with oil requirements growing at the even greater rate of 6 per cent per annum.[9] Estimates indicate that by 1976 the Free World will be consuming 75 per cent more oil and gas than in the year 1966.[10]

Increased production in the short run would be possible with little real difficulty; however, other factors must also be considered. Any increase in the production level without

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[8]For example see the Annual Review and Forecast Issue of The Oil and Gas Journal which is generally published in the last week in January. The International Outlook and Review Issue of World Oil is usually published in the middle of August.

[9]"Oil to Ease Back a Bit This Year," The Oil and Gas Journal, LXV (January 2, 1967), 16.

[10]Ibid.

a corresponding increase in the hydrocarbon reserves, can weaken the ratio of reserves to production, since the industry would be replacing less reserves than it produces. The domestic production of crude oil has already exceeded the discovery of domestic reserves for some years, and it is projected that this will soon be the case in natural gas as well. The following table indicates production and reserve data for both oil and gas:

TABLE V

DOMESTIC PRODUCTION AND NEW RESERVES--
SELECTED YEARS FROM 1955*

| Resource and Year | Production | New Reserves |
|---|---|---|
| Crude Oil** | | |
| 1955 | 2,484 | 2,871 |
| 1960 | 2,575 | 2,365 |
| 1965 | 2,849 | 3,048 |
| 1966 | 3,039 | 2,963 |
| Natural Gas*** | | |
| 1956 | 10,908 | 24,851 |
| 1960 | 13,090 | 13,920 |
| 1965 | 16,333 | 21,273 |
| 1967 | 18,250 | 19,360 |

*Source: Data on Oil from Henry J. Struth, "Why More Capital Is Needed For Wildcatting," World Oil, CLXV (September, 1967), 66. Data on gas from "Day of Reckoning Drawing Near for U. S. Gas Supply," The Oil and Gas Journal, LXVI (February 5, 1968), 107.

**Millions of Barrels. ***Billions of Cubic Feet.

The purpose of the table is to show that in the case of oil, there have been years in which the production has exceeded

the new reserves which were found. While this has not yet happened in the case of gas, it is a likelihood soon. Those in the industry believe that the increasing usage of petroleum and the decreasing ratio of reserves to production for both oil and gas demonstrate the need for the development of new hydrocarbon reserves. The data, however, apply only to the domestic production and reserve situation and not to the entire industry on an international basis. Those in the industry further contend that a relatively constant price for crude oil in the face of rising exploration and development costs has undoubtedly curtailed new exploration.[11]

The need for increased hydrocarbon reserves is usually discussed at the industry level. However, the need for reserves is felt more acutely by individual companies. The continued existence, and growth, of any company depends upon profitable operations. In spite of growth of demand at the industry level, the increased costs and difficulty of finding reserves have made progress difficult for the non-integrated production company. Marginal production companies have experienced the greatest difficulty in meeting investor objectives.

## Investor Objectives

An important element in the present environment of the petroleum industry is the requirement that the company satisfy

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[11]Henry J. Struth, "Why U. S. Gas and Oil Reserves Are Not Keeping Pace With Production," World Oil CLXV (April, 1967), 130.

the objectives of the investors. The petroleum industry, and individual companies within the industry, cannot function nor continue to meet the many requirements placed on it without adequate capital; yet investors and lenders must be satisfied, in terms of profitability, before there can be a sufficient flow of capital into the industry.

Meeting the goals of investors proves increasingly difficult. Reserves are harder to find and costs have risen without a corresponding increase in the selling prices of the raw hydrocarbons. Some in the industry believe that new capital is required to expand exploration in order to meet projected future demands, and yet to attract capital it is necessary for the industry to show good profits. Because of the problems facing the petroleum industry, satisfying the goals of the investors is a very difficult necessity.

Some of the goals of investors are fairly easy to ascertain, at least in general terms, since they are merely the objectives which would be held by any individual investing funds in a business venture. Investors require that their investments return a profit in terms of dividends and/or growth in the market price of their investments; they also expect the profits of the company to increase. Goldberg indicates these goals of investors:

> The shareholders will be concerned (a) with the dividends paid and likely to be paid to them, which in turn involves consideration of the profit-earning capacity of the company, (b) with the security for

> their investment, for which the asset backing is a significant measure, and (c) with the potentialities of growth of their investment.[12]

In terms of growth, investors want not only increasing profits but also require an increase in the carrying value of assets. Since the petroleum industry is considered a high risk type of industry, investors will require a somewhat higher rate of return on their investment in this industry than they would in a more secure investment.

The investors learn the extent that their objectives are met through the various communications or reporting of economic data pertaining to the corporation. Myers stresses the necessity of adequate reporting to all persons connected with the corporation.

> The question can certainly be raised as to the extent of the obligation to report to external audiences. In addition to any legal requirements, public corporations have a substantial obligation to report to the public and other outside groups. They draw upon creditors for funds, employees devote a substantial part of their everyday lives to the company, customers . . . governments . . . The magnitude of this general interest in a corporation's affairs bestows upon a corporation an obligation to provide dependable and relevant information to all concerned in its affairs.[13]

The shareholders must read the annual reports, or other reports of a financial nature very carefully; and management of the corporations should make the reports as dependable and

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[12]Louis Goldberg, An Inquiry Into the Nature of Accounting (Menasha, Wisconsin, 1965), p. 289.

[13]George V. Myers, "Accounting--Missing or Connecting Link," Financial Executive, XXXIII (August, 1965), 25.

as meaningful as possible. Bevis indicates that corporate financial reporting and accounting has evolved from, and responded to, the social and economic environment; the reporting is now good, but it will evolve further through the interaction of the environment and information needs of the investors.[14]

Parts of the economic environment have remained basically the same, such as the objectives of investors who have generally desired dividends, security, and growth. Changes within the economic environment, however, have made satisfaction of objectives increasingly difficult.

### Changes From Prior Economic Environment

Many changes in the economic environment of the petroleum industry have been indicated in setting out parts of the present environment. The location of hydrocarbon reserves is both more difficult and more expensive than had been the case in previous years. With current heavy or even excessive production of hydrocarbons, the prices have been depressed. Attempts to satisfy investor objectives in the face of these changes in the environment of the industry has resulted in strenuous competition within the petroleum industry. Additional changes in the environment affecting competition in the industry have included increases in the amount of stock

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[14]Herman W. Bevis, Corporate Financial Reporting in a Competitive Economy (New York, 1965), p. 1.

in the hands of the public, the effects of governmental influence, and pressures imposed by the financial community.

## Increased Stock Outstanding

The number of all corporate shares outstanding in the hands of the public has greatly increased in the ten year period from 1957 to 1966. The number of companies listed on one of the major stock exchanges[15] and the number of persons owning stock[16] indicate this increase. With one out of every seven shareowners owning stock in the oil industry,[17] the number of shares and the number of shareowners has increased in the petroleum industry.

Twenty companies, from those replying to the questionnaires, were selected for consideration of changes in stock outstanding. No attempt was made to obtain a random sample since many of the companies were not in existence in 1957 and some of them are subsidiaries of other oil companies or of conglomerate enterprises. Rather the chosen companies were selected on the basis of: (1) the companies must have

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[15]New York Stock Exchange, 1967 Fact Book (New York, 1967), p. 71. The number of listed companies rose from 1,107 to 1,286 in this period and the market value of the stocks rose from $195.6 billions to $482.5 billions.

[16]Ibid., p. 35. In 1956, one out of every twelve adults owned stock for a total of 8,630,000 shareowners. In 1965 this had increased to one out of every six adults owning stock for a total of 20,120,000 shareowners.

[17]Andrew R. Cecil, "Opening Remarks," Oil and Gas Accounting: Financial Analysis and Reporting, ed. A. C. Ernst (New York, 1966), p. iv.

been in existence in 1957, (2) ten of the companies must be using the full cost method of accounting and ten must not be using the method, and (3) subsidiary relationships must be avoided. The number of common shares outstanding at the end of 1957 and 1966 accounting years was obtained.[18] After making any adjustments necessary for stock splits and stock dividends, the percentage of increase was obtained. The stock outstanding in 1966 was approximately 150 per cent of that in 1957 for companies using the full cost method; for companies not using the method the amount outstanding was approximately 128 per cent. As a group, the companies using the full cost method represented younger, growing companies.

With a slightly higher increase in the number of shares outstanding for the companies using the full cost method as opposed to those not using the method, it is possible for an increase in the number of shares outstanding or of the number of shareholders to be one of the reasons for some of the companies adopting the full cost method.

In the case of closely held corporations, the owner-operators have all of the financial information that is needed for financial decisions. In widely held corporations, the owners do not have sufficient information. In moving from closely held to publicly held corporations, the importance of the single net income figure is greatly increased.

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[18] Moody's Industrial Manual (New York, 1958 and 1967.

## Effects of Governmental Influence

The effects of governmental influence are as noticeable in the petroleum industry as in any industry. In the exploration and production phases of the industry, governmental influence exists in granting leases, in determining spacing requirements, in setting the production allowables, in establishing the amount of income to be made in some cases, in setting reporting requirements, and in a wide variety of other areas. Some within the petroleum industry believe not only that governmental influence exists within the industry, but also that the governmental influence will continue to increase. "Government's growing involvement in the petroleum industry, therefore, results from its broad range of interests in the industry. It is a policy-maker in a multitude of areas. And it is the administrator of numerous programs designed to carry out these adopted policies."[19] Government influence or control originates from many sources; some of these should be mentioned.

Securities and Exchange Commission--The Securities Acts have been amended through the years with the aim of providing that financial statements available for distribution will, in fact, be dependable. However, a large portion of financial reporting is not covered by any specific rules of the Securities and Exchange Commission. The Commission

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[19]Don E. Lambert, "Major Challenges Discussed at IPAA Mid-Year Meeting," World Oil, CLXII (June, 1966), 12.

requires that the financial statements of a publicly held corporation be certified to by an independent public accountant. However, certification does not assure that the financial statements will be comparable since one of the main considerations is the use of generally accepted principles of accounting. Some of the current controversy over financial reporting is attributable to the use of alternative generally accepted accounting principles. There is concern that the disclosure provisions of the securities laws, as they are now being applied, do not produce the quality nor quantity of information needed for informed and undistorted trading.[20]

The Securities and Exchange Commission has not made any general pronouncements on the subject of full cost accounting in the petroleum industry.[21] The Commission does accept reports of companies that use the full cost method of accounting. However, the Commission's acceptance of use of the method by companies is determined on an individual company basis. With respect to the method itself, at present the Commission can neither be said to be in favor of, nor against, the use of full costing.

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[20]Manuel F. Cohen, "Public Policy, The Securities Markets and Institutional Investing," The Journal of Accountancy, CXXIII (January, 1967), 56.

[21]Letter from Walter Mickleson, Chief Accountant, Division of Corporation Finance, Securities and Exchange Commission, December 11, 1967. A copy of this letter is included in Appendix A.

Federal Power Commission--The Natural Gas Act of 1938 gave the Federal Power Commission the authority to regulate the prices paid in gas sales made in interstate commerce. Until 1954, the provisions of this act were not assumed to be applicable to producers of natural gas.[22] Based upon an examination of data, the regulated entity is allowed to charge prices which are supposed to allow the recovery of cost plus a "fair" rate of return based on the cost of the investment.[23] Founded on either the historical cost basis or on the current cost basis for determination of a rate base, the determination of the costs becomes of prime importance.

At this point, the Federal Power Commission has rejected the full cost method of accounting for finding costs in the petroleum industry as not being adequately supported. The present rejection of the method does not rule out its possible future acceptance for rate making purposes. Regulation of prices paid for gas in interstate commerce is not the sole consideration of the Federal Power Commission. Rates must be allowed which will provide for a continued and even increasing supply of natural gas. Even though the full cost method is presently rejected, the Commission will give further

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[22]Stanley P. Porter, Petroleum Accounting Practices (New York, 1965), p. 264.

[23]Ibid., p. 265.

consideration to it and to other methods of accounting which might facilitate regulatory activities.[24]

The Federal Power Commission is considering "the possibility of using the true yield method rather than an expensing of exploration and development costs."[25] No indication was given as to precisely what the "true yield" method is; but where the exploration and development costs are not expensed, a reasonable assumption is that the "true yield" method and the full cost method are the same. Consideration of another method is in line with a policy of trying to improve regulatory activities even though the mathod might not be accepted initially.

The Federal Power Commission has not accepted the full cost method of accounting at the present. However, the possibility of increasing the rate base for regulatory purposes, with its corresponding increase in the revenues of a concern, could be considered a possible reason for some companies' adopting the full cost method of accounting.

Other Governmental agencies--Within the last year or two, there has been an increase in governmental regulation which affects the petroleum industry. The significance of additional dicta is that the rules have been imposed by

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[24]Letter from Arthur L. Litke, Chief Accountant, Federal Power Commission, April 17, 1968. A copy of this letter is included in Appendix A.

[25]Don E. Lambert, "Major Challenges Discussed at IPAA Mid-Year Meeting," World Oil, CLXII (June, 1966), 43.

agencies which had not previously engaged in extensive regulatory activities. Specifically, the involvement of the Department of Interior has caused much discussion. Early in 1967, the Department of Interior announced that it would set offshore allowables.[26] Discussion in the petroleum industry has not been directed primarily at the existence of federal proration; there is anxiety, however, over added federal involvement in the petroleum industry. The anxiety within the petroleum industry is not merely over the one or two agencies that may be seeking additional controls; rather, the implications are for all of the governmental agencies and their future regulations. Some companies within the industry forsee the probability of more numerous and more stringent controls for the petroleum industry.[27]

The various governmental agencies are part of the surroundings of the petroleum industry. The activities of these agencies with respect to the petroleum industry have been changing just as have other parts of the environment. With increased governmental involvement in the petroleum industry affairs, governmental activity is a potential influence on petroleum industry accounting. At the present time, and in spite of this being an often advanced argument in

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[26]Gene T. Kinney, "U. S. Taking Over Proration in Federal Waters," The Oil and Gas Journal, XLV (January 9, 1967), 43.

[27]Donald E. Kliewer, "Could It Mean Further Control," World Oil, CLXIV (May, 1967), 7.

favor of full costing, governmental actions have had no direct influence on petroleum accounting. The governmental agencies are merely a part of the overall surroundings of the petroleum industry. As the result of a general maturity of the petroleum industry, some pressures within the financial community have influenced accounting practices to portray favorable results where possible.

## Pressures Imposed by Financial Community

The pressures imposed by the financial community are not explicit in nature. Rather, the pressures are part of the environment that must be faced by companies operating within the petroleum industry. Part of these surroundings include the increased attention of financial analysts, the general maturity of the industry, and the continuing need to satisfy stockholder objectives.

Attention of financial analysts--In the period from 1956 to 1965, both the number of shares and the number of shareowners more than doubled.[28] The size of the companies involved in all industries also increased. Investment decisions are sometimes the result of mere whims; but these decisions are also based on careful analyses, prepared in some cases by the financial analyst.

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[28]New York Stock Exchange, 1967 Fact Book, p. 35.

Financial reports are one of the primary sources of information for the analyst in evaluating various companies. The financial reporting of corporations does not furnish all of the necessary invormation, and at times the reports are difficult to interpret properly. Analysts and the securities markets expect the financial statements of the listed companies to be prepared in accordance with generally accepted accounting principles.[29] Specifically with respect to full costing, implications are that efforts of the New York Stock Exchange are to encourage the narrowing of existing alternative accounting practices.[30] Outside of this area of alternative accounting practices, the New York Stock Exchange has not taken any position even though it recognizes many of the problems present in the petroleum industry. In an address before a group of the American Petroleum Institute, G. Keith Funston of the New York Stock Exchange mentioned this situation:

> A "credibility gap" appears to be developing as the result of the proliferation of alternative accounting practices which can, and often do, produce materially different figures of net income and earnings per share under similar circumstances.
> . . . . . .

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[29]Letter from Morton B. Solomon, Executive Assistant, New York Stock Exchange, January 25, 1968. A copy of this letter is included in Appendix A.

[30]G. Keith Funston, President of the New York Stock Exchange, "Financial Reporting for the Investor," Unpublished address given before the Executive Committee of the American Petroleum Institute, February 2, 1967. A copy of this address is included as Appendix B.

> These non-conventional accounting procedures may not always have an impact on the earnings of the majors, but they can and do have a drastic effect on the earnings of smaller companies.
>
> . . . . . .
>
> It also illustrates the need for disclosure on a continuing basis of the particular practices being followed and of the impact on earnings of variations from preferred industry practices [Emphasis supplied].[31]

As spokesman for the Exchange, Funston implies that the New York Stock Exchange prefers to let the petroleum industry determine what the preferred practices are. If alternative practices can be justified and are used, a continuing, not merely initial, disclosure of the differences between the methods should be given. It may be significant that in all of the replies and annual reports that have been examined in connection with this study, not one company has followed the policy of continuing disclosure.

Funston's statement above is the only indication that was found of pressure on the part of financial analysts or the exchanges to influence reporting practices in the petroleum industry in the United States.

General maturity of the industry--The petroleum industry has come a long way since the first commercial well in 1859. Initial operations in the industry can be characterized as wild speculation and exploitation. Profits, and losses, could be spectacular. Yet, the possibility of large quick

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[31] Ibid.

profits laid the groundwork for development of the petroleum industry.

Competition was almost nonexistent in the period from 1870 to 1910 as the result of the rise of the giant Standard Oil Company. With the dissolution of this giant, and several significant discoveries of oil, an appearance of competition, at least, was restored to the industry. In this same period following 1910, vertical integration of oil companies began to develop. Rapid expansion in the industry continued until even after World War II with great development in the natural gas and petrochemical sides of the industry.

With the development and general maturity of the industry have come significant changes. After initial exploitation in the industry and the influx of firms seeking large profits, the profit margins have decreased. As desirable locations and areas have been developed, exploration has had to move into more difficult regions. These regions are more difficult because of inaccessability, climatic factors, and the requirements for exploration of deeper horizons. Integration and growth of the companies involved in the industry has permitted the concentration of production in a relatively few large companies as indicated by the fact that roughly 60 per cent of the Free World production of crude oil is produced by twenty-nine major oil companies.[32]

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[32]Chase Manhattan Bank, N. A., Financial Analysis of a Group of Petroleum Companies 1966 (New York, 1967), p. 6.

The growth of the industry, and particularly some of the companies within the industry, has led to opposing or countervailing power to some extent on the part of various governmental groups. The growth and maturity of the industry, and of companies within the industry, has also led to keener competition within the industry for a greater share of the hydrocarbon reserves, for additional distribution outlets, and ultimately for increased profits.

Even integrated companies roughly the size of some of the majors have felt the pressure of increased competition from the giant corporations. In some cases these companies have sold their properties to others within the major grouping, and some have revised their operations. With the extremely rapid technological innovations in the petroleum industry and the greater difficulty in discovering reserves, the smaller companies within the petroleum industry have had to find ways of raising greater amounts of capital in order to compete with the larger companies in the industry as the profit margins within the industry have decreased. The acquisition of additional capital within the petroleum industry, just as within other industries, has required the continuing satisfaction of investor objectives.

Satisfaction of investor objectives--What does the continuing satisfaction of investor objectives have to do with some of the petroleum companies changing to full cost accounting? Management must attempt to satisfy the goals of

investors for profits, increasing profits, and increasing asset values. Only then can management meet its own goals. In a petroleum company the objectives of management include discovering and producing hydrocarbons, making and increasing profits, attracting adequate capital, and staying in business.

Management in the petroleum industry is extremely profit-minded[33] and having access to all financial information, has been able to determine the effect on reported earnings of a change to full cost accounting. According to the hypotheses under consideration, a desire to achieve the expected results of a particular method of accounting is the reason for adopting or changing to that method of accounting. This is similar to original reasons for going into business. Bedford indicates that "when the desire for business income motivates economic activity, it is the expectation of the income, rather than the realization of it, which causes the activity. . . . the motivation of business activity is expected future income."[34]

Specifically, if the hypotheses are true, full costing has been adopted because of the expected effects of use of the method. There may be a desire on the part of some

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[33]"The Dynamic Oil Industry," The Magazine of Wall Street, CXVI (April, 1965), 97.

[34]Norton M. Bedford, Income Determination Theory: An Accounting Framework (Reading, Mass., 1965), p. 24.

managements to present more favorable results. This might be questionable, since the petroleum industry has consistently earned a higher rate of return on stockholders' equity than has all industry:


Fig. 5--Earnings expressed as percentage rate of return on stockholders' equity.

Source: Monthly Economic Letter, annual April issues, First National City Bank of New York.

The difference, or premium on earnings of the petroleum industry, has been narrowing, as evidenced in recent years. These are averages and the individual companies have done better, or worse, in the time under consideration; the majority of changes to full cost accounting took place in 1963 and 1964. Perhaps some managers did desire a more favorable reflection

of the company's efforts and progress. As will be shown in Chapter VI, it is possible to increase earnings and thus to show a better rate of return in the short run, through use of the full cost method of accounting. Where alternatives exist, it is only natural to choose the one presenting the more favorable picture; "putting your best foot forward, an understandable human trait, is still the rule in reports."[35] This is a frequently expressed thought.

> Management, having relatively short tenure, is becoming more a steward than an owner. There is a tendency on the part of some . . . to put the best reflection on their stewardship in terms of profit and loss, earnings per share, and balance sheet treatment.[36]

Earnings alone, or increasing earnings, is not sufficient to meet the requirements of investors. A steady pattern of earnings is also important; this amounts to a desire for normalized earnings or the elimination of severe fluctuations in the earnings pattern.

While the petroleum industry (as indicated in Fig. 5) has consistently earned a higher rate of return on stockholders' equity than has all industry, more relevant comparisons involve averages for the petroleum industry and for companies which have changed to full cost accounting. Earnings for these categories are indicated in the following figure.

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[35]Andrew Barr, "Trends in Corporate Financial Reporting," Financial Executive, XXXV (September, 1967), 16.

[36]Carl L. Blumenschein, "Public Confirmation of Accounting Principles," Financial Executive, XXXV (March, 1967), 20.

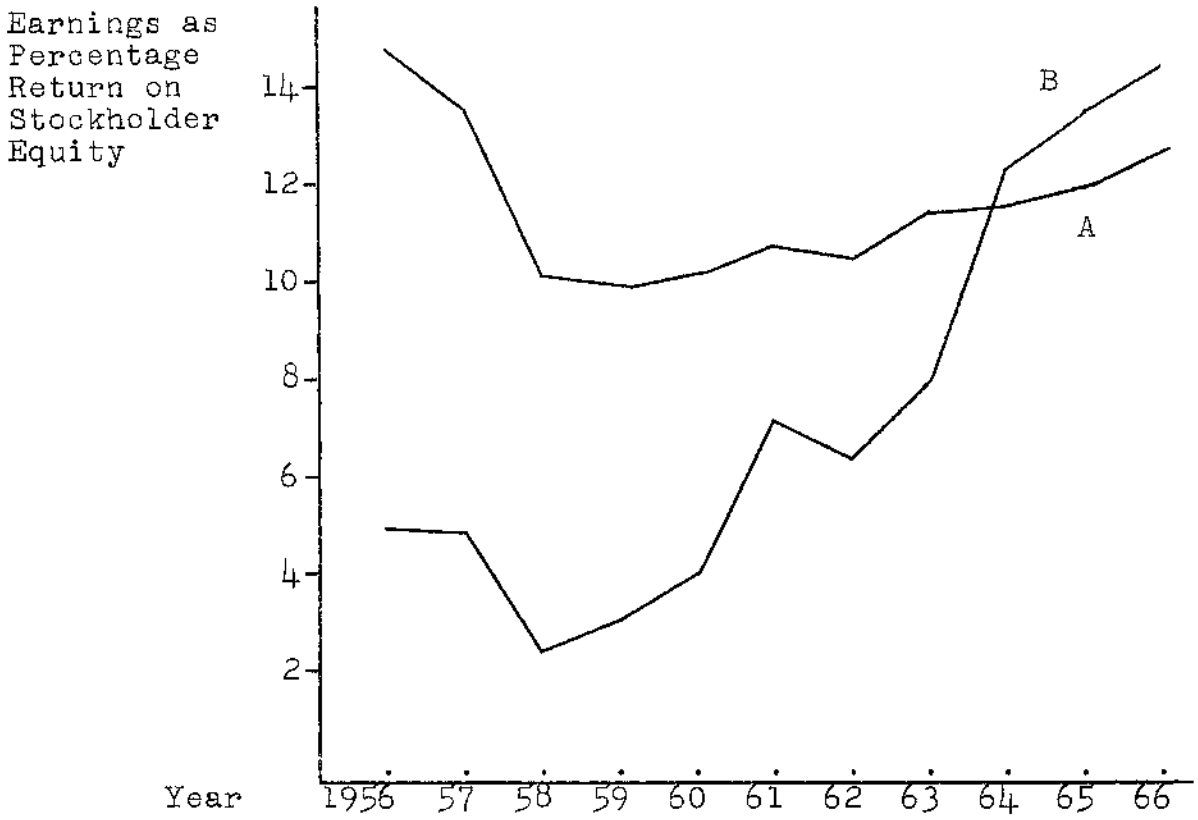


Fig. 6--Earnings expressed as a rate of return on stockholders' equity.

A--Industry averages as given in the First National City Bank Monthly Economic Letter.

B--Earnings expressed on full cost basis for companies which have changed to the full cost method.

Source: First National City Bank of New York, Monthly Economic Letter, annual April issues, for the industry averages. Other data obtained from companies and from annual reports.

As indicated in Figure 6, the rate of return on stockholders' equity for companies changing to full costing has been substantially lower than the averages for the industry. Even though the earnings of the full cost companies have been well below the industry figures, or even marginal in many

cases, the use of the full cost method has made their performance appear (as is indicated in Ch. VI) substantially better than with the use of conventional accounting. In recent years the use of the full cost method of accounting for these companies has changed subnormal rates of return to supra-normal rates of return.

With the changes that have taken place in the environment of the petroleum industry and the relative position before change of the companies making the change to full costing, the managements of these companies must have desired an improvement in their indicated performance and advantages for future improvement. In view of fairly rapid growth and recently improved earnings trends, added capital has flowed to many of the companies which have adopted full cost accounting. Greatly improved earnings and additional capital have given a competitive advantage to these companies which have adopted full cost accounting in the petroleum industry.

It is submitted that the full cost method of accounting has been adopted by companies in order to secure competitive advantage through beneficial effects upon financial statements.

## Summary of Possible Reasons for Adoption of Full Cost Accounting

One of the purposes of this study was to examine some of the possible reasons for some of the companies in the petroleum industry changing from another presumedly generally accepted method of accounting to the full cost method of

accounting for finding costs. Stated reasons for the use of the full cost method were obtained through the use of a questionnaire which called for personal comments and from annual reports furnished to the stockholders. Where unsupported comments are given, the question always remains as to whether the reasons stated are in fact the real reasons for the action taken.

While certain things have had a definite influence upon the petroleum industry, the surroundings of the industry should be viewed, as much as possible, in their entirety. To support, or modify as the case might be, the reasons given for use of one method of accounting or another, certain environmental factors facing the petroleum industry now and in the past few years, were examined.

Costs within the industry have increased both absolutely and relatively in recent years. Production costs have risen faster than the selling price of the raw hydrocarbons. Despite many improvements and efficiencies throughout the industry, the increase in costs still remains a problem. It is also becoming increasingly more difficult to find hydrocarbon reserves. Increasing costs and greater difficulty in the location of reserves both add to the increase in the cost of hydrocarbon reserves. The increased difficulty in locating reserves is indicated by the fact that the number of new-field wildcats required to locate a significant discovery has increased from twenty-seven in 1945 to fifty-nine in 1960.

In spite of increasing costs and a greater difficulty in the locstion of hydrocarbon reserves, the demand for crude oil has been growing at an annual rate of 6 per cent. To maintain reserves at an adequate level in view of future demands, some within the governmental agencies and within industry believe there is some urgency for additional development and exploration. An increase in exploration, and the discovery of reserves, requires that companies have profitable operations.

Profitable operations are required in order to attract the needed capital to the industry. Investors and lenders must be satisfied in this respect before the needed capital can be obtained. With continual changes in the surroundings of the industry, satisfaction of investor objectives is increasingly more difficult.

The general maturity of the industry has had a great deal of effect upon the industry. The integration of companies has brought about several changes. With fewer, but larger, companies there has been some lessening of competition within the industry. There has been some decrease in profit margins and a concentration of production in the hands of the larger companies. In reply, there has, to some extent, developed a countervailing power in the added involvement of government in industry affairs. Rapid technological developments and increasing capital requirements have been the rule in recent years. Changes in the environment and the

maturity of the industry have contributed to increasingly keener competition in the petroleum industry for additional reserves, for outlets, and for profits.

More strenuous competition in the industry has made the satisfaction of investor objectives much more difficult. Yet, these objectives must be met if a company is to attract capital and continue to grow. Satisfaction of the objectives of investors requires profitable operations. Companies which have now adopted the full cost method of accounting were, as a group, earning materially lower rates of return on stockholders' equity than the averages for the industry. In some cases, the returns were even marginal. The full cost method of accounting was adopted by companies in order to secure competitive advantage through beneficial effects upon financial statements. The overwhelming majority of companies have not chosen to adopt this method of accounting. For the firms who have, application of the method has produced the appearance of materially better performance. The actual effect of application of the full cost method is discussed in the next chapter.

# CHAPTER VI

## IMPACT OF FULL COSTING ON FINANCIAL STATEMENTS

A change from conventional accounting practices to the full cost method of accounting in the petroleum industry has effects upon the income statement and upon the statement of financial position of a concern. The effects of a change in accounting methods are examined in this chapter through a comparison of results obtained using both the conventional practices and the full cost method. A statement of the effects gives credence to the possible reasons indicated for companies having adopted the full cost method of accounting.

The determination of income and of the values to be included on the balance sheet of a firm is indeed a complex process. Yet, the majority of items can be held constant while the effects of changes in one or a few of the variables are examined. Black indicates that individual financial transactions can be examined:

> The observation that a given revenue or expense transaction has a known effect on income is not invalidated by the fact that income results from a combination of all resources. The effects of particular transactions on total income can be traced convincingly and usefully because analyzing and recording individual transactions is the very basis of accounting.[1]

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[1]Homer A. Black, Interperiod Allocation of Corporate Income Taxes (New York, 1966), p. 71.

In an examination of the effects of a change to the full cost method of accounting, the treatment of major categories of expenditures were examined. In determining the effects of a change in methods, no additional information could be obtained by examining individual transactions from within the grouping of similar items.

## General Effects of a Change in Methods

As an indication of the direction of this chapter, some discussion of the general effects of a change to full cost accounting is given before an examination of the specific effects. Most of the primary data examined was obtained from corporations that are using the full cost method of accounting and which were contacted by survey connected with this research. Additional data were obtained through reference to published annual reports of these and other corporations using full costing. The effects considered are those pertaining to the income statement and the balance sheet of concerns changing to the full cost method of accounting.

### Income Effects

From the data obtained, comparisons were made of the income computed using the full cost method and the income computed using the conventional accounting practices. The general effect upon income of a change to the full cost method of accounting was an increase in income in the year that the method was initially applied and in subsequent years.

In most cases the increase in reported earnings, attributable to a change to the full cost method, was significant. The amounts of the increases ranged from approximately 10 per cent up to several hundred per cent over what the earnings would have been through use of conventional practices. The increases in reported earnings attributable to a change to the full cost method of accounting are indicated in the following figure for a group of companies.

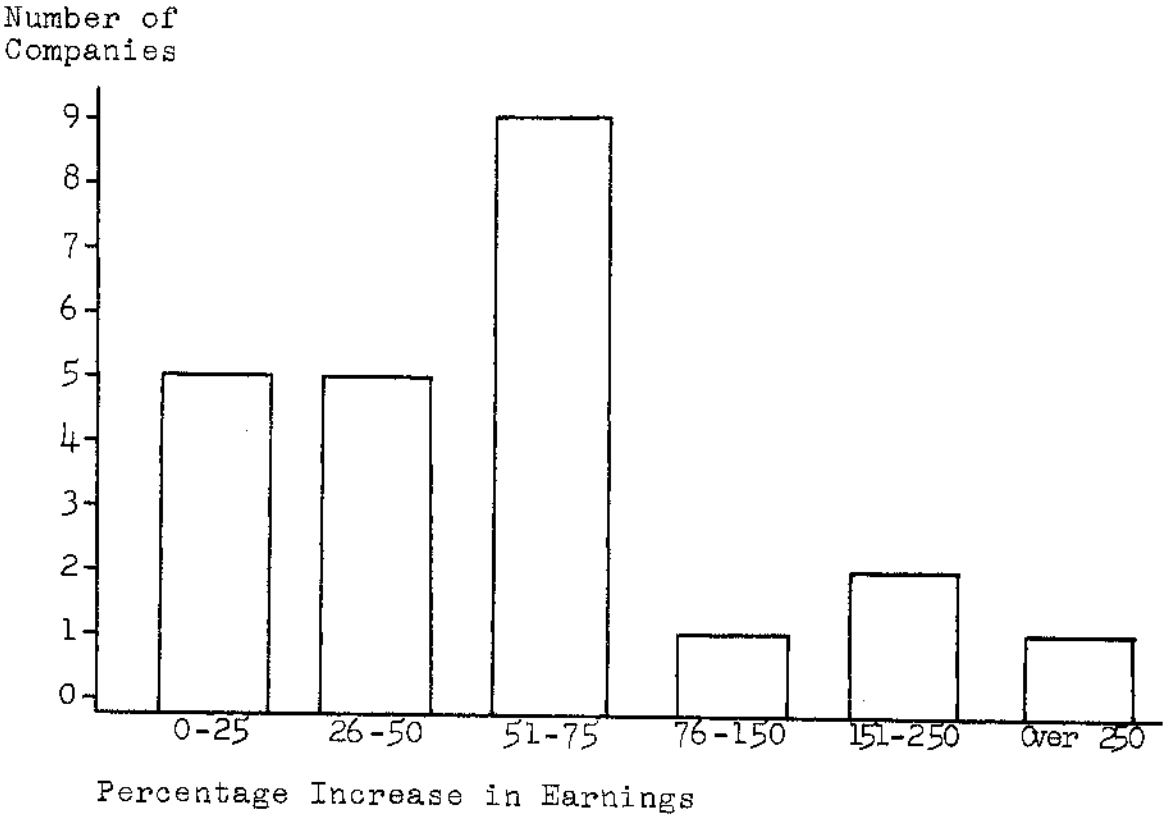


Fig. 7--Percentage increase in earnings attributable to first year of application of full cost method of accounting for twenty-three companies.

Twenty-eight companies' figures were used. Under conventional accounting practices, five of the twenty-eight companies

indicated a net loss for the year. The losses for two of these five companies were decreased as the result of changing to the full cost method. Because of the change to the full cost method, the remaining companies reported profits instead of losses. Of the twenty-three companies indicated in the above figure, the reported earnings of nine of the companies increased between 51 and 75 per cent as the result of changing to the full cost method of accounting.

In addition to an initial increase in the reported earnings of a concern, use of the full cost method also has an effect upon the income for a series of years. Income for a period of several years is increased; and, further, there is a noticeable smoothing of the fluctuations in the reported earnings. The full cost method of accounting, with its composite method of computing depletion, is essentially a broad based average. Extreme fluctuations in earnings are not present when averages are used and the nonproductive expenditures are not allowed to influence the reported earnings. The use of broad averages contributes to smoother, normalized earnings.

## Balance Sheet Effect

Not all of the effects of a change to the full cost method of accounting are shown on the income statement or on a series of income statements; the statement of financial position is also affected. However, the effect to the

balance sheet is not so noticeable in the year that the method is first employed. Increases in the reported earnings are attributable to the fact that nonproductive expenditures are capitalized rather than currently charged against the income from production of oil and gas. Since the items are capitalized rather than expensed, the carrying value of the oil and gas properties will be increased by precisely the same dollar figure as the reported earnings have increased. With total assets being a significantly higher base than the total income, the change to the carrying value of the properties is not as noticeable. However, the increase in the carrying value of the properties does exist. The general effects to the balance sheet are not always immediately apparent.

### Retroactive Application of Full Cost Accounting

When a company uses the full cost method of accounting, the amount of reported earnings will change depending upon the manner in which the full cost method is applied. Differences here are not meant to include differences which will arise out of the application of a different percentage to overhead to be capitalized or the capitalization of a minor expenditure. The specific concern is whether a company will apply the full cost method of accounting on a retroactive basis.

Retroactive application of the full cost method involves the reinstatement of net nonproductive costs back to the

inception of the company, or, for at least a production cycle. A production cycle is that period of time required to locate and produce the hydrocarbon reserves. If, for example, a company locates reserves that usually produce for a period of twelve years, then the production cycle for this particular company is twelve years. Every twelve years the company has completely replaced its reserves. A retroactive adjustment results in adding back all of the nonproductive finding costs as the cost of oil properties, for the entire production cycle. A partial offset to the increase in property is the addition to the accumulated depletion account for the depletion that would have been claimed on the increased asset values. The adjustment could be further complicated by the use of deferred taxes which is discussed in the next section. However, for purposes of the immediate section, the subject of deferred taxes is not considered. The retroactive adjustment that is considered is the difference between the increases in the asset values and increases in the accumulated depletion. The adjustment has usually been shown as an extraordinary increase in the retained earnings of the corporation.

One of the reasons given by companies for use of the full cost method of accounting is to charge the full or total cost of the reserves to the revenues realized from the production of the reserves. However, most companies do not follow the method completely and make the retroactive application of costs. Adoption of the full cost method without a retroactive

application of the method lets the full revenues be taken into earnings but only applies a portion of the "total costs." In the following table, hypothetical data are used to illustrate this situation. The only variables concern the question of a retroactive application of the full cost method. Several assumptions must be made in this case: net income in each year is assumed to be $1,000 computed under the conventional methods used by the majority of the petroleum industry; the total of nonproductive expenditures which are capitalized under full costing amount to $1,000 per year; production is at the rate of 8 per cent per year of reserves as originally discovered; and deferred taxes are not considered in this illustration.

TABLE VI

COMPARISON OF ADOPTION OF FULL COSTING WITH AND WITHOUT RETROACTIVE APPLICATION OF METHOD*

| (a) Year | (b) Cumulative Expenditures Capitalized | (c) Depletion For Year on (b) | (d) Retro-active Adjustment | (e) Income Difference Retro-active | (f) Income Difference Not Retro-active |
|---|---|---|---|---|---|
| 1 | $ 1,000 | $ 80 | $ 920 | $920 | $920 |
| 2 | 2,000 | 160 | 1,760 | 840 | 920 |
| 3 | 3,000 | 240 | 2,520 | 760 | 920 |
| 4 | 4,000 | 320 | 3,200 | 680 | 920 |
| 5 | 5,000 | 400 | 3,800 | 600 | 920 |
| 6 | 6,000 | 480 | 4,320 | 520 | 920 |
| 7 | 7,000 | 560 | 4,760 | 440 | 920 |
| 8 | 8,000 | 640 | 5,020 | 360 | 920 |
| 9 | 9,000 | 720 | 5,300 | 280 | 920 |
| 10 | 10,000 | 800 | 5,500 | 200 | 920 |
| 11 | 11,000 | 880 | 5,620 | 120 | 920 |
| 12 | 12,000 | 960 | 5,660 | 40 | 920 |

*Source: Hypothetical data.

At the beginning of operations, the results are the same regardless of whether the change is made on a retroactive basis. As indicated in columns (e) and (f), however, the reported earnings using the full cost method are $920 more than would be the case if conventional practices are used. If a change to full costing occurs in the twelfth year of operations, the application of a retroactive adjustment is significant. For most of the companies making the change to full costing, a retroactive adjustment, if made, would be significant.

If a retroactive adjustment is not made, and a change to the full cost method is made in the twelfth year, the reported earnings would be increased by $920 since there were no prior costs to amortize against the increase in earnings which resulted from the capitalization of nonproductive expenditures. As indicated in column (e), if a retroactive adjustment is made, the increase in reported earnings attributable to the adoption of the full cost method would be only $40 since $960 of depletion was applied to the costs which had been reinstated. With the assumptions given, in the twelfth year, the reported earnings would have been: $1,000 using conventional accounting practices, $1,040 using the full cost method with a retroactive application of the method, and $1,920 using the full cost method without any retroactive application of the method.

Effects to the balance sheet of a company changing to full costing are the same if the year of adoption is the first year of operations. In the above table, the carrying value of the oil and gas properties would be increases by $920 in the first year. In the twelfth year, if no retroactive application of the full cost method were made, the carrying value of the assets would still be increased by only the $920, which is the net amount of nonproductive expenditures capitalized in that year. If, however, the full cost method of accounting were adopted in the twelfth year and a retroactive adjustment were made, the carrying value of the oil and gas properties would be increased by $5,660 as indicated in column (d).

When a company which has been in existence for several years changes to the full cost method of accounting, the manner in which the change is made can make a significant difference in the reported earnings of the corporation. If the change is not made on a retroactive basis, the reported earnings will be significantly higher than would be the case had the change been made retroactively.

Of the forty-eight reporting entities known to be using the method, the manner of making the change to full costing could not be determined for nine of the companies. Four of the companies used the method from the inception of their operations, or from a substantial reorganization; the question of retroactive application is not applicable to these

four companies. Of the remaining thirty-five companies, only fourteen have made retroactive application of the full cost method. The remaining twenty-one companies have taken full advantage of the increases in income possible through a change to the full cost method, but have not suffered any reduction because of the amortization of reinstated costs.

The subject of a retroactive application of full costing has been discussed separately, and the subject is of primary importance in a change to the full cost method. Differences in application of the full cost method will produce differences in the earnings reported; this is also true with the area of tax deferrals.

## Deferred Income Taxes

Some of the companies that have adopted full cost accounting use deferred taxes; some do not. Deferred taxes arise because of differences between financial income before taxes and taxable income. While either financial or taxable income can be the greater, the usual situation is that more expenses are claimed for tax purposes than for financial purposes. The result is that less taxes are paid on taxable income than would be the case if the same rate were applied to financial income.

There is no problem on deferral of income taxes when particular items of income are not taxable, or where certain expenditures are not deductible, under specific provisions of the tax law. However, if the differences in taxes are

attributable to differences in timing of deductions for financial and tax purposes, a deferred tax problem is present. When deductions are claimed more rapidly for tax purposes than for financial purposes, the actual taxes payable will be less than the taxes attributable to financial income. If the deductions for tax purposes are less than those for financial purposes, the actual taxes that are payable will be greater than the taxes attributable to financial income. The entire subject of deferred taxes is predicated upon the matching concept. Advocates of deferred tax procedures contend that a proper matching of income and expense requires that, for financial reporting purposes, the tax expense relate to financial income instead of to taxable income.

Deferred taxes are as applicable where full costing is used as in other areas where complete expensing or rapid amortization are claimed for tax purposes. The amount of deductions claimed for nonproductive exploration expenses in the tax returns in the earlier years exceeds the amortization of the capitalized nonproductive exploration costs for book purposes. The result is that the company pays less income tax than it would have paid, had the company also capitalized these items for income tax purposes and had it amortized the costs over the expected life of the properties. If only one asset were involved, as in the case of a single depreciable asset, in later years the taxable income would exceed the financial income and greater taxes would be paid at that time.

In the earlier years of the asset's life, the temporary reduction in income taxes amounts to a deferred tax. In order to show a tax based on financial income, an addition is made to the tax expense on the financial statements for the deferred tax. The additional amount is over and above the actual amount paid, and an offsetting credit is shown on the balance sheet. The accumulated credit is used in later years to reduce the tax expense when taxable income is in excess of the financial income. A change in the relative positions of the taxable and financial income occurs if there are only single assets or a limited number of assets involved. For a single situation, the following table will serve to illustrate the use of deferred taxes.

TABLE VII

EFFECT OF DEFERRED TAXES, SINGLE SITUATION*

| Year | Financial Income | Tax Income | Tax Deferral | | Tax Expense | Taxes Paid |
|---|---|---|---|---|---|---|
| | | | - | + | | |
| 1 | $ 2,000 | $ 1,000 | $ - | $500 | $1,000 | $ 500 |
| 2 | 1,800 | 2,000 | 100 | - | 900 | 1,000 |
| 3 | 1,800 | 2,000 | 100 | - | 900 | 1,000 |
| 4 | 1,800 | 2,000 | 100 | - | 900 | 1,000 |
| 5 | 1,800 | 2,000 | 100 | - | 900 | 1,000 |
| 6 | 1,800 | 2,000 | 100 | - | 900 | 1,000 |
| Total | $11,000 | $11,000 | $500 | $500 | $5,500 | $5,500 |

*Source: Hypothetical data.

The assumptions used in this illustration are: (1) income before nonproductive exploration costs is $2,000. (2) non-productive exploration expenditures of $1,000 are incurred

in year 1 only, (3) reserves are produced at the rate of 20 per cent of the original reserves beginning in the year following exploration, and (4) the tax rate is 50 per cent. From examining the table, the fact that the total income and total tax expense are the same over the six-year period is apparent. Yet the deferred tax which arises in year 1, when the financial income is in excess of taxable income, is spread over the subsequent years when the taxable income is higher than the financial income.

The situation is somewhat different where the assets are numerous, and are continually being replaced. Replacement, or rather the continual incurring of expenses as in the case of exploration costs, is necessary in the petroleum industry. A company must explore in order to find reserves; a large share of the exploration expenditures will turn out to be nonproductive. If this expenditure normally recurs year after year, the excess of tax deductions over amortization for financial purposes of nonproductive costs in the earlier years may be followed by an indefinite period in which there is a substantial equality of the deductions claimed for tax purposes and the amortization for financial purposes. Deferred taxes which had been accumulated tend to remain relatively constant thereafter. The effects of stability of charges are relevant only when the operations of the concern are relatively constant. If a concern is continually growing with a continued increase in exploration activities as well,

there will be a sustained increase in deferred taxes, without the deferred taxes ever becoming a reality.

The following table illustrates the situation of a constant addition of nonproductive exploration costs being capitalized under the full cost method each year. The assumptions used in this case are (1) income before nonproductive expenditures amounts to $2,000 per year, (2) nonproductive exploration expenditures amount to $1,000 per year, (3) the reserves are produced at the rate of 10 per cent of original reserves beginning with the year of exploration, and (4) the tax rate is 50 per cent. Taxable income would be $1,000 per year for each of the 10 years; net taxable income after tax would be $500 for each of the 10 years.

TABLE VIII

EFFECT OF DEFERRED TAXES, CONTINUING EXPENDITURES*

| Year | Financial Income | Taxes Paid | Tax Deferral | Tax Expense | Financial Net Income | |
|---|---|---|---|---|---|---|
| | | | | | With Tax Deferral | Without Tax Deferral |
| 1 | $ 1,900 | $ 500 | $ 450 | $ 950 | $ 950 | $1,400 |
| 2 | 1,800 | 500 | 400 | 900 | 900 | 1,300 |
| 3 | 1,700 | 500 | 350 | 850 | 850 | 1,200 |
| 4 | 1,600 | 500 | 300 | 800 | 800 | 1,100 |
| 5 | 1,500 | 500 | 250 | 750 | 750 | 1,000 |
| 6 | 1,400 | 500 | 200 | 700 | 700 | 900 |
| 7 | 1,300 | 500 | 150 | 650 | 650 | 800 |
| 8 | 1,200 | 500 | 100 | 600 | 600 | 700 |
| 9 | 1,100 | 500 | 50 | 550 | 550 | 600 |
| 10 | 1,000 | 500 | - | 500 | 500 | 500 |
| Total | $15,500 | $5,000 | $2,250 | $7,250 | $7,250 | $10,500 |

*Source: Hypothetical data.

Initially, there is a material difference in the net income reported for financial purposes between the use and the non-application of deferred taxes. In the table above, the net income for the first year without tax deferral would be $1,400. With a tax deferral, however, the net income is reduced to $950. By the tenth year, there is no difference between the financial income including tax deferrals and the financial income without tax deferral. The lack of difference is because of constant income and expense and the fact that under the assumptions used, the ten year period constituted a complete production cycle.

Constant situations rarely exist in business; rather, some degree of growth is involved if the concern is to remain in business. Assuming some growth and an increasing expenditure for exploration, the reported earnings will always be higher if deferred taxes are not applied than if a provision is made for deferred taxes. Proponents of the full costing method contend that deferred taxes must be applied in order to effect a proper matching of income and expense. Under the assumption of continued growth, the accumulated tax deferral of $2,250 (in Table VIII) would never be paid and would not serve to reduce taxes in a later year. It is significant that the Accounting Principles Board is postponing consideration of deferred taxes in conditions peculiar to

the petroleum industry until after the research study on extractive industries is published.[2]

The use, as opposed to the nonuse, of deferred taxes will reduce income in situations in which financial income exceeds taxable income because of differences in the timing of the deductions. The application of tax deferrals by the companies using the full cost method of accounting is very minor. No information could be obtained on nine of the forty-eight reporting entities known to be using the full cost method of accounting; only one of the four companies which have used full costing from inception of operations makes use of deferred taxes. Of the remaining thirty-five companies, only four have applied tax deferral procedures. Thirty-one of the companies have not been willing to reduce reported earnings by making a provision for deferred income taxes.

In order for comparisons to be made between companies with respect to the effects of a change to full costing, adjustments were required for both the tax deferrals and the retroactive adjustments if these items had been applied.

## Data Obtained and Adjustments

In connection with this research, corporations known to be using the full cost method of accounting were requested

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[2]Accounting Principles Board of the American Institute of Certified Public Accountants, Accounting for Income Taxes, Opinion 11 of the Board (New York, 1967), p. 171.

to furnish information concerning their use of the method; since one of the primary aims of the research was to determine the effects of a change to the full cost method, information which would allow determination of the effects of a change was required.

Differences between the results indicated under full cost accounting and under conventional accounting practices arise primarily because of three factors. Under full cost accounting the nonproducing exploration expenditures are capitalized rather than being shown as a current charge to income; consequently, income is significantly increased. The increase in income is modified by the amortization or depletion of the capitalized nonproductive expenditures and by deferred taxes applicable to the differences in timing of the deductions for financial and tax purposes. Knowledge of the amount of the capitalized nonproductive exploration costs, the amortization of the capitalized costs, and the deferred taxes applicable to full costing, permits determination of the difference between earnings computed on the basis of the conventional practices and those computed under full costing. When the differences between the methods are known, the effects of a change in methods are also known.

In the majority of cases in which the companies contacted did furnish information for more than one year, no adjustments were required to be made. The income which would be reported under conventional accounting practices was

indicated, as was the income which would be reported under the full cost method of accounting. In some instances, however, adjustments to the information obtained were required.

Whenever possible, the extraordinary items were eliminated from consideration. The extraordinary item appearing most frequently involved the gain or loss from the disposition of marketable securities. Other extraordinary items included the gain or loss on disposition of subsidiaries and other nonoperating losses. The extraordinary items were not considered pertinent in examination of the effects of the full cost method on the exploration and development operations of an oil company.

For purposes of most comparisons, the deferred income tax was eliminated for those few companies providing for tax deferrals. The large majority of companies which have adopted the full cost method of accounting has done so without the application of tax deferral procedures to the benefits that are achieved under the full cost method. The rationale given by the companies is generally that no additional taxes have been provided since there will never by any added taxes paid as the result of the deduction of the exploration expenditures. However, there are some examples of the effects of using and not using a provision for deferred taxes (see below pp. 165-167).

An allocation of depletion claimed or indicated in the annual reports between the amounts applicable to the full

cost items and conventional amounts was required in a few instances. Since depletion is computed on an average or composite basis in these cases, no material loss of accuracy results from the allocation of the depletion between the two portions involved. Companies included in the survey provided the amounts indicated as being capital items under conventional practices and the amounts capitalized under full cost accounting, except for one case where the amounts were obtained from the company's annual reports. In one case the difference between full cost accounting and conventional practices was indicated as a specific figure, but this figure covered a period of three years. Since the differences are applicable to nonproducing expenses, the difference was allocated over the three years on the basis of the number of nonproductive wells drilled in each of the three years.

Adjustments and eliminations of certain items from the information obtained from companies was necessary in order that valid comparisons could be made. The effects of a change in accounting methods on various companies can vary for a number of reasons. The amount of exploration, the success of discovering reserves, and the rate of production of existing reserves influence the effects of a change in accounting methods. Differences in the effects of a change in methods can also arise because of the size and variety of the operations of the different companies. A classification of the companies connected with this research, as well as

the adjustment of information from these companies, was beneficial in determining the effects of a change to the full cost method of accounting. The categories used in this study were those of the mature stable company, the declining company, and the growing company.

### Effects on a Mature or Stable Company

A change to the full cost method of accounting is less material to the mature, stable company than is the case with other classifications of companies. The mature, stable company is defined as a company which is exploring, finding, and producing reserves at a relatively constant rate and which has been in existence for more than one production cycle.[3] Most of the larger, older oil companies would come within this category.

Some growth is necessary for all companies, including the mature companies. A completely stable situation in which reserves are discovered and produced on a constant and equal basis is not to be expected. However, if a stable situation did exist and a change to full costing were made on a retroactive basis, there would be no difference between the income reported on the conventional basis as opposed to the full cost basis. There would, however, be a difference in the

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[3]In this instance, the term "production cycle" refers to the time required to locate, develop, and produce deposits of hydrocarbon reserves. For example, if the production rate were 6 2/3 per cent of reserves, the production cycle would be fifteen years.

carrying value of the assets employed in the business; and earnings expressed as a rate of return on assets employed would be less under the full cost method than under the conventional accounting practices.

## Completely Stable Company

With a constant and equal level of the discovery and production of hydrocarbon reserves, the net earnings as reported by a company will eventually be the same, regardless of the method of accounting that is used. In consideration of a change from conventional practices to the full cost method, the eventual equality of earnings in a stable situation will apply even though the change to full costing is not made on a retroactive basis. The period of time that is required for the earnings reported under the different methods to become equal is the production cycle. To illustrate these points, a situation will be posed, and the differences between the accounting methods will be shown. The following table contains the assumptions used in this initial illustration.

TABLE IX

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS*

| | |
|---|---|
| Exploration activity: | |
| Preliminary surveys (25 areas comprising 500,000 acres @ $0.10) . . . . . | $ 50,000 |
| Detailed surveys (20 prospective fields comprising 200,000 acres @ $1.50 . . . . . | $ 300,000 |
| Land activity: | |
| Acreage acquired (10 prospective fields comprising 50,000 acres @ $10.00). . . . . | $ 500,000 |

TABLE IX - Continued

| | |
|---|---|
| Acreage released (including 9 prospective fields @ 5,000 acres each) | 48,500 |
| Acreage transferred to producing properties | 1,500 |
| Total undeveloped acreage maintained at | 250,000 |
| Delay rentals paid on 200,000 acres | $ 200,000 |
| Drilling activity: | |
| 10 exploratory wells, with 9 dry holes. | $1,500,000 |
| 20 development wells, with 4 dry holes. | $1,500,000 |
| Wells equipped: | |
| 17 wells at an average cost of $15,000. | $ 255,000 |
| Other production investment | $ 300,000 |
| Recoverable reserves added (barrels). | 4,200,000 |
| Production rate (based on original reserves). | 6 2/3% |
| Field price of oil per barrel | $ 3.00 |
| Lifting cost per barrel (including overhead and production taxes but excluding depletion and depreciation) | $ 0.80 |
| Other assumptions: | |
| Exploratory surveys are conducted before properties are acquired. | |
| Exploratory drilling is conducted in the fifth year of each block of leases. | |
| One exploratory dry hole is taken as justification for abandonment of a prospective field. | |
| Each year's development is assumed to be one field, and production starts the first of the next year. | |
| No consideration is given to federal income taxes since comparison of pre-tax earnings is sufficient. | |
| Both depletable and depreciable assets are written off using a unit-of-production method. | |

*Source: Hypothetical data.

Not all of these assumptions are realistic, but they can be used since they do serve to illustrate effects between the two methods. The assumptions will be further modified to illustrate additional points later (see below pp. 157-158). Using these assumptions, in a static or constant situation the income reported by the entity at the end of the production cycle will be the same regardless of the method that is used. These data are included in the following table.

TABLE X

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS--COMPARATIVE RESULTS FOR YEAR 16*

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 5,600,000 |
| Lease bonuses | 2,500,000 | 8,000,000 |
| Delay rentals | - | 3,200,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 261,000 | - |
| Intangible drilling and development | 21,600,000 | 48,000,000 |
| Equipment | 3,825,000 | 4,080,000 |
| Total | 24,336,000 | 68,880,000 |
| Accumulated depreciation and depletion | 11,356,800 | 34,440,000 |
| Net properties | 12,979,200 | 34,440,000 |
| Other productive assets | 4,500,000 | 4,500,000 |
| Total assets employed | $20,379,200 | $38,940,000 |
| Estimated reserves (barrels) | 33,600,000 | 33,600,000 |
| Unrecovered cost per barrel | $0.6065 | $1.1589 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $12,600,000 | $12,600,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 3,360,000 | 3,360,000 |
| Depreciation and depletion | 1,622,400 | 4,305,000 |
| Total deductions | 7,665,000 | 7,665,000 |
| Net income (loss) before tax | $ 4,935,000 | $ 4,935,000 |
| Percentage of income to assets employed | 24.5% | 12.7% |

*Source: Hypothetical data.

This table shows that while there may be the same income reported by a corporation under two differing methods of accounting, the carrying values of the assets are not the same; accordingly, the rate of return on assets employed is far less under the full cost method. In this example, the carrying value of the assets is almost twice as much under the full cost method as it would be under conventional practices. Were the static situation to continue, reported earnings would be the same under either method, but of course with differing rates of return on assets employed. The significant point is, however, that during this production cycle (or until a production cycle has been completed, if the change to full cost were made in an existing concern without retroactive application) the reported earnings of the concern have been considerably higher under the full cost method than they would under conventional practices. During the initial production cycle reported earnings amounted to approximately $21 million under conventional practices while they were $40 million, some 90 per cent higher, under the full cost method. The following figure shows the pattern that such earnings took in this hypothetical example.[4]

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[4]Details of individual years involved are given in Appendix C.

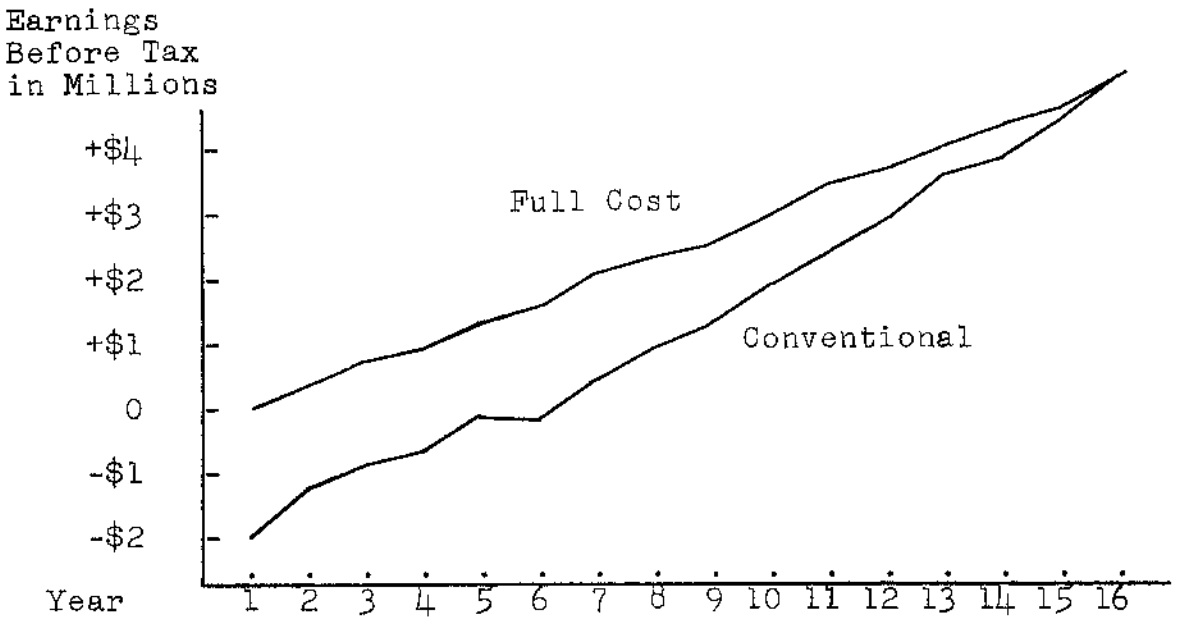


Fig. 8--Comparison of annual pre-tax earnings of hypothetical concern under conventional and full cost methods of accounting. Production rate of 6 2/3 per cent of reserves.

The general trends as indicated in Figure 8 can be expected to hold true in situations in which the discovery, development, and production of reserves hold to a fairly constant pattern. Such is not the case in actual situations, however. Some factor is always changing; and while the patterns remain fairly stable for the industry as a whole, they are not so for an individual company. Within the mature or fairly stable company there is some change in the level of exploratory activity, the level of reserves, or the level of production. More than likely, there are multiple changes and interrelationships among these three variables. Each is important; but a change in one factor, with the other variables being held constant, does nothing more than shorten or lengthen the time period required for the results under both of the methods to be the

same, at least in terms of income effect. The income effect shown in the following figure uses the same data given in Table IX except that the rate of production has been changed from 6 2/3 per cent of reserves to 10 per cent of the reserves.

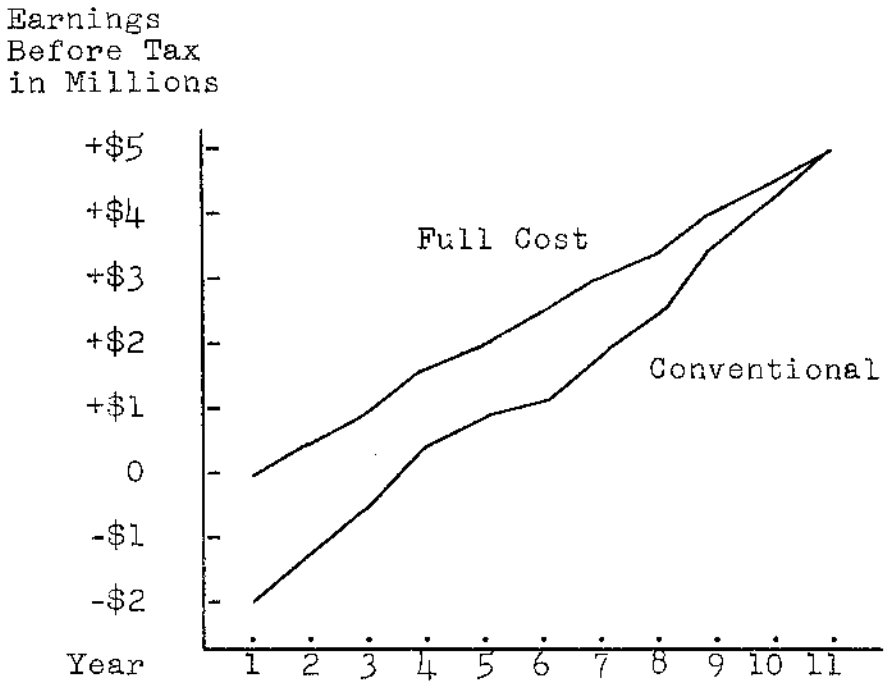


Fig. 9--Comparison of annual pre-tax earnings of hypothetical concern under conventional and full cost methods of accounting. Production rate of 10 per cent of reserves.

The pattern exhibited in Figure 9 is almost identical to that in Figure 8 except for the time period involved.

As the variables of exploratory activity, discovery, and production are constantly changing, there will continuously be differences between the full cost method and conventional practices. The differences depend to a greater extent on exploration and production than on the amount of reserves

discovered. Exploration and production both have an immediate impact on one or the other method, while the effect of a change in reserves is spread over a longer period of time under either conventional practices or the full cost method. The magnitude of the differences between the two methods is also influenced by a retroactive application of the full cost method (see above, pp. 131-136).

## Relatively Stable Companies

The data presented thus far in this chapter have been limited to hypothetical data. Assumptions have been made to the effect that a change to full costing will increase the reported earnings of the concern, that the earnings will be smoothened or normalized to some extent, and that over a relatively long period of time the differences between the methods will become less even though they will not become the same except in a static situation. Because of the nature of full cost accounting, any increase in income which is applicable to the method also serves to increase the carrying value of the assets. These assumptions apply not only to hypothetical situations, but also to actual companies. Some comparisons of earnings between conventional and full cost methods are given for several actual companies in the following figures. The use of an index of earnings has converted various earnings to a common denominator. This has been done to avoid the actual figures and to permit more valid comparisons of the effects of full costing.

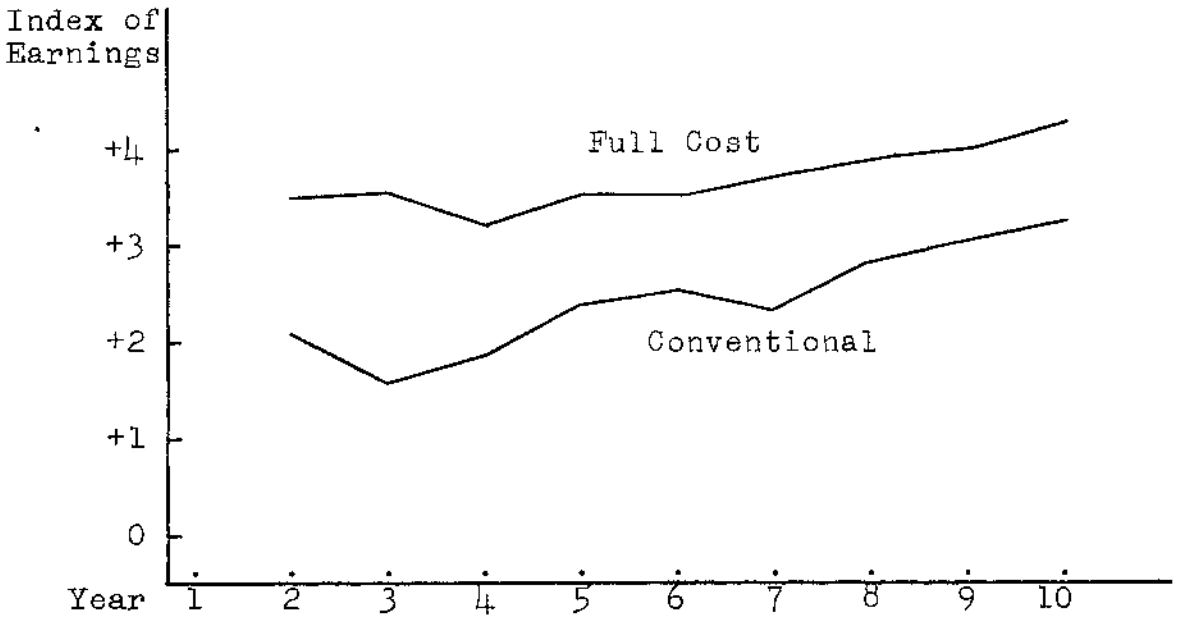


Fig. 10--Comparison of actual earnings under full cost and conventional methods for Company A.

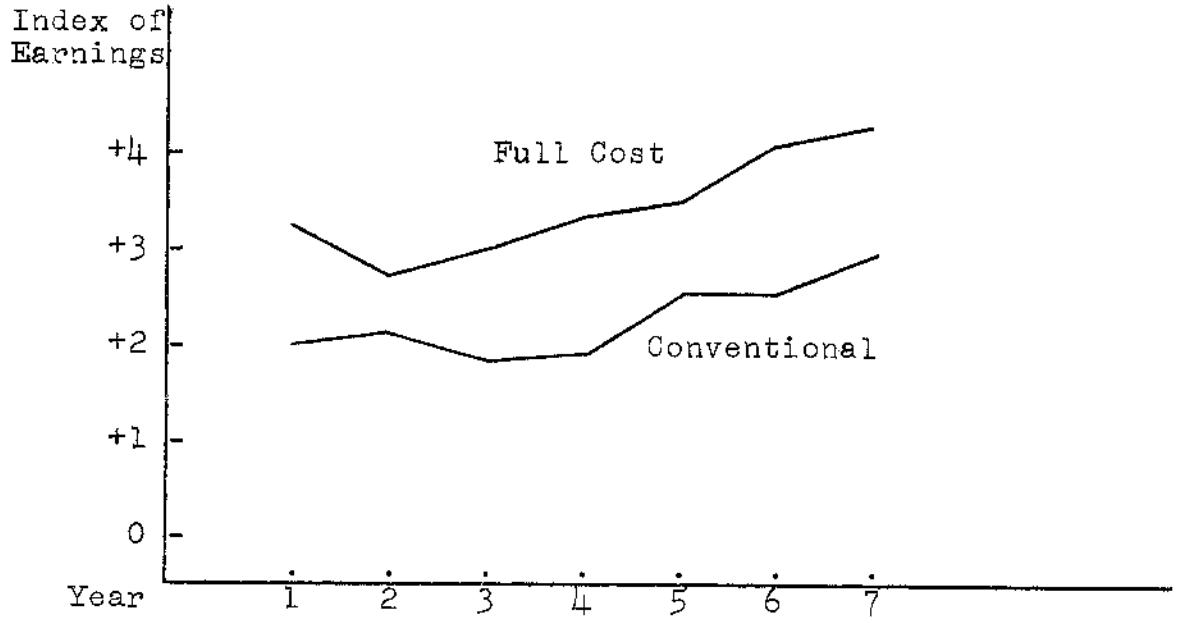


Fig. 11--Comparison of actual earnings under full cost and conventional methods for Company B.

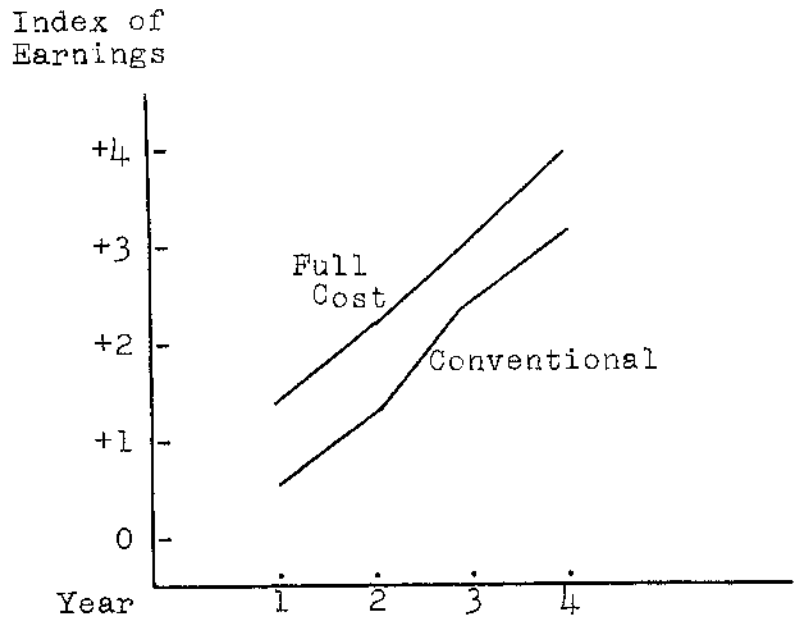


Fig. 12--Comparison of actual earnings under full cost and conventional methods for Company C.

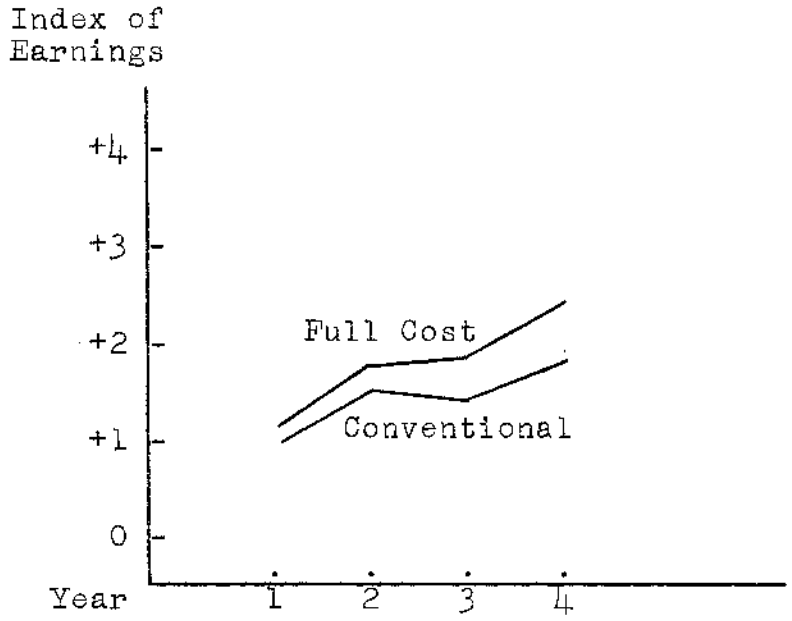


Fig. 13--Comparison of actual earnings under full cost and conventional methods for Company D.

The companies shown in Figures 10 and 11 have a pattern quite similar to the hypothetical examples shown in Figures 8 and 9. The actual data are more erratic because of the changes in the variables, as mentioned. Still, the effects are that the full cost method results in smoother and higher earnings. The data indicated in Figures 12 and 13 conform to this general pattern also.

The earnings reported under the full cost method for these companies have been higher and smoother as they appear. Over the period of time involved, there is a significant difference in the amount of earnings which would be reported, depending upon the method used by the company. In order to make a comparison among the companies, the data in the following figure are based on a four-year time period.

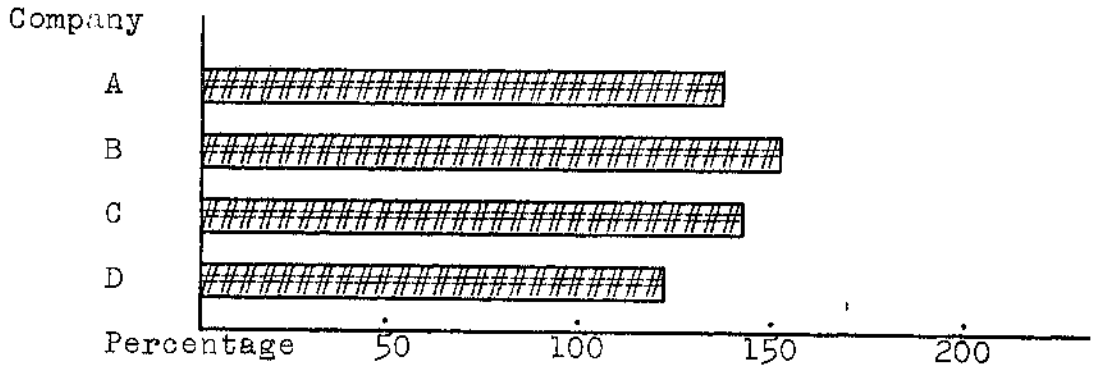


Fig. 14--Full cost earnings expressed as percentage of conventional earnings over a four year period for actual companies.

As indicated in the above figure, the increases in earnings attributable to use of the full cost method ranged from 20 per cent up to 50 per cent. Reported earnings for the

mature, relatively stable companies are significantly higher under the full cost method of accounting than are earnings which would be reported using conventional accounting practices. However, differences between methods for the mature companies are not as great as in the case of growing companies (which are discussed in a later section).

### Effects on a Declining Company

Data are not available which deal with the classification of the declining company. In view of decreasing rates of return on stockholders' equity and decreasing reserves in some cases, some of the companies included among those using the full cost method must be classed as declining companies. Since no actual data could be obtained with respect to the declining companies, some use must again be made of the hypothetical data.[5] There are many limitations in the use of this kind of data. However, use of hypothetical data is necessary for an insight into possible effects of a change of accounting methods in a declining company situation. If the previous example is to be used, some changes in the assumptions are necessary. The changes considered are concerned with the discovery rate of reserves, the number of dry holes, rate of production, and the time of replacement of equipment. First, it was assumed that the discovered reserves decreased by approximately 10 per cent each year.

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[5]Refer to Table IX, pp. 147-148, for the assumptions used.

Starting with the third year and in subsequent odd years, an additional development well was considered to be dry or non-productive. Production started with 10 per cent of reserves but decreased starting with year nine. Finally, equipment replacement and leasehold surrender were deemed to occur after twelve years even though there was some variance in production.

Another set of assumptions obviously could have been adopted. Usually exploration is curtailed to some extent when a company is in financial trouble; but since added reserves are needed to strengthen the position of any company, exploration would not be eliminated. The assumptions as changed illustrate the effects of a change in accounting methods. The pattern or earnings for this example under the modified assumptions are shown in the following figure.

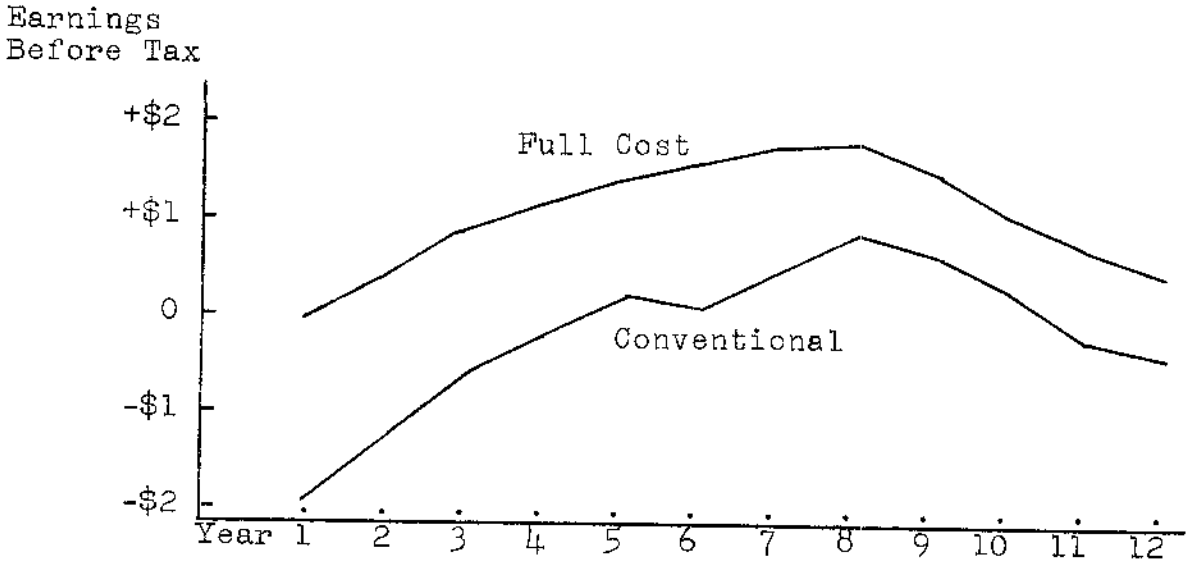


Fig. 15--Comparison of annual pre-tax earnings of a hypothetical declining company under conventional and full cost methods of accounting.

Use of the full cost method would produce earnings in each of the twelve years involved in this illustration except for the first, where neither profit nor loss would be shown. On the other hand, under conventional practices, losses from operations would be reported for six of these same twelve years. Again, as shown in the preceeding figure, earnings to be reported under the full cost method are higher and show a smoother trend than do those as determined under conventional accounting practices. With earnings being higher under the full cost method, the carrying value of the properties is also higher under the full cost method. Details, as they pertain to the twelfth year, are shown in the following table.[6]

TABLE XI

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS--COMPARATIVE RESULTS FOR YEAR 12 OF A DECLINING COMPANY*

| | Conventional Method | Full Cost Method |
|---|---|---|
| Assets at End of Year | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 4,200,000 |
| Lease bonuses | 2,500,000 | 6,000,000 |
| Delay rentals | - | 2,400,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 208,800 | - |
| Intangible drilling and development | 13,950,000 | 36,000,000 |

[6]Details for individual years are included in Appendix C.

TABLE XI - Continued

| | Conventional Method | Full Cost Method |
|---|---|---|
| Equipment | $ 2,610,000 | $ 2,610,000 |
| Total | 16,768,800 | 51,210,000 |
| Accumulated depreciation and depletion | 8,678,540 | 25,242,520 |
| Net properties | 8,090,260 | 25,967,480 |
| Other productive assets | 3,600,000 | 3,600,000 |
| Total assets employed | $14,590,260 | $29,567,480 |
| Estimated reserves (barrels) | 12,700,000 | 12,700,000 |
| Unrecovered cost per barrel | $1.1488 | $2.3281 |
| Income Statement | | |
| Revenue (at $3.00 per barrel) | $ 5,100,000 | $ 5,100,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 2,025,000 | - |
| Lifting costs | 1,360,000 | 1,360,000 |
| Depreciation and depletion | 1,024,570 | 3,219,440 |
| Total deductions | 5,442,170 | 4,579,440 |
| Net income (loss) before tax | $ (342,170) | $ 520,560 |
| Percentage of income to assets employed | (2.41)% | 1.84% |

*Source: Hypothetical data.

Over the twelve-year period, reported earnings under the full cost method would be approximately $12.9 million. Under the same conditions, use of conventional practices would result in a reported loss totaling $1.7 million for the same years.

In the description of the full cost method in Chapter IV, a ceiling on the capitalized costs was mentioned. There is a maximum amount which can be capitalized as the cost of

reserves to a firm. Beyond a point, the accumulation of costs cannot be said to constitute an asset, but should instead be treated as losses to the concern. In the petroleum industry, one often hears figures of $1.00 per barrel and $1.25 per barrel mentioned with respect to the market value of reserves in the ground. An examination of the per barrel cost of reserves in Table XI indicates that there must have been an overstatement of the asset values under the full cost method during the period involved; this overstatement also indicates an overstatement of the earnings within the period. An indicated reserve cost of $2.33 per barrel is well above the ceiling for capitalized costs that would be determined by any company. Even allowing an amount of $1.50 per barrel for the reserves, the assets employed in this case would be overstated by approximately $10.5 million.

It is acknowledged that, under the full cost method, amounts in excess of the value of the reserves held would be charged off as losses. The time to recognize losses is not the point here, since even the $1.15 per barrel, as indicated under conventional practices for this example, may be pushing the ceiling. Rather, the data have been presented in this manner as an example of a declining company to re-emphasize the facts that the effects of use of the full cost method are to raise reported earnings, to smoothen the reported earnings, and to increase the carrying value of assets over that which would be reported under conventional practices.

## Effects on a Growing Company

The effects of a change to the full cost method of accounting in the petroleum industry are more significant to the growing company than to other types of companies. The growing company is a company whose primary orientation is towards the exploration and production side of the petroleum industry. The mature firms generally involve completely integrated operations. The growing company has not reached the size and stability of operations to be considered a mature or fully developed firm. Placement of companies included in this research intc categories was done through an examination of annual reports of the concerns and through reference to Moody's Industrial Manuals for determination of the portion of operations which were emphasized. The growing company is more concerned with the exploration and production phases of the petroleum industry than with the refining and marketing operations.

In determining the effects of the adoption of the full cost method of accounting, several factors must be examined. The subjects of deferred taxes and retroactive adjustments have been discussed earlier in this chapter. Retroactive adjustments and deferred taxes are both applicable to the mature company and to the declining company as well as to the growing company. However, in the case of the mature companies information on deferred taxes and retroactive adjustments was not available and the analysis of declining companies was

based upon hypothetical data. In the case of growing companies, information on both the deferred taxes and the retroactive application of the full cost method was obtained. Accordingly, a more complete analysis of the effects of a change in accounting methods can be made for the growing companies than for the other classes of companies. As growing companies are generally young and have not built a broad base of operations, the reported results are subject to more fluctuation than is the case in the mature, fairly stable companies.

Effects of Retroactive Adjustments on Growing Companies

A more complete discussion of retroactive adjustments made in connection with a change to the full cost method of accounting was given earlier in this chapter (see pp. 131-136). However, the discussion dealt with hypothetical data; consideration should be given to actual situations.

A retroactive adjustment, as indicated earlier, consists of reinstating certain nonproductive costs, ideally back to the inception of the company, in order to have some of the "full costs" to amortize against the increase in income that will occur when the change to full costing is made in the current period. Without a retroactive adjustment being made, the effect is an immediate, and usually significant, increase in the reported earnings of the corporation without the matching of the applicable additional prior costs. The magnitude of these factors is indicated in the following figure.

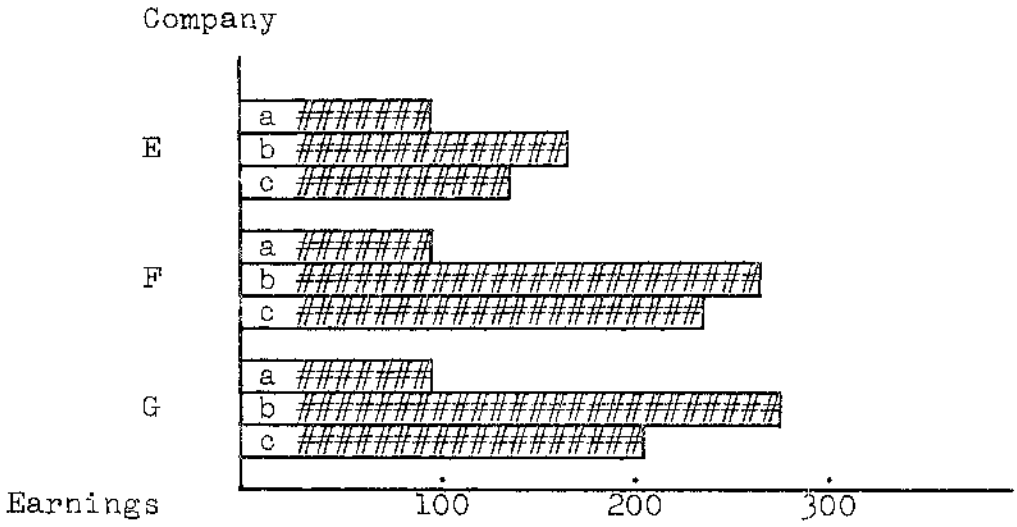


Fig. 16--Earnings expressed as a percentage of conventional earnings and showing effects of a retroactive change to full costing for actual companies for a specific year.

a Conventional earnings.
b Full cost earnings without retroactive adjustment.
c Full cost earnings with retroactive adjustment.

The above figure indicates the material effect of a change to the full cost method of accounting for the growing company. Sufficient detailed data were not available to permit inclusion of all of the growing companies considered in this study. If a retroactive adjustment were made in connection with a change to full cost accounting, the reported earnings of the companies were materially higher than the earnings which would have been reported under conventional practices. However, the reported earnings were not as high as would be the case if the retroactive adjustment had not been applied. The data above do not consider the effects of deferred income taxes, since only the effects of a retroactive adjustment were examined in this case.

## Effects of Deferred Taxes on Growing Companies

When a company changes to the full cost method of accounting, the effects of using tax deferral procedures are much the same as when making a retroactive application of the method. Some advocates of full costing indicate that in changing to the full cost method, it is desirable for the company to make the change on a retroactive basis. They further contend that it is necessary to provide for deferred taxes on the increased tax differences which are attributable to the change to the full cost method of accounting.[7] However, as was indicated earlier in this chapter, only four out of thirty-five companies changing to full cost accounting have provided for deferred taxes on the additional tax differences attributable to the use of the method. The general subject of income tax deferral has been more than adequately covered in other studies,[8] and is not pertinent here.

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[7] Arthur Andersen & Co., Accounting for Oil and Gas Exploration Costs (Chicago, 1963), pp. 28-29.

[8] For example see: Homer A. Black, Interperiod Allocation of Corporate Income Taxes (New York, 1966); Arthur Andersen & Co., Accounting for Income Taxes (Chicago, 1961), and Accounting for Oil and Gas Exploration Costs; and Stanley P. Porter, Petroleum Accounting Practices (New York, 1965), Chapter 30. At the present time, there has been no position taken on deferred taxes in the petroleum industry by either the American Petroleum Institute or by the American Institute of Certified Public Accountants. Accounting Principles Board of the American Institute of Certified Public Accountants, Accounting for Income Taxes, Opinion 11 of the Board (New York, 1967), p. 171, indicates that an opinion dealing with deferred taxes in extractive industries will be forthcoming sometime after publication of the Accounting Research Study on Accounting Practices in Extractive Industries.

The inclusion of deferred income taxes in a change to full costing effects the reported earnings of a concern similarly as does a retroactive application of the method. Earnings to be reported by the concern are higher when deferred taxes are not used than are earnings when the deferred taxes are employed. The following figure shows the effects of including or excluding deferred taxes when the full cost method of accounting is used.

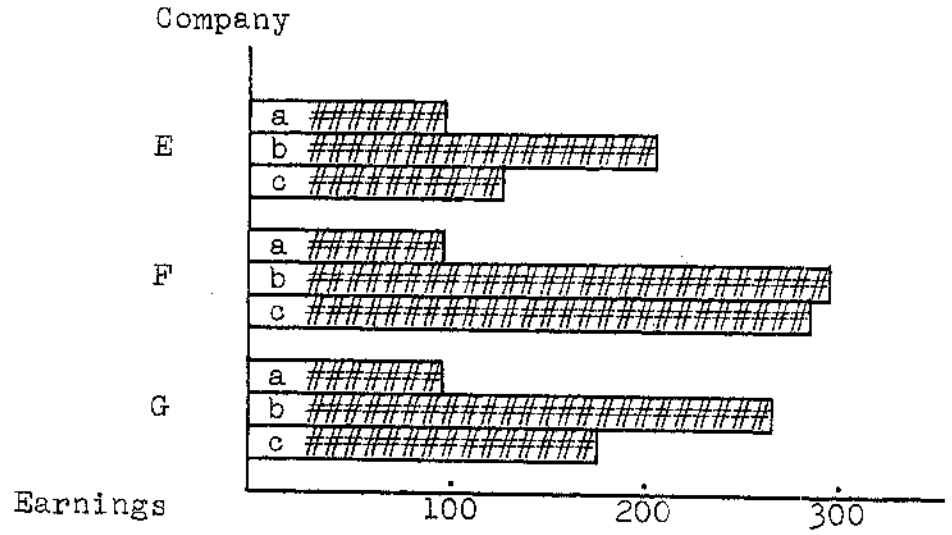


Fig. 17--Earnings expressed as a percentage of conventional earnings and showing effect of deferred taxes on full cost earnings for actual companies for a specific year.

a Conventional earnings.
b Full cost earnings without deferred taxes.
c Full cost earnings with deferred taxes.

In order to examine the effects of deferred taxes only, the data included in the above illustration do not give effect to any retroactive adjustments. This illustration included three of the four companies using deferred taxes. Data were

not available for the fourth company, which is classed as a mature, stable company and not included in the category of growing companies.

Use of the full cost method of accounting increases earnings substantially over what would be shown for use of the conventional practices. If deferred income taxes are considered, there is a reduction of these earnings; but the difference between the conventional and full cost methods is still material.

Thus far, data presented in this chapter have been concerned primarily with the income effects of a change to the full cost method of accounting. The two effects are a definite and material increase in reported earnings and the smoothing or normalizing of these same earnings as the result of using full costing.

## Balance Sheet Effects and Return on Assets

The effects of a change to full cost accounting for a growing company are significant to the statement of financial position as well as to the income statement. However, it takes a longer period of time for the effects to become noticeable. As an example, a company could have $5 million of earnings under conventional practices and $7.5 million of earnings computed under the full cost method; the carrying value of assets under conventional practices of $75 million would be raised to $77.5 million. It makes no difference for purposes of this illustration whether deferred taxes and

retroactive adjustments are made. Any increase in the earnings of a concern attributable to a change to the full cost method of accounting will have the same absolute increase in the carrying value of the assets of the concern. Income has been raised by 50 per cent as the result of a change to the full cost method of accounting, but asset values have been raised only 3 1/3 per cent. Assuming the same facts for an additional year, income would again be 50 per cent higher through use of the full cost method; but now the carrying value of the properties would be 6 2/3 per cent higher. The earnings expressed as a rate of return on assets employed would have remained stationary under the conventional practices but would have decreased from 9.68 to 9.37 per cent under the full cost method. This pattern is shown for one company in the following figure.

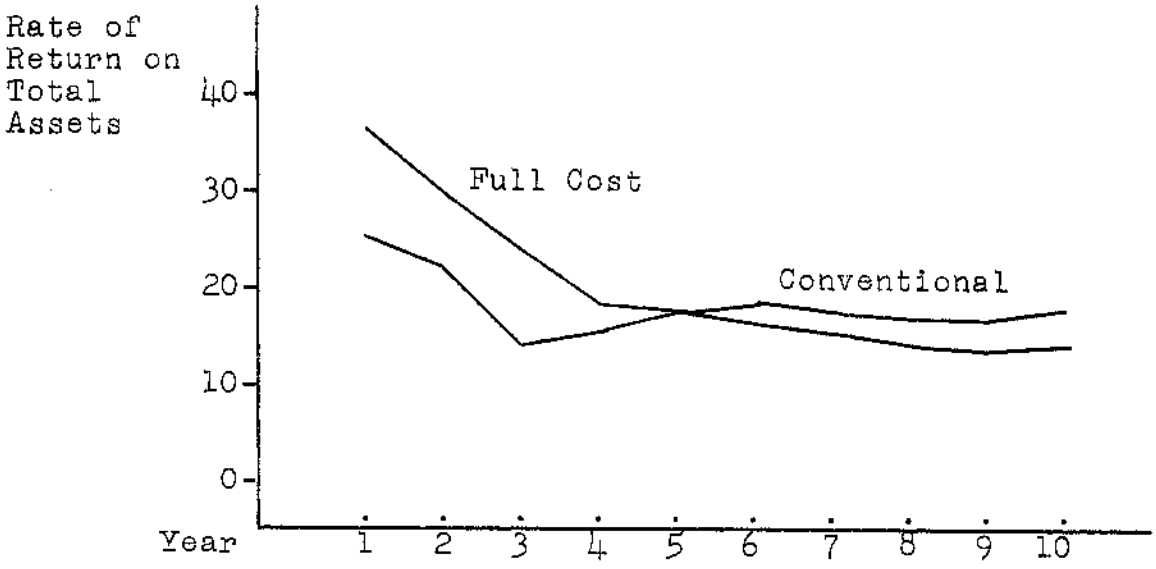


Fig. 18--Comparison of pre-tax earnings expressed as a rate of return on total assets employed for full cost and conventional methods in one actual case.

Eventually, as a result of the continual increase in costs under the full cost method, the rate of return on assets employed will be less under the full cost method than under the conventional practices, as indicated in the preceeding figure. This particular case shows a higher rate of return than for the industry as a whole. Industry figures are, of course, very broad averages. However, the figure does serve to indicate that a point will be reached at which the rate of return is less under the full cost method than under conventional practices, in spite of the reported earnings being higher absolutely.

## Long Term Effects on Growing Companies

In the case of growing companies, the effect upon the reported earnings of a change to the full cost method of accounting has been shown to be significant increase in the earnings. An increase in the carrying value of the assets of the company also results. Increases in income and the carrying value of assets have been given for individual years, even though a continuing increase has been implied. The increases and a smoothening effect that are attributable to a change to the full cost method are shown for a period of years in the following figures.

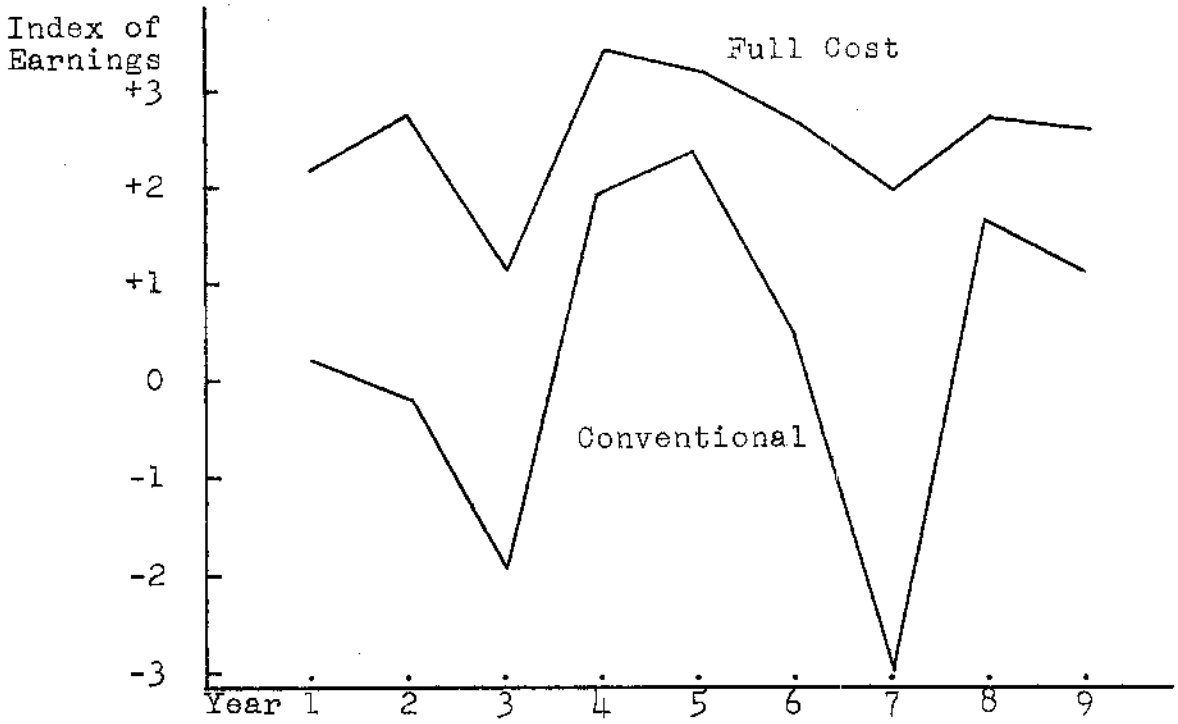


Fig. 19--Company F--Comparison of earnings on full cost and conventional methods for an actual nine-year period.

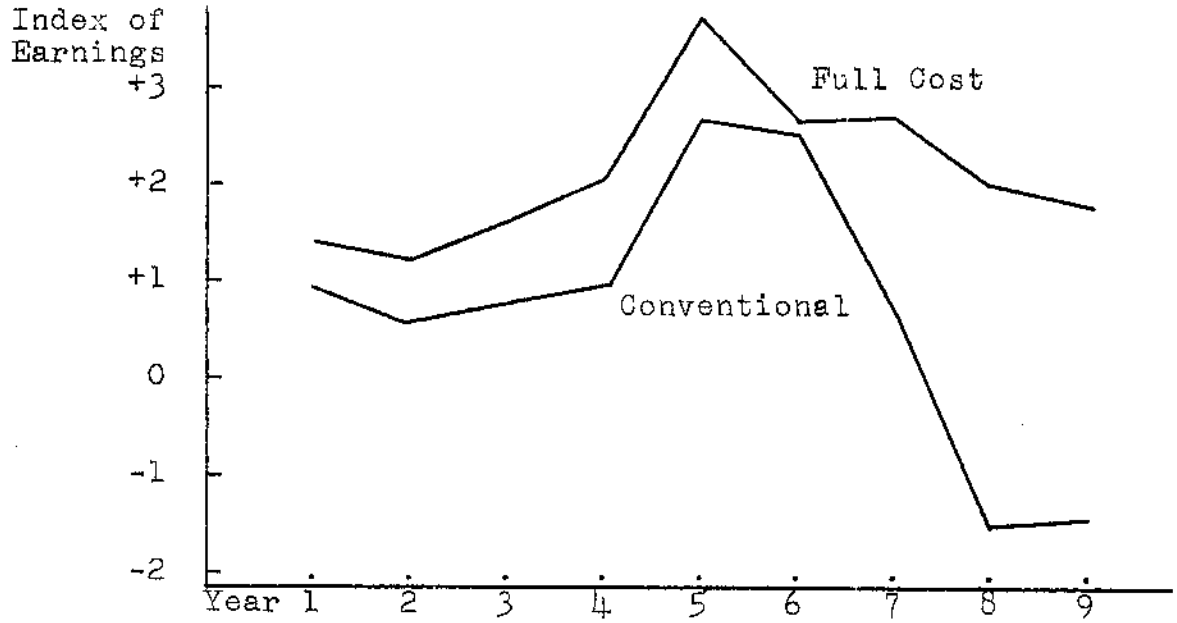


Fig. 20--Company H--Comparison of earnings on full cost and conventional methods for an actual nine-year period.

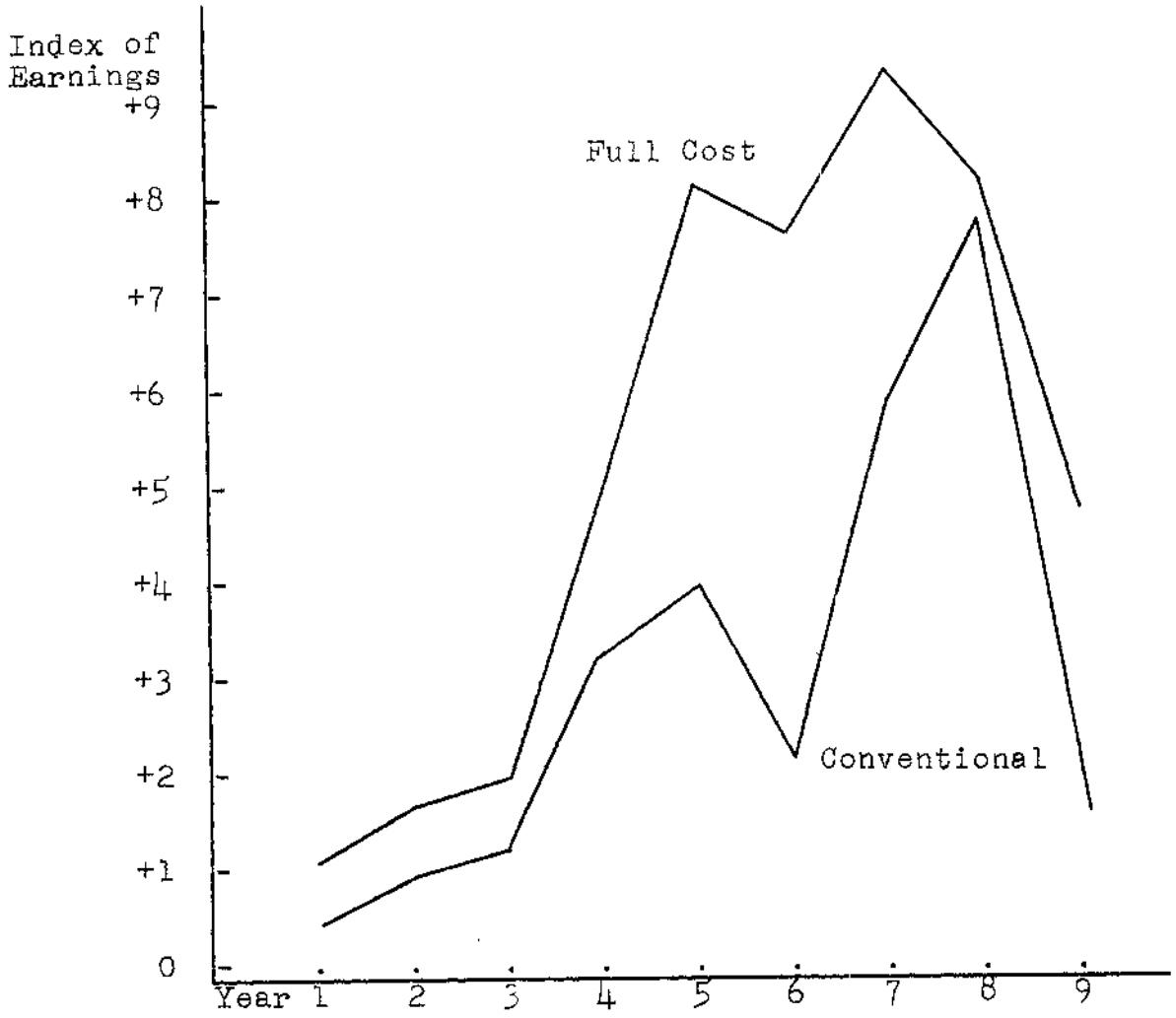


Fig. 21--Company G--Comparison of earnings on full cost and conventional methods for an actual nine-year period.

No provision is made for deferred taxes in any of the three preceeding examples. For the first year shown in each of the three figures, there is no retroactive adjustment. However, since the data for individual companies are cumulative, the data portrayed for the ninth year include at least a partial retroactive adjustment.

In each of the cases illustrated in the three preceeding figures, the use of the full cost method has resulted in an

increase in reported earnings and accordingly an increase in the carrying value of the properties; at the same time, the earnings are noticeably smoother.

The immediately preceeding figures portray data to show only relative increases and smoothening. In order to indicate the magnitude of the effects of using the full cost method for a relatively long period of time, the following illustration is included:

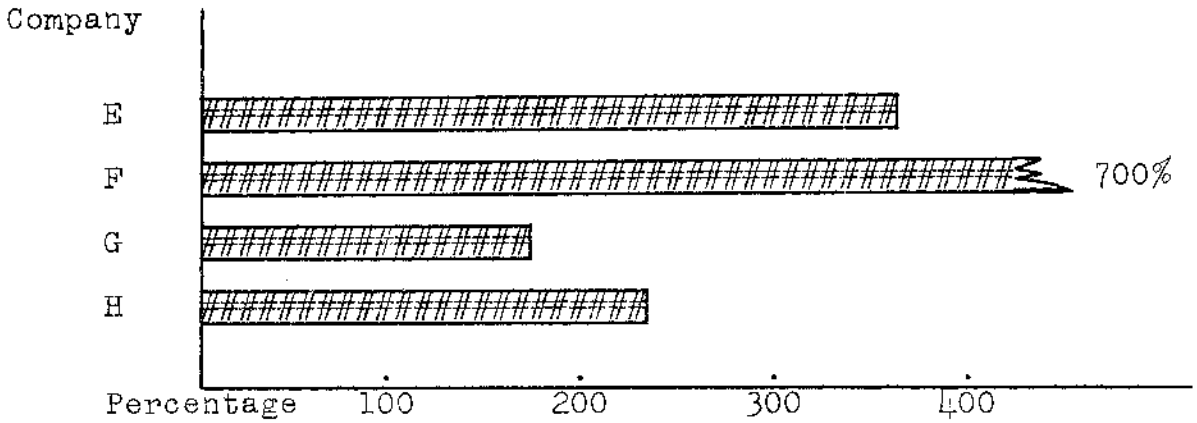


Fig. 22--Summation of full cost earnings expressed as a percentage of total conventional earnings for a nine-year period for actual companies.

Data is not available which would allow comparisons of earnings for an extended period of time for more of the growing companies using the full cost method. The information necessary for comparison was furnished by three of the companies included in the preceeding illustration. Detailed information on the fourth company was obtained from the company's annual reports. The indicated increases in earnings resulting from the use of full costing are very material. In four additional

growing companies from which the data was obtained for at least four years, the percentage of full cost earnings as compared with conventional earnings ranged from 135 per cent up to 555 per cent.

An indicated decrease in reported earnings upon adoption of the full cost method is possible under certain conditions. In one situation, a substantial retroactive adjustment would increase the amortization of capitalized costs. If, at the same time, the company is in a declining phase or has voluntarily curtailed its exploration program, then the increased amortization might well exceed the differences in items capitalized, and thus a decrease in earnings would result. Under consideration of the entire period applicable to the retroactive adjustment, however, there would be a significant increase in the total earnings.

### Summary of Effects of a Change in Methods

A retroactive application of the full cost method reinstates some of the prior nonproductive costs in order to charge a portion of the full costs to current operations. A change to full costing without a retroactive adjustment will have the effect of an immediate and significant increase in reported earnings. The increase is attributable to the capitalization, rather than to expensing, of current nonproductive costs and to no additional amortization against this increase. With a retroactive adjustment, the increase is still present

though modified somewhat because of having the additional costs to apply to the increase.

Deferred taxes arise through differences in the timing of deductions for financial and tax purposes. If deductions are claimed more rapidly for tax purposes than for financial purposes, the taxes paid are less than those attributable to the financial income, and a deferral of this difference has occurred. The use of deferred tax procedures attempts to relate the tax expense to the financial income over the life of the company.

Of the forty-eight reporting entities known to be using the full cost method nine companies offered no information; four companies had used the method from the inception of their operations. Of the thirty-five remaining companies, thirty-one have failed to use deferred taxes and twenty-one have failed to make any retroactive adjustment. The majority of companies employing full costing use the method without any reductions caused by deferred taxes or retroactive application.

In this examination of the effects of a change to the full cost method of accounting, companies were classified according to size and type of operations within the petroleum industry: the mature or fairly stable company, the declining company, and the growing company. It was possible to obtain sufficient data for the mature company and for the growing company; however, no data could be obtained for the

declining companies and it was necessary to use hypothetical data for this portion of the analysis. Further since the majority of companies do not use deferred income taxes or make retroactive adjustments in connection with the full cost method, these items were eliminated for most comparisons.

One occasionally hears that the particular method used makes little difference so long as the method which is used is applied consistently. In the case of the full cost method of accounting, this is valid only if the company remains constant or static over a fairly long period of time. In the fluid commercial world in general, and in the petroleum industry in particular, companies cannot remain in such a state. There is continual change; if a company is to continue in business and is to remain successful, the change must be growth.

A company can have sustained growth and still be fairly mature and stable in its operations. Several of these companies were examined with respect to the effects on earnings and the carrying value of assets. Without exception, there was a material increase in earnings attributable to use of the full cost method of accounting. There occurred a similar increase in the carrying value of the properties. A further effect of the use of full cost accounting was a noticeable smoothing of earnings.

The details pertaining to a declining company point to basically the same effects of a change from conventional

practices to the full cost method: an increase in the earnings of the concern, smoother earnings, and an increase in the carrying value of the properties (in the case of a declining company, more of a potential problem). In a declining company, the increase in the carrying value of the properties may well continue to the point that the indicated cost of the reserves is above the fair market value; in such a case the excessive amounts would be recognized as losses. However, the carrying value would still be in excess of that under conventional practices.

Differences between the earnings to be reported under conventional practices and the full cost method are more noticeable in the case of young, growing companies. This is partly because of the fact that the growing companies are more susceptible to fluctuations in earnings as the result of exploratory activity, and partly that these companies are more inclined to be concerned only with exploration and production. Older or more mature companies quite often receive a large portion of their revenues from sources other than the production of raw hydrocarbons.

In the growing company, just as in other classifications, the effect of a change to the full cost method of accounting is a significant raising and smoothening in reported income. Moreover, the carrying value of the properties will also be increased.

One of the primary differences of effects of the classifications of companies is that fluctuations as the result of

the level of exploration are more violent in the case of the young, growing companies. Other than the effect of these fluctuations, the results of a change to full cost accounting are basically the same.

A change to the full cost method of accounting for finding costs results in usually a material increase in the earnings of the concern. A similar absolute increase will occur in the carrying value of the oil and gas properties. An additional change is a definite smoothing or normalizing of reported earnings over a period of years. Thus the generalizations made concerning the effects of adoption of full costing are valid.

The financial and economic environment of the petroleum industry is continually changing. For several years the climate in the petroleum industry has been such that there has been greater competition among companies for added oil and gas reserves, for new distribution outlets, for added capital, and for increasing profits. In order to meet its own objectives and stay in business, management must meet these keener requirements imposed by the industry environment. To do this, it is necessary that management have the support of investors. The investors, however, will support corporate management only when it appears that the company is doing well. The raising and smoothening of reported income and the increasing asset values made possible through the use of the full cost method aid in presenting more favorable

financial statements. Thus, the adoption of the full cost method of accounting for finding costs is the logical step for management to take in fulfilling its goals.

# CHAPTER VII

## SUMMARY AND CONCLUSIONS

The various data and factors examined in connection with this study of full cost accounting in the petroleum industry are summarized in this chapter; in connection with this summarization, some conclusions are drawn with respect to the possible reasons for the adoption of the method and the effects of its use in the petroleum industry.

### General Comments on the Method and Its Use

Since 1959, accountants have developed a new method of accounting for finding costs within the petroleum industry. Up to that time, finding costs were accounted for in one of two ways: a very few companies elected to expense all exploration and development costs on the rationale that such were recurring expenditures to be faced each year; the majority of the companies followed the practice of capitalizing as the cost of assets only the costs which could be associated with specific reserves and of recognizing as losses, when they were incurred, all of the costs associated with nonproductive efforts.

The new method of accounting for finding costs in the petroleum industry is called the full cost method, or sometimes, the total cost method. Under full costing, the costs

to be capitalized include all of the productive and the non-productive costs incurred in finding hydrocarbon reserves--the lease acquisition costs, the lease carrying costs, the geological and geophysical costs, and the exploration and development costs, as well as some of the general overhead of the concern. These total costs are then applied to the operations as reserves are produced on a broad based unit-of-production method of depletion.

The full cost method is not widely used in the petroleum industry. From information obtained as the result of this study, fifty-five companies, which include forty-eight reporting entities, are known to use this method of accounting for finding costs. Use of the method appears to be growing, at least in the smaller companies that are oriented primarily towards exploration and production.

Use of the full cost method is more widespread in Canada than it is in the United States; of the forty-eight reporting entities that are known to use the full cost method, twenty-four are located in Canada. Since there are relatively fewer firms in Canada as opposed to the United States, the percentage of Canadian firms using the full cost method is definitely higher. Some of the companies involved have indicated that the majority of the non-major, non-integrated companies in Canada have employed, or are considering, the full cost method. In view of these facts, and since the method is apparently more favorably viewed in Canada than in the United

States, use of the method will probably continue to increase in the Canadian firms.

A prediction as to the extent of probable use of full costing in the United States is not possible at this time. It is not known what conclusions will be reached in the forthcoming Accounting Research Study on Accounting Practices in the Extractive Industries, or what the nature of the opinion of the Accounting Principles Board will be on this subject. A preliminary report on the Accounting Research Study indicated that the recommendations for preferred practices in the petroleum industry would closely follow the conventional practices employed by the majority of the industry at this time. The assumption that the recommendations will approximate those included in the preliminary report appears reasonable, as does the assumption that the opinions of the Accounting Principles Board will follow the recommendations made in the study. Even though the opinions of the Board are not binding in the strict sense of the word, the failure of a company to follow them is difficult to explain in annual reports. While the full cost method may continue to be permitted, its place as the preferred practice of the petroleum industry is doubtful. Given the present conditions in the petroleum industry, one would not expect a drastic increase in the number of firms using the full cost method of accounting. However, if the method is permitted as a generally accepted accounting principle, adverse conditions in the industry might result in a more extensive use of the method.

## Possible Reasons for Adoption of the Full Cost Method

Companies in the petroleum industry have adopted the full cost method of accounting for different reasons. At the outset of this study, several possible reasons for adoption were included as part of a general hypothesis stating that the reasons for changes to the full cost method are the result of changes in the environment within which the petroleum industry must operate. The actual causes for a change to the full cost method of accounting cannot be determined since a change is the result of personal decisions of management, and the reasons for such decisions are not subject to objective verification.

Isolation of specific factors within the petroleum industry environment which might have induced a change to full costing was not the purpose of this study. Rather, such items as costs and location problems of reserves, demand-supply relationships, investor objectives, governmental influence, and the maturity of the industry have been studied to gain some insight into the environment of the industry together with some of the changes that have occurred.

Costs involved in the location of hydrocarbon reserves have been increasing in recent years. The costs involved have increased both absolutely and relatively. Costs have increased at a greater rate than have the selling prices for the products involved. With increased costs, earnings as a

rate of return on stockholders' equity have also had some decrease.

Long-range prospects in the petroleum industry are for continued growth. Usage of crude petroleum has been growing at an annual rate of 6 per cent. Yet, the big problem for the industry as a whole has been that of over-supply, in that the industry is capable of producing much more petroleum than is required for any given year on a world wide basis. For the future, however, the existing supply must be increased by a great deal. Individual companies are not primarily concerned with the needs of the industry, but instead, are directly concerned with an increase in the share of the total reserves that are held by their company. To insure its success in the industry, a company must be capable of showing an ever increasing share of the total hydrocarbon reserves.

In the last ten years, the number of stockholders has more than doubled in this country. This increase has applied to the petroleum industry as well as to all industry. The increase has been more noticeable in the case of companies which have made the change to full costing. Considering the greater increase in companies making the change in methods, it is possible that an increase in stockholders might be a contributing factor to the change to full cost accounting.

Governmental influence with respect to full cost accounting is more in the nature of fear of increased regulation than it is of present regulation. The Securities and Exchange

Commission has not given any opinion on the method at this point, and will accept statements filed on the basis of full cost accounting, or on conventional accounting as the case may be. The Federal Power Commission has rejected the method at the present time for rate making purposes but has left the door open to further examination of the method if they feel it to be of any significant value. Concern with other agencies, as for instance the Department of Interior, is that of a fear of increased regulation in the future rather than an immediate threat. The governmental agencies, however, are merely part of the total environment of the industry.

The maturity of the industry is not only a fact for the industry as a whole, but for the individual company, this is part of the environment in which companies must operate. The integration and growth in the industry have permitted large concentrations of capital and production. At the same time, competition among the companies for the reserves, profits, and investor capital has contributed to a decrease in profit margins of companies in the petroleum industry.

Rapid technological innovations, the increasing difficulty in locating hydrocarbon deposits, and decreasing profit margins have made it increasingly difficult for the smaller companies to attract sufficient capital to compete with the larger, more mature companies. Unless companies can continue to satisfy investor objectives, there is no chance to attract the capital needed for growth, or even survival. Management

can satisfy its objectives of staying in business only by meeting the goals of investors.

While the earnings of the petroleum industry as a whole have been consistently higher than other industries, such is not the case with the companies (as a group) that have made the change to full cost accounting. Prior to such change, earnings of these companies have generally been less than the industry averages. Earnings as a rate of return on stockholders' equity have been less for the group of full cost companies than for the industry as a whole. Management is able to determine the effects of a change of practices upon the reported results of a company's operations. It is possible that a desire to improve these results is, in fact, a definite reason for making a change in the accounting practices followed by the company. Most of the companies in the industry have not adopted the full cost method of accounting. Those companies which have adopted the method, however, have shown greatly increased earnings, and reported higher asset values as well. These companies have also had less fluctuations in the reported earnings. Adoption of the full cost method has given certain companies some degree of competitive advantage through the beneficial effects of the method on the financial statements. Perhaps, companies which have adopted the full cost method have been able to attract additional capital through additional stock issues.

In view of the relative position of the companies which have made the change to the full cost method and the effects

of actually making the change, a desire to achieve competitive advantage through beneficial effects to the financial statements must be considered the primary reason for adoption of this method of accounting in the petroleum industry.

## Impact of Full Costing on Financial Statements

The approach used to examine the impact of a change to the full cost method of accounting was to determine the differences between the earnings which would be reported under the full cost method of accounting and those which would be reported using conventional accounting practices. The continuing impact of a change in methods was also considered important.

Data were obtained through interviews, through the use of questionnaires requesting specific data regarding financial statements, and from examination of annual reports of firms known to be using the full cost method of accounting. The impact on the financial statements was then determined for companies that would fall into the classifications of a mature or fairly stable company, a declining company, and a growing company; comparisons of results are more valid when the comparisons are of like or similar items.

The mature, stable companies are involved in all phases of the petroleum industry, including exploration, production, refining, marketing, and research. Because of the diversity of operations, earnings are less subject to fluctuation and are less dependent upon exploration and

production. The operations of a mature company are different from those of a declining company which, for one reason or another, is gradually going out of business. In a declining company, the production is often decreasing and the success of exploratory efforts is insufficient to replace old reserves, much less to add needed new reserves. Growing companies are oriented primarily towards the exploration, development, and production phases of the industry. Earnings computed on conventional methods are subject to wide fluctuations as the result of exploratory activities.

In examining the impact of an adoption of full costing, the effects of a change in methods were quite similar among the three classes of companies used. The effects were so similar that in summarizing the study, generalizations for the method can be made with respect to the impact of full costing on financial statements.

## Increase in Income

At times, the comment is made that it really makes little difference as to the method of determining income, so long as it is applied in a consistent manner. The implication is that if the method is consistent, the income reported will be comparable to that reported under another consistently applied method of accounting. Results in reported income under the full cost method of accounting will be comparable with those obtained under conventional practices only in the case where the company is maintaining a constant exploration program, is

discovering the same amount of reserves each year, and is maintaining the same production level. Earnings as a rate of return on assets employed, however, are not comparable even in this instance, since the carrying value of properties under the full cost method exceeds that of conventional practices. The only other case in which the earnings would be comparable is after the concern has ceased to exist, since regardless of the method, total earnings cannot be changed over the life of the concern. Businesses are not constant, however, and there is change within the total environment. Accordingly, there will always be some differences in earnings presented by the full cost method of accounting and those by conventional methods in the petroleum industry.

The immediate impact that can be anticipated on the reported earnings of a concern changing to full cost accounting is that the earnings will be increased, usually by a significant amount. An increase can definitely be expected when it is considered that the majority of firms which have changed to full cost accounting have done so without using either deferred taxes or a retroactive application of the method. Both deferred taxes and a retroactive application have the effect of modifying any increase in income which is the result of capitalizing nonproductive expenditures under the full cost method. However, these adjustments do not eliminate the increase in income attributable to a change to the full cost method of accounting. As long as some amount

of growth continues, the earnings reported under the full cost method will exceed those which would be reported under conventional practices.

## Smoothening of Income

There is less fluctuation in the income reported under full cost accounting than under conventional practices. The capitalization of all nonproductive costs eliminates the fluctuations attributable to the level of exploratory activity. Further, the use of a broad based average for depletion and amortization tends to smoothen these charges. The reduction of items charged to income, and the leveling of those items charged against earnings, have the effect of smoothening or normalizing the reported earnings of a firm which uses the full cost method of accounting.

## Increase in Asset Values

The impact of a change to full cost accounting upon the statement of financial position is directly related to the impact upon the reported earnings of the concern. Since the earnings are increased as the result of capitalizing normally expensed items, this capitalization results in an identical increase in the carrying value of oil and gas properties. A ceiling is placed upon the amount of the costs that can be capitalized. This maximum is considered to be the fair market value of the underlying reserves, but ordinarily such is reached only in the case of declining companies and does

not present any major problems to the usual firm. Even if the ceiling is not reached, the carrying value under the full cost method is above that of the conventional method.

Summary of Impact on Financial Statements

The impact of a change from the conventional practices to the full cost method of accounting in the petroleum industry is specific. Upon adoption of the method, there is a significant increase in the reported earnings of the company involved. Over a period of years, there is a definite smoothening of the reported earnings. There is also an increase in the carrying value of the assets, which increase is equal in absolute amount to the increase in the reported earnings.

Management, to meet its own goals, must be able to cope with the requirements imposed by the financial and economic environment of the industry. The overall climate of the industry has been one of increasingly keener competition among companies for a greater share of hydrocarbon deposits, of profits, and of additional capital. Management looks for the support of investors in order to meet its objectives of staying in business. The investors, in turn, will support management when it appears that the corporation is doing well. Since the effects of use of the full cost method are to raise and smoothen reported income and to increase the carrying value of the assets, then, the adoption of the full cost method of accounting is the logical step for management to take in fulfilling its goals.

## Consequences of Adoption of Full Cost Accounting

One of the purposes of business is generally assumed to be the maximization of profits for the owners. Maximization of profits ultimately requires a proper allocation of resources and valid decisions of the owners concerning the utilization of resources. Accounting statements do not maximize the profits; however, the use of accounting statements is an aid to the maximization of profits, since decisions are based upon the statements.

Meaningful financial statements are generally considered to be based upon sound theory or standards. Yet, the theory in accounting today is in a large part, if not completely, induced from practice. The theoretical structure of accounting imposes only restraints on practice. These restraints are in reality against there being too rapid or too drastic changes in accounting practice.

Accounting theory or induced standards do not determine whether or not a given accounting practice is good, or is bad. A decision as to whether some practice is right or wrong can only be made after considering the consequences of the application or nonapplication of such practice. This is true with the subject of full cost accounting in the petroleum industry. For some situations, however, consequences of adoption of full costing remain little more than conjecture.

With the probability of increased involvement of government in the petroleum industry, full costing, if recognized,

would add to problems of regulation in the industry. Costs, whether or not related to specific reserves, are capitalized under the assumption that the costs are relevant. Since the costs are capitalized, they would become a part of the rate base used to determine the prices allowed to the industry. Ordinarily, one would assume that it would be contrary to the desired public goals to allow earnings on unsuccessful efforts as well as the successful ventures. Such would, in effect, be in the nature of a reward for inefficiencies, and there would be little incentive to optimize the allocation of resources. A practice that would lead to higher prices and the possible misallocation of resources through failure to give the greater reward to companies making the greater contribution could not be considered a desirable practice.

In terms of adequate financial reporting, the use, or nonuse, of the full cost practice would also affect the allocation of resources and the continued existence of the firms. In a fairly new company, heavy exploration expenditures would also generally mean heavy nonproductive costs. Losses would probably be reported in the financial statements under the conventional practices regardless of the amounts of new reserves that were discovered. Without any indication of the reserves actually discovered, the reported earnings, or losses, would not serve to indicate the success or failure of the company involved. Yet, with the reported losses, attraction of additional capital would prove very difficult.

On the other hand, use of the full cost method would tend to disguise or delay recognition of the actual results of the operations. With the use of averages, as is the case in full costing, the results of any unsuccessful operations may tend to be obscured until such time that the company's operations are marginal. Appropriate action may be delayed since pertinent information is not readily available when the averages are used. The smoother earnings as reported under full costing give the appearance of a lesser amount of fluctuations in the earnings picture of a company. Such is not the case. Exploration is a vital and necessary part of the oil business. Successful years should be indicated. So should the unsuccessful, and as soon as is possible to do so; not years later when the depletion rate finally indicates that the company is operating at less than a desirable rate.

Favorable financial statements may give rise to unwarranted speculation in the securities of a company. Recently, the American Stock Exchange banned trading by its members in 103 of its most volatile stocks.[1] It may be significant that five of these companies use the full cost method of accounting. If favorable financial statements which are in part attributable to use of full costing, add to speculation in given stocks, then use of the method cannot be considered desirable.

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[1] Wall Street Journal, February 5, 1969.

Favorable financial statements do not necessarily mean that the company is doing well. The meeting of some of the goals of management may not be desirable from an overall point of view. Perhaps some companies should not remain in business. In some instances, the use of the full cost method has resulted in declining conventional earnings being reported instead as increasing earnings. Losses under conventional practices have also been reported as profits under the full cost method. Capital, invested and borrowed, has been obtained by some of the firms in these declining or loss situations. The attraction of capital, which has been aided by favorable financial statements made possible through the use of full costing. has resulted in a misallocation of resources in some situations. Where such has been the case, the use of the full cost method cannot be considered good.

In terms of improved reporting, the use of any new method must offer a great deal to overcome the decided disadvantage of increasing the lack of comparability among companies within an industry. Based upon this research, the full cost method does not appear to offer sufficient advantages to overcome the disadvantage of an additional alternate method.

## Need for Research Sponsored by Industry

Research in the area of full cost accounting will be undertaken by the American Petroleum Institute within the near future. Additional research is necessary since the

present study does not include all of the answers to this intriguing subject in petroleum accounting. The conclusions reached in this study, however, would probably not change as the result of additional research.

One factor that could be established through industry-wide research is the actual extent to which the full cost method is in use. Industry-sponsored research should also be able to obtain a better response to requests for information, in that an implied authority exists which is not present in an individual research study. Industry-sponsored research would also have a bearing on the amount and types of information that could be obtained. A need exists to know more about this relatively new and different method of accounting. More and better information is available through industry-sponsored research than through any other method.

## Benefits of Additional Research

Some benefits may be possible through additional research on the subject of full costing since accounting practices in the petroleum industry need to be improved. Alternative accounting practices have been the subject of much recent discussion and writing. There are few, if any, who actually want the rigidity of statutory accounting. However, the elimination of alternatives which cannot be justified on the basis of factual situations must be considered a very desirable goal. In view of the extremely wide divergence of the

accounting in the petroleum industry, one could question whether all of the practices can in fact be justified.

Interest of the Securities and Exchange Commission in alternative practices has been indicated on several occasions by Manuel F. Cohen, Chairman of the Commission (Chapter V, p. 110). Some have evidenced concern that unless the business community, along with the accounting and financial analysts professions, can work toward this goal of the elimination of unjustified practices, the government may increase its regulatory activities. If additional research could aid in determination of the preferred accounting practice for major types of transactions in the petroleum industry, an increase in governmental intervention or regulation might be lessened or avoided.

Uniformity of accounting practices in the strictest sense is not the answer to some of the reporting problems in the petroleum industry. However, uniformity to the degree necessary to permit meaningful inter-company comparisons is desirable. Disclosure of additional information would also improve financial reporting; financial statements are not adequate at this time to serve as the basis for decision making in the petroleum industry. This inadequacy is particularly apparent in the area of accounting for finding costs. When comparisons of financial statements are attempted between petroleum companies that use conventional practices and the companies that use the full cost method of accounting, the only result will be that of confusion.

# APPENDIX A

## QUESTIONNAIRES USED IN RESEARCH

## LETTERS FROM ORGANIZATIONS AND AGENCIES

NOTE: NEITHER YOUR NAME NOR YOUR COMPANY NAME WILL BE USED IN CONNECTION WITH THIS INFORMATION. THERE WILL BE NO TIE-IN TO YOUR COMPANY IN ANY WAY.

Company:

Questions with respect to use of full cost method of accounting in the petroleum industry.

(1) Has your company considered use of the full cost method of accounting for finding costs?

(2) Does your company now use this method?

(3) Does your company expect to change to this method in the near future?

(4) What are the primary reasons for your company's rejection or acceptance of this method as the case may be?

(5) Other relevant comments.

Under the full cost method of accounting for finding costs, items such as dry hole costs, delay rentals, exploration costs, certain geological and geophysical costs, abandonments, a portion of overhead, and certain other costs which would normally be expensed under conventional accounting, are capitalized and depleted on a company wide unit-of-production basis under the Full Cost Accounting method.

NOTE: NEITHER YOUR NAME NOR YOUR COMPANY NAME WILL BE USED IN CONNECTION WITH THIS INFORMATION. FURTHER, THE EXACT FIGURES WILL NOT BE USED IN THE FINISHED STUDY, AS ONLY PERCENTAGES OR RATIOS WILL BE USED. THERE WILL BE NO TIE-IN TO YOUR COMPANY IN ANY WAY.

Company:

If the full costing portion is split among the accounts and/or properties, please give the year-end balances for the following.

| | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|
| Leasehold Costs | | | | |
| Conventional basis | | | | |
| Full cost portion | | | | |
| Total | | | | |
| Intangible Development | | | | |
| Conventional basis | | | | |
| Full cost portion | | | | |
| Total | | | | |
| Tangible Equipment | | | | |
| Conventional basis | | | | |
| Full Cost portion | | | | |
| Total | | | | |
| Accumulated Depreciation and Depletion | | | | |
| Conventional basis | | | | |
| Full cost portion | | | | |
| Total | | | | |
| Depletion for Year | | | | |
| Conventional basis | | | | |
| Full cost portion | | | | |
| Total | | | | |

If, however, the amounts applicable to the Full Cost Method are kept in a Full Cost Account or a Company Wide Development Account, please show net additions to the account for the year, and the depletion on the account for the year.

| | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|
| Full Cost Account | | | | |
| Full Cost Depletion for the Year | | | | |

Please show the year of the change to Full Costing as Year 1.

The Full Cost portion, or the Full Cost Account, includes those items such as dry hole costs, delay rentals, exploration costs, certain geological and geophysical costs, abandonments, a portion of overhead, and certain other costs which would normally be expensed under conventional accounting, but which are capitalized and depleted on a company wide unit-of-production basis under the Full Cost Accounting method.

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# AMERICAN STOCK EXCHANGE

(AREA CODE 212) 964-3200 TWX-710-581-2172

86 TRINITY PLACE, NEW YORK, N. Y. 10006

E. STANLEY PECK, JR., DIRECTOR
DIVISION OF SECURITIES

March 6, 1968

Mr. John Paul Klingstedt, CPA
North Texas State University
Denton, Texas 76203

Dear Mr. Klingstedt:

I regret the delay in answering your letter of February 17th which has been due in part to my attempting to obtain a responsive answer for you.

The Exchange does not have any specific accounting requirements for its listed companies. We do require that annual financial statements be prepared in accordance with generally accepted accounting principles by independent auditors.

Several of our companies have adopted full-cost methods, but we have no guidelines or recommendations on the subject.

I am sorry that this is not responsive to your inquiry, but appreciate your giving the Exchange an opportunity to comment.

Sincerely,

Peck

NEW YORK STOCK EXCHANGE
ELEVEN WALL STREET
NEW YORK, N.Y. 10005

MORTON B. SOLOMON
EXECUTIVE ASSISTANT

January 25, 1968

Mr. John Paul Klingstedt
North Texas State University
School of Business Administration
Division of Accounting
Denton, Texas 76203

Dear Mr. Klingstedt:

Your letter of January 17, 1968 addressed to the Research Department of the Exchange has been given to me for reply.

The Exchange does not have any rules of accounting which listed companies must follow. At the time a company becomes listed, the form of the financial statements to be included in future annual reports is agreed upon and incorporated into the listing agreement executed with the Exchange. In addition, the company also agrees that all financial statements contained in the annual report will be audited by independent public accountants. We expect that the financial statements of listed companies will be prepared in accordance with generally accepted accounting principles.

A copy of the listing agreement referred to above is enclosed. Please note Section II, paragraph 1 through 6. I have also enclosed Section A-4 of our Company Manual which covers financial reporting requirements of listed companies.

Although the Exchange has no list of accounting rules, it is greatly interested in the development of improved reporting standards among listed companies. We have traditionally supported the pronouncements of the American Institute of Certified Public Accountants. In addition, we have encouraged various industries to work toward the development of reporting practices which will lead to greater comparability among companies in the same industry.

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Mr. John Paul Klingstedt January 25, 1968

The petroleum industry is one of the industries that we have cooperated with in this regard. I have enclosed a copy of a speech that G. Keith Funston, former President of the New York Stock Exchange gave before a group of oil company executives last year. I believe it will crystalize for you the Exchange's thinking in this area.

I'm sure that you will find in the course of your research that there are companies listed on the Exchange that use 'full costing' in their stockholder reports. Our effort in this area is to encourage the industry to narrow the existing alternative accounting practices.

The petroleum industry has made an industry wide research effort through the American Petroleum Institute to classify various accounting practices within the industry. I have enclosed the 1965 and 1967 edition of the API's "Report of Certain Petroleum Industry Accounting Practices." The AICPA is also in the process of completing a research study on the extractive industries and they may be of further help to you in this regard.

I hope the above information and the enclosed material will be useful to you. We wish you the best of luck on your research project.

Sincerely,

Martin Sheldon

Encls.

FEDERAL POWER COMMISSION
WASHINGTON, D.C. 20426



IN REPLY REFER TO:
OAF-SY

APR 17 1968

AIR MAIL

Mr. John Paul Klingstedt
School of Business Administration
Division of Accounting
North Texas State University
Denton, Texas 76201

Dear Mr. Klingstedt:

Chairman White has asked me to respond to your letter of March 27 regarding the accounting for finding costs in the petroleum industry.

I might note at this point, for clarity of my comments, that I interpret your use of the term "full cost" accounting as that accounting which capitalizes all finding costs - those associated with successful (productive) and unsuccessful (nonproductive) projects, wells, leases, etc. - with subsequent amortization of the capitalized costs over the production of the successful projects.

The Uniform System of Accounts Prescribed for Natural Gas Companies does not permit full cost accounting and the Commission, in proceedings involving Natural Gas Pipeline Companies, has consistently required accounting and rate treatment consistent with the prescribed accounting. For example, Account 796, Nonproductive Well Drilling, one of the exploration and development expense accounts, provides that the net cost of drilling nonproductive wells be recorded therein. That is, the cost of nonproductive wells is charged to expense currently. Also, all expenditures for preliminary surveys, plans, investigations, etc., made for the purpose of determining the feasibility of acquiring land and land rights to provide a future supply of natural gas are charged to expense currently (Account 798, Other Exploration), for those projects abandoned.

Of course, not all gas pipeline transmission companies are directly involved in finding and producing natural gas. Although some of the companies operate production properties this is not their principal business and the question of full cost accounting for finding and developmental costs is of little import in establishing a cost of service for a regulated natural gas transmission company.

The accounting requirements imposed on natural gas transmission companies have not been extended to natural gas producers. Shortly after the Supreme Court held, in Phillips Petroleum (347 U.S. 672), June 7, 1954, that producers making sales in interstate commerce were subject to all the requirements of the Natural Gas Act, the Federal Power Commission promulgated regulations governing the filing of rate schedules and certificates by producers, but exempted producers from the regulations requiring natural gas companies to keep their accounts in accordance with the Commission's Uniform System of Accounts.

Interested parties have submitted evidence on this issue in the area rate proceedings, and in Opinion No. 468, the Commission rejected the full cost concept saying:

> As we have already noted, other methods of computing dry hole costs were suggested in the record. Of particular interest is the alternative method of cost determination, advocated by the Major Producer Group, often called the project method, which capitalizes the total cash outlays to acquire a capital asset (i.e., project) and allows a return on that investment over its productive life. Under this method, dry hole costs and other costs associated with unproductive ventures would be capitalized along with the cost of productive ventures. We find that this alternative method which would constitute a departure from our treatment of E & D in prior proceedings as well as a departure from present industry accounting practices is not adequately supported in the record. The inadequacy is especially notable with respect to the cost of capital for establishing the fair rate of return to be allowed on the computed investment base. However, capitalization of E & D may well be a useful approach and we do not foreclose in succeeding cases further consideration of this alternative method of costing or of improvements in the cost-finding techniques herein employed.

You may find other sections of Opinion No. 468 helpful so I am enclosing a copy. Another document which may be of assistance is the American Institute of Certified Public Accountants research study on the extractive industries, and I am enclosing a draft of the final chapter setting forth the conclusions and recommendations.

This draft is subject to revision so it should be used with this in mind. Also, you may find the Uniform System of Accounts helpful and Commissioner O'Connor's recent speech before the Petroleum Accountants Society of Houston may be of interest.

In summary, we do not anticipate any changes in the Commission's policy in the foreseeable future concerning accounting for finding costs.

On behalf of Chairman White I wish to thank you for writing and if we can be of further assistance, please contact us again.

Sincerely yours,

Arthur H. Litke
Chief Accountant

Enclosures

AMERICAN PETROLEUM INSTITUTE

1271 AVENUE OF THE AMERICAS

NEW YORK, N. Y. 10020

DIVISION OF FINANCE AND ACCOUNTING

ROBERT H. STEWART, DIRECTOR

February 29, 1968

Mr. John Paul Klingstedt
School of Business Administration
North Texas State University
Denton, Texas

Dear Mr. Klingstedt:

In reply to your February 27 letter, I am afraid we can't be of much help to you at this time on the subject of your thesis.

You are probably aware that The Canadian Institute of Chartered Accountants covered full costing in its publication, "Accounting Problems in the Oil and Gas Industry", 1963. You may also know that the AICPA has a research project on accounting for the extractive industries, under the direction of Robert E. Field, a partner of Price Waterhouse here in New York. This report will probably be released within the next few months and it contains a discussion of full cost accounting.

As you noted from our 1965 study of accounting methods, we did not go into full cost accounting for the reason that it was not being practiced by any of the companies in our survey. However, it is one of the subjects suggested to our Accounting Research Committee for a research study by the API because there is considerably more interest being shown in it in several quarters. I do expect that it will be one of the subjects approved by us at our midyear meeting in June.

Yours very truly,

RHS:ed

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

DIVISION OF
CORPORATION FINANCE



December 11, 1967

Mr. John P. Klingstedt, C.P.A.
North Texas State University
School of Business Administration
Division of Accounting
Denton, Texas

Dear Mr. Klingstedt:

Your letter of November 20, 1967 has been received. Set forth hereafter are answers to the questions raised in the second, third and fourth paragraphs of your letter.

The Commission has not made any general pronouncements with respect to the adopting of full cost accounting in the petroleum industry. Full cost accounting has been followed in a limited number of cases as an alternative practice. It is the writer's experience that full cost accounting had been adopted principally by production and exploration oriented companies rather than by the international integrated oil companies.

At the time of change to full cost accounting, it is required that the change be reported as the change affects the consistency of the accounting practices followed in the preparation of financial statements from year to year. The effect on income of the change is required to be reported for the year of the change but there is no requirement for continuous reporting of the differences in income under the full cost and another method for years subsequent to the change. Such disclosure in the year of change is deemed required under the general disclosure requirements set forth in Rules 2-02-C(ii) and 3-08 of Regulation S-X issued by the Securities and Exchange Commission.

I am unable to recall of any of the national certified public accounting firms having submitted a brief with the Commission prior to one of its clients adopting full cost accounting.

Under the conditions indicated, any such brief would no doubt have been submitted as confidential information and would not be available for release to the public.

Very truly yours,

Walter Mickelsen

Walter Mickelsen
Chief Accountant
Division of Corporation Finance

APPENDIX B

"FINANCIAL REPORTING FOR THE INVESTOR"

Address by G. Keith Funston, President
New York Stock Exchange
Before the Executive Committee
Of the American Petroleum Institute
February 2, 1967

The New York Stock Exchange is proud of the 48 companies which represent the petroleum and natural gas industry on our roster of listed companies. The aggregate market value of their 1.2 billion outstanding shares is over $68 billion -- more than 15% of the total value of all of the 10.9 billion shares of the 1,265 companies making up our list of common stocks. This is second only to the 144 utility companies whose 2.4 billion shares outstanding have a market value of $91 billion.

The petroleum and natural gas industry has attracted an impressive following among both individual and institutional holders. We estimate that approximately 3 million stockholders are direct owners of shares of companies in your industry. Six out of the 25 listed companies with the largest number of stockholders of record are from this group. Vickers' list of the top 50 institutional favorites includes 13 of your companies.

Let us look for a moment at what has been happening to the shareowner population. The Exchange's first Census of Shareowners in 1952, estimated the number of individual owners at 6 1/2 million. In the intervening years, the shareowner population has more than tripled to reach today's estimated total of 22 million. Our projections for the future indicate that there may be as many as 30 million individual shareowners in 1975.

This stockholder population explosion is, of course, very important to the securities industry. I think it is at least equally important to your industry and to the entire free enterprise system in our country.

I am told that many of your companies which deal with the public find their new stockholders a prime source of new and loyal credit card customers. Thus, in a sense, the Exchange's vigorous encouragement of broader sharecwnership might be considered as an extension of your own sales efforts.

Over the years, we have worked with our own securities industry and with listed companies to provide a sound basis for broadening shareownership on a sound basis. In all of our advertising and educational literature, we have urged investors to get the facts about a company before they invest.

The most important source of facts for the prospective investor is, of course, the company's annual report and other communications to its stockholders. Although investors still may not fully understand the nuances of the balance sheet and income statement, there is ample evidence that investors, in general are becoming more and more interested in financial

information, And, significantly, companies are making a major effort to present financial data in terms that are more readily understandable to them. This is tremendously important -- and particularly apparent in your industry -- and I cannot pass up this opportunity to compliment you on your continuing efforts to make the annual report a more informative and useful document.

Other important sources of investment data are the research reports, evaluations and recommendations of brokerage firms and statistical services. The professional securities analyst brings specialized knowledge and training to bear on the interpretation of stockholder reports and other sources of data. His need for information is great. He is often concerned with technical data that would not be particularly meaningful to the average investor. Recognizing this, more and more companies are turning to statistical supplements to meet the needs of both the sophisticated investor and the professional analyst. These may either be sent along with the regular report or offered separately to stockholders who wish to receive them.

This practice has much to recommend it. It makes adequate disclosure possible without unduly complicating the report to stockholders. Of course, such a supplement is in no sense a substitute for a well written, complete and documented annual report.

Statistical supplements can be used by companies each in their own way. There is, however, another question that requires attention on an industry-by-industry basis and by business as a whole -- a question that is even more important and urgent. I believe, as a matter of fact, that this question may be approaching crisis proportions.

A "credibility gap" appears to be developing as the result of the proliferation of alternative accounting practices which can, and often do, produce materially different figures of net income and earnings per share under similar circumstances. Not only is there a lack of comparability from an over-all viewpoint, but divergent practices followed by companies in the same industry accentuate the problem.

To further compound the issue, there are instances where companies do not even disclose which of several alternative practices they are following in presenting their accounts. In addition, and possibly the most perplexing question of all, is the clamor for more data on a product-line basis by the so-called "conglomerate companies."

Essentially, the problem of comparability does not center on whether financial data should be compared or not, but rather on how to improve the usefulness of the comparisons which are inevitably made. Responsible voices in the financial press and in the top ranks of corporate executives have joined in the call for action.

While strict uniformity does not offer a realistic approach to the problem of comparability, there is no question that narrowing existing alternatives would be in the best interests of both industry and the investing public.

In a very real sense, every publicly owned company is involved in daily competition in the securities market for the investor's dollar. It is certainly in the long-term interest of every responsible businessman that this competition be fair, and not complicated by bookkeeping sleight-of-hand.

The ultimate responsibility for financial reporting -- and particularly for the public impression created by such reporting -- rests, of course, with management.

Before going on to talk more specifically about the specific reporting problems of the petroleum industry, I should point out that government agencies -- and particularly the SEC -- have increasingly been injecting themselves into the current controversy.

The 1964 amendments to the SEC proxy rules brought the Commission into direct concern with the content of the annual report to stockholders for the first time. A further step in this area was taken just two weeks ago in another proxy rule amendment.

In 1965, the SEC issued a directive prescribing uniform accounting procedures for reporting deferred income taxes for retailers.

The Commission is presently urging increased disclosure by "so-called conglomerates" even though in their initial reply to the question raised by Senator Hart and the Senate Subcommittee on Anti-Trust and Monopoly they took a stand against such a requirement.

Let me assure you right now that the Exchange will vigorously oppose and over-all SEC rule or Conressional rule setting rigid requirements in this area.

Our opposition to a rigid requirement stems from a first-hand appreciation of the problems involved. For some time, the Exchange has had a team of full-time employees making cost and revenue studies of our member organizations. They have encountered the usual problems in allocating expenses and profits among various segments of our firms' business. So, we can readily appreciate some of the special complexities that would be involved in cost allocations relating to refining and petrochemical operations if product-line reporting should become a requirement in your industry.

In our continuing review of listed company annual reports, we are seeing more and more divisional or product-line data, relating primarily to volume rather than to profit. And we are encouraging this developing trend.

You can be sure that we are following this entire situation very closely. The Financial Executives Institute has launched a research project on this subject, and Mr. Phillip West, a vice president of the Exchange is serving on the Advisory Committee for this project.

Up to this point I have talked mostly of problems rather than solutions. But I can assure you that, for its part, the Exchange has been doing all that it can to encourage progress toward solutions, especially through its support of the American Institute of Certified Public Accountants.

In 1964, I urged that future reports to stockholders include a Source and Use of Funds Statement. This was an endorsement of an AICPA recommendation. You may be interested to know that all listed operating oil companies included such a statement in their last annual report to stockholders -- a fact which clearly demonstrates your interest -- as an industry -- to take a leadership role in improving financial reporting on a voluntary basis.

Last month, I forwarded a letter to the Presidents of all listed companies, endorsing the most recent Opinions issued by the AICPA which are designed to narrow the existing alternative practices. I urged all listed companies to adopt these new reporting practices -- insofar as feasible -- in preparing financial statements for their 1966 annual reports.

This will further indicate to the investing public that management is willing and able to move quickly in making voluntary improvements.

An Industry Approach to Disclosure and Comparability

This leads us to the basic question: What additional disclosure is required and what needs to be done to make reported earnings more comparable in the oil industry?

In the 1930's, the Exchange worked with the American Petroleum Institute Committee on Uniform Accounting Practices in order to narrow the alternative practices in use at that time. This project was most successful in standardizing the fundamentals known at the time. However, there was no provision for a continuing standardization review of accounting practices. During the past 30 years, of course, conditions have changed and many complications have arisen. Indeed, a provocative array of alternative accounting practices has developed for such significant items as production payments, exploration surveys, delay rentals, lease bonuses, and intangible drilling costs. As you well know, the sums involved are material.

Fortunately, your industry appears to be facing up to the problem. The 1965 API Report of Certain Petroleum Industry Accounting Practices provides an excellent research background for further action. I understand that a subcommittee of your Division of Finance and Accounting has been hard at work with a view to suggesting a practical approach to the problem.

I know of no other industry that is better organized than yours to consider industry-wide accounting problems. And, obviously, the major share of the credit for this can be found in your support for the work carried out by the American Petroleum Institute. It is hardly surprising, in view of this over-all constructive attitude, that the search for ways to improve comparability in financial reporting was rateda matter of substantial urgency at a recent gathering of your industry's financial executives.

While I am obviously no expert on petroleum accounting, there are certain broad areas where comments from an investor's viewpoint might be helpful.

In the first place, it would appear helpful to provide for additional disclosure of the particular practices being followed where there is more than one alternative.

For example, a company capitalized all costs incurred in the exploration and development of unproductive wells. But it would be impossible for an investor or analyst to determine, from either the annual report to stockholders or the 10-K

report filed with the SEC, what the net income under the more conventional expense accounting would have been.

In the second place, it would seem desirable to narrow the existing alternatives.

The smaller companies have looked to the majors in the industry to lead the way in developing acceptable standards of financial reporting. However, some of the smaller companies have exibited a preference for alternatives that are less commonly used by the large companies.

These non-conventional accounting procedures may not always have an impact on the earnings of the majors, but they can and do have a drastic effect on the earnings of the smaller companies.

On occasion, they also have a material effect on a large company.

In one reported instance, a major oil company adopted the practice of capitalizing intangible drilling costs rather than expensing such charges as it had done over previous years. Notes to the financial statement indicated that as a result of the change there had been a $150 million adjustment to retained earnings and that net income for the year was approximately 10% higher than it would otherwise have been.

The point of the illustration is not to express any opinion or preference for either method. Rather it illustrates the material impact that the use of alternative practices can have on net income and net book value not only in the year of change but also on a continuing basis.

It also illustrates the need for disclosure on a continuing basis of the particular practices being followed and of the impact on earnings of variations from preferred industry practices.

Another example where alternative accounting had a material effect is illustrated where the bulk of the earnings of one company reflected the profit on sale of carved-out production payments recognized at the time of sale -- rather than at the time of production. This led to several years' delay in our listing of this company on the Exchange.

The more recent Westec situation has led to criticism from many quarters on the impact of the accounting for certain of its oil operations which apparently was in accord with practices followed by some other members of the industry. I

should hasten to add, of course, that there were other factors involved in that situation as well.

Third, the foreign operations of many U. S. oil companies have grown considerably faster than domestic activities and they are frequently more responsible for changes in company-wide earnings than are domestic activities. The investments of U. S. oil companies overseas are substantial. Department of Commerce data show that the book value of these investments totaled $14.4 billion at the end of 1964 with earnings of $1.86 billion for that year. Most companies give their shareowners general information on their overseas operations. However, financial analysts and other investors seem justified in requesting additional detailed data to permit a meaningful analysis of the impact of foreign operations.

I suggested earlier the use of statistical supplements as a method of accomplishing adequate disclosure without unduly complicating the annual report. It seems to me that this practice would be especially helpful to the larger oil companies.

## Long Range Planning

Looking to the future, oil companies have an excellent opportunity to further improve comparability and usefulness of the financial reports in the industry. Many of your reports present information on the underground reserves. These reserve estimates are generally not comparable between Company A and Company B because they are prepared by different individuals with different backgrounds and different training. The absence of objective standards for reserve estimates limits the usefulness of this information so far as stockholders and analysts are concerned. Clearly a company's oil reserves are one of the most important factors in any intelligent appraisal of an oil producing company.

On a long-range basis, therefore, it might be very helpful to review the feasibility of establishing more comparable reserve information. This is one very important area in which the industry could make substantial contribution to existing disclosure techniques.

## Conclusion

Let me conclude by re-emphasizing the New York Stock Exchange's strong commitment to the view that both the investing public and corporate management can benefit greatly from improved financial reporting standards. Important progress

has been made in recent years -- but much remains to be done, particularly in the area of comparability. We firmly believe that the best approach is on a voluntary industry-by-industry basis. The petroleum industry can lead the way by seeking constructive solutions to the many complex reporting questions which are unique to your industry. Through the API, you have the machinery and ability to coordinate an industry-wide effort. And I feel certain that we can look to you for the kind of leadership that can and will be emulated by other industries -- and that will earn the attention and respect of the investing public.

# APPENDIX C

## ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS

### COMPARATIVE RESULTS FOR A STABLE COMPANY

### COMPARATIVE RESULTS FOR A DECLINING COMPANY

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 1 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 80,000 | $ 350,000 |
| Lease bonuses | 500,000 | 500,000 |
| Delay rentals | - | 200,000 |
| Total | 580,000 | |
| Producing properties: | | |
| Leasehold | 17,400 | - |
| Intangible drilling and development | 1,350,000 | 3,000,000 |
| Equipment | 255,000 | 255,000 |
| Total | 1,622,400 | 4,305,000 |
| Accumulated depreciation and depletion | - | - |
| Net properties | 1,622,400 | 4,305,000 |
| Other productive assets | 300,000 | 300,000 |
| Total assets employed | $ 2,502,400 | $ 4,605,000 |
| Estimated reserves (barrels) | 4,200,000 | 4,200,000 |
| Unrecovered cost per barrel | $0.5958 | $1.0964 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ - | $ - |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | - | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | - | - |
| Depreciation and depletion | - | - |
| Total deductions | 1,920,000 | - |
| Net income (loss) before tax | $(1,920,000) | $ - |
| Percentage of income to assets employed | (76.7)% | - |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 2 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 160,000 | $ 700,000 |
| Lease bonuses | 1,000,000 | 1,000,000 |
| Delay rentals | - | 400,000 |
| Total | 1,160,000 | |
| Producing properties: | | |
| Leasehold | 34,800 | - |
| Intangible drilling and development | 2,700,000 | 6,000,000 |
| Equipment | 510,000 | 510,000 |
| Total | 3,244,800 | 8,610,000 |
| Accumulated depreciation and depletion | 108,160 | 287,000 |
| Net properties | 3,136,640 | 8,323,000 |
| Other productive assets | 600,000 | 600,000 |
| Total assets employed | $ 4,896,640 | $ 8,923,000 |
| Estimated reserves (barrels) | 8,100,000 | 8,100,000 |
| Unrecovered cost per barrel | $0.6045 | $1.1016 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 900,000 | $ 900,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease cost | - | - |
| Delay rentals | 50,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 240,000 | 240,000 |
| Depreciation and depletion | 108,160 | 287,000 |
| Total deductions | 2,318,160 | 527,000 |
| Net income (loss) before tax | $(1,418,160 | $ 373,000 |
| Percentage of income to assets employed | (29.0)% | 4.2% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 3 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 240,000 | $ 1,050,000 |
| Lease bonuses | 1,500,000 | 1,500,000 |
| Delay rentals | - | 600,000 |
| Total | 1,740,000 | |
| Producing properties: | | |
| Leasehold | 52,200 | - |
| Intangible drilling and development | 4,050,000 | 9,000,000 |
| Equipment | 765,000 | 765,000 |
| Total | 4,867,200 | 12,915,000 |
| Accumulated depreciation and depletion | 324,480 | 861,000 |
| Net properties | 4,542,720 | 12,054,000 |
| Other productive assets | 900,000 | 900,000 |
| Total assets employed | $ 7,182,720 | $12,954,000 |
| Estimated reserves (barrels) | 11,700,000 | 11,700,000 |
| Unrecovered cost per barrel | $0.6139 | $1.1071 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 1,800,000 | $ 1,800,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | 100,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 480,000 | 480,000 |
| Depreciation and depletion | 216,320 | 574,000 |
| Total deductions | 2,716,320 | 1,054,000 |
| Net income (loss) before tax | $ (916,320) | $ 746,000 |
| Percentage of income to assets employed | (12.8)% | 5.8% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 4 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 320,000 | $ 1,400,000 |
| Lease bonuses | 2,000,000 | 2,000,000 |
| Delay rentals | - | 800,000 |
| Total | 2,320,000 | |
| Producing properties: | | |
| Leasehold | 69,600 | - |
| Intangible drilling and development | 5,400,000 | 12,000,000 |
| Equipment | 1,020,000 | 1,020,000 |
| Total | 6,489,600 | 17,220,000 |
| Accumulated depreciation and depletion | 648,960 | 1,722,000 |
| Net properties | 5,840,640 | 15,498,000 |
| Other productive assets | 1,200,000 | 1,200,000 |
| Total assets employed | $ 9,360,640 | $16,698,000 |
| Estimated reserves (barrels) | 15,100,000 | 15,100,000 |
| Unrecovered cost per barrel | $0.6199 | $1.1058 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 2,400,000 | $ 2,400,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | 150,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 640,000 | 640,000 |
| Depreciation and depletion | 324,480 | 861,000 |
| Total deductions | 3,034,480 | 1,501,000 |
| Net income (loss) before tax | $ (634,480) | $ 899,000 |
| Percentage of income to assets employed | (6.8)% | 5.4% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 5 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 1,750,000 |
| Lease bonuses | 2,500,000 | 2,500,000 |
| Delay rentals | - | 1,000,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 87,000 | - |
| Intangible drilling and development | 6,750,000 | 15,000,000 |
| Equipment | 1,275,000 | 1,275,000 |
| Total | 8,112,000 | 21,525,000 |
| Accumulated depreciation and depletion | 1,081,600 | 2,870,000 |
| Net properties | 7,030,400 | 18,655,000 |
| Other productive assets | 1,500,000 | 1,500,000 |
| Total assets employed | $11,430,400 | $20,155,000 |
| Estimated reserves (barrels) | 18,200,000 | 18,200,000 |
| Unrecovered cost per barrel | $0.6280 | $1.1074 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 3,300,000 | $ 3,300,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 880,000 | 880,000 |
| Depreciation and depletion | 432,640 | 1,148,000 |
| Total deductions | 3,432,640 | 2,028,000 |
| Net income (loss) before tax | $ (132,640) | $ 1,272,000 |
| Percentage of income to assets employed | (1.2)% | 6.3% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 6 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| Assets at End of Year | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 2,100,000 |
| Lease bonuses | 2,500,000 | 3,000,000 |
| Delay rentals | - | 1,200,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 104,400 | - |
| Intangible drilling and development | 8,100,000 | 18,000,000 |
| Equipment | 1,530,000 | 1,530,000 |
| Total | 9,734,400 | 25,830,000 |
| Accumulated depreciation and depletion | 1,622,400 | 4,305,000 |
| Net properties | 8,112,000 | 21,525,000 |
| Other productive assets | 1,800,000 | 1,800,000 |
| Total assets employed | $12,812,000 | $23,325,000 |
| Estimated reserves (barrels) | 21,000,000 | 21,000,000 |
| Unrecovered cost per barrel | $0.6100 | $1.1107 |
| Income Statement | | |
| Revenue (at $3.00 per barrel) | $ 4,200,000 | $ 4,200,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 1,120,000 | 1,120,000 |
| Depreciation and depletion | 540,800 | 1,435,000 |
| Total deductions | 4,343,400 | 2,555,000 |
| Net income (loss) before tax | $ (143,400) | $ 1,645,000 |
| Percentage of income to assets employed | (1.1)% | 7.1% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 7 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 2,450,000 |
| Lease bonuses | 2,500,000 | 3,500,000 |
| Delay rentals | - | 1,400,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 121,800 | - |
| Intangible drilling and development | 9,450,000 | 21,000,000 |
| Equipment | 1,785,000 | 1,785,000 |
| Total | 11,356,800 | 30,135,000 |
| Accumulated depreciation and depletion | 2,271,360 | 6,027,000 |
| Net properties | 9,085,440 | 24,108,000 |
| Other productive assets | 2,100,000 | 2,100,000 |
| Total assets employed | $14,085,440 | $26,208,000 |
| Estimated reserves (barrels) | 23,500,000 | 23,500,000 |
| Unrecovered cost per barrel | $0.5993 | $1.1152 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 5,100,000 | $ 5,100,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 1,360,000 | 1,360,000 |
| Depreciation and depletion | 648,960 | 1,722,000 |
| Total deductions | 4,691,560 | 3,082,000 |
| Net income (loss) before tax | $ 408,440 | $ 2,018,000 |
| Percentage of income to assets employed | 2.9% | 7.7% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 8 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 2,800,000 |
| Lease bonuses | 2,500,000 | 4,000,000 |
| Delay rentals | - | 1,600,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 139,200 | - |
| Intangible drilling and development | 10,800,000 | 24,000,000 |
| Equipment | 2,040,000 | 2,040,000 |
| Total | 12,979,200 | 34,440,000 |
| Accumulated depreciation and depletion | 3,028,480 | 8,036,000 |
| Net properties | 9,950,720 | 26,404,000 |
| Other productive assets | 2,400,000 | 2,400,000 |
| Total assets employed | $15,250,720 | $28,804,000 |
| Estimated reserves (barrels) | 25,700,000 | 25,700,000 |
| Unrecovered cost per barrel | $0.5934 | $1.1207 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 6,000,000 | $ 6,000,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 1,600,000 | 1,600,000 |
| Depreciation and depletion | 757,120 | 2,009,000 |
| Total deductions | 5,039,720 | 3,609,000 |
| Net income (loss) before tax | $ 960,280 | $ 2,391,000 |
| Percentage of income to assets employed | 6.3% | 8.3% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 9 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 3,150,000 |
| Lease bonuses | 2,500,000 | 4,500,000 |
| Delay rentals | - | 1,800,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 156,600 | - |
| Intangible drilling and development | 12,150,000 | 27,000,000 |
| Equipment | 2,295,000 | 2,295,000 |
| Total | 14,601,600 | 38,745,000 |
| Accumulated depreciation and depletion | 3,893,760 | 10,332,000 |
| Net properties | 10,707,840 | 28,413,000 |
| Other productive assets | 2,700,000 | 2,700,000 |
| Total assets employed | $16,307,840 | $31,113,000 |
| Estimated reserves (barrels) | 27,700,000 | 27,700,000 |
| Unrecovered cost per barrel | $0.5887 | $1.1232 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 6,600,000 | $ 6,600,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 1,760,000 | 1,760,000 |
| Depreciation and depletion | 865,280 | 2,296,000 |
| Total deductions | 5,307,880 | 4,056,000 |
| Net income (loss) before tax | $ 1,292,120 | $ 2,544,000 |
| Percentage of income to assets employed | 7.9% | 8.2% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 10 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 3,500,000 |
| Lease bonuses | 2,500,000 | 5,000,000 |
| Delay rentals | - | 2,000,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 174,000 | - |
| Intangible drilling and development | 13,500,000 | 30,000,000 |
| Equipment | 2,550,000 | 2,550,000 |
| Total | 16,224,000 | 43,050,000 |
| Accumulated depreciation and depletion | 4,867,200 | 12,915,000 |
| Net properties | 11,356,800 | 30,135,000 |
| Other productive assets | 3,000,000 | 3,000,000 |
| Total assets employed | $17,256,800 | $33,135,000 |
| Estimated reserves (barrels) | 29,400,000 | 29,400,000 |
| Unrecovered cost per barrel | $0.5869 | $1.1270 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 7,500,000 | $ 7,500,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 2,000,000 | 2,000,000 |
| Depreciation and depletion | 973,440 | 2,583,000 |
| Total deductions | 5,656,040 | 4,583,000 |
| Net income (loss) before tax | $ 1,843,960 | $ 2,917,000 |
| Percentage of income to assets employed | 10.7% | 8.8% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 11 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 3,850,000 |
| Lease bonuses | 2,500,000 | 5,500,000 |
| Delay rentals | - | 2,200,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 191,400 | - |
| Intangible drilling and development | 14,850,000 | 33,000,000 |
| Equipment | 2,805,000 | 2,805,000 |
| Total | 17,846,400 | 47,355,000 |
| Accumulated depreciation and depletion | 5,948,800 | 15,785,000 |
| Net properties | 11,897,600 | 31,570,000 |
| Other productive assets | 3,300,000 | 3,300,000 |
| Total assets employed | $18,097,600 | $34,870,000 |
| Estimated reserves (barrels) | 30,800,000 | 30,800,000 |
| Unrecovered cost per barrel | $0.5875 | $1.1321 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 8,400,000 | $ 8,400,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 2,240,000 | 2,240,000 |
| Depreciation and depletion | 1,081,600 | 2,870,000 |
| Total deductions | 6,004,200 | 5,110,000 |
| Net income (loss) before tax | $ 2,395,800 | $ 3,290,000 |
| Percentage of income to assets employed | 13.2% | 9.4% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 12 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 4,200,000 |
| Lease bonuses | 2,500,000 | 6,000,000 |
| Delay rentals | - | 2,400,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 208,800 | - |
| Intangible drilling and development | 16,200,000 | 36,000,000 |
| Equipment | 3,060,000 | 3,060,000 |
| Total | 19,468,800 | 51,660,000 |
| Accumulated depreciation and depletion | 7,138,560 | 18,942,000 |
| Net properties | 12,330,240 | 32,718,000 |
| Other productive assets | 3,600,000 | 3,600,000 |
| Total assets employed | $18,830,240 | $36,318,000 |
| Estimated reserves (barrels) | 31,900,000 | 31,900,000 |
| Unrecovered cost per barrel | $0.5902 | $1.1384 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 9,300,000 | $ 9,300,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 2,480,000 | 2,480,000 |
| Depreciation and depletion | 1,189,760 | 3,157,000 |
| Total deductions | 6,352,360 | 5,637,000 |
| Net income (loss) before tax | $ 2,947,640 | $ 3,663,000 |
| Percentage of income to assets employed | 15.7% | 10.1% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 13 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 4,550,000 |
| Lease bonuses | 2,500,000 | 6,500,000 |
| Delay rentals | - | 2,600,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 226,200 | - |
| Intangible drilling and development | 17,550,000 | 39,000,000 |
| Equipment | 3,315,000 | 3,315,000 |
| Total | 21,091,200 | 55,965,000 |
| Accumulated depreciation and depletion | 8,436,480 | 22,386,000 |
| Net properties | 12,654,720 | 33,579,000 |
| Other productive assets | 3,900,000 | 3,900,000 |
| Total assets employed | $19,454,720 | $37,479,000 |
| Estimated reserves (barrels) | 32,700,000 | 32,700,000 |
| Unrecovered cost per barrel | $0.5949 | $1.1461 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $10,200,000 | $10,200,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 2,720,000 | 2,720,000 |
| Depreciation and depletion | 1,297,920 | 3,444,000 |
| Total deductions | 6,700,520 | 6,164,000 |
| Net income (loss) before tax | $ 3,499,480 | $ 4,036,000 |
| Percentage of income to assets employed | 18.0% | 10.8% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 14 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 4,900,000 |
| Lease bonuses | 2,500,000 | 7,000,000 |
| Delay rentals | - | 2,800,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 243,600 | - |
| Intangible drilling and development | 18,900,000 | 42,000,000 |
| Equipment | 3,570,000 | 3,570,000 |
| Total | 22,713,600 | 60,270,000 |
| Accumulated depreciation and depletion | 9,842,560 | 26,117,000 |
| Net properties | 12,871,040 | 34,153,000 |
| Other productive assets | 4,200,000 | 4,200,000 |
| Total assets employed | $19,971,040 | $38,353,000 |
| Estimated reserves (barrels) | 33,300,000 | 33,300,000 |
| Unrecovered cost per barrel | $0.5997 | $1.1517 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $10,800,000 | $10,800,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 2,880,000 | 2,880,000 |
| Depreciation and depletion | 1,406,080 | 3,731,000 |
| Total deductions | 6,968,680 | 6,611,000 |
| Net income (loss) before tax | $ 3,831,320 | $ 4,189,000 |
| Percentage of income to assets employed | 19.2% | 10.9% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO
PETROLEUM FINDING COSTS -- COMPARITIVE RESULTS
FOR YEAR 15 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| Assets at End of Year | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 5,250,000 |
| Lease bonuses | 2,500,000 | 7,500,000 |
| Delay rentals | - | 3,000,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 261,000 | - |
| Intangible drilling and development | 20,250,000 | 45,000,000 |
| Equipment | 3,825,000 | 3,825,000 |
| Total | 24,336,000 | 64,575,000 |
| Accumulated depreciation and depletion | 11,356,800 | 30,135,000 |
| Net properties | 12,979,200 | 34,440,000 |
| Other productive assets | 4,500,000 | 4,500,000 |
| Total assets employed | $20,379,200 | $38,940,000 |
| Estimated reserves (barrels) | 33,600,000 | 33,600,000 |
| Unrecovered cost per barrel | $0.6065 | $1.1589 |
| Income Statement | | |
| Revenue (at $3.00 per barrel) | $11,700,000 | $11,700,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 3,120,000 | 3,120,000 |
| Depreciation and depletion | 1,514,240 | 4,018,000 |
| Total deductions | 7,316,840 | 7,138,000 |
| Net income (loss) before tax | $ 4,383,160 | $ 4,562,000 |
| Percentage of income to assets employed | 21.5% | 11.7% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 16 OF A STABLE COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| Assets at End of Year | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 5,600,000 |
| Lease bonuses | 2,500,000 | 8,000,000 |
| Delay rentals | - | 3,200,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 261,000 | - |
| Intangible drilling and development | 20,250,000 | 48,000,000 |
| Equipment | 3,825,000 | 4,080,000 |
| Total | 24,336,000 | 68,880,000 |
| Accumulated depreciation and depletion | 11,356,800 | 34,440,000 |
| Net properties | 12,979,200 | 34,440,000 |
| Other productive assets | 4,500,000 | 4,500,000 |
| Total assets employed | $20,379,200 | $38,940,000 |
| Estimated reserves (barrels) | 33,600,000 | 33,600,000 |
| Unrecovered cost per barrel | $0.6065 | $1.1589 |
| Income Statement | | |
| Revenue (at $3.00 per barrel) | $12,600,000 | $12,600,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 3,360,000 | 3,360,000 |
| Depreciation and depletion | 1,622,400 | 4,305,000 |
| Total deductions | 7,665,000 | 7,665,000 |
| Net income (loss) before tax | $ 4,935,000 | $ 4,935,000 |
| Percentage of income to assets employed | 24.5% | 12.7% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 1 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 80,000 | $ 350,000 |
| Lease bonuses | 500,000 | 500,000 |
| Delay rentals | - | 200,000 |
| Total | 580,000 | |
| Producing properties: | | |
| Leasehold | 17,400 | - |
| Intangible drilling and development | 1,350,000 | 3,000,000 |
| Equipment | 255,000 | 255,000 |
| Total | 1,622,400 | 4,305,000 |
| Accumulated depreciation and depletion | - | - |
| Net properties | 1,622,400 | 4,305,000 |
| Other productive assets | 300,000 | 300,000 |
| Total assets employed | $ 2,502,400 | $ 4,605,000 |
| Estimated reserves (barrels) | 4,200,000 | 4,200,000 |
| Unrecovered cost per barrel | $0.5958 | $1.0964 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ - | $ - |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | - | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | - | - |
| Depreciation and depletion | - | - |
| Total deductions | 1,920,000 | - |
| Net income (loss) before tax | $(1,920,000) | - |
| Percentage of income to assets employed | (76.7)% | - |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 2 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 160,000 | $ 700,000 |
| Lease bonuses | 1,000,000 | 1,000,000 |
| Delay rentals | - | 400,000 |
| Total | 1,160,000 | |
| Producing properties: | | |
| Leasehold | 34,800 | - |
| Intangible drilling and development | 2,700,000 | 6,000,000 |
| Equipment | 510,000 | 510,000 |
| Total | 3,244,800 | 8,610,000 |
| Accumulated depreciation and depletion | 154,130 | 408,980 |
| Net properties | 3,090,670 | 8,201,020 |
| Other productive assets | 600,000 | 600,000 |
| Total assets employed | $ 4,850,670 | $ 8,801,020 |
| Estimated reserves (barrels) | 7,600,000 | 7,600,000 |
| Unrecovered cost per barrel | $0.6382 | $1.1580 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 1,200,000 | $ 1,200,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | 50,000 | - |
| Dry hole costs | 1,650,000 | - |
| Lifting costs | 320,000 | 320,000 |
| Depreciation and depletion | 154,130 | 408,980 |
| Total deductions | 2,444,130 | 728,980 |
| Net income (loss) before tax | $(1,244,130) | $ 471,020 |
| Percentage of income to assets employed | (49.7)% | 10.2% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 3 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| Assets at End of Year | | |
| Undeveloped leases: | | |
| Exploration costs | $ 240,000 | $ 1,050,000 |
| Lease bonuses | 1,500,000 | 1,500,000 |
| Delay rentals | - | 600,000 |
| Total | 1,740,000 | |
| Producing properties: | | |
| Leasehold | 52,200 | - |
| Intangible drilling and development | 3,975,000 | 9,000,000 |
| Equipment | 750,000 | 750,000 |
| Total | 4,777,200 | 12,900,000 |
| Accumulated depreciation and depletion | 478,650 | 1,270,090 |
| Net properties | 4,298,550 | 11,629,910 |
| Other productive assets | 900,000 | 900,000 |
| Total assets employed | $ 6,938,550 | $12,529,910 |
| Estimated reserves (barrels) | 10,200,000 | 10,200,000 |
| Unrecovered cost per barrel | $0.6802 | $1.2284 |
| Income Statement | | |
| Revenue (at $3.00 per barrel) | $ 2,400,000 | $ 2,400,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | 100,000 | - |
| Dry hole costs | 1,725,000 | - |
| Lifting costs | 640,000 | 640,000 |
| Depreciation and depletion | 324,520 | 861,110 |
| Total deductions | 3,059,520 | 1,501,110 |
| Net income (loss) before tax | $ (659,520) | $ 898,890 |
| Percentage of income to assets employed | (13.6)% | 10.2% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 4 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 320,000 | $ 1,400,000 |
| Lease bonuses | 2,000,000 | 2,000,000 |
| Delay rentals | - | 800,000 |
| Total | 2,320,000 | |
| Producing properties: | | |
| Leasehold | 69,600 | - |
| Intangible drilling and development | 5,250,000 | 12,000,000 |
| Equipment | 990,000 | 990,000 |
| Total | 6,309,600 | 17,190,000 |
| Accumulated depreciation and depletion | 942,890 | 2,526,120 |
| Net properties | 5,366,710 | 14,663,880 |
| Other productive assets | 1,200,000 | 1,200,000 |
| Total assets employed | $ 8,886,710 | $15,863,880 |
| Estimated reserves (barrels) | 12,200,000 | 12,200,000 |
| Unrecovered cost per barrel | $0.7284 | $1.3003 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 3,300,000 | $ 3,300,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | 150,000 | - |
| Dry hole costs | 1,725,000 | - |
| Lifting costs | 880,000 | 880,000 |
| Depreciation and depletion | 464,240 | 1,256,030 |
| Total deductions | 3,489,240 | 2,136,030 |
| Net income (loss) before tax | $ (189,240) | $ 1,163,970 |
| Percentage of income to assets employed | (2.7)% | 9.3% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 5 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| Assets at End of Year | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 1,750,000 |
| Lease bonuses | 2,500,000 | 2,500,000 |
| Delay rentals | - | 1,000,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 87,000 | - |
| Intangible drilling and development | 6,450,000 | 15,000,000 |
| Equipment | 1,215,000 | 1,215,000 |
| Total | 7,752,000 | 21,465,000 |
| Accumulated depreciation and depletion | 1,560,060 | 4,212,470 |
| Net properties | 6,191,940 | 17,252,530 |
| Other productive assets | 1,500,000 | 1,500,000 |
| Total assets employed | $10,591,940 | $18,752,530 |
| Estimated reserves (barrels) | 13,600,000 | 13,600,000 |
| Unrecovered cost per barrel | $0.7788 | $1.3788 |
| Income Statement | | |
| Revenue (at $3.00 per barrel) | $ 4,200,000 | $ 4,200,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | - | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,800,000 | - |
| Lifting costs | 1,120,000 | 1,120,000 |
| Depreciation and depletion | 617,170 | 1,686,350 |
| Total deductions | 4,007,170 | 2,806,350 |
| Net income (loss) before tax | $ 192,830 | $ 1,393,650 |
| Percentage of income to assets employed | 2.2% | 8.8% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 6 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 2,100,000 |
| Lease bonuses | 2,500,000 | 3,000,000 |
| Delay rentals | - | 1,200,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 104,400 | - |
| Intangible drilling and development | 7,650,000 | 18,000,000 |
| Equipment | 1,440,000 | 1,440,000 |
| Total | 9,194,400 | 25,740,000 |
| Accumulated depreciation and depletion | 2,334,050 | 6,369,040 |
| Net properties | 6,860,350 | 19,370,960 |
| Other productive assets | 1,800,000 | 1,800,000 |
| Total assets employed | $11,560,350 | $21,170,960 |
| Estimated reserves (barrels) | 14,400,000 | 14,400,000 |
| Unrecovered cost per barrel | $0.8028 | $1.4702 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 5,100,000 | $ 5,100,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,800,000 | - |
| Lifting costs | 1,360,000 | 1,360,000 |
| Depreciation and depletion | 773,990 | 2,156,570 |
| Total deductions | 4,966,590 | 3,516,570 |
| Net income (loss) before tax | $ 133,410 | $ 1,583,430 |
| Percentage of income to assets employed | 1.3% | 8.4% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 7 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 2,450,000 |
| Lease bonuses | 2,500,000 | 3,500,000 |
| Delay rentals | - | 1,400,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 121,800 | - |
| Intangible drilling and development | 8,775,000 | 21,000,000 |
| Equipment | 1,650,000 | 1,650,000 |
| Total | 10,546,800 | 30,000,000 |
| Accumulated depreciation and depletion | 3,287,640 | 9,061,600 |
| Net properties | 7,259,160 | 20,938,400 |
| Other productive assets | 2,100,000 | 2,100,000 |
| Total assets employed | $12,259,160 | $23,038,400 |
| Estimated reserves (barrels) | 14,600,000 | 14,600,000 |
| Unrecovered cost per barrel | $0.8396 | $1.5779 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 6,000,000 | $ 6,000,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,875,000 | - |
| Lifting costs | 1,600,000 | 1,600,000 |
| Depreciation and depletion | 953,590 | 2,692,560 |
| Total deductions | 5,461,190 | 4,292,560 |
| Net income (loss) before tax | $ 538,810 | $ 1,707,440 |
| Percentage of income to assets employed | 4.7% | 8.1% |

ALIERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 8 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 2,800,000 |
| Lease bonuses | 2,500,000 | 4,000,000 |
| Delay rentals | - | 1,600,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 139,200 | - |
| Intangible drilling and development | 9,900,000 | 24,000,000 |
| Equipment | 1,860,000 | 1,860,000 |
| Total | 11,899,200 | 34,260,000 |
| Accumulated depreciation and depletion | 4,383,770 | 12,223,300 |
| Net properties | 7,515,430 | 22,036,700 |
| Other productive assets | 2,400,000 | 2,400,000 |
| Total assets employed | $12,815,430 | $22,436,700 |
| Estimated reserves (barrels) | 14,400,000 | 14,400,000 |
| Unrecovered cost per barrel | $0.8899 | $1.5581 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 6,600,000 | $ 6,600,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,875,000 | - |
| Lifting costs | 1,760,000 | 1,760,000 |
| Depreciation and depletion | 1,096,130 | 3,161,700 |
| Total deductions | 5,763,730 | 4,921,700 |
| Net income (loss) before tax | $ 836,270 | $ 1,678,300 |
| Percentage of income to assets employed | 6.8% | 7.3% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS FOR YEAR 9 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 3,150,000 |
| Lease bonuses | 2,500,000 | 4,500,000 |
| Delay rentals | - | 1,800,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 156,600 | - |
| Intangible drilling and development | 10,950,000 | 27,000,000 |
| Equipment | 2,055,000 | 2,055,000 |
| Total | 13,161,600 | 38,505,000 |
| Accumulated depreciation and depletion | 5,533,630 | 15,594,920 |
| Net properties | 7,627,970 | 22,910,080 |
| Other productive assets | 2,700,000 | 2,700,000 |
| Total assets employed | $13,227,970 | $25,610,080 |
| Estimated reserves (barrels) | 14,000,000 | 14,000,000 |
| Unrecovered cost per barrel | $0.9448 | $1.8292 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 6,600,000 | $ 6,600,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,950,000 | - |
| Lifting costs | 1,760,000 | 1,760,000 |
| Depreciation and depletion | 1,149,860 | 3,371,620 |
| Total deductions | 5,892,460 | 5,131,620 |
| Net income (loss) before tax | $ 707,540 | $ 1,568,380 |
| Percentage of income to assets employed | 5.5% | 7.0% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO
PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS
FOR YEAR 10 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| **Assets at End of Year** | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 3,500,000 |
| Lease bonuses | 2,500,000 | 5,000,000 |
| Delay rentals | - | 2,000,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 174,000 | - |
| Intangible drilling and development | 12,000,000 | 30,000,000 |
| Equipment | 2,250,000 | 2,250,000 |
| Total | 14,424,000 | 42,750,000 |
| Accumulated depreciation and depletion | 6,624,430 | 18,871,060 |
| Net properties | 7,799,570 | 23,878,940 |
| Other productive assets | 3,000,000 | 3,000,000 |
| Total assets employed | $13,699,570 | $26,878,940 |
| Estimated reserves (barrels) | 13,600,000 | 13,600,000 |
| Unrecovered cost per barrel | $1.0073 | $1.9763 |
| **Income Statement** | | |
| Revenue (at $3.00 per barrel) | $ 6,000,000 | $ 6,000,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 1,950,000 | - |
| Lifting costs | 1,600,000 | 1,600,000 |
| Depreciation and depletion | 1,090,800 | 3,276,140 |
| Total deductions | 5,673,400 | 4,876,140 |
| Net income (loss) before tax | $ 326,600 | $ 1,123,860 |
| Percentage of income to assets employed | 2.5% | 4.4% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO
PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS
FOR YEAR 11 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| Assets at End of Year | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 3,850,000 |
| Lease bonuses | 2,500,000 | 5,500,000 |
| Delay rentals | - | 2,200,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 191,400 | - |
| Intangible drilling and development | 12,975,000 | 33,000,000 |
| Equipment | 2,430,000 | 2,430,000 |
| Total | 15,596,400 | 46,980,000 |
| Accumulated depreciation and depletion | 7,653,970 | 22,023,080 |
| Net properties | 7,942,430 | 24,956,920 |
| Other productive assets | 3,300,000 | 3,300,000 |
| Total assets employed | $14,142,430 | $28,256,920 |
| Estimated reserves (barrels) | 13,200,000 | 13,200,000 |
| Unrecovered cost per barrel | $1.0713 | $2.1406 |
| Income Statement | | |
| Revenue (at $3.00 per barrel) | $ 5,400,000 | $ 5,400,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 2,025,000 | - |
| Lifting costs | 1,440,000 | 1,440,000 |
| Depreciation and depletion | 1,029,540 | 3,152,020 |
| Total deductions | 5,527,140 | 4,592,020 |
| Net income (loss) before tax | $ (127,140) | $ 807,980 |
| Percentage of income to assets employed | (.9)% | 3.0% |

ALTERNATIVE ACCOUNTING PRACTICES WITH RESPECT TO
PETROLEUM FINDING COSTS -- COMPARATIVE RESULTS
FOR YEAR 12 OF A DECLINING COMPANY

| | Conventional Method | Full Cost Method |
|---|---|---|
| Assets at End of Year | | |
| Undeveloped leases: | | |
| Exploration costs | $ 400,000 | $ 4,200,000 |
| Lease bonuses | 2,500,000 | 6,000,000 |
| Delay rentals | - | 2,400,000 |
| Total | 2,900,000 | |
| Producing properties: | | |
| Leasehold | 208,800 | - |
| Intangible drilling and development | 13,950,000 | 36,000,000 |
| Equipment | 2,610,000 | 2,610,000 |
| Total | 16,768,800 | 51,210,000 |
| Accumulated depreciation and depletion | 8,678,540 | 25,242,520 |
| Net properties | 8,090,260 | 25,967,480 |
| Other productive assets | 3,600,000 | 3,600,000 |
| Total assets employed | $14,590,260 | $29,567,480 |
| Estimated reserves (barrels) | 12,700,000 | 12,700,000 |
| Unrecovered cost per barrel | $1.1488 | $2.3281 |
| Income Statement | | |
| Revenue (at $3.00 per barrel) | $ 5,100,000 | $ 5,100,000 |
| Deductions: | | |
| Exploration costs | 270,000 | - |
| Surrendered lease costs | 562,600 | - |
| Delay rentals | 200,000 | - |
| Dry hole costs | 2,025,000 | - |
| Lifting costs | 1,360,000 | 1,360,000 |
| Depreciation and depletion | 1,024,570 | 3,219,440 |
| Total deductions | 5,442,170 | 4,579,440 |
| Net income (loss) before tax | $ (342,170) | $ 520,560 |
| Percentage of income to assets employed | (2.4)% | 1.8% |

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