I Introduction

Although all Certified Public Accountants in the oil and gas industry are aware of conventional accounting practices and frequently modify some of their internal accounting practices in accordance with corporate policy or shifting financial dynamics within their firms, there are stringent regulatory requirements imposed externally on their entire industry. Such bodies as the Financial Accounting Standards Board (FASB) routinely review existing policies and procedures in an effort to reflect the prevailing desires of the industry, but also to protect the integrity and accuracy of accounting practices within the entire range of financial reporting under their authority. Often, the FASB must issue directives to all financial managers and accountants in order to enforce compliance with standards aimed at ensuring uniformity of reporting.

Over the last four decades, in particular, a major debate has emerged in the professional literature concerning two equally reputable methods of accounting in the oil and gas industry. This economic sector features certain characteristics – namely the up-front investment of large sums of risk-capital prior to generating income or profit -- that demand special treatment from an accounting standpoint. One method, “full-costing”, has been demonstrated to produce favorable results for the investment community, while the other, ”successful efforts” accounting, produces pin-point accuracy and is of special use to internal financial analysts and astute investors who can see beyond its sometimes somewhat more pessimistic portrayal of a firm’s activities.

The foregoing assessment is quite superficial, of course, and for this reason the present paper intends to survey twenty chapter-segments or articles published in ten professional journals or widely circulated textbooks, by renowned accountants, professors, financial theorists and economists. As the paper progresses, the current reasoning of the FASB will become apparent, as will the positions of the advocates and the
opponents of these two sometimes conflicting, sometimes complementary methods.

Observations and assessments will be offered at the conclusion of this fairly detailed discussion of the relative merits of full-cost and successful effort methodologies.

We begin our analysis with an introduction to, and an historical perspective of, the oil industry as a whole, and will then progress to the general characteristics of this vital economic sector as they apply to oil and gas accounting practices in the United States and abroad. The two methods will be subsequently dissected and contrasted within the context of ‘production’ and ‘revenue’, and their limitations and strengths will be elucidated. The viewpoints of the authors of these professional articles will be juxtaposed, leading to certain conclusions and recommendations, which will prove to be either in agreement with or in opposition to the current position of the FASB.

II Historical Synopsis of the Petroleum Industry

Using source materials from the American Petroleum Institute, Stanley S. Porter, CPA for Arthur Young and Company, in his book chapter entitled “Introduction to the Petroleum Industry” (1965), outlines the innate significance and vital nature of the petroleum industry in the United States. He notes that, in 1900, coal constituted the principal fuel in this country and that some 90% all American energy requirements were satisfied by this readily available resource. Forty years ago, dependence on coal had already dropped to approximately 20% and oil, as well as natural gas, began to supplant reliance on coal and wood, both of which had dominated the previous century in this country.

Interestingly, he points out that Europe has not developed widespread reliance on natural gas since limited supplies are available in European countries, although, of course, petroleum products are widely used. Curiously, he seems to neglect stating that France, for example, has been increasing its importation of natural gas from supplier nations such as Algeria. Both now dominate the energy market in the United States, Porter confirms. High-octane general-aviation and jet fuel is obviously in far greater demand today than in yesteryear, he notes.

Since his article was published in 1965, at the height of the Cold War, there is a rather quaint and outdated analysis in Porter of the energy situation from today’s perspective. While the industrialized nations are still certainly predominantly dependent on petroleum in the year 2000, considerable thought (unforeseen by Porter in his overview) is being given
to admixtures of alcohol, for example, to gasoline or to propane, electricity and alternate sources of energy in today’s progressive nations.

Nonetheless, Porter’s observations validly set the stage for judging the on-going indispensability of petroleum in today’s world and hence, justify the entire discipline of accounting in the gas and oil field. Indeed, a growing need for accountants well versed in the intricacies of several ‘competing’ accounting methodologies is being felt by major petroleum corporations in the Middle East, in Europe and in North America.

Gallun and Stevenson in their material devoted to Historical Development of Accounting Methods (1986, 25–31) set the stage for a narrowing of focus toward advances, over the decades, made in the specific area of gas and oil accounting. We devote attention, now, to some of their insightful observations.

These two professors from universities along the Gulf Coast of Texas collaborated in 1986 to produce an insightful analysis. Early in their description of the ever-evolving development of oil industry accounting practices, they allude to the grand debate that seems, even today, to be dominating the field of oil accounting and financial management. Given the complexity of tax regulations related to intangible energy exploration and drilling activities, they point out, and the non-renewable nature of petroleum resources in the United States and abroad, accounting practices have been heavily influenced by two schools of thought. Before December 1977, both approaches were found to be acceptable without official pronouncements one way or the other. They were, namely, the successful effort method and the full cost method. Over the intervening years, the advantages of these two methods were genuinelly supported by many specialists in the field. Both were widely taught and practiced in the industry. However, the Financial Accounting Standards Board (FASB), acting on the basis of a "pro-successful effort" report issued by the American Institute of Certified Public Accountants (AICPA), officially investigated the relative merits of both systems. The result, according to Gallun and Stevenson (1986, 26), was temporary implementation by the FASB of a method called ‘reserve recognition accounting’ (RRA). This approach, developed in approximately 1978, was apparently an amalgam of both full cost and successful effort, aimed at improving exposure in financial statements of the actual operating results of oil companies; nonetheless, it proved unsatisfactory and was abandoned in the November 1982 timeframe.

The two Texas-based authors of this historical accounting overview continue to explain, not only the historical development of the struggle
to achieve methodological uniformity, but the content and assertions of the two camps attempting to implement the most effective system. FASB Statement No. 69, issued in 1982, insisted that certain criteria be publicly recorded in all oil companies’ Annual Reports. The FASB as responding, in part, to concerns expressed by the Securities and Exchange Commission (SEC), since Annual Reports and Financial Statements are, of course, routinely used to attract investment capital. Among required criteria had to appear (1) a statement of capitalized costs relating to production activities, and (2) another statement itemizing exploration and development activities. Both full cost and successful effort methods were, and still remained (as of 1986), legally acceptable according to the SEC and the FASB, as cited in the Gallun and Stevenson article.

The 1986 analysis by these two Texas Professors of Accounting thus concludes its section on the historical debate and proceeds immediately with a discussion of the successful effort method. The authors provide a helpful chart and an in-depth explanation of the ways in which ‘successful efforts’ meets the stipulations of FASB Statement No. 69. Since other experts have contributed to this discussion in greater detail, our analytical overview will proceed with a presentation of the ways in which ‘successful efforts’ methodology accounts for such items as acquisition, exploration, development and production costs in relation to properties, proved reserves, drilling and amortization. This can be credibly accomplished by quoting several other authors and oil accounting specialists.

III Drawing the Parameters of the Full Cost and Successful Efforts Dialogue

Introducing the grand debate, opposing those who embrace successful efforts methodology and those who prefer full-cost accounting, Koester, in providing a synopsis of General Industry Characteristics (1982, 17-19), draws some of the primary parameters within which this discussion will occur.

The Institute for Energy Development, based in Oklahoma City, routinely provides explanatory material in either textbook format or in professional petroleum or petro-chemical journals concerning the general characteristics of the oil and gas industry both in this country and abroad. Prior to delving into cost-categorization terminology useful for an understanding of the full-cost and successful effort methods of accounting in this field, it is naturally important to grasp the fundamental nature of the industry itself. Robert J. Koester achieves this goal in Chapter 2 of his book entitled *Handbook on Oil and Gas Accounting* (1982). He dramatically indicates that, as of the 1980s, 13 of the 20
largest corporations in the United States were oil-related and had cumulative assets of more than 263 billion dollars. In comparison, the auto industry has only 2 out of the top 20 US firms. Under these circumstances, he notes, any legally required modifications of accounting systems for the oil industry will directly or indirectly impact accounting procedures in all business firms. After mentioning the sheer magnitude of the oil and gas sector, Koester turns to the high risk factor inherent in exploration and development of frequently unproven sites. Costs are exorbitant, conceivably rising into the hundreds of millions of dollars just to explore potential wells or deposits. If successive failures are registered by a given firm, this company will be unable to attract market capital, he emphasizes (1982, 18). On the other hand, if oil is struck, then profits are phenomenal in many instances. Yet, technical complexity comes into the picture, as well. To realize high profits, highly paid technical people must be compensated for their engineering, geological or professional expertise in other crucial specialties. And, fourthly, Koester points out, there is the degree of regulatory legislation hanging, sometimes as a Sword of Damocles, over the oil producer. Locations where drilling is permitted are controlled, as are the depths to which exploration may be executed, not to mention the precise timing of drilling, the actual quantities produced, or the rate at which they are produced.

Koester’s cited chapter is neither highly specialized, nor geared closely to accounting practices in this industry. It simply establishes the groundwork and provides a survey of the magnitude of this industry with implications for the enormous significance of accounting practices within it.

Building to some degree on the preceding information, Brock, Klingstedt and Jones (1981, 60-61) define important oil and gas accounting boundaries by describing, in some detail, the subject of “Classification of Costs Incurred”.

The Professional Development Institute in Denton, Texas, where North Texas State University is located, published Brock’s straightforward explanatory text in 1981. On pages 60 and 61, key definitions of the four primary classifications are offered. Whether full cost or successful effort methods are used, the authors indicate, these terms are, and must remain, uniformly recognized among accountants in this industry. Roughly paraphrased, major costs incurred in all phases of oil and gas activity, because they are deserving of considerable attention in our overview, are summarized below for easy reference.

- **Acquisition Costs**: purchase, lease or rental or property. There are also bonuses, options to purchase or mineral rights issues
sometimes associated with acquisition costs. Both types of methodological procedures take all of these variables into account.

- **Exploration Costs**: identification of suitable areas for drilling or extraction. Examination of these areas using geological testing methods or exploratory techniques. These costs may occur prior to actually acquiring the property and they include geologists fees and drilling costs for both productive wells and dry-holes. Brock and his colleagues mention that some of these costs can arguably be included under Development, if they actually produce oil or gas.

- **Development costs**: These items are related to improving a well that has been shown capable of producing. Improved oil recovery systems, for example, and other “intangible drilling costs”, upgrading of processing equipment, and storage facilities.

- **Production Costs**: Actual removal of the oil from the source. Permanent drilling equipment, on-going labor costs, repairs, and perhaps ‘connection to pipeline’ expenses are all legitimate development costs. Of course, there are others, the authors confirm. Certain taxes are also included in this category, such as the windfall profit tax, plus property insurance expenses where applicable.

In addition to these four major cost categories or classifications, the authors also mention “support facilities”, such as bunkhouses and kitchens for the work crew. They then immediately turn their attention to SEC regulations for successful efforts accounting, a feature of their chapter demonstrating the importance they assign to the prevalence of this methodology.

Shedding additional light on the diverging characteristics of these two systems (each possessing advantages and disadvantages), Koester refers directly to the nature of Full Costing versus Successful Efforts (1982, 50-59).

Chapter Four of Koester’s referenced text dwells in depth on the differentiation between the two most prominently utilized accounting methods in the oil and gas industry. He expresses his intention to provide not only an explanation, but an example of each (1982, 50). He also traces the history of the debate to which we have already alluded, but makes the point that “full costing”, as some specialists refer to it, is, in fact, the same “full-cost” method as it is more concisely known in other articles.

There is a wide divergence in the results obtained under each method, which is why properly understanding both is so critical to the oil industry itself and to the investment community. A higher net income will be
revealed under the full cost method for a firm undertaking an energetic program of acquisition and exploration, Koester notes. For this reason, start-up, young or ‘adolescent’ companies used to prefer this accounting strategy, he notes; but, both successful efforts and full-cost were considered almost equally popular among all oil firms, for a variety of reasons, according to a chart provided in 1982 by the author.

What, however, are the differences between these two well-accepted approaches? The author provides a succinct reply on page 53 of his referenced chapter. The major difference, he clarifies, involves how dry-holes are recorded for accounting purposes. Those firms using the successful efforts method expense the costs associated with dry holes, while full cost method supporters capitalize such costs. In other words, under successful effort accounting, the loss of capital incurred by drilling a dry-hole is written off as an expense during the actual year the hole fails. Under full cost accounting, the non-productive wells are capitalized (funded), and are then amortized (depreciated) over the entire life of the successful wells. On the statement, then, it appears as if successful wells are offsetting the dry-holes, as if they were, in fact, producing oil. It’s really a question of how, from an accounting perspective, the producing and non-producing wells are treated. It is easy to understand how the illusion of success, or failure, can be created using or misusing these two methods. Of course, both can be an accurate portrayal of the firm’s viability, as well, Koester acknowledges.

In further clarification of the differences, the writer provides a detailed breakdown of the distinguishing characteristics, using diagrams and schematics. The Full Cost method appears quite simple (1982, 55). All four of the primary cost classifications (i.e. acquisition, exploration, development and production) are charged to the Income Statement, along with amortized costs. Successful Efforts accounting re-categorizes unproven wells under development costs and adds them, indirectly, to amortization costs (1982, 57). These distinctions are further refined by the concept of a ‘cost center’ that Koester defines carefully. These centers revolve around the proven or non-proven status of various assets or property. In simplified terms, the costs associated with each category of property are averaged, jointly or separately, and are then charged to the Statement as indicated on Koester’s earlier graphics, explained briefly above.

As he moves through his chapter, the author demonstrates that through successful efforts accounting, a firm may well show a loss for several years, whereas under full cost methods this loss would not appear on the statement, lending an almost deceptive overlay to the firm’s profile (1982, 68, 69).
Casting an oblique light over the preceding issues, and predicting, in some ways, the development of the Successful Efforts vs. Full Cost discussion among professional accountants, Flory and Grossman outline, as early as 1978, "new" requirements under both methods.

Curiously, these two Texas A&M Assistant Professors of Accounting foreshadow the grand debate concerning the two methods, which is about to erupt in the 1980s. It might be asserted that they establish the tone and the parameters for the discussion to follow among their colleagues in the years ahead. In early 1978, the FASB had only issued its Statement No. 19 bearing on the financial reporting practices of the oil and gas industry. At that stage, they felt it important to demonstrate clearly the successes or failures encountered and, as the best way to do so, they had insisted on use of the ‘successful efforts’ methodology, or at least a variation of it. This article concentrates on the nature of the debate, after explaining the key points in each system. Their explanation of a "cost center" is far simpler than in Koester and quite clear in the mind of the reader. Flory and his colleague explain that, under the successful efforts method, each well, whether successful or not, is viewed as a separate cost center, instead of as a global concept, as under full-cost methods. This approach exposes the fundamental issues lying at the heart of the debate, they claim. Only one in thirty wells, even if it spurts an initial geyser of oil, and is considered a "wildcat", ever becomes commercially viable, or even operable. So, full cost advocates realize this, and attempt to ‘conceal’, beneath the few successful wells, amounts expended on the failures. Whether this is an advantage of such accounting is a matter of perspective, of course. If the financial statement is destined for consumption by investors, it is definitely an advantage. However, a cost analyst or intra-corporate managerial personnel, on the other hand, would probably prefer to see where, precisely, funds were being lost, to what extent, and for what reasons. For them, the successful efforts model would prove more valuable.

This high-pitched argument reaches into the loftiest circles. Grossman and Flory point out that the then President of the Independent Petroleum Association of America argued strenuously for the full-cost method since he felt that no venture capital or risk-capital could be raised for the oil industry if financial statements were prepared under successful efforts accounting procedures.

The Flory and Grossman article investigates far deeper into the past years of this controversy. It analyzes, in particular, the 1976 and 1977 period when some of the initial arguments were being formulated on both sides.
However, it retraces much of the ground explored in Koester and Gallun, among others. It would be unfair to state that Flory and Grossman do not elucidate the actual reasoning of the FASB in the mid-1970s; actually, they seem to do a credible job of reconstructing the thinking of that period. And of resurrecting the relationships of those who proposed either one or another of the two methods. Because the Flory and Grossman discussion is far better drafted than the articles previously critiqued, it appears that the four primary cost classifications, the boundaries of which were blurred in previous articles, are comparatively quite crisp and well delineated herein.

Gallun and Stevenson (1982, 18–25) expand key concepts in their initial chapters, notably under the section entitled “Introduction to Oil and Gas Accounting.”

In their second chapter of the referenced text, for example, Gallun and Stevenson (1982) recap content-wise what has been mentioned earlier in our discussion. Specifically, they describe the four cost categories and the two methods (which they casually abbreviate ‘FC and SE’), plus an enlightening discussion of the interaction of these dynamics. They do point out, however, as if they wish to further clarify this significant point, that under both methods (SE and FC) acquisition and development costs are routinely capitalized, while production costs are technically expensed. There are certain assumptions under SE as to the actual intent of producing oil rather than simply exploring for it. And this rationale governs classification of costs under SE. FC tends to group everything together, not informally, but with fewer constraints on classification. Gallun and Stevenson in this second chapter professionally, in words and graphically, describe the subtle differences between a development well and an exploratory well (1982, 22). Classification seems not always to prove simply a difference related to productivity or expectation of production. It deals, rather, with the establishment of productive boundaries of oil-reservoirs within a given well and the nature and/or scope of their productivity. Among other sources cited in their presentation, the authors rely on information excerpted from Burrow in the Spring of 1982 issue of The Journal of Extractive Industries.

The writers also provide valuable insight into how, when using SE methods, by revising the order, or sequence, of drilling various types of wells on a financial statement, it is possible to vary the bottom line results. The secret lies in how borderline wells are defined and hence classified. In the hypothetical case of five wells, three of which demarcate the boundaries of an underground reservoir of oil, and the other two fall within the perimeter but are not producing, the latter two would be considered development wells. They would be capitalized and expensed.
differently than if they did not fall within the purview of the first three. This affects bottom line SE results in a favorable sense.

As early as 1972, R.T. Johnson, writing in *The CPA Journal* (June 1972, 479-84), initiated the dialogue that was destined to affect the petroleum industry for decades to come, not to mention the perception of success and failure in this sector as viewed by prospective investors on Wall Street. His article, "Full Cost vs. Conventional Accounting in the Petroleum Industry", has been reprinted due to its classic implications for Full-Cost accounting as opposed (not to Successful Efforts) but rather to "conventional accounting", as Johnson terms it. To dramatize the effects of the FC model over preceding methods, Johnson cites an experimental study conducted over a period of 10 years in which both firms began with the same amount of capital ($400,000). One used traditional accounting methods, within the context of exploratory activities, while the other used the full-cost model. All other variables were neutralized mathematically so as not to interfere with the discrepancy that may or may not have surfaced as a result of the disparate accounting methods used. Johnson points out that non-productive holes are charged as expenses under traditional accounting methods, where as under FC methods, such dry holes are classified as having some future benefit, in that they are a necessity, first of all, and, secondly, eliminate dry locations, conceivably leading geologists to productive zones. In fact, about 42% of all activity is non-productive, to paraphrase Johnson in the reprinted chapter appearing in Grossman (1980, 3). When reviewing the two companies’ resulting financial statements over a ten year period, it was determined that major differences surfaced depending on how financial results were displayed, via conventional methods or full-cost. Conventional methods showed a 2 million dollar loss, on balance after ten years. Reduced drilling (necessitated by lack of available capital in certain years) "tends to increase reported income for conventional accounting..." (Johnson, 1980, 3). But as soon as drilling increased, the losses skyrocketed due to the intrinsically unprofitable nature of such operations as shown under conventional accounting methods. By way of contrast, the full-cost company published results showing a profit in all but the first year of operation; in fact, a 2.6 million dollar profit. It is assumed, of course, that their actual discoveries were equal in nature and that methods of accounting were the only variable. This experiment may have had some flaws of course, pointed out in articles that rebutted Johnson, such as Baker below; however, the point was adequately made. Method of accounting could highlight certain fiscal and financial features, all things being equal, and down-play others. Return on investment was different, of course, and investors responded far more favorably to the full-cost firm. Johnson discusses, in his concluding section, the rosier merits of Full-Cost, but
implies that, ultimately, analysts or investors may wish to look beneath the surface veneer. He does not seem to imply, however, that either approach is intrinsically misleading.

V Several Scholarly Analyses of the Two Methods

Professor Baker in his "Discussion of Drawbacks to Full-Cost in Petroleum Industry Accounting" (1980, 8-20) opens an extremely more insightful probe into the relative merits of the two methods.

This distinguished Columbia University professor presents his material in a formal vein, documents it impeccably and does not steep his reader in idle suppositions or conjecture, as have at least two of the preceding writers. An astute analysis of the two principal methods is offered, followed by an acknowledgement of the then on-going debate among professional accountants over the characteristics of both models. Baker’s article is heavily footnoted, thus providing easy access to more permutations of the arguments under discussion in the 1970s. He presents several arguments clearly in favor of FC, including one that stresses the advantages that would lead to further exploration and enhancement of competition in the industry. FC accounting can result in a more realistic or so-called true-value accounting balance, he mentions. He then presents a panoply of cogent arguments in opposition to Full-Cost. The reader’s eyes fall upon his fourth argument, among others, an argument which points out that FC can rely on poor estimates of oil reserves and thus skew depletion and amortization calculations unrealistically. He cites others’ arguments against Full Cost and then proceeds, in formal academic style, to note arguments in favor of the then increasingly accepted Successful Efforts model, stressing that SE is "congruent with economic realities in the oil industry..." (1980, 18). He derives support for his position from Accounting Principles Board (APB) Statements and from the American Association of Petroleum Geologists Bulletin, among other well-reputed sources. He deems, in his conclusion, the Successful Efforts method to be the more acceptable of the two for the sake of accuracy and in terms of representing proper accountancy.

Porter’s analysis of ‘Disposition for Financial Purposes’ (1965, 63-65) serves as an adjunct support to the preceding discussion and is certainly deserving of inclusion.

In a flashback to 1965, somewhat before the grand debate began, Porter, in his text entitled Petroleum Accounting Practices, alludes to the delicate nature of either expensing or capitalizing certain costs
depending on how they are perceived within the exploratory phase of a firm’s activities (1965, 63). He makes what seem to be rather dogmatic statements reflective, perhaps, of the classification of costs in his time. In introducing the concept of full-cost accounting (not widely known at the time), Porter writes, “This method for the disposition of exploration operating costs...is sometimes referred to as ‘full costing’ (and) has not become general practice within the industry” (1965, 64). Thirty-five years ago, therefore, one can assume that full-costing was barely in the introductory stages of acceptance, in spite of its obvious advantages from an investment broker’s standpoint. Porter points out that one factor discouraging eager acceptance of full-costing involves the need to delay determination of valuation until such time as the property emerges from the exploratory stage and gears up for full production or development. Ten years may elapse between a well’s experimental stage and its final development into a predictably producing facility. At that point, geologists can estimate the underlying reservoir of oil or gas and accountants can then assign it a tentative, but fairly accurate, value.

Even in 1965, however, there were advocates of full-cost methodology who acknowledged that there were advantages to this methodology. Once all properties have been capitalized, they can then be amortized as well, and then ‘set against’ all operations on the Statement, using a unit of production approach. This should provide a clear picture of the bottom line and produce convincing results for analysts of a firm’s medium and long-range performance profile.

Porter’s segment on disposition of pre-drilling costs is not tremendously detailed; yet, he does an adequate job of delving into some of the vital considerations pertaining to exploration rights, test-well contributions and the methods of treating a contributor’s property from an accounting standpoint. He acknowledges, for example, that ‘contributions’ do not always reflect an on-going active exploration attempt, and must be judged carefully on the basis of their actual status.

Because the debate concerning the efficacy of SE and FC encompasses all aspects of the oil exploration, development, production and refinement process, Professor Koester devotes special attention, in his Handbook’s (1982) seventh chapter, “Accounting for Production and Revenue”, to proper accounting in the actual production phase. He outlines in some detail the three principal types of taxes applied to producing wells: property tax, severance or production tax, and the windfall profit tax. Without specifically referring to the two methods of year-end accounting, Koester explains how these three taxes differ and how, and under what circumstances, the producer pays them to the State. He then progresses to an explanation of treatment under the two methods.
Production costs are expensed, he points out, in the same year that the product is generated, and in the same timeframe during which production costs are actually incurred. He notes a minor exception to this principle under FASB Rule 19, dating from many years earlier (1982, 90). The exception states that ‘lifting’ costs (physically extracting the oil) can be included, under successful efforts accounting, in production costs. Under full-costing, these expenses must be listed as they are incurred, apparently not in conjunction with production costs. Unpaid taxes of any type are to be recorded as a liability, until they are remitted to the state. This applies to both SE and FC methods.

Koester then proceeds to demonstrate his points using graphics and a fictitious case study involving an imaginary firm he names Black Gold Oil Company. He points out how revenue is affected by taxes, and how each type of tax is to be recorded for accounting purposes. An important entry is the gross revenue accruing to the owner. In this chapter, at least, minimal mention is made of SE and FC methods, largely because both methods use similar strategies for expensing and charging production activities. This, in itself, is useful information to retain for comparative purposes with other phases of oil and gas operations.

Also referring to the treatment of Production Costs are Gallun and Stevenson in their text *Fundamentals of Oil and Gas Accounting* (1986, 172-182). They highlight the necessity to sub-divide production costs immediately into direct and indirect costs, and they stipulate how this determination is made. Once that is accomplished, it is possible to graph the allocation of, for example, indirect costs. On the Gallun graph (174-175), reference is made to the type, name or characteristics of the Lease or Property Status, to the number of wells on it and to the quantity of oil, in barrels, produced. Methods of charging are subsequently shown. A distinction is made between these costs and overhead, and it is noted that such costs, if they are not directly related to a specific well, are not charged to it.

The authors proceed to discuss taxes in the same light as Koester. They seem content to define them broadly and to cite relevant state regulations dating from the 1920s and 1930s. Interestingly, they refer to drilling permits and well-spacing, concepts that later apply indirectly to certain cost-category distinctions under SE and FC methods, though they seem not to point this out under these headings. Without reference to the two methods, the authors devote considerable space to completion of wells, and how costs associated with completion should be set against hypothetical cash-flow to be generated by the well. This seems to be more a managerially oriented discussion on their part than strictly an accounting matter.
VI Problems related to Leases and Exploratory Wells under Both Methods

Brock, Klingstedt and Jones (1982, 38-45), pointing out peculiarities of the full-cost system as opposed to the successful efforts approach, devote valuable attention to ‘Amortization, Conveyances, Full Costing and Disclosures’.

Indeed, in Part Two of their Accounting for Oil and Gas Producing Companies (1982), Brock and his associates at the Professional Development Institute devote attention to some of the risks inherent in unamortized capitalized costs (1982, 38). These risks are usually emphasized by detractors of the full-cost method. If such costs are not treated correctly under full-cost methodology, then there is a danger that, within a specific cost-center, they may be greater than the intrinsic value of the oil or gas assets themselves. Assuming unamortized costs exceed the estimated value of the oil deposits, then these costs must be ‘written down’, Brock states, to the level of the intrinsic value. By writing down is meant charging these excessive costs as expenses. This would usually apply to actual or potential dry holes or to low-value wells. Once these costs are written off as expenses, they cannot be returned to the cost center from which they originated, even if the value ceiling increases. This is essentially a warning to accountants and managers that limits or ceilings must be placed on costs (and expenses) that cannot be properly covered.

The authors turn their attention in the last sections of their chapter to mineral conveyances and to promotion. Under the full cost method, they assert, a number of special rules apply governing how these activities are to be recorded. Conveyances, inclusive of subleases and sales, complicate the entire picture, although the reader can infer that the same might be true of successful efforts accounting, as well (1982, 44).

Within the context of special problems, it was perhaps indispensable to discuss production accounting prior to exploration and development activities, because the latter category represents, in the eyes of experienced oil and gas accountants, two somewhat troublesome areas, unlike production accounting -- which is arguably more straightforward. This is particularly true in the oil and gas industry where up-front exploratory expenses are significant and need to be treated judiciously.

Speaking authoritatively, Koester, in his segment entitled Accounting for Exploration and Development Costs (1982, 82-87), proceeds with an insightful explanation of exploration and development costs, breaking them both down into forms and types of activities.
Koester defines an exploration cost as not belonging to any of several other categories, such as those associated with a development well or a stratigraphic test well. However, not satisfied with this type of definition by negation, he moves toward an acceptable description of an exploratory well by stating,

"exploratory wells are drilled with the intent of finding proved reserves, but only in those areas where reserves are not already known to exist." (1982, 82)

Once a clear-cut definition is available, the accountant can proceed with cost-categorizing the data pertaining to that specific well.

Koester further expands his article in the same manner with respect to development costs. Some development wells are classified as step-out wells, since they can not be further developed if obstructions or problems occur. Ultimately, they must be considered as dry-holes from an accounting standpoint.

The author reiterates in his final section that exploratory wells, under the successful efforts method, are capitalized until the well proves to be unproductive, at which time costs are reclassified as pertaining to a dry-hole. This would seem to make good sense even from a layman's standpoint. Under full cost, all expenses incurred are capitalized, but a ceiling is placed on them.

Using the appropriate cost-center, development wells are capitalized until they are brought into full-scale production. At that point, their costs and expenses are recorded against actual income from the well.

Koester continues his explanation of treatment by turning to how leases are recorded. Many of the same rules apply, except that unproved reserves are treated over an extended period of time under the successful efforts method. Frequently, as new events affect the various leased wells, costs must be reclassified. The status of such wells changes, of course, as often as for non-leased wells. Basic logic is applied to how costs are treated under the various scenarios that develop.

**VII Under SE and FC: Classification of Exploration and Development Wells**

As part of the University of Texas Petroleum Accounting Lecture Series, Professor Bennett devotes in his No. 3 Booklet, "Exploration Expense Accounts" (1969, 49-50), considerable attention to exploration expensing. He retraces much of the material found in Brock, Koester and Gallun, but does so from a distinctly different perspective. His stream of thinking
leads to a credible definition of how to treat funds related to a dry-hole, although he does not refer directly or indirectly to the SE or FC methods. He explains the nature of success ratios that can prove to be a useful statistical tool in predicting anticipated expenses and planning financially in advance.

His attention subsequently turns to a type of lease not mentioned above by Koester, the Surrendered Lease. This occurs when a well fails to produce and the leasing arrangement must be cancelled and written off. A lease cannot, he confirms, be cancelled prematurely. The annual renewal date must be honored; however, no rent is paid beyond the renewal date for a Surrendered Lease. Although Bennett does not so stipulate in this segment of his lecture series, costs would seem to be simply 'written off' as expenses, the same way in which one might treat a dry well.

Reference is made at this juncture to Brock, Klingstedt and Jones once again but within the context of Accounting for Costs of Exploratory Wells (1981, 198-203, 203-205).

Professor Brock and associates writing in their text published by the Professional Development Institute in Denton Texas (1981, 198-205) present a detailed and highly structured segment on how costs are to be treated for exploratory wells. Much of this material is duplicated in Koester and Gallun; however, some key points seem worthy of mention for our purposes. Brock uses tangible examples rather than vague explanations. He outlines how a hypothetical firm would actually account for exploratory costs, stipulating that work in progress is recorded clearly, and separately, on the company’s general ledger. Distinctions are later made, he points out, depending on the outcome of a given well, whether a dry-hole or a successful and productive well.

Accountants using the successful efforts approach must determine how long to delay applying costs assignable to an exploratory well that has not been clearly determined as dry or productive. Parenthetically, this is one major objection of those in the Grand Debate who find Successful Efforts a cumbersome and ill-delineated methodology.

Brock outlines an interesting dilemma faced by accountants during the period after the balance sheet has been finalized, but before the year-end financial statement has been published (1981, 200). If an exploratory well has been deemed a dry-hole during this interim period, most companies assign all costs on the financial statement as if the well were unsuccessful, but do not change the balance-sheet which may or may not be technically accurate. In other words, no post-event retouching of the balance sheet is generally permitted.
Another facet of the on-going discussion among accountants (affecting the larger debate involving SE and FC) relates to the "length of deferral costs" pertaining to a drilled well, but one that is not yet clearly classified as producing. Also within this context, Brock discusses stratigraphic test wells, explaining that their costs are to be categorized under development activities (1981, 203).

This discussion leads him into a detailed analysis of development wells during the course of which several interesting statements impacting indirectly SE and FC methodologies emerge:

- His definitions severely restrict the classes of wells validly considered development wells; for example →
- A developed well must be drilled within a proven productive zone;
- Outpost (i.e. wells beyond or on the periphery of proven zones) and step-out wells are considered exploratory in nature;
- There are very few development dry holes (since they have usually been eliminated during the exploratory phase).

Brock proceeds with a graphic break-down of how costs assignable to the few remaining development wells are to be tabulated and treated as entries on the ledger, balance sheet and financial statement. His analysis is especially helpful in terms of forming an opinion of how SE and FC methods might differ for each of the financial documents required by an oil firm and what overall impression of the firm’s solvency might be projected.

In his chapter "The Nature of Exploration Costs", Brock and his colleagues set forth quite specific data related to classification of costs associated with exploration (1981, 85-86). In fact, they refer to their material as reflecting ‘special problem areas’ in exploration cost accounting. Early in their explanation, the authors cite SEC regulations, notably Reg. SX 3-18, that set forth parameters and descriptive guidelines for defining the nature of an exploratory well (1981, 85). This regulation is actually quite specific and should be consulted during preparation of any financial statement by the CPA. On the basis of this detailed and geologically descriptive passage, Brock launches into a discussion of the origin and evolution of petroleum – an aside that does not concern our analytical discussion of the two primary methodologies.

Coutts, in his segment entitled "Treatment of Exploration and Development Costs" sheds light on both types of wells and how they should be processed under both methodologies (1963, 22-25).

The Canadian Institute of Chartered Accountants published an early study in 1963 that began to elucidate some of the issues already touched upon
at length in foregoing pages of this report. What is so compelling about
the aforementioned Coutts article (part of a broader research study) is
that it defines the nature of assets and the treatment of asset costs in
terms not entirely familiar to accountants in later decades south of the
Canadian border. The advantages of capitalization are discussed
insightfully as well, and an itemized listing of primary features reveals
some of the early thinking in the area of FC and SE accounting approaches.

He points out that although land is considered an asset under usual
criteria, when oil accountancy is involved it is viewed on the basis of
whether or not it produces oil (1963, 23). A dry-hole, though property,
is, of course, a non-performing asset. The Coutts article continues to
elborate on some of the finer points associated with cash-flow and
indicates that the spending of money – however it is accounted for – in a risky industry in no way guarantees financial or production success.
This seems fairly obvious to the initiated reader at this point in our
analysis. Coutts does, however, allude in this vintage 1960s article to
full cost accounting and does so in a favorable manner, implying perhaps
that it is a justifiable and worthy methodology not likely to mislead
investors or internal financial officers.

Lastly, in a pair of excerpted sub-headings from their text published by
the Professional Development Institute, Brock, Klingstedt, and Jones
(1981, 112-116, 206-207) address special problems related to accounting
in relation to exploration costs, drilling and development. While these
classification problems are germane to our discussion of the ‘grand
debate’ to a limited degree, they do not seem to focus on the major
features of each methodology, other than to provide in depth guidelines
for the cost-categorization of exploratory wells in various stages of
execution. They add information concerning permits required from the U.S.
Geological Survey (USGS) and discuss the role of the IRS in evaluating
certain wells. However, SEC regulations, notably SX 3-18, are mentioned
as applying if the company is going to charge exploratory costs incurred
to “current expense”, as under the full cost methodology. So, allusion
is made in these two Brock segments to the usefulness of applying the
principles of full-costing to many exploratory operations. This is not
to totally exclude successful efforts, however, to which the authors
allude in their material. By stating that “some companies” employ one
practice and others another (1981, 206), they seem to lend credence to
the viability of both well-recognized and accepted practices.

VIII Concluding Observations

This review of twenty excerpted segments from at least ten widely
acclaimed and generally authoritative sources in the field of oil and gas
accounting has outlined several major viewpoints in support of both Successful Efforts and Full Cost accounting. Allusion has also been made to the detractors of one method or the other with particular reference to the reasons for rejection or disapproval of a given methodology. It was basically felt that Successful Efforts accounting exposed many of the internal flaws or weaknesses within a firm, by revealing the extent and nature of losses incurred on unsuccessful wells. Other analysts, however, felt this was a distinct advantage in that costs could be broken-out objectively and forthrightly for all to see. If overall success was forthcoming within a firm throughout an extended period of operation, the SE method was seen to constitute an advantageous approach. Full cost, to be sure, would also have presented positive results in a favorable light, as well, although the FC methodology would probably have revealed more positive bottom-line results sooner, thus attracting capital from a broader base of investors.

The sheer breadth of articles considered in this analysis, encompassing the petroleum accounting profession in Canada and the United States, with distinct implications for the Middle East, tended to lend a sense of depth and completeness to the points raised, as if to reinforce the validity of both methodologies.

It is useful to observe that the FASB is currently supporting both methods, as long as ground rules of consistency and accuracy are honored.

Indeed, the ‘grand debate’, as we chose to refer to it in this report, may, in the eyes of some observers, never have really materialized, although in the heyday of Flory, Brock, Gallun, Koester, and Bennett it certainly assumed proportions worthy of consideration in the preceding analysis.

REFERENCES

(Nota Bene: All Cited Segments, Chapters, and Reprinted Articles are Individually Listed herein below to Facilitate Cross-Verification, although this may appear at first glance to be redundant Multiple Listing)


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