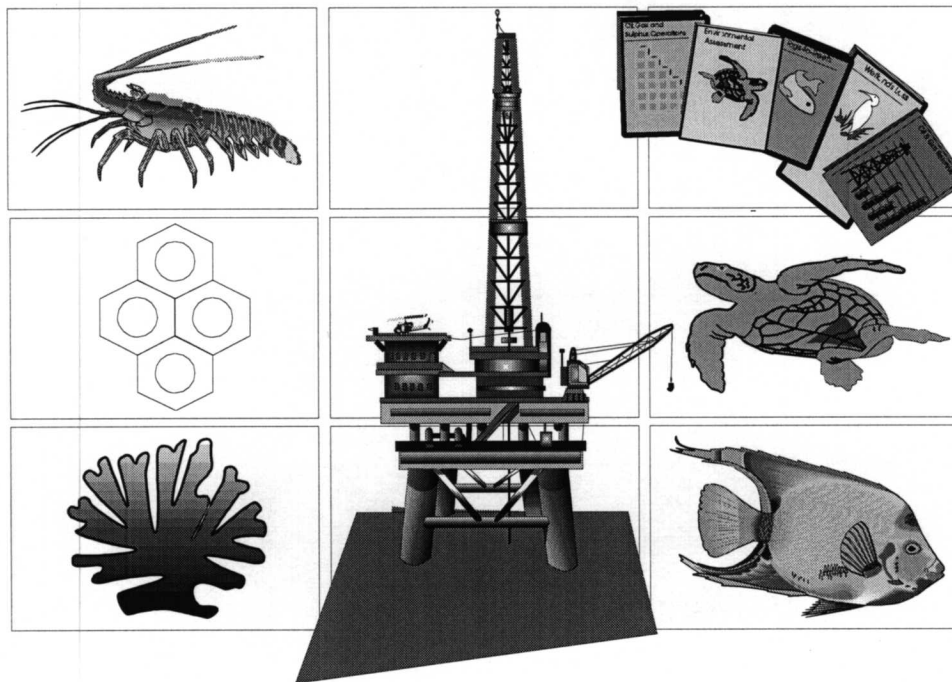
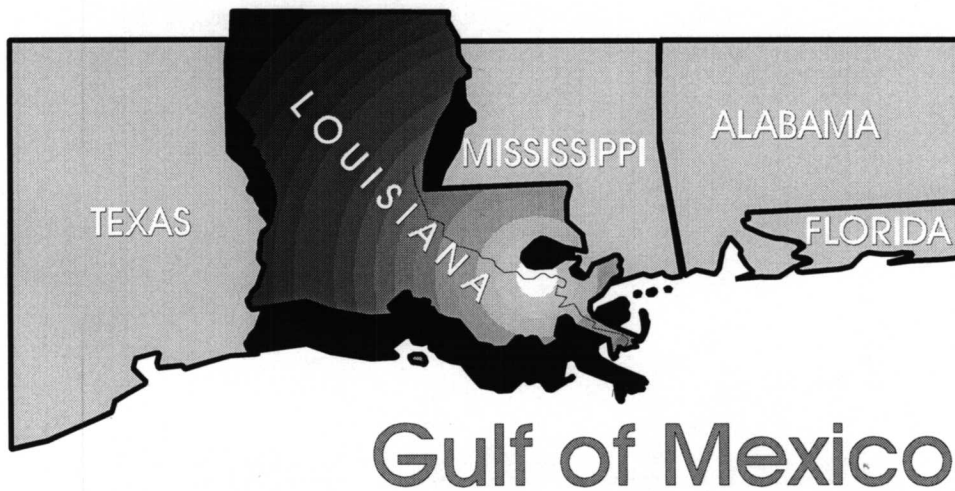


Coastal Marine Institute

# Characteristics and Possible Impacts of a Restructured OCS Oil and Gas Industry in the Gulf of Mexico



U.S. Department of the Interior  
Minerals Management Service  
Gulf of Mexico OCS Region



Cooperative Agreement  
Coastal Marine Institute  
Louisiana State University

**Coastal Marine Institute**

# **Characteristics and Possible Impacts of a Restructured OCS Oil and Gas Industry in the Gulf of Mexico**

Authors

Ruth Seydlitz  
John Sutherlin  
Samantha Smith  
Environmental Social Science Research Institute  
University of New Orleans  
New Orleans, Louisiana

Appendix A: Summary of Findings from Exploratory Interviews

Authors

Edward M. Bergman  
Thomas R. Hammer  
Bergman and Hammer, Ltd.

October 1995

Prepared under MMS Contract  
14-35-0001-30660-19903  
by  
Coastal Marine Institute  
Louisiana State University  
Baton Rouge, Louisiana 70803

Published by

**U.S. Department of the Interior  
Minerals Management Service  
Gulf of Mexico OCS Region**

**Cooperative Agreement  
Coastal Marine Institute  
Louisiana State University**

## **DISCLAIMER**

This report was prepared under contract between Minerals Management Service (MMS) and the Environmental Social Science Research Institute, Department of Sociology, University of New Orleans. This report has been technically reviewed by MMS and approved for publication. Approval does not signify that the contents necessarily reflect the view and policies of the Service, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. It is, however, exempt from review and compliance with MMS editorial standards.

## **REPORT AVAILABILITY**

Extra copies of the report may be obtained from the Public Information Unit (Mail Stop 5034) at the following address:

U.S. Department of the Interior  
Minerals Management Service  
Gulf of Mexico OCS Region  
Public Information Unit (MS 5034)  
1201 Elmwood Park Boulevard  
New Orleans, Louisiana 70123-2394

Telephone Number: (504) 736-2519  
1-800-200-GULF

## **CITATION**

Suggested citation:

Seydlitz, R., J. Sutherlin, and S. Smith. 1995. Characteristics and possible impacts of a restructured OCS oil and gas industry in the Gulf of Mexico. Prepared by the Environmental Social Science Research Institute, Department of Sociology, University of New Orleans. OCS Study MMS 95-0055. U.S. Dept. of the Interior, Minerals Mgmt. Service, Gulf of Mexico OCS Region, New Orleans, La. 188 pp.

## ABSTRACT

The focus of this study is to describe the business characteristics, environment and practices of companies involved in offshore oil and gas extraction and production in the Gulf of Mexico. In addition, the effect of the characteristics of these firms and the business environment on their operations is examined. Moreover, the changes in the business characteristics, environment and practices since 1986 is investigated to enable discussion of the shift in the operators in the Gulf of Mexico. Further, the potential impacts of such a shift are presented.

Five types of companies operating offshore in the Gulf of Mexico are studied - major corporations, large integrated independent businesses, small integrated independent firms, large nonintegrated independent enterprises, and small nonintegrated independent concerns. Data were collected from companies representing each of the five kinds using a phone interview consisting of open-ended questions. The questions concern: 1) the firms' characteristics, including their size, the amounts of oil and gas extracted, and the location of their headquarters and other offices in 1986 and the present; 2) the business environment, such as the federal agencies and technologies involved, the applicable leasing policies and regulations, and access to joint ventures and service companies; and 3) the outlook of the executives on the future of oil and gas extraction in the offshore Gulf. Some of the questions elicited answers that could be quantitatively coded and these responses were analyzed using frequency and percentage distributions. Other questions obtained replies that could not be quantitatively coded and these comments were transcribed and sorted by type of company and content of the answer.

Some findings suggest particular trends are occurring in the industry. First, the results suggest growth in the number of companies involved. Second, the findings imply that production has increased. Third, the outcome intimates that exploration activities have increased. Fourth, participation in joint ventures has increased. Fifth, there may be a tendency toward involvement in downstream integration. Sixth, the results imply that a shift is occurring. However, the results suggest that the nonintegrated independent businesses are becoming more involved while the major and integrated independent companies are maintaining a steady rate of activity or reducing their involvement.

The other important results concern business characteristics, environment and operations. First, there was widespread support for both areawide leasing and the reduction in the minimum bid. Second, a vast majority of the executives were against the implications of four possible regulations in the Gulf: OPA '90, the increases in lease bonding to cover plug-and-abandon liabilities, the Clean Water Act, and the Clean Air Act. Third, there were three key areas of employment: production/platform maintenance and operation, exploration, and administration. Fourth, there were more differences between the five types of companies by integration than by size or the usual categorization scheme of major vs independent businesses. In addition, the following potential impacts of the shift in the operators in the



vi

Gulf are discussed: working conditions and employment, operations, and government revenues.

**TABLE OF CONTENTS**

	<u>Page</u>
List of Figures	ix
List of Tables	xi
Acknowledgments	xv
Chapter 1. Executive Summary	1
Chapter 2. The Oil and Gas Industry in the Gulf of Mexico	11
Chapter 3. Exploration and Production Companies in the Gulf of Mexico	45
Chapter 4. Comparisons Among the Five Types of Companies	89
Chapter 5. The Shift in the Gulf and Potential Impacts	143
Glossary	153
Literature Cited	157
Appendix A. Summary of Findings from Exploratory Interviews	163

**LIST OF FIGURES**

	<u>Page</u>
Figure 2.1 Oil and Gas Prices in Constant Dollars	26
Figure 2.2 Gas Prices in Constant Dollars	26
Figure 3.1 Resources Extracted in 1994	46
Figure 3.2 Resources Extracted in 1986	46
Figure 3.3 Change in Petroleum Extraction 1986 to 1993	47
Figure 3.4 Change in Gas Extraction 1986 to 1993	47
Figure 3.5 Downstream Integration in 1994	48
Figure 3.6 Downstream Integration in 1986	48
Figure 3.7 Change in Exploring 1986 to 1994	49
Figure 3.8 Location of Headquarters in 1994	50
Figure 3.9 Location of GOM Headquarters by State in 1994	51
Figure 3.10 Common Cities for Headquarters in 1994	51
Figure 3.11 Location of Other Offices in 1994	52
Figure 3.12 Location of Other Offices by State in 1994	52
Figure 3.13 Common Cities for Other Offices in 1994	53
Figure 3.14 Use of New Technology	60
Figure 3.15 Participation in Joint Ventures in 1994	61
Figure 3.16 Participation in Joint Ventures in 1986	61
Figure 3.17 Changes in Joint Venture Participation 1986 to 1994	62
Figure 3.18 Use of Contractors in 1994	64

Figure 3.19	Change in the Use of Contractors 1986 to 1994	65
Figure 3.20	Change in Percentage of GOM Cost 1986 to 1994	65
Figure 3.21	Expected Change in Exploration 1994 to 1998	67
Figure 3.22	Expected Change in Workforce 1994 to 1998	68
Figure 3.23	Expected Change in Independents' Share 1994 to 1998	69
Figure 3.24	Effects of Current Prices in Percentages	71
Figure 3.25	Effects of Future Prices in Percentages	72
Figure 3.26	Most Common Positive Responses to Areawide Leasing	74
Figure 3.27	Positive Responses to Reduced Minimum Bid	75
Figure 3.28	Effect of Deep Water Projects	78
Figure 3.29	Effect of 3D Seismic Data	78
Figure 3.30	Positive Effects of 3D Seismic Data	79
Figure 3.31	Effect of Subsalt Exploration	80
Figure 3.32	Positive Effects of Horizontal Drilling	81
Figure 3.33	Effect of OPA '90	82
Figure 3.34	Effect of Plug and Abandon Liabilities	84
Figure 3.35	Effect of the Clean Water Act	85
Figure 3.36	Effect of the Clean Air Act	86

**LIST OF TABLES**

Table 2.1	Exploration and Development Funds and Asset Rankings by Type of Company	15
Table 2.2	Rankings of Revenues and World Reserves by Type of Company	15
Table 2.3	OCS Activity	28
Table 2.4	Acreage Offered/Leased and Production for Federal OCS Leasing Program, 1970-1991	33
Table 2.5	Environmental Costs of Oil and Gas Exploration and Development by Year	36
Table 3.1	Distribution of Employees in 1994	54
Table 3.2	Changes in Workforce Distribution from 1986 to 1994	54
Table 3.3	Federal Agencies with the Greatest Effect on Gulf Extraction	56
Table 3.4	Rankings of Regulations	58
Table 3.5	Most Frequent Joint Venture Partner	63
Table 3.6	Joint Venture Partners	63
Table 4.1	Major Corporations	90
Table 4.2	Major Corporations' Employees	91
Table 4.3	Large Integrated Independent Companies	92
Table 4.4	Large Integrated Firms' Employees	93
Table 4.5	Small Integrated Independent Companies	94
Table 4.6	Small Integrated Firm's Employees	95
Table 4.7	Large Nonintegrated Independent Companies	96
Table 4.8	Large Nonintegrated Firms' Employees	97

Table 4.9	Small Nonintegrated Independent Companies	99
Table 4.10	Small Nonintegrated Firms' Employees	100
Table 4.11	Distribution of Employees in 1994 by Type of Company	101
Table 4.12	Headquarters in 1994	103
Table 4.13	Other Offices in 1994	104
Table 4.14	Change in Numbers of Other Offices 1986 to 1994	105
Table 4.15	Changes in Workforce Distribution from 1986 to 1994 by Type of Company	106
Table 4.16	Federal Agencies with the Greatest Effect on Gulf Extraction	109
Table 4.17	Rankings of Regulations for All Companies and by Type of Company	113
Table 4.18	Technology Use by Company Type	114
Table 4.19	Joint Venture Involvement by Type of Company	117
Table 4.20	Joint Venture Partners by Type of Company	118
Table 4.21	Use of Contractors by Type of Company	119
Table 4.22	Future of Gulf Activities by Type of Company	120
Table 4.23	Exploration in the Gulf in 1998	121
Table 4.24	Independents' Share in the Gulf in 1998	122
Table 4.25	Workforce in the Gulf in 1998	123
Table 4.26	The Effect of Prices on Operations	127
Table 4.27	Effects of Areawide Leasing	130
Table 4.28	Reduction of the Minimum Bid	131
Table 4.29	The Effect of Technology on Operations in the Gulf	132
Table 4.30	The Effect of Regulations on Gulf Operations	135

Table A-1 Alternative Scenarios for Calendar Year 1998

188

## ACKNOWLEDGMENTS

The authors want to thank the respondents who participated in this study. We realize that collecting the data to answer the questions required time and we appreciate the diligence with which they addressed these questions. We would also like to thank the following individuals who assisted in other ways on this project. They are listed in alphabetical order.

Edward M. Bergman, Ph.D.; Secretary, Bergman and Hammer, Ltd.; Professor, Department of City and Regional Planning, and Director, Institute for Economic Development, University of North Carolina. As part of this project, Professor Bergman, with Dr. Hammer, completed an initial indepth qualitative study of 11 companies highly involved in the offshore oil and gas industry which raised issues to be examined in this study. In addition, he reviewed both the interview instrument and this document and made helpful suggestions.

Raymond J. Burby, Ph.D.; DeBlois Chair of Urban and Public Affairs and Professor of Urban and Regional Planning, College of Urban and Public Affairs, University of New Orleans. Professor Burby examined both the interview instrument and this report and made useful comments.

Thomas R. Hammer, Ph.D.; President, Bergman and Hammer, Ltd. Dr. Hammer, in association with Professor Bergman, completed the initial indepth examination of 11 companies that was used as background for this study and to develop questions for the interview instrument. He also critiqued the interview instrument and this manuscript.

Lori Kelly, M.A. While a graduate student in the Department of Sociology at the University of New Orleans, Ms. Kelly assisted in this project by collecting data for some of the tables, coding the data that could be quantitatively coded, preparing this data for computer scanning, and transcribing the answers to the open-ended questions that could not be quantitatively coded.

Shirley Laska, Ph.D.; Principle Investigator; Professor, Department of Sociology, University of New Orleans. Professor Laska obtained funding for this project and made the connections with Professors Burby, Bergman, and Hammer that led to their involvement in this project. She also reviewed the interview instrument and this document and made valuable contributions.

Adrienne E. Vining, B.S. While an undergraduate student in the Department of Biological Sciences at the University of New Orleans, Ms. Vining assisted in the early phases of this project by contacting state and federal agencies and industry institute to obtain background material.



## CHAPTER 1

### EXECUTIVE SUMMARY

A restructuring of the offshore oil and gas industry in the Gulf of Mexico began in the mid-1980s. Major companies have been reducing their activity and presence in the Gulf while independent firms have been more aggressive in their oil and gas extraction operations. Although the major corporations' share of production in the Gulf has not decreased significantly, declining from 74 percent to 70 percent between 1987 and 1991, their portion of exploratory wells dropped by almost 20 percentage points (40 percent to 21 percent) and their share of developmental wells decreased by 14 percentage points (63 percent to 49 percent) (Dodson and LeBlanc 1993).

The resource base which these new independent businesses inherit is substantially different from the resource base when the major corporations began operations in the Gulf about a half of a century ago. New sources of oil and gas are in areas from which extraction is increasingly difficult and capital intensive such as subsalt regions and deep water. In addition, the infrastructure is aging, such as pipelines and rigs. Hence, the operating conditions in the Gulf create different challenges and place different pressure on these independent firms than were experienced by the major corporations. Therefore, it is important to examine the business characteristics of independent and major operators currently active in the Gulf and to determine how they are similar and different. It is also necessary to investigate the business environment of extraction in the Gulf of Mexico to ascertain how changes in policies, federal agencies involved, regulations, technology, and cooperative endeavors impacts independent and major firms and their operations. Moreover, it is important to study how the business characteristics of independent and major companies and the business environment affect business practices in this region. Further, the changes since 1986 in the business characteristics of these two groups of firms and the environment must be examined to document the restructuring of the industry in this area. Thus, the important questions to be addressed in this study are:

1. What are the characteristics of major corporations and independent operators that are involved in oil and gas exploration and production in the offshore Gulf of Mexico and how have these characteristics changed since 1986?
2. What is the business environment in the Gulf and how has this changed since 1986?
3. How do the characteristics of companies operating in the Gulf affect their practices?
4. How does the business environment of offshore Gulf extraction influence the practices of firms active in the oil and gas industry in this region?

5. Is there evidence concerning a shift in the companies involved in offshore exploration and production in the Gulf?
6. What are the potential impacts of such a shift in the firms engaged in these endeavors?

## **METHODOLOGY**

To create a sampling frame of businesses active in offshore oil and gas exploitation in the Gulf of Mexico, the names of all the companies that participated in MMS lease sales in this area since 1988 were obtained. This list consisted of 17 major corporations and 113 independent companies. However, not all of these firms could be included in the sampling frame due to the following reasons: some businesses were subsidiaries of enterprises already included in the frame; a few were not actual companies as they were partnerships, etc.; some were no longer active in the Gulf; and another group had no phone. Thus, the final sampling frame included 101 companies: 17 major corporations, 19 large and 5 small integrated independent businesses, and 14 large and 46 small nonintegrated firms. The enterprises to be interviewed were selected by random sampling within each of the five groups. The sample from which data were obtained consisted of 11 major corporations, 13 large and 4 small integrated independent companies, and 9 large and 11 small nonintegrated businesses. These numbers represent relatively large percentages of each of the five types of companies operating in the Gulf.

The data were collected during a phone interview with an executive knowledgeable about exploration and production matters from each firm. Thirty-nine open-ended questions were asked during the interview. These questions concerned: 1) the characteristics and operations of the firms in 1986 and currently (the fall of 1994 for most questions, 1993 for data for which a total amount for a year was needed); 2) the companies' use of service firms and outside contractors in 1986 and 1994; 3) the executives' predictions about the future of oil and gas exploration and production in the Gulf; and 4) the influences of leasing policies, technological developments, federal agencies and environmental regulations on the businesses' practices in the Gulf. Some of the questions elicited answers that could be quantitatively coded and these data were analyzed using frequency and percentage distributions for the companies as a group and for each of the five types of firms separately. Other responses could not be quantitatively coded. These comments were transcribed and the answers sorted by both the type of company and the similarity of the content of the replies.

## **FINDINGS**

Some of the major findings from the study suggest trends that are occurring in the offshore oil and gas exploration and production industry in the Gulf of Mexico. First, the results suggest that there were more companies involved in the Gulf in the fall of 1994 than in 1986. Second, most of the companies obtained more oil and gas in 1993 than in 1986. Third, most of the firms were engaged in more exploration activities in the Gulf in the fall of 1994 than

in 1986. Fourth, participation in joint ventures increased between 1986 and the fall of 1994. Fifth, changes in the businesses' activities suggested a tendency toward becoming involved in downstream integration operations. Sixth, changes in characteristics, views of the environment and practices implied that a shift is occurring in activity in the Gulf. However, the results did not intimate that the major corporations are less active and the independent firms more active, rather the outcome suggested that the nonintegrated independent businesses are becoming more involved in the offshore Gulf while the major and integrated independent companies are maintaining a steady rate of activity or reducing their involvement in the Gulf.

The rest of the most important results concern business characteristics, environment and operations as of the fall of 1994. First, there was widespread support for both areawide leasing, which began in 1983, and the reduction in the minimum bid to \$25, which started in 1987. Second, as would be expected, a vast majority of the executives were against four possible regulations in the Gulf: the financial responsibility provisions of OPA '90, the increases in lease bonding to cover plug-and-abandon liabilities, the possibility of being required to reinject produced water (a potential implication of the Clean Water Act in the fall of 1994), and the prospect of the extension of onshore air quality standards to the offshore Gulf (a potential implication of the Clean Air Act). Third, there were three key areas of employment in oil and gas exploration and production in the offshore Gulf: production/platform maintenance and operation, exploration, and administration. Fourth, there were more differences between the five types of companies by integration (integrated vs nonintegrated firms) than by size or the usual categorization scheme of major vs independent businesses. The remainder of this discussion will be organized around the questions presented earlier in this chapter.

1. What are the characteristics of major corporations and independent operators that are involved in oil and gas exploration and production in the offshore Gulf of Mexico and how have these characteristics changed since 1986?

Most of the companies operating in the Gulf of Mexico extracted both petroleum and natural gas. The majority of these firms obtained more of both substances in 1993 than in 1986 and the bulk were doing more exploring in 1994 than in 1986. The largest group of these businesses had their headquarters in the Gulf of Mexico region and half of the other offices occupied by these enterprises were also in the area surrounding the Gulf of Mexico. Over half of the operators increased the size of their staffs between 1986 and 1994.

Some of the major corporations did appear to be reducing their presence in the Gulf. A number of these firms extracted smaller quantities of oil and gas in 1993 than in 1986, some were less engaged in exploring for these commodities in 1994 than in 1986, and some reduced their workforces between 1986 and 1994. The large integrated independent corporations were very similar to the major companies. Like the major firms, a number had smaller staffs in 1994 than in 1986; yet, unlike the major businesses, they obtained more oil and gas in 1993 than in 1986 and were more involved in exploring in 1994 than in 1986.

Analogous to the major and large corporations, the small integrated independent firms demonstrated signs of decreased interest in oil and gas exploitation in the Gulf. One of these enterprises was no longer active in extracting in the Gulf and the firms that were still involved in such endeavors tended to be doing less exploring and had smaller numbers of employees in 1994 than in 1986. In sharp contrast to the three sets of integrated companies, the two types of nonintegrated firms displayed evidence of increased commitment to offshore oil and gas extraction. Both the small and large nonintegrated groups of businesses tended to be extracting more oil and gas in 1993 than in 1986, more involved in exploring in 1994 than in 1986, and had hired additional workers between 1986 and 1994.

There were some similarities in the operators' characteristics across type of company. First, regardless of kind of business, the majority of the firms extracted both oil and gas. Second, the bulk of all five kinds of enterprises derived more natural gas in 1993 than in 1986. Third, the distribution of employees by type of work was alike for all five kinds of firms.

Yet, there were some differences across the five types of businesses. Although the vast majority of the nonintegrated firms extracted more oil and gas in 1993 than in 1986, only about half of the integrated firms got more oil in 1993 than in 1986. The bulk of the nonintegrated and large integrated businesses were more involved in exploring in 1994 than in 1986; the same cannot be said about the small integrated and major corporations. The nonintegrated companies tended to increase their staffs between 1986 and 1994 while the integrated firms tended to reduce their workforces during this period. Most of the major companies were based in cities outside the Gulf region while most of the other types had headquarters in the Gulf zone. The majority of the other offices occupied by the major and large integrated concerns were outside the Gulf area while most of the other offices used by the nonintegrated endeavors were in the Gulf territory. In general, the integrated businesses tended to close their offices in the Gulf region while the nonintegrated firms opened more offices in this area than they closed.

## 2. What is the business environment in the Gulf and how has this changed since 1986?

The business environment examined in this study consisted of the following aspects: federal agencies involved, environmental regulations, technological developments, involvement in partnering, the use of service companies, and the outlook on the oil and gas industry in the Gulf of Mexico. The five agencies found to have the greatest influence on operations in the Gulf of Mexico in descending order from the most influential were the Minerals Management Service, the Environmental Protection Agency, the Coast Guard, the Department of Transportation, and the Occupational Safety and Health Administration.

The respondents were asked to rank order the following environmental regulations: the financial responsibility provisions of the Oil Pollution Act of 1990 (OPA '90), the increase in lease bonding to cover plug-and-abandon liabilities, the Clean Water Act and the Clean Air Act. Overall, the regulation with the greatest impact on operations in the Gulf was the Clean

Water Act followed in descending order by OPA '90, the Clean Air Act and the plug-and-abandon liabilities. However, the order differed by type of company. The major and large integrated corporations ranked them in descending order as follows: the Clean Water Act, the Clean Air Act, OPA '90, and the plug-and-abandon liabilities. The small integrated independent firms switched the third and fourth regulations: the Clean Water Act, the Clean Air Act, the plug-and-abandon liabilities, and OPA '90. The nonintegrated companies' rankings differed from those of the integrated firms and from each other in that the large nonintegrated businesses listed the regulations as OPA '90, the Clean Water Act, the Clean Air Act, and the plug-and-abandon liabilities while the small nonintegrated enterprises mentioned them in this order: OPA '90, the plug-and-abandon liabilities, the Clean Water Act and the Clean Air Act. One consistency occurred in the rankings by all five types of companies - the Clean Water Act was always considered to have a greater impact than the Clean Air Act.

There were some similarities and differences across the five types of firms in the use of new technologies. Almost all of the companies studied used 3D seismic data. In contrast, most of the small nonintegrated firms were involved in or planning to be involved in deepwater projects while only about half of the major, large and small integrated concerns were engaged in such projects and almost none of the large nonintegrated businesses were committed to deepwater endeavors. The bulk of the major companies were involved in subsalt exploration while the majority of each group of independent firms were not. Approximately half of the major corporations and each type of nonintegrated firm used horizontal drilling, but less than half of the integrated independent businesses utilized this technology.

Almost all of the companies were involved in joint ventures and most of the firms were engaged in more of these projects in 1994 than in 1986. Most of the nonintegrated firms were more involved in joint ventures in 1994 while only about half of the major and large integrated companies were more involved in 1994. The integrated firms mainly partner with large enterprises and the nonintegrated businesses tend to partner with a mix of both large and small companies. Overall, major corporations were most often mentioned as the primary joint venture partners. Major corporations were referred to as the most frequent partner by other major corporations and by large independent firms whereas small nonintegrated firms were claimed to be the most habitual partner by other nonintegrated businesses.

The use of service companies was ubiquitous. The majority of the extraction and production firms reported increasing their employment of such companies between 1986 and 1994 and half claimed that they were spending a greater percentage of their budgets for operations in the Gulf of Mexico on hiring service companies. There were no differences by type of extraction business in the use of service companies, but there was a disparity in the percentage of the Gulf budget spent to employ them. The nonintegrated enterprises spent a greater percentage of their Gulf operations budget hiring service companies while the large integrated firms spent the least and the major and small integrated concerns spent moderate percentages of their Gulf budgets in this manner. In addition, the bulk of the respondents

from large integrated and small nonintegrated firms asserted that the percentage expended by contracting out increased from 1986 to 1994 while the majority of those from large nonintegrated and small integrated companies reported that the percentage was stable between 1986 and 1994. Executives from major corporations reported in equal numbers that the percentage had stayed the same or the percentage had increased.

In general, the officials were optimistic about the future of oil and gas activities in the Gulf of Mexico. The majority of the respondents stated that their company would be more involved in exploring in 1998 than in 1994. About half of the executives declared that the workforce employed in offshore operations in the Gulf would be larger in 1998 than in 1994. Representatives from both types of small firms and from the large nonintegrated businesses were more optimistic about the size of the workforce in 1998 than were those from the major and large integrated enterprises; over half of these representatives thought the workforce would be larger in 1998. Also, over half of the people asserted that the independent companies' share of activity in the Gulf would be greater in 1998 than in 1994.

3. How do the characteristics of companies operating in the Gulf affect their practices?

The data collected in this study do not lend themselves to extensive statistical analysis; however, characteristics of the companies are related to the five groups of firms. Therefore, the focus of this section of the report is on how the practices differ by the type of enterprise. First, as would be expected, the major corporations extracted the most oil and gas from the Gulf. Second, the majority of the independent businesses, but not the major corporations, were more involved in exploring in 1994 than in 1986. Third, most of the major corporations, but not the independent firms, had their headquarters outside of the Gulf of Mexico region. Fourth, the three kinds of integrated businesses had more other offices that were not in the Gulf area than did the two types of nonintegrated companies and the integrated firms tended to close offices in the Gulf region between 1986 and 1994 while the nonintegrated ones tended to open offices in this area. Fifth, workforce size was related to both integration and size of company. Integrated firms had larger staffs than did nonintegrated businesses; the major corporations had the biggest workforces followed in descending order by the large integrated, small integrated, large nonintegrated and small nonintegrated companies. Sixth, between 1986 and 1994, the integrated businesses tended to reduce their labor forces while the nonintegrated companies tended to enlarge their staffs.

4. How does the business environment of offshore Gulf extraction influence the practices of firms active in the oil and gas industry in this region?

The effect of the following aspects of the business environment on business practices were examined: current and expected future prices of oil and gas, leasing policies, technology, and regulations. First, almost all of the executives felt that prices of oil and gas affect activity in the Gulf. About half of the company representatives stated that the current prices decreased activity and another 17 percent claimed that the current prices caused economic problems in

their firms. Almost half of the respondents were not optimistic about the future prices of oil and gas while about 30 percent thought that the prices would rise.

Second, most of the company representatives were in favor of both areawide leasing and the reduction of the minimum bid to \$25. They felt that these two changes in leasing policies increased activity in the Gulf of Mexico. The executives from major and large integrated corporations were more likely than the others to state that these policies had no influence on activity in the Gulf. Only officers from nonintegrated firms asserted that these changes in leasing policies allowed their company to become active in Gulf exploration and production. Third, 3D seismic data and horizontal drilling were viewed very positively by the respondents while deepwater projects and subsalt exploration were too new and too expensive for many of the executives to be able to discuss how these two technologies would impact their companies' operations in the Gulf. Almost every firm involved in the Gulf employed 3D seismic data and many businesses used horizontal drilling largely because it is more economical, especially in shallow water. Deepwater projects and subsalt exploration were discussed favorably by some executives, mainly those representing major corporations.

Fourth, none of the new regulations examined - the financial responsibility provisions of OPA '90, the increase in lease bonding to cover plug-and-abandon liabilities, the Clean Water Act and the Clean Air Act - were considered favorably by the executives. The results for the first two regulations were similar as were the results for the latter two regulations. The financial responsibility provisions of OPA '90 elicited negative comments concerning its economic impacts. In fact, 21 percent of the executives declared that their company would be out-of-business if this regulation were enforced as written. These officers were from nonintegrated firms, only representatives of integrated companies stated that their enterprises would be able to insure themselves. The increase in lease bonding evoked similar responses with presentations of negative economic impacts being the most common comments. However, 32 percent of the respondents stated that the regulation would have no direct effect, although it would have indirect influences on their operations. The most frequent answer to the question concerning how the implications of the Clean Water Act would affect operations in the Gulf was that this regulation would increase costs and lead to premature abandonment of wells. Similarly, the most often mentioned result of the Clean Air Act extension to the Gulf of Mexico was adverse economic influences while some executives added that the regulation would reduce activity in the Gulf.

5. Is there evidence concerning a shift in the companies involved in offshore exploration and production in the Gulf?

People speak of a shift in the companies in the Gulf of Mexico in which major corporations are becoming less active, particularly in exploration, while independent firms are becoming more active. In addition, operations that used to be conducted in-house by major corporations are now being contracted out and some companies are being created to do these tasks, sometimes on a specialty basis, such as the firms that do 3D seismic data and sell the information to oil and gas exploration and production firms. These new businesses to which

the tasks are contracted out are very useful to large companies, like the major oil and gas firms, that are downsizing to maintain their competitive edge. This trend toward contracting out some functions is occurring in other large industries as well, such as the automotive industry. The results found in this study were examined for evidence relevant to the issue of a shift in the oil and gas extraction industry in the Gulf.

There was more evidence for a shift in activity levels of different types of companies in the Gulf than evidence against such a shift. Moreover, the results suggest that the popular idea that the major corporations are becoming less active and the independent companies are becoming more involved in Gulf extraction and production is not quite accurate. The results of this study indicate that the three types of integrated companies are reducing their presence in the Gulf, including the large and small integrated independent firms, while the nonintegrated independent businesses are engaging in more exploration and production activity in this area. The evidence for this type of shift includes the changes, discussed above, in the amount of oil extracted, involvement in exploration, location of headquarters and other offices, numbers of employees, participation in joint ventures, and outlook on the future of oil and gas activity in the Gulf.

First, the nonintegrated firms overwhelmingly were obtaining more oil in 1993 than in 1986 while only about half of the integrated businesses obtained more oil in 1993 than in 1986. Second, the vast majority of the nonintegrated companies did more exploring in 1994 than in 1986, yet only about half of the major and small integrated corporations were more engaged in exploring in 1994. Third, most the major corporations' headquarters were not in the Gulf region while most of the nonintegrated companies' headquarters were in the area. Fourth, integrated firms closed offices in the Gulf zone while nonintegrated enterprises gained offices in this territory. Fifth, the integrated endeavors reduced their staffs while the nonintegrated concerns added employees between 1986 and 1994. Sixth, the bulk of the nonintegrated firms were more involved in joint ventures in 1994 than in 1986 while only about half of the integrated companies participated in more of these operations in 1994 than in 1986. Seventh, the representatives of nonintegrated businesses were more optimistic about the workforce size in 1998 than were those from integrated companies.

There was some evidence that does not support a shift in the players in oil and gas extraction in the Gulf. For instance, the major corporations tended to extract more natural gas in 1993 than in 1986. In addition, the major companies were highly involved in new technology in the Gulf, including the long-term and expensive projects such as deepwater and subsalt exploration. Six of the major firms were engaged in deepwater projects and nine were active in or planning to do subsalt exploration. Moreover, the major businesses were the most active of any of the five types of companies in joint ventures. However, the meaning of this participation is not clear; this could be a way to stay actively involved in the Gulf or it might be a means of reducing activity in the Gulf.

6. What are the potential impacts of such a shift in the firms engaged in these endeavors?



The potential impacts are due not only to the shift in the operators in the Gulf, but also to changes in the prices of oil and gas, the degradation of the pipelines and other aspects of the infrastructure, the increases in the costs of drilling, and various other factors. Three categories of potential impacts were discussed: 1) working conditions and employment, 2) operations and 3) government revenues. Although the following discussion compares the major corporations with the independent ones because this is the manner in which the shift is usually conceptualized, it should be noted that the shift suggested by the results of this study would have a greater effect on the impacts presented than the shift as it is usually viewed.

Impacts on working conditions and employment consist of safety on the job, number of jobs, and benefits of jobs. First, there may be an increase in fatalities and injuries due in part to the shift in operators in the Gulf. Information presented in chapter 2 demonstrated that the independent companies had more fatalities and injuries in recent years than did the major corporations. Thus, if the independent businesses are becoming more active, it is possible that there will be an increase in serious accidents involving injuries and fatalities. Second, there may be an overall decrease in offshore employment. The results of this study showed that major corporations employed far more people than did any type of independent business, especially nonintegrated independent firms. Thus, a small percentage decrease in the number of workers employed by major corporations could be greater than a large percentage increase in the number of workers employed by independent companies, particularly nonintegrated ones. Third, there may be an overall decrease in the quality of employment in the Gulf. Benefits of employment given by the major corporations, such as retirement, income, and working conditions, may be better than those offered by independent enterprises. If so, then the quality of jobs may decline as the major corporations layoff workers.

Impacts on operations consist of production and a reduction in resources for the development of new technology. First, there could be a reduction in production of oil and gas in the offshore Gulf of Mexico. The findings showed that major corporations extracted far more oil and gas than did independent businesses, especially nonintegrated ones. Hence, a small percentage decrease in production by the major corporations might be greater than a large percentage increase in production by independent companies. Second, the shift could result in a decrease in resources available for technological development in the Gulf of Mexico. Again, the major corporations devoted far more resources, employees and money, to research and development in the Gulf, than did the independent businesses. Therefore, a reduction in interest in exploitation of the offshore Gulf by the major firms could result in a decline in resources for the creation of new technology and thus fewer new technological developments.

If there is an overall decline in exploration and production in the offshore Gulf, which is possible if the major corporations become less involved even while the nonintegrated businesses become more involved, then government revenues might also decline. The money collected by the Minerals Management Service for offshore oil and gas activity, which is primarily in the Gulf of Mexico, was the second largest source of revenue for the federal government.

## CHAPTER 2

### THE OIL AND GAS INDUSTRY IN THE GULF OF MEXICO

A restructuring of the offshore oil and gas industry in the Gulf of Mexico began in the mid-1980s. Major companies have been reducing their activity and presence in the Gulf while independent firms have been more aggressive in their oil and gas extraction operations. Although the major corporations' share of production in the Gulf has not decreased significantly, declining from 74 percent to 70 percent between 1987 and 1991, their portion of exploratory wells dropped by almost 20 percentage points (40 percent to 21 percent) and their share of developmental wells decreased by 14 percentage points (63 percent to 49 percent) (Dodson and LeBlanc 1993).

The resource base which these new independent businesses inherit is substantially different from the resource base when the major corporations began operations in the Gulf about a half of a century ago. New sources of oil and gas are in areas from which extraction is increasingly difficult and capital intensive such as subsalt regions and deep water. In addition, the infrastructure is aging, such as pipelines and rigs. Hence, the operating conditions in the Gulf create different challenges and place different pressure on these independent firms than were experienced by the major corporations. Therefore, it is important to examine the business characteristics of independent and major operators in the Gulf and to determine how they are similar and different. It is also necessary to investigate the business environment of extraction in the Gulf of Mexico to ascertain how changes in policies, federal agencies involved, regulations, technology, cooperative endeavors impact independent and major firms and their operations. Moreover, it is important to study how the business characteristics of independent and major companies and how the business environment affect business practices in this region. Further, the changes since 1986 in the business characteristics of these two groups of firms and the environment must be examined to document the restructuring of the industry in this area.

The purpose of this chapter is to describe the study conducted to examine the business characteristics and environment and their influences on practices and to investigate the changes in the characteristics, environment and practices since 1986, the year in which the price of oil collapsed and the bust in the oil and gas extraction industry began. The first section will present information concerning the groups of companies examined and the methods used to collect and analyze the data. This section concerning the data and methods will be followed by a brief history of oil and gas extraction in the Gulf of Mexico. In the last section, the major findings will be discussed.

## DATA AND METHODS

### Oil and Gas Companies Operating in the Gulf of Mexico

When oil and gas exploration and production companies in the Gulf of Mexico are discussed, they are usually classified as either major corporations or independent companies. To be classified as a major firm, an oil or gas company must be integrated to a substantial degree; it must be engaged in all phases of the industry. These phases include exploration, production, transportation, manufacturing and refining, and retailing (*Saturn Oil & Gas Co. v Federal Power Comm'n*, 250 F.2d 61). Many journalistic reports limit the number of operations they call major companies to consist of Exxon, Shell, BP, Gulf, Texaco, Mobil, and Chevron (Yergin 1991). Yet, a recent study published by Salomon Brothers included 17 companies as major corporations based on the level of exploration and production expenditures, number of employees, and the amount of reserves and assets (Crandell et al. 1993). In contrast, independent companies are comparatively small and not integrated (Williams and Meyers 1991, p. 589). Although this categorization scheme is typical, it is not precise enough to analyze the companies operating in the Gulf of Mexico because the independent firms are too diverse to be included in one group.

Another factor sometimes used when discussing oil and gas companies in the Gulf is the firms' involvement in downstream integration activities such as oil and gas refining and processing, wholesale trade, and retail trade. Hence, the companies could be divided into three groups: 1) major corporations, which are all integrated; 2) integrated independent businesses, which differ from the first group by being independent firms instead of major corporations; and 3) nonintegrated independent enterprises, which vary from the first group by being independent companies and differ from the first and second kinds because they are not involved in many, if any, downstream integration activities. The distinction between major companies and independent ones as well as the disparity between enterprises that have downstream integration and those that do not are well documented (Crandell et al. 1993; Moore 1993; Staff 1993). Therefore, it is easy to classify the companies into the three groups. However, a categorization scheme that only classifies firms as major, integrated independent and nonintegrated independent firms is incomplete. Within both categories of independent firms, there is still a large degree of diversity. Hence, it was necessary to look for another factor that could account for the variation in the two groups of independent businesses.

An aspect of oil and gas companies usually not considered in discussions of these companies is the size of the business although size is a criterion in the major corporation vs independent company classification. There are no publications that consider size of the business in classifying the companies in the Gulf despite the obviousness of the importance of the size of the company. If size is taken into account, then there are five groups: 1) major corporations, which are large and integrated; 2) large integrated independent firms, which differ from major businesses in their marketing (e.g., gas pump recognition) and overseas involvement; 3) small integrated companies, which differ from the second type in that they are smaller; 4)

large nonintegrated enterprises, which differ from the second and third kinds by not being involved in many, if any, downstream integration activities and vary from the third group by their size; and 5) small nonintegrated concerns, which differ from the second and third groups in their lack of integration and vary from the second and fourth groups by their small size. The Crandell et al. (1993) study examined levels of exploration and production expenditures, reserves and assets, and numbers of employees to identify 17 companies as major corporations. This information is available for a large number of oil and gas companies operating in the Gulf and thus can be used to determine the size of the firms to sort the integrated and nonintegrated independent businesses into the two additional groups based on size.

Therefore, in this report, the size of the firm is included and the companies are categorized into five groups: major corporations, large integrated enterprises, large nonintegrated businesses, small integrated firms and small nonintegrated endeavors. The following information is published for most of the companies and thus was used to determine the size of the independent companies: 1) worldwide exploration and development funds as opposed to funds used only in the Gulf; 2) rankings on worldwide assets, worldwide revenues, and worldwide reserves; and 3) the total number of employees (Crandell et al. 1993; Moore 1993, Staff 1993). The data were collected for each company eligible for inclusion in this study (eligibility was determined by participation in a lease sale in the Gulf of Mexico since 1988 as will be presented below). The firms' classification was based on its categorization on all five variables: 1) exploration and development funds, 2) rankings on assets, 3) rankings on revenues, 4) rankings on reserves, and 5) number of employees. Usually the large independent businesses were large on all five variables, although sometimes a firm would be considered large on four variables and small (or missing a ranking) on the fifth variable. Typically, the small independent companies were small on all five variables, occasionally an enterprise would be small on four variables and large (or missing a ranking) on one. The senior author classified the companies and was unfamiliar with the firms' names other than the ones seen at retail outlets; therefore, there was no predetermination of category by size for the independent businesses.

In general, large independent enterprises have exploration and development budgets of at least \$30 million, the rankings of their assets are less than forty-four, the rankings of their revenues are less than fifty-eight, the rankings of their world reserves are less than fifty, and they have more than five hundred employees (Crandell et al. 1993; Moore 1993, Staff 1993). In contrast, small independent businesses have exploration and development budgets of less than \$27 million, the rankings of their assets are more than forty-eight, the rankings on their revenues are greater than seventy, the rankings on their world reserves are greater than fifty-six, and they have fewer than five hundred employees, and often fewer than one hundred employees.

To be considered an oil and gas exploration and production company active in the Gulf of Mexico, the firm had to participate in MMS lease sales in the Gulf since 1988. One hundred and thirty companies have participated in MMS lease sales in the Gulf of Mexico since 1988,

the earliest year for which the data could be feasibly obtained. Of these, 17 were major firms and 113 could be classified as independent businesses. However, not all 130 companies are appropriate candidates for current studies of oil and gas companies operating in the Gulf of Mexico. Five of the independent businesses should not be included because they are subsidiaries of firms already included in the list of 130 companies. Another five should be excluded because they are partnerships or temporary ventures, rather than actual companies operating in the Gulf. Eight additional firms should be omitted because they lost their leases in the Gulf and hence are not active in the Gulf. Moreover, one enterprise is not actively working on their leases in the Gulf and another endeavor is no longer involved offshore extraction in the Gulf. Therefore, these 20 companies should not be included in the population of oil and gas extracting businesses operating in the Gulf. Unfortunately, there are nine additional companies for which published information in the directories of operators in the Gulf (Crandell et al. 1993; Moore 1993; Staff 1993) is insufficient and these nine endeavors have no phones. The issue of having a phone was important because an author called firms for which data in publications was insufficient to enable classification by size to collect the missing information and because the interviews were conducted over the phone. Thus, these nine firms could not be classified and were omitted from the sampling frame of businesses active in oil and gas operations in the Gulf.

Therefore, there are 101 companies currently operating in the Gulf of Mexico that can be classified as major or independent businesses, as having downstream integration or not, and as large or small. Of these, 17 are major corporations, 19 are large integrated firms, 5 are small integrated businesses, 14 are large nonintegrated operators, and 46 are small nonintegrated enterprises. The characteristics of these five types of companies are shown in tables 2.1 and 2.2. Since more than one indicator was used to determine the size of the company, occasionally a business was an outlier on one measure; however, no company was an outlier on more than one indicator. Comparisons of the numbers of companies in each of the five groups and the numbers of companies for which published data were available demonstrates that very little is known about companies operating in the Gulf of Mexico. The characteristics of the companies in the five categories demonstrate the differences across the five groupings.

Table 2.1  
Exploration and Development Funds and Asset Rankings by Type of Company

Type of Company	Range of E&D Funds (Millions of Dollars)	Range without Outlier(s)	E&D Average	Range of Asset Rankings	Range without Outlier	Asset Ranking Average
Major (17)	20-1500 (16)	126-1200 (14)	597.7 (16)	1-28 (15)	no outliers	9.7 (15)
Large Integrated (19)	18-276 (13)	30-276 (12)	109.9 (13)	12-41 (16)	no outliers	22.8 (16)
Large Non-integrated (14)	36-150 (10)	56-150 (9)	82.2 (10)	17-81 (7)	17-43 (6)	41.7 (7)
Small Integrated (5)	15-17 (2)	no outliers	16 (2)	57-87 (4)	no outliers	72.8 (4)
Small Non-integrated (46)	0-33 (22)	no outliers	11.8 (22)	49-288 (14)	no outliers	104.8 (14)

Note: Numbers in parentheses are Ns.

Table 2.2  
Rankings of Revenues and World Reserves by Type of Company

Type of Company	Range of Revenue Rankings	Range without Outliers	Revenue Rankings Average	Range of Reserve Rankings	Range without Outliers	Reserve Rankings Average
Major (17)	1-30 (15)	no outliers	10.3 (15)	1-21 (14)	no outliers	8.1 (14)
Large Integrated (19)	10-50 (16)	10-38 (15)	25.7 (16)	10-87 (16)	10-58 (15)	29.4 (16)
Large Non-integrated (14)	20-69 (7)	20-57 (6)	47.3 (7)	17-47 (7)	no outliers	33 (7)
Small Integrated (5)	45-79 (4)	no outliers	62.8 (4)	57-137 (4)	no outliers	84.8 (4)
Small Non-integrated (46)	44-293 (14)	no outliers	112.6 (14)	38-263 (13)	no outliers	112.8 (13)

Note: Numbers in parentheses are Ns.

The major companies have the most money, the largest assets, revenues, and reserves (Crandell et al. 1993; Moore 1993, Staff 1993). They are all integrated and employ the most people. Most of the major firms have exploration and development funds in excess of \$100 million. The range of these funds is from \$20 million to \$1,500 million and the average is \$598 million. One major firm has less than \$100 million. The rankings of the assets of major companies range from 1 to 28 and the average rank is 9.7. In addition, 11 of the companies with the largest assets are major businesses. The rankings of their revenues vary between 1 and 30 and the average rank is 10.3. Moreover, 9 of the companies with the highest rankings on revenues are major companies. The rankings of the world reserves of the major

companies range from 1 to 21 for an average of 8.1; 12 of the companies with the greatest reserves are major firms. All major corporations have more than five hundred employees.

In general, the large integrated companies have smaller exploration and development funds than do the major enterprises and smaller assets, revenues and world reserves (Crandell et al. 1993; Moore 1993, Staff 1993). Like the major firms, they are all integrated and they employ many people. The large integrated companies, with one exception, have exploration and development funds between \$30 and \$276 million. The average fund is \$110 million. Only one business has less than \$30 million, only four have less than \$50 million while three have over \$200 million in these funds. In addition, their assets are ranked from 12 to 41 and the average rank is 22.8. Most of these firms have revenues ranked between 10 and 38, the average rank is 26. With the exception of one company, the world reserves of these enterprises are ranked between 10 and 58 and the average rank is 29.4. All of these operators have over five hundred employees.

Overall, the large nonintegrated businesses, have less money in exploration and development funds and smaller revenues than do major companies and large integrated firms (Crandell et al. 1993; Moore 1993, Staff 1993). Their assets and reserves are similar to those of large integrated enterprises, but smaller than those of the major corporations. In addition, these businesses have fewer employees than do the major companies and large integrated firms. Their exploration and development funds range from \$56 to \$150 million, with one exception, and the average of these funds is eighty-two. The rankings of their assets are between seventeen and forty-three for an average ranking of forty-two. Their revenues are ranked between twenty and fifty-seven, with one exception, and the average ranking is forty-seven. The world reserves of this type of firm are ranked between seventeen and forty-seven; the average rank being thirty-three. These companies have fewer than five hundred employees.

There are very few small integrated companies, probably due to the size requirements inherent in maintaining the operations necessary for downstream integration (Crandell et al. 1993; Moore 1993, Staff 1993). These endeavors have smaller exploration and development funds, fewer assets, smaller revenues, less reserves and fewer employees than the major, large integrated and large nonintegrated enterprises. These businesses have exploration and development funds between \$15 and \$17 million with an average of \$16 million. Their assets have an average rank of seventy-three and range from fifty-seven to eighty-seven while their revenues are ranked between forty-five and seventy-nine, the average of which is sixty-three. The world reserves of these companies have rankings between 57 and 137 with an average of 85. One company has more than five hundred employees, but the rest have fewer than five hundred.

The smallest operators in the Gulf of Mexico are the small nonintegrated endeavors, which are the most numerous group. Very little is known about this type of company. Based on the few businesses for which data have been recorded, the exploration and development funds range from \$0 to \$33 million and average \$12 million (Crandell et al. 1993; Moore 1993,

Staff 1993). The assets for seventy percent of these firms are not included in published rankings, but, for the thirty percent that are published the average rank is 105 and the range is from 49 to 288. The published rankings of their revenues range from 44 to 293 and average 113 while their reserves range from 38 to 263, averaging 113. These enterprises have fewer than five hundred employees.

## **Data and Methods**

The data were obtained in the fall of 1994 from 48 petroleum and gas companies: 11 major corporations, 13 large integrated firms, 4 small integrated enterprises, 9 large nonintegrated businesses and 11 small nonintegrated endeavors. Although the actual number of companies in the sample was relatively small, the businesses examined represent large percentages of the firms operating in the Gulf of Mexico: 65 percent of the major companies, 68 percent of the large integrated businesses, 80 percent of the small integrated firms, 64 percent of the large nonintegrated enterprises and 24 percent of the small nonintegrated enterprises. Very few companies refused to participate in the study: 1 major business, 1 small integrated firm, 2 large nonintegrated enterprises of which one was replaced, and 1 small nonintegrated endeavor which was replaced. A representative of one of the 48 companies did not answer the questions asked of the other executives because the company no longer had operations in the Gulf. This company was interviewed concerning the decision to leave the Gulf; therefore, it is included in the 48. Two other companies included in the 48 also were no longer active in the Gulf; however, their representatives did answer the questions.

The data analyzed in this study came from both the 10 pretested companies and the 38 firms that responded to the revised interview. Before administering the interview to the target sample, the questions were pretested. As there were very few changes after the pretest, the results of both the pretest and the final administration are reported. The findings will be presented separately for the few questions that were revised after the pretest.

Ten companies participated in the pretest: 2 major businesses as well as 5 large integrated, 1 large nonintegrated and 2 small nonintegrated firms. One major corporation refused to respond during to the pretest. The 11 enterprises chosen for the pretest were selected nonrandomly. These 11 companies were examined during the first wave of the study in which representatives of the firms took part in a much longer, exploratory, nonstructured interview concerning the oil and gas industry in the Gulf of Mexico (see Appendix A). The enterprises chosen for this interview consisted of many of the most important companies operating in the Gulf. Therefore, due to the importance of these firms and the fact that only minor revisions were made, the pretest results were included in this report.

Thirty-eight companies responded to the revised interview: 9 major businesses and 8 large integrated, 4 small integrated, 8 large nonintegrated and 9 small nonintegrated concerns. One small integrated firm refused to participate and could not be replaced because there were only 5 small integrated enterprises operating in the Gulf. Two large nonintegrated businesses refused as well, one was replaced, but the replacement for the second one no longer operated



in the Gulf. One small nonintegrated endeavor refused and was replaced. The companies were chosen by random sampling within each of the four groups in which there were more than 10 businesses. Random sampling within categories was used instead of stratified random sampling due to the unequal distribution of companies in the five categories. The descriptive nature of the study required that enough companies in each of the five types be examined to enable description of each kind of concern and comparison across the five types.

The data were obtained in phone interviews using a set of open-ended questions. Several steps were necessary to collect the data due to the detailed information requested and the busyness of the respondents most qualified to address the issues raised by the questions. First, the respondents, who were CEOs, vice-presidents, or managers knowledgeable about exploration and production decisions in the Gulf of Mexico, received a fax that contained a letter of introduction describing the study from the investigators, a letter of introduction from Minerals Management Service, and a copy of the questions. Thus, the respondents obtained the questions before they were contacted by phone. Second, each respondent was contacted to arrange an appointment for the interview. Third, the respondent was called for the actual interview. This method had several advantages for this study. The method facilitated contacting the respondents at a time when they were available to be interviewed. In addition, since the respondents had the questions in advance, the interviews were shorter, the data were complete, and rapport with the respondents was good. Further, it was possible to obtain detailed information concerning size of operations, use of new technology, opinions about the future of oil and gas exploration and development in the Gulf, and attitudes concerning environmental regulations from an industry normally considered secretive about such information.

The interview consisted of 39 basic questions and 11 contingent questions. The first section contained eighteen questions concerning the companies' characteristics and operations in the Gulf of Mexico both currently (the fall of 1994 for most questions, 1993 for a few questions) and in 1986, the year in which the price of oil dropped by half of its previous amount. For some characteristics an entire year amount was desired, such as the amounts of oil and gas extracted and the size of research and development funds. In these cases, the current year was the most recently completed year - 1993. Thus, in the results, the comparisons are usually between 1986 and 1994 and the words currently and now refer to the fall of 1994; however, a few comparisons are between 1986 and 1993 and these are specified as such. The second part had five questions inquiring about the businesses' use of service companies and independent contractors currently (fall of 1994) and in 1986. The third portion consisted of four questions focusing on the firms' outlook on the future of oil and gas exploration, production, and employment in the Gulf of Mexico. The fourth section had six questions examining the impact of leasing policies and technology on the enterprises' operations in the Gulf. The final part contained six questions about the effect of federal agencies and regulations on the businesses' operations in the Gulf.

All of the questions were open-ended, although some elicited answers that easily could be coded quantitatively such as 1) yes or no, 2) more, the same, or less, and 3) actual numbers

like the number of employees. The responses to 27 of the 39 basic questions and 6 of the contingent questions were coded quantitatively. The replies to 15 of the 39 questions and 5 of the contingent questions could not be coded quantitatively. Three questions in the section concerning the future of the oil and gas industry in the Gulf had answers that could be coded quantitatively and answers that could not because respondents were asked to explain their responses to these three questions.

Two people independently coded the data that could be quantitatively categorized. The intercoder reliability for these data was 95.8 percent. All differences in coding were resolved. Frequency and percentage distributions were calculated for the questions that could be coded quantitatively. These distributions were calculated for all the companies together and for each of the five types of companies separately. Responses to the questions that could not be coded quantitatively were written verbatim and transcribed. The content was analyzed and the responses were grouped by company type as well as similarity of answers. The classification of the answers was exhaustive, as many categories were employed as were necessary to capture all of the company representatives' reactions to these questions. Thus, no information was omitted. Likewise, owing to the importance of using the respondents' own words, there was no attempt to place the comments into mutually exclusive categories. Hence, the total number of responses to these questions can be greater than the total number of companies because a response could contain elements of more than one category and were coded into more than one category.

### **THE HISTORY OF OIL AND GAS EXPLORATION IN THE GULF**

The first instance of over water drilling took place in northwest Louisiana in 1911 at Caddo Lake, the site of an enormous natural gas field discovery in 1905. From there land based drilling equipment was slowly moved from the soggy marshes onto timber pilings and platforms in the shallow waters of the Gulf of Mexico (Freudenburg and Gramling 1994, p.18). The first attempt at oil extraction in the Gulf was made in 1933, 3000 feet off of the Louisiana coast at Creole in Cameron Parish (Brantly 1971, p.1383). A land rig built on a platform twelve feet above the water, modeled after a platform used a year earlier off of Rincon, California drilled a dry hole. Drilling was not successful in the Gulf of Mexico until four years later when the Pure Oil Company and the Superior Oil Company leased 7000 acres onshore and 33,000 acres offshore just west of Creole from the newly formed Louisiana State Mineral Board. Using a similarly designed platform, Superior and Pure spudded a well on October 6, 1937 (Brantly 1971, p.1394) symbolizing the birth of the offshore oil and gas industry.

The oil and gas industry was not yet prepared for drilling or service on the water. Equipment had to be transported to the barge via a thirteen mile water route. Since there was no radio, any problems, such as equipment failure, were relayed to the shore by the first boat going back inland. In addition, there were no quarters for the crew on the platform. Therefore, each crew made the rough thirteen mile journey daily by shrimp boat. In spite of these difficulties, as well as the expense of using landbased equipment on water, this platform was

enlarged over the next year and ten more wells were drilled directionally. This became known as the Creole field which in the following twenty-five years produced almost four million barrels of oil. Prior to 1958, it was estimated that the Gulf of Mexico region, including on and offshore drilling, produced as much as 70 percent of the oil and gas found in the United States (Brantly 1971, pp.1383-4).

In the next few years, several events led to the growth of drilling in the Gulf of Mexico. In 1938, Texas' first offshore well was completed. In 1946, the Magnolia Petroleum Company established a platform six miles off of the coast of Louisiana, ten miles southeast of Eugene Island, on a lease from the state of Louisiana (Freudenburg and Gramling 1994, p.18). This was the first to be constructed using steel pilings and in the following year Kerr-McGee developed a new tender-supported platform which was developed specifically for use on the water. This barge, which was attached to three pilings and anchored to the Gulf floor, had quarters for crew members and proved to be 95.3 percent reliable in terms of its ability to withstand weather (Brantly 1971, p.1390). This particular well drilled successfully yielding 40 barrels per hour. By 1949, this technology had been improved once again with the introduction of the first mobile offshore rig, and subsequently three major fields were discovered. By 1950, twenty-five percent of the wells drilled offshore were successfully drilling oil as compared to ten percent on land (LeBlanc 1994, p.36). In the years that followed, particularly between 1953 and 1958, the technological aspects of the industry were continuously changing. By 1958, two hundred rigs were operating in the Gulf of Mexico and were routinely drilling in waters as deep as three hundred feet (Brantly 1971, p.1412).

As offshore technology improved, more companies began exploring and, finding success, moving further offshore. This not only led to an increased number of wells and oil production, but also conflicts over who was to control and lease the rights to the protected waters off the Louisiana coast (Freudenburg and Gramling 1994, p.18). These battles went on for years over not only the waters off the coast of Louisiana, but also those off the Texas and Florida coasts. Eventually these battles were settled by the U.S. Supreme Court and Congress. The Tidelands cases of 1947 and 1950 established the legal rights of the federal government over all offshore lands. In 1953, Congress passed the Submerged Land Act which assigned states title to offshore land within three miles of the mainland. The Supreme Court immediately ruled that Texas and Florida had rights to nine miles of submerged land off of their Gulf coasts to which they had held title as sovereign nations before entering the Union (Freudenburg and Gramling 1994, p.20). Legislation which immediately followed and built on the foundation of these previous rulings focused on the land beyond the reach of the states, the Outer Continental Shelf (OCS). The Outer Continental Shelf Lands Act of 1953 "authorized the Secretary of the Interior to lease the OCS for mineral exploration, through competitive bidding, and subsequently to administer the leases" (Freudenburg and Gramling 1994, p. 20). In 1954, the first federal lease sale in the Gulf occurred. Leasing proved to be a great source of revenue for the federal government generating 28.3 billion dollars in bonuses between 1954 and 1978 (Earney 1980, p.95).

Production in the Gulf since that first lease sale in 1954 up to 1981 was enormous, particularly during the boom period from 1973 to 1981. There are a number of reasons for this. An oil spill off the Santa Barbara coast in 1969 halted lease sales in the Pacific, Atlantic and Alaskan coasts for five years. Yet there was no change in leasing policy in the Gulf of Mexico. The 1973-74 oil embargo also had a great effect on drilling in the Gulf of Mexico. The resulting rise in domestic and foreign oil prices provided economic incentive for increased exploration. The northern Gulf of Mexico had become more developed than any other offshore area by 1981 (Freudenburg and Gramling 1994, p. 29). Between 1973 and 1981, 9-12 percent of the crude oil and 10-20 percent of the natural gas extracted in the U.S. had come from the Gulf of Mexico OCS. Although this contribution of the Gulf of Mexico region of the U.S. OCS appears to be a small percentage of all oil and gas extracted onshore and offshore in the U.S., the oil and gas extracted from the Gulf of Mexico OCS is a large percentage of oil and gas extracted from the U.S. OCS. By 1989, it was estimated that 90 percent of the oil and gas produced in the entire U.S. OCS had come from the Gulf of Mexico (Freudenburg and Gramling 1994, p.26). At the same time, people were becoming more conservation minded and legislation was passed to encourage conservation and decrease pollution. Since petroleum products are an elastic commodity, consumption decreased over time, and, by 1981, it had fallen below the levels reached before 1973 (Freudenburg and Gramling 1994, p.30). This led to "the bust" and a general decrease in production in the Gulf.

The 1980's were a difficult decade for the petroleum industry in general, and the Gulf of Mexico was no exception. The price of crude oil and the number of operating rigs declined in the early part of the decade, even though the Gulf was opened to areawide leasing in 1983. Prices continued to fluctuate through 1985, but remained relatively strong until the drop from \$22.39 per barrel in 1985 to \$11.41 per barrel in 1986 (Laska et al. 1993, p.162, in inflation adjusted dollars, 1982-1984=100). Environmental regulations also became stronger due to increased public awareness as well as the negative public attention generated by major spills such as the Exxon *Valdez* spill. By the end of the 1980's, many major companies were pulling out of the Gulf of Mexico to "pursue larger prospects outside of the United States" (Koen 1993b, p.20).

Current literature suggests that the 1990's will offer a resurgence for the oil and gas industry, yet prices remain relatively low. Oil prices in mid-1994 were often well below \$16 per barrel. Because of this, and the decreasing number of discoveries in the Gulf of Mexico, there continues to be a trend of major companies looking abroad for exploration opportunities. The New York Times reported in 1991 that Chevron, ARCO, and Texaco negotiated with Soviet officials in 1990 to develop vast oil fields in that region (Hayes 1991, p.D3 L). Investment bankers report that capital has been shifting overseas for about the last ten years, but that movement is accelerating now (Staff 1992a, p.75). Still many people are optimistic due to the movement of smaller independent companies into the Gulf. Strong U.S. natural gas prices and a decrease in the need for initial investment dollars due to improved geophysical technology and a pre-existing infrastructure are enabling these companies to be very active (Koen 1993b, p.20). Companies like Forcenergy Gas Exploration, Inc., based in

Miami, are looking to the Gulf of Mexico due to dwindling onshore opportunities and attractive leasing prices in the Gulf (Kaplan 1994, p.6).

Companies are shifting from traditional means of production to alternatives which may prove more profitable. More companies are becoming involved in deepwater drilling projects, subsalt exploration, and horizontal or directional drilling which may improve prospects. The problem is that these projects are costly and risky, especially for the smaller companies. There have been deepwater finds in the Gulf of Mexico in the last few years, but the low price of oil makes some of them too expensive to drill (Staff 1992a, p.75). Some of the major companies, however, do still seem to be somewhat interested in deepwater projects in the Gulf of Mexico. In 1988, Shell Offshore, Inc. launched Bullwinkle, the world's tallest human-made offshore structure costing \$500 million. And early in 1995, Shell, Amoco, and Exxon announced plans to develop a deepwater well in the Gulf of Mexico (Judice, 1995a p.D-3). Subsalt is also a viable option, especially since the availability of 3D seismic data is increasing which means that smaller companies can be involved (Tipple and Koen 1994, p.33). Horizontal or directional drilling is being increasingly used as a means of developing marginally productive fields, especially those in shallow water. This technique has gained acceptance recently with the availability of new, versatile tools and improved knowledge of reservoir structure (Groten 1991, p. 4).

Another trend in the Gulf of Mexico that many companies are part of is the shift toward an increase in natural gas extraction. Natural gas prices are strong and in March of 1994, gas rig counts were up 20 percent over 1993 (Judice 1994a, p.C-1). This may mean more gas exploration by more companies in the Gulf of Mexico where gas discoveries have been large in the past.

The overall trends in the Gulf of Mexico where major companies are moving out, companies are shifting to non-traditional means of extraction, and natural gas extraction is becoming more important implies that the vast resources, particularly oil, once present in the Gulf of Mexico have been greatly reduced. Discoveries in the Gulf have become consistently smaller and more difficult to find. The average field size and cumulative success rates have consistently decreased, and annual success rates have plummeted from 70 percent or more in the early 1950's to 7 percent in 1992 (Lore 1992, p.48).

## **MAJOR FINDINGS AND DISCUSSION**

Some of the major findings from the study suggest trends that are occurring in the offshore oil and gas exploration and production industry in the Gulf of Mexico. First, the results suggest that there were more companies involved in the Gulf in the fall of 1994 than in 1986. Second, most of the companies obtained more oil and gas in 1993 than in 1986. Third, most of the firms were engaged in more exploration activities in the Gulf in the fall of 1994 than in 1986. Fourth, participation in joint ventures increased between 1986 and the fall of 1994. Fifth, changes in the businesses' activities suggested a tendency toward becoming involved in downstream integration operations. Sixth, changes in characteristics, views of the

environment and practices implied that a shift is occurring in activity in the Gulf. However, the results did not intimate that the major corporations are less active and the independent firms more active, rather the outcome suggested that the nonintegrated independent businesses are becoming more involved in the offshore Gulf while the major and integrated independent companies are maintaining a steady rate of activity or reducing their involvement in the Gulf.

The rest of the most important results concern business characteristics, environment and operations as of the fall of 1994. First, there was widespread support for both areawide leasing, which began in 1983, and the reduction in the minimum bid to \$25, which started in 1987. Second, as would be expected, a vast majority of the executives were against four possible regulations in the Gulf: the financial responsibility provisions of OPA '90, the increases in lease bonding to cover plug-and-abandon liabilities, the possibility of being required to reinject produced water (a potential implication of the Clean Water Act in the fall of 1994), and the prospect of the extension of onshore air quality standards to the offshore Gulf (a potential implication of the Clean Air Act). Third, there were three key areas of employment in oil and gas exploration and production in the offshore Gulf: production/platform maintenance and operation, exploration, and administration. Fourth, there were more differences between the five types of companies by integration (integrated vs nonintegrated firms) than by size or the usual categorization scheme of major vs independent businesses. Now that the major findings have been summarized, the rest of the chapter will be devoted to discussing each of these results.

## **Trends**

**More Companies, Greater Production, and More Exploring in the Offshore Gulf.** The results showed a trend toward more operators in the Gulf. Although no questions directly asked the executives when their firms became involved in offshore petroleum and gas extraction, some of the data collected demonstrated that some businesses began exploration and production of oil and gas in the offshore Gulf after 1986. Twelve companies obtained neither oil nor gas from the Gulf in 1986 and derived at least one of these two minerals in 1993. Seven of these firms were small nonintegrated businesses, three were large nonintegrated firms, one was a large integrated enterprise, and one was a major company. Some of the executives for these concerns reported that they were not involved in offshore extraction in 1986 and some stated that the switch to areawide leasing or the reduction of the minimum bid were either irrelevant because the company was not involved in the offshore Gulf at the times when these changes were made or that the reduced minimum bid enabled their firms' entries into oil and gas extraction in the Gulf. In addition, four of the seven small nonintegrated businesses had no headquarters in 1986; hence, the company might not have existed then. The other firms had headquarters in 1986, but they might have been engaged in onshore Gulf extraction only or involved in exploration and production elsewhere. Thus, some evidence was collected that suggests that there are more operators in the Gulf now than in 1986.

However, there may be a counter trend followed by fewer companies, which is to quit oil and gas exploration and production in the Gulf. As mentioned previously, some firms were not contacted to be interviewed because they were no longer active in the Gulf. In addition, there were three firms that were interviewed that no longer extract oil or gas from the Gulf.

Another trend indicated by the findings was an increase in production. The respondents were asked how the amount of oil and gas their firms extract had changed since 1986. Two-thirds of the executives stated that the amount of oil had increased and three-fourths of them declared that the amount of gas had increased. The third trend was the increase in exploration activities. Slightly over two-thirds of the officials asserted that their businesses were doing more exploring in the fall of 1994 than in 1986.

Activity in the Gulf is highly influenced by the prices of oil and gas. When the officials were asked how the current prices of oil and gas affected their operations in the Gulf, 41 percent of the 51 replies mentioned impacts on activity, 39 percent of these 51 comments concerned reduced activity due to the low prices of oil and gas. Further, when queried about the effects of anticipated future prices of oil and gas on activities in the Gulf, a third of the 48 replies mentioned reduced or a cautious level of activity while another 29 percent referred to increased activity. Thus, 41 percent of the replies about the effect of current prices and 62 percent of the responses concerning the influence of future prices on operations in the Gulf presented effects on activity suggesting that prices are related to activity levels. Due to the importance of oil and gas prices, it is useful to briefly examine their histories.

The annual world average prices of a barrel of petroleum were collected from 1956 (U.S. Bureau of the Census 1956-1993; Hall, 1992). These dollar figures were then converted into constant dollars (1982-1984 = 100) to control for inflation thus enabling the comparison of the prices over time (see figure 2.1). Between 1956 and 1973, the price of oil was low and stable, the prices varied from \$11.00 in 1957 to \$8.11 in 1972. There was an increase of almost \$5.00 in the price of a barrel of petroleum from \$8.76 in 1973 to \$13.67 in 1974. Between 1974 and 1981, the price of a barrel of petroleum rose rapidly from \$13.67 to \$34.95. The largest increases were between 1979 and 1980 (almost \$9.00) and between 1980 and 1981 (\$8.75). In 1981, the price of petroleum peaked. From 1981 until 1985, the price of petroleum dropped rapidly from \$34.95 to \$22.39. However, the largest decrease in the price was between 1985 and 1986 when the price declined by almost half. The price in 1985 was \$22.39 while the price in 1986 was \$11.41. The price of petroleum has been low and stable since its dramatic decline between 1985 and 1986. With one exception, the price varied between \$10.63 and \$12.79. The exception was 1990, the year of the war in the Persian Gulf, when the price of petroleum was \$15.33.

The annual world average prices per one thousand cubic feet of natural gas were collected from 1960 through 1993 (U.S. Bureau of the Census 1970, 1976, 1987, 1992, 1993). These dollar figures were converted into constant (1982-1984 = 100), inflation controlled dollars to allow for comparison (see figure 2.2). From 1960 to 1973, natural gas prices were low and stable, ranging between \$.44 and \$.51 per one thousand cubic feet. As with oil, natural gas

prices began to climb around 1974 when the price went to \$.61. Prices rose steadily until 1983 when natural gas hit an all time high at \$2.61. In the next two years, prices dropped slightly to \$2.60 in 1984 and \$2.32 in 1985. Between 1985 and 1986, like oil prices, natural gas prices fell a drastic \$.59 per thousand cubic feet to \$1.73 and have been slowly on the decline ever since. The average price in 1993 was \$1.40.

The consistent decrease in both oil and natural gas prices has led to changes in the industry. At an energy conference in New Orleans in April of 1994, companies focused on how they are coping with the low prices. The overall trend seems to be "less drilling in the Gulf of Mexico, particularly by independents" (Judice 1995c, C-10). Many companies have moved operations overseas where there is more activity and drilling is more productive. This trend contradicts forecasts at the end of 1994 that companies would be spending and exploring more in the Gulf of Mexico in 1995 (Judice 1994f, C-3). The industry is tightening its belt in other ways as well. Many companies are contracting out labor that once was performed in-house. Field production is no longer a management responsibility, but rather being contracted out to companies specializing in production management (Judice 1994g, F-1).



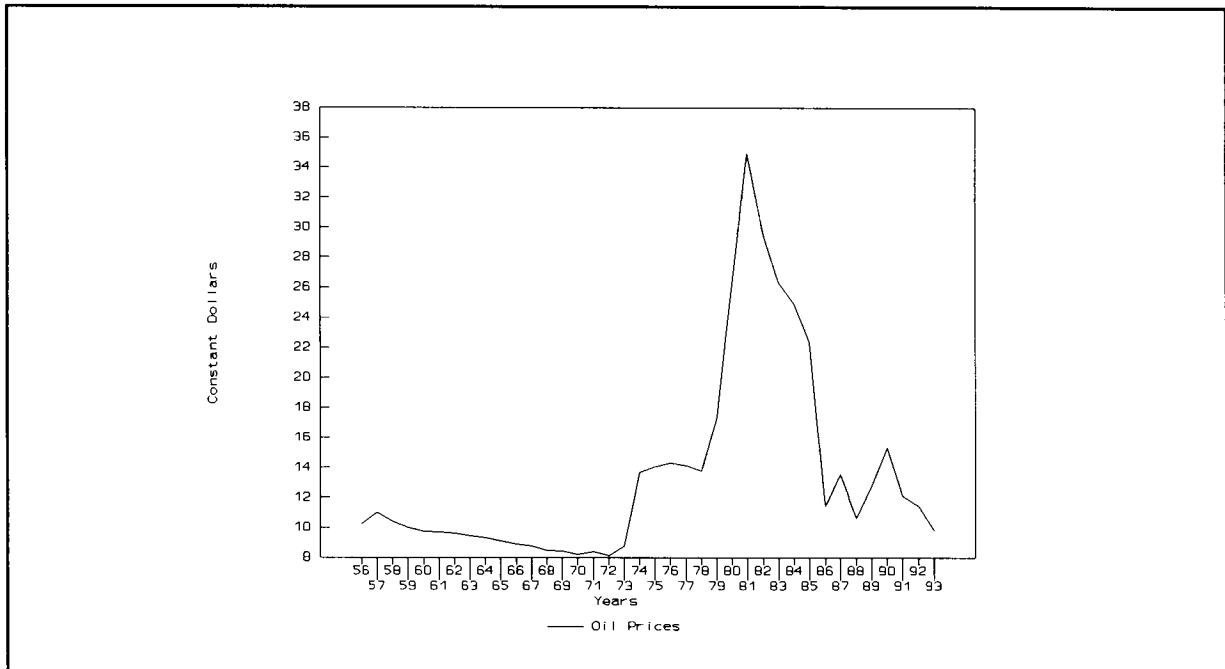


Figure 2.1 Oil and Gas Prices in Constant Dollars

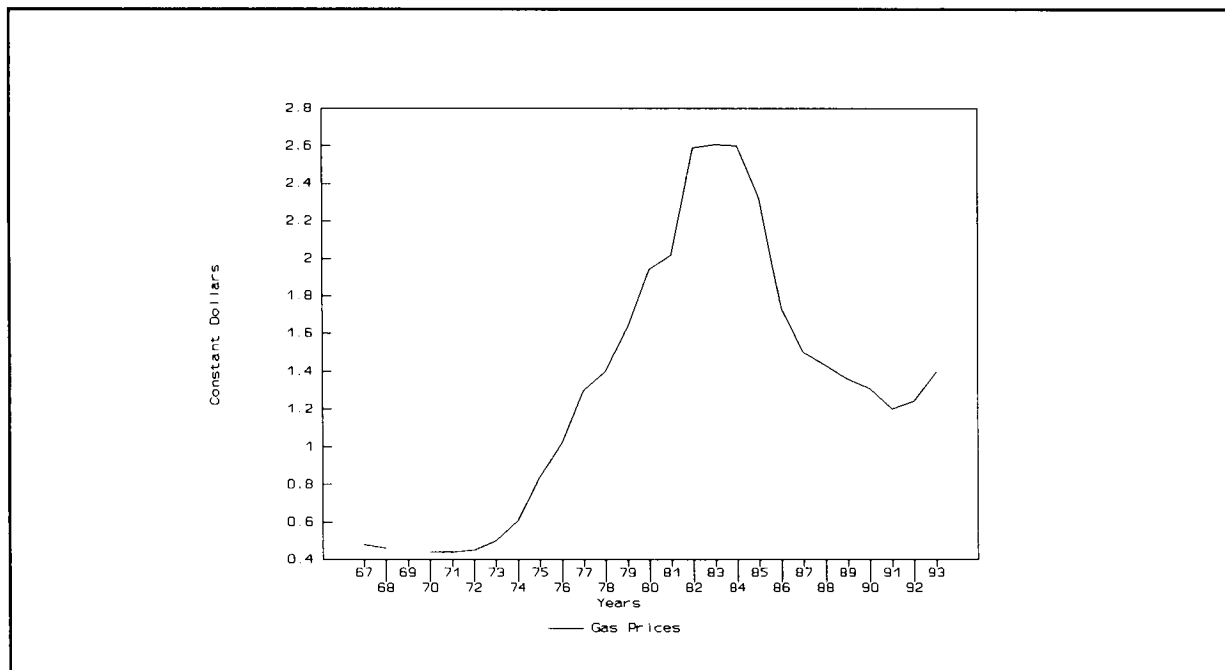


Figure 2.2 Gas Prices in Constant Dollars

With the sudden crash of prices in 1986 several things occurred: 1) the number of rigs dropped by over half, 2) the number of platforms installed and removed decreased, 3) total exploration dropped, and 4) the number of companies operating in the Gulf increased. This last occurrence is most interesting because it seems counter-intuitive. The reason for this is that there are factors other than prices that effect change in the Gulf, including dwindling onshore reserves. Table 2.3 provides data concerning the world average price per barrel of oil in constant dollars; the wellhead price of natural gas in constant dollars; the numbers of rigs, platforms installed and removed, wells, and operators on the OCS. The table demonstrates several pieces of information useful to understanding activity on the OCS. First, the price of oil dropped by almost half between 1985 and 1986 and has remained relatively low and stable since 1986 with the exception of 1990, the year of the Persian Gulf War. Second, the recent prices of natural gas have been low and stable.

Third, although there is no direct relationship between the price of oil and the number of rigs, there are similarities in the numbers over time. When the price of oil was declining from 1983 to 1986, the number of rigs was also decreasing. When the price of oil fell by almost half, the number of rigs also dropped by almost half. Between 1986 and 1989, the price of oil was low and relatively stable but the rig count was increasing. Also, 1990 was the most recent peak in both the price of oil and the rig count. Fourth, oil prices and the number of platforms installed were alike in that both declined by almost half between 1985 and 1986; yet, while the price of oil remained low and stable from 1986 through 1989, the number of platforms installed increased. Fifth, as would be expected, while oil and gas prices have been low and stable, the number of platforms removed has been high and relatively constant. Although oil prices fell between 1985 and 1986, the number of platforms removed did not increase until two years later (between 1987 and 1988) probably due to the lag between prices and the reduction in activity resulting in platform removal. It should also be noted that as oil prices dropped between 1992 and 1993, platform removal jumped. Sixth, there were some comparable changes in the price of oil and the numbers of both exploratory and developmental wells. All three series declined between 1985 and 1986. However, the number of exploratory wells recovered from 1987 through 1990 to the pre-1985 level while the price of oil and the number of developmental wells remained low and stable. Between 1990 and 1991, all three series declined again, although the numbers of both types of wells increased between 1992 and 1993 as did the price of gas. Seventh, the comparison between the price of oil and the number of operators on the OCS is also revealing. Prior to the bust in the price of oil, the number of operators was low and stable. When the dramatic drop in price occurred, the number of operators increased and has continued to rise since 1987.

Table 2.3  
OCS Activity

Year	Price per Barrel	Price per 1000 cu. ft.	Rigs	Platforms Installed	Platforms Removed	Exploratory wells	Developmental Wells	Total Operators
1983	26.30	2.61	214	178	36	420	761	60
1984	24.91	2.60	234	230	47	597	755	65
1985	22.39	2.32	217	217	68	513	656	64
1986	11.41	1.73	107	110	33	273	430	82
1987	13.56	1.50	108	120	24	404	455	77
1988	10.63	1.43	132	178	102	554	372	81
1989	12.79	1.36	185	190	100	498	515	98
1990	15.33	1.31	203	174	107	497	498	104
1991	12.11	1.20	125	143	115	287	373	112
1992	11.40	1.24	153	86	122	199	298	120
1993	9.83	1.40	183	109	221	312	486	123

Sources: Price of oil - Hall 1992; U.S. Bureau of the Census 1956-1993. Price of natural gas - Energy Information Administration, Natural Gas Monthly, Table 4 obtained via Internet through the University of Michigan economic bulletin board. The prices were converted into constant dollars. Rigs, Platforms, Wells, and Operators - MMS Offshore Stats Second Quarter Report 1994 (USDOJ, MMS, 1994a).

**Joint Ventures.** A fourth trend was the increase in joint venture participation; a majority of the respondents indicated that their firms were more involved in joint ventures in 1994 than in 1986. Sixty-two percent of the officials stated that participation in such activities had increased. Another indication of the importance of these partnerships was the frequency with which reduced partnering was stated as a negative outcome of OPA '90 and the increase in lease bonding to cover plug-and-abandon costs. These partnerships may be most necessary for the more expensive types of exploration, that is subsalt and deepwater projects. Joint ventures may be so popular in the Gulf because it is a way for each company involved to reduce risks by sharing the risks and resources. Involvement in oil and gas industry organizations, conferences and workshops may be useful in forging connections with other firms that lead to joint ventures.

Industry organizations play an important role in the activity of these companies. Some of these organizations operate on a local or state level. For example, the Louisiana Independent Oil & Gas Association (LIOGA) was incorporated in October 1992 to represent the interests of those companies operating in the state by doing the following: lobbying in the legislature, acting as a liaison with governmental agencies, and providing information. On the other hand, there are some organizations with members from many states. This section will outline the two main organizations that represent most of those operators on the OCS.

First, the Independent Petroleum Association of America (IPAA) was organized in 1929 to act as a primary spokesperson for the domestic exploration and production industry in Washington, D.C. before all departments and agencies of the federal government and the public. According to its informational packet, IPAA provides a full range of services for its more than 8,000 members including government relations; communications; and statistical and economic analysis for the industry, government and the public.

Second, the American Petroleum Institute (API) was established in 1919 as the first national trade association in the United States to encompass all branches of the petroleum industry. The API functions in much the same way that the IPAA does, except, for example, the former has a much more extensive publications service. Also, the API has seemingly been more critical of government policies (Staff 1991). Both the IPAA and the API coordinate the activity of smaller organizations so that a somewhat unified position can be advanced on the federal level.

In addition to the previously mentioned organizations' publications, the industry has many other sources that serve its informational needs. Of the wide divergence of existing literature, PennWell Publishing Company in Tulsa, Oklahoma is, perhaps, the most important due to the variety of its offerings. In addition to publishing the Oil & Gas Journal, arguably the best journal in its field, PennWell also publishes the following: International Petroleum Encyclopedia, Incorporating: The Oilman, Ocean Oil Weekly Report, and U.S.A. Gulf Coast Oil & Gas Industry Directory.

Another source of information for the industry, although not as widely known, is that of legal foundations. For example, the Institute on Oil and Gas Law and Taxation has been publishing its annual proceedings for over forty years. Its focus is primarily one of economic matters and includes contributors from industry, government, and academia. Moreover, law schools, such as those of Tulane and the University of Houston, also publish journals that focus on various aspects of the industry. Increasingly, these and other law school journals include either environmental law sections or offer completely separate journals, such as the Virginia Environmental Law Journal.

Further, many Gulf region newspapers, such as The Times-Picayune (New Orleans) and the Houston Chronicle, also provide a daily record of events that effect government policy or industry prices. Both newspapers have editors that focus entirely on oil and gas matters. For example, Mary Judice is the Energy Editor for the Times-Picayune. Also, government publications, such as Today and Offshore Stats published by MMS, are readily available as viable sources for those in the industry. These publications can be obtained either by subscription or through MMS by contacting the public relations department or the librarian.

Finally, a relatively new source for information ranging from historical analysis to current production figures can be found on the Internet via gopher (e.g., the University of Michigan's economic bulletin board). It remains to be seen whether or not this source will be greatly utilized by those in industry or in government.

Conferences and workshops serve at least three purposes for industry leaders by offering a forum for discussion, summarizing or updating regulatory or legislative changes, and introducing new technologies or management techniques. Whether it is a corporate sponsored or a government initiated conference or workshop, the goals remain the same: risk reduction and profit maximization. For example, the Clean Gulf and Petro-Safe conferences had a regulatory compliance and environmental-technology focus, respectively. Yet both were industry sponsored attempts to show operators how to reduce their financial exposure by staying current with new and changing regulations, such as OPA '90, and technology, such as 3D seismic data manipulation with high speed computers. These types of conferences or workshops usually have representatives from all sectors of the industry: major and independent companies, federal and state government agencies, attorneys, service contractors, and various support companies.

Those conferences or workshops that are government initiated, such as the Minerals Management Service OCS Leasing Workshop, generally have more of a policy or regulatory focus. For example, at this particular workshop, all aspects of OCS leasing regulations and requirements were covered. This type of information has less to do with giving one company a competitive edge, as technology conferences may, than it does with conveying material that is essential for operators to remain in compliance. Subsequently, by attending the workshop, an operator knows exactly what must be done to avoid unnecessary delays or fines. Such information is paramount to the survival of both independent and major companies.

Another aspect that is important to note regarding both types of conferences or workshops is how well those in attendance relate with one another. It was not uncommon to see seemingly fierce competitors getting along quite well.

**Trend toward Integration.** The results suggested a tendency toward integration. The firms were classified by their worldwide activities, but, during the interview concerning operations in the Gulf of Mexico, the representatives were asked if their businesses were involved in any downstream integration activities in 1994 and in 1986. One representative of a large integrated company answered no to the question for 1986 and yes to the question concerning 1994 as did two officials from small integrated enterprises. In addition, four executives from large nonintegrated businesses indicated that their companies were involved in at least one downstream integration activity in both 1986 and 1994. Thus, there may be a tendency toward integration among oil and gas firms involved in the Gulf of Mexico.

**Shift in the Gulf.** When people mention the shift in the Gulf, they have assumed that the independent companies as a whole were becoming more active and the major corporations less active, but the findings of this study do not support this assumption. The results implied that the nonintegrated firms became more active in oil and gas exploration and production activities between 1986 and 1994 while the integrated businesses including the major corporations either were equally involved in both years or less engaged in 1994 than in 1986. These findings include the following. First, 10 of the 12 new companies in offshore extraction were nonintegrated enterprises. Second, nonintegrated firms extracted more oil,

were more involved in exploring, had more other offices in the Gulf of Mexico region, enlarged their workforces and increased their participation in joint ventures between 1986 and the present (1993 for the amount of oil, 1994 for the other variables). The same cannot be said for integrated corporations. Third, representatives of nonintegrated enterprises were more optimistic about the future of oil and gas exploration and production in the Gulf than were integrated companies. Fourth, the changes in the lease policies (areawide leasing in 1983, the reduced minimum bid in 1987) had the greatest impact on the nonintegrated firms. In fact, some executives stated that these changes enabled nonintegrated companies to enter and compete in the Gulf.

### **Other Major Findings**

**Leasing Policies.** The respondents were overwhelmingly in favor of areawide leasing and the reduction of the minimum bid. Sixty-eight percent of the 47 responses concerning the effect of areawide leasing on business practices were positive and only 2 percent were negative. The most common positive effects were: more activity, more leases, a greater potential for finding oil and gas, and that this was a fairer and easier way to do leasing. The results were similar for the reduction in the minimum bid. Sixty-six percent of the 47 replies discussed positive effects and there were no mentions of negative impacts. The most common positive influences referred to were: increases in bids, leases and acres; more activity; and that this policy enabled companies to enter and compete in the industry in the Gulf. Although the respondents did not mention it, areawide leasing may enable companies to establish core areas in the Gulf.

The authorization for the way in which MMS conducts the federal OCS lease sales comes from two primary sources: OCS Lands Act of 1953, as amended in 1978, and 30 CFR Part 256, codified 43 U.S.C. 1331 et seq. MMS prepares a 5 year plan for upcoming sales in the leasing regions in federal waters. For most states, federal waters begin after the three-mile limit; but, in the case of Florida and Texas, federal waters begin after the nine mile limit. Unlike an auction, prospective lessees offer sealed bids on federal tracts that are publicly revealed the day of the scheduled lease sale. The acceptance of a particular bid is based on a complex set of variables with the following goals: 1) receipt of fair market value, 2) reliance upon the competitive market to determine fair market value, and 3) efficiency in the Government's evaluation process (USDOJ, MMS 1994b).

Depending on the type of tract being bid on, the MONTCAR Methodology, the selection process employed, chooses the one that best satisfies the criteria of the process. The four types of tracts as identified by MMS are drainage, wildcat, development, and confirmed. The variables of the methodology include: 1) significant geological factors, such as oil recovery per acre-foot or depth of geopressure; 2) significant engineering factors, such as platform type or location (water depth); and 3) significant economic factors, such as oil and gas price projections or inflation rates.

After the lease sale, the government has 90 days to determine if the prospective lessee has acquired the desired lease. Once acquired, the lessee pays rent on the tract for the length of the lease, which is usually 5 to 7 years, but may be up to twelve years in deeper water. If the lessee is able to produce oil and gas commercially from this lease, a royalty is also paid.

There has been an increase in activity at recent lease sales due in part to recent trends toward subsalt exploration and the increase of the availability of 3D seismic data that helps to decrease the risk (Judice 1993). Although subsalt exploration is risky, it does allow for elephant hunting since heretofore untapped large reserves may lie beneath the salt dome. Using 3D seismic data, companies can also examine oil fields to determine the reserves that remain and may be able to reach these resources through horizontal drilling. Also, the amount of acreage offered seems to play a role in the amount leased. But, other factors must be considered as well. For example, in 1984 when the most acres were offered, the acreage leased as a percentage of acreage offered was only 4.8 percent (see table 2.4). However, in 1971 when the least amount of acres were offered, the acreage leased as a percentage of acreage offered was 66 percent. It should be noted that 1983 was the first year of area-wide leasing which explains in part why there was such a dramatic increase in the acreage offered. This had virtually no impact on production levels of either oil or gas when one considers the turn-around time for a leased area to go on-line.

In addition, the table shows that although the switch to areawide leasing increased the acreage offered and the acreage leased, the acreage leased did not rise in proportion to that offered. Moreover, by 1992 and 1993, the amount of acreage leased had returned to the levels prior to the switch to areawide leasing possibly because there are fewer opportunities for elephant (i.e., large field/reserves) hunting in the Gulf and more opportunities for oil and gas exploration and production off the coasts of countries other than the United States. Prior to 1983, the peak in acreage offered and leased occurred in 1981 which was the year in which the price of oil attained its highest amount in constant dollars. Moreover, production of oil increased with the change to areawide leasing and was at a high level between 1983 and 1987. However, in 1987 and 1988, oil production declined dramatically. This decrease was two years after the precipitous drop in the price of oil and was probably related to this drastic change. Even with areawide leasing, oil production never returned to its peak of over 400 million bbl, which was reached in 1971 and 1972. Further, gas production jumped between 1977 and 1978 and remained relatively high until 1984. While oil production was relatively high between 1983 and 1987, natural gas production was comparatively low from 1985 and 1989. Gas production peaked in 1990 and remained relatively high through 1993.

Table 2.4  
Acreage Offered/Leased and Production for Federal  
OCS Leasing Program, 1970-1991

Year	Acreage		Production	
	Offered	Leased	Oil (mdbl)	Gas (tcf)
1970	666,845	598,540	361	2.419
1971	55,872	37,222	419	2.777
1972	970,711	826,195	412	3.039
1973	1,514,940	1,032,570	395	3.212
1974	5,006,881	1,762,158	361	3.515
1975	7,247,327	1,679,877	330	3.459
1976	2,827,342	1,277,937	317	3.596
1977	1,843,116	1,100,734	304	3.738
1978	3,140,696	1,297,274	292	4.385
1979	3,412,249	1,767,443	286	4.673
1980	2,563,452	1,134,227	277	4.641
1981	7,680,397	2,265,537	290	4.850
1982	7,637,122	1,886,360	321	4.680
1983	119,811,784	6,587,823	348	4.041
1984	154,383,680	7,397,939	370	4.538
1985	87,028,709	3,573,544	389	4.001
1986	58,670,104	734,418	389	3.949
1987	59,762,078	3,447,809	366	4.426
1988	158,016,215	8,838,867	321	4.310
1989	60,097,672	5,580,929	305	4.200
1990	29,788,766	4,263,446	324	5.093
1991	90,287,925	3,413,560	316	4.516
1992	52,380,047	1,020,919	337	4.685
1993	55,070,269	1,714,458	352	4.533

Source: USDOJ, MMS, 1994c.

In addition, the table shows that although the switch to areawide leasing increased the acreage offered and the acreage leased, the acreage leased did not rise in proportion to that offered. Moreover, by 1992 and 1993, the amount of acreage leased had returned to the levels prior to the switch to areawide leasing possibly because there are fewer opportunities for elephant hunting in the Gulf and more opportunities for oil and gas exploration and production off the coasts of countries other than the United States. Prior to 1983, the peak in acreage offered and leased occurred in 1981 which was the year in which the price of oil



attained its highest amount in constant dollars. Moreover, production of oil increased with the change to areawide leasing and was at a high level between 1983 and 1987. However, in 1987 and 1988, oil production declined dramatically. This decrease was two years after the precipitous drop in the price of oil and was probably related to this drastic change. Even with areawide leasing, oil production never returned to its peak of over 400 million bbl, which was reached in 1971 and 1972. Further, gas production jumped between 1977 and 1978 and remained relatively high until 1984. While oil production was relatively high between 1983 and 1987, natural gas production was comparatively low from 1985 and 1989. Gas production peaked in 1990 and remained relatively high through 1993.

**Regulations.** As would be expected, the executives were overwhelmingly against the four regulations included in the interview. Only one respondent mentioned a positive effect of OPA '90 whereas ten indicated that their companies would be out-of-business if the \$150 million liability was enforced, and no one referred to a positive impact of any of the other three regulations - the increases in lease bonding to cover plug-and-abandon liabilities, the possibility of being required to reinject produced water (a potential implication of the Clean Water Act in the fall of 1994), and the prospect of the extension of onshore air quality standards to the offshore Gulf (a potential implication of the Clean Air Act).

Prior to the passage of the Oil Pollution Act of 1990 (OPA '90), the method for preventing and compensating victims of oil spills or other types of pollution associated with the oil and gas industry was somewhat confusing and underfunded. The Federal Water Pollution Control Act, or Clean Water Act, passed in 1972, ambitiously, and somewhat optimistically, set compliance standards and deadlines that later were modified. The objective of the Clean Water Act was to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (33 U.S.C. 1251a). Part of this objective included the elimination of the "discharge of pollutants into the navigable waters [of the U.S.]" (33 U.S.C. 1251a.1). But, more specifically, the Clean Water Act included provisions that addressed the problems associated with the oil and gas industry. Section 311 of this Act covers oil and hazardous substance liability and was intended to provide the government with authority to respond to an oil spill (Uda 1991, p.406). The Act spells out the policy of the federal government by offering various administrative, civil, and criminal penalties for an unauthorized discharge upon the navigable waters of the United States (33 U.S.C. 1321). There was even an oil spill fund statutorily authorized (33 U.S.C. 1321k.1) to contain up to \$35 million, yet at the time of the Exxon *Valdez* accident, the fund contained only approximately \$6 million (Uda 1991, p.406). Further, this Act never really provided a clear federal method for its enforcement with regard to spills and adequate compensation for victims. Although several laws have been enacted to enable victims to seek relief, as evidenced in *Askew v American Waterways Operators*, 411 U.S. 325, many academics, environmentalists, and the oil industry found oil spill and discharge laws to be a "confusing maze" (Uda 1991, p.415).

The next move, and this is in addition to OPA '90 standards, has been to strengthen existing laws. For example, extending the Clean Water Act to cover offshore activity, such as the reinjection of processed water, has been debated recently. Also, expanding the Clean Air

Act's ambient air standards to include offshore facilities has been discussed. Here, as with the Clean Water Act, some of the concern by the industry involves the possibility of having to retrofit existing rigs and platforms. For now, these increased standards, which were initiated by the Environmental Protection Agency, will not apply to the Gulf of Mexico region (Staff 1992b, p.26). In addition, in the spring of 1995, steps were taken to weaken the Clean Water Act. A House Committee proposed changes in the act that "would make it easier to develop wetlands and set more lenient water pollution standards" (Dewar 1995, p. A1,16).

Other ideas concerning environmental regulations that would affect oil and gas extraction in the Gulf include allowing the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq., to redefine oil as a solid waste. This would also enable federal involvement under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or Superfund, 42 U.S.C. 9601 et seq., in oil spills. However, section 106 of CERCLA does not permit the government to issue administrative clean up orders to a private party (42 U.S.C. 9606a-b). Perhaps, the utilization of the Pollution Prevention Act of 1990, 42 U.S.C. 13101 et seq., would be the best method for reducing environmental degradation resulting from the offshore oil industry. This Act asserts that the policy of the United States is: "pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner."

The Oil Pollution Act of 1990, 33 U.S.C. 2701 et seq., was written to address specific areas of concern which were not addressed by these previous acts. The major provisions of OPA '90 (CQ Almanac Staff, 1990) include the following. First, it increases spillers' liability many times over existing federal limits and imposes stiffer civil and criminal penalties. Liability could top \$200 million for big tankers. Second, it requires companies to pay for cleaning up oil spills they produce and to compensate parties economically injured by them. (Note: this provision is not explicitly defined but rather implied in section 1012). Third, it continues to allow states to impose unlimited liability on shippers. Fourth, it authorizes using money from a federal fund, subject to annual appropriations, to pay for clean up and compensation costs not covered by the company responsible for the spill. The fund, designed eventually to contain \$1 billion, was to be financed by a recent five-cents-a-barrel oil tax. Fifth, it requires shippers to draft "worst-case" oil-spill response plans for quick clean up. Sixth, it enhanced the federal government's oil-spill response capability. District response groups have been positioned across the country to aid strike teams, and a new national command center was to be established in Elizabeth City, N.C. Seventh, it expands Presidential power to control a company's clean up operations. Eighth, it establishes a multi-agency oil-pollution panel to coordinate federal research.

As one might imagine, such an Act, although passed unanimously and then signed by President Bush in August of 1990, met with much criticism from those in the oil and gas

industry and then, subsequently, legislators. Outgoing American Petroleum Institute (API) president and chief executive officer of Mobil, Allen E. Murray, claimed the following regarding recent U.S. policy toward the oil industry, "[The industry] is being thrown out" (Staff 1991, p.21). Industry complaints include that regulations create undue restraints and are costly. As a result the number of independent refineries in the U.S. has declined because they are unable to meet the financial burden created by environmental regulations. According to H. Leighton Steward, chair and chief executive of the Louisiana Land and Exploration Company, the amount of money refineries will have to spend to comply with environmental regulations by the year 2000 exceeds the current book value of these companies by six billion dollars (Judice 1995b). Many in the industry claim that increased investing by companies outside of the U.S. is a direct result of more stringent environmental regulations in the U.S. Such feelings among industry leaders has caused an avalanche of legislation. For example, now retiring Senator J. Bennett Johnston D-LA introduced the OCS Deepwater Royalty Relief Act (S.318) on February 4, 1993, which was to suspend some of the royalty payments for OCS operators until they had recovered part of their initial investment. The bill was soundly defeated as it was labeled "corporate welfare" by its opponents. Also, there have been several pro-environment bills offered to keep the federal government from leasing the waters off the coasts of Florida (S.290 introduced by Senator Connie Mack D-FL) and other states. Obviously, there are still problems with existing legislation. While the recently enacted OPA '90 is not a panacea, it is still a marked improvement over the previous legal quagmire (Uda 1991, p.405).

Table 2.5  
Environmental Costs of Oil and Gas Exploration and Development by Year

1986							
Company Type	Total Number of Incidents	Type of Incident	Number by Type	Type of Pollution	Volume of Pollution	Type of Damage	Amount of Damage
Major	41	Fire	30	Oil	342	Fatality	3
		Blowout	1			Injury	7
		Explosion	0			Structure	5
		Human	5			Property	19
		Pollution	5				
Independent	20	Fire	15	Oil	0	Fatality	2
		Blowout	1			Injury	4
		Explosion	0			Structure	0
		Human	4			Property	7
		Pollution	0				

Table 2.5  
Environmental Costs of Oil and Gas Exploration and Development by Year  
(continued)

1987

Company Type	Total Number of Incidents	Type of Incident	Number by Type	Type of Pollution	Volume of Pollution	Type of Damage	Amount of Damage
Major	30	Fire	24	Oil	0	Fatality	0
		Blowout	6			Injury	3
		Explosion	0			Structure	3
		Human	0			Property	10
		Pollution	0				
Independent	15	Fire	11	Oil	120	Fatality	14
		Blowout	2			Injury	2
		Explosion	0			Structure	2
		Human	1			Property	8
		Pollution	1				

1988

Company Type	Total Number of Incidents	Type of Incident	Number by Type	Type of Pollution	Volume of Pollution	Type of Damage	Amount of Damage
Major	27	Fire	20	Oil	15,841	Fatality	0
		Blowout	2			Injury	4
		Explosion	0			Structure	2
		Human	1			Property	9
		Pollution	4				
Independent	13	Fire	7	Oil	167	Fatality	6
		Blowout	2			Injury	8
		Explosion	0			Structure	1
		Human	2			Property	2
		Pollution	2				

Table 2.5  
Environmental Costs of Oil and Gas Exploration and Development by Year  
(continued)

1989

Company Type	Total Number of Incidents	Type of Incident	Number by Type	Type of Pollution	Volume of Pollution	Type of Damage	Amount of Damage
Major	27	Fire	16	Oil	0	Fatality	9
		Blowout	7			Injury	28
		Explosion	0			Structure	2
		Human	3			Property	7
		Pollution	0				
Independent	11	Fire	2	Oil	300	Fatality	5
		Blowout	6			Injury	2
		Explosion	0			Structure	1
		Human	2			Property	1
		Pollution	1				

1990

Company Type	Total Number of Incidents	Type of Incident	Number by Type	Type of Pollution	Volume of Pollution	Type of Damage	Amount of Damage		
Major	25	Fire	9	Oil	38,005	Fatality	3		
		Blowout	3			Zn Br	110	Injury	25
		Explosion	0			Structure	4		
		Human	6			Property	4		
		Pollution	7						
Independent	17	Fire	8	Oil	19,012	Fatality	3		
		Blowout	4			Injury	24		
		Explosion	0			Structure	2		
		Human	3			Property	5		
		Pollution	2						

Table 2.5  
Environmental Costs of Oil and Gas Exploration and Development by Year  
(continued)

Totals for 1986 to 1990

Company Type	Total Number of Incidents	Type of Incident	Number by Type	Type of Pollution	Volume of Pollution	Type of Damage	Amount of Damage
Major	150	Fire	99	Oil	54,188	Fatality	15
		Blowout	19			Injury	67
		Explosion	0			Structure	16
		Human	15			Property	49
		Pollution	16				
Independent	76	Fire	42	Oil	19,599	Fatality	30
		Blowout	15			Injury	40
		Explosion	1			Structure	6
		Human	12			Property	23
		Pollution	6				

Source: USDOJ, MMS, 1992c.

Note: Volume of pollution is measured in barrels unless otherwise noted. Structure damage includes large-scale property damage associated to but not limited to pipelines, rigs, and platforms.

Table 2.5 demonstrates part of the environmental problem as it shows the type, volume and damage caused by reported accidents on the OCS by major and independent companies. In addition the table demonstrates that independent firms report only about half the amount of accidents that the major corporations report each year. Moreover, despite the difference in reported incidents, the independent businesses have as many or more fatalities than the major corporations each year and the total fatalities for the independent enterprises is twice that of the major companies although the reported incidents are only about half those of the major firms. Further, with the exception of 1989, the independent businesses have as many or more injuries than the major firms per year despite reporting only half as many incidents. Also, the major companies reported more structural and property damage than the independent firms.

**Agencies.** When the executives were asked to list in order the five federal agencies that have the greatest impact on their oil and gas exploration and production activities in the Gulf, the results in descending order were: the Minerals Management Service, the Environmental Protection Agency, the Coast Guard, the Department of Transportation, and the Occupational Safety and Health Administration. There were some differences by type of company in the

ordering of these agencies as will be presented in chapter 4; however, regardless of the kind of firm, the Minerals Management Service was ranked as the most important agency.

Government agencies play an important role in the business activity of Gulf of Mexico operators. Although state agencies have an impact that ranges from significant, e.g., Texas Railroad Commission, to marginal, e.g., Mississippi Oil and Gas Board, the major federal agencies possess greater authority to regulate the activity of Gulf of Mexico operators. The most important of the federal agencies is the Department of Interior's Minerals Management Service (MMS). The legal basis for their actions, whether it be setting bonding requirements or holding lease sales, can be found in Title 30 C.F.R. 256. MMS is the agency that handles almost every aspect of the operators' daily life. MMS activities include everything from data collection such as sponsored studies to information dissemination, including supporting workshops.

The primary agencies that affect OCS activity besides MMS include: the Environmental Protection Agency, the Department of Transportation (Coast Guard and Office of Pipeline Safety), the Department of Energy (Federal Energy Regulatory Commission), and the Department of Labor (Occupational Safety and Health Administration). The Environmental Protection Agency (EPA) was authorized as the primary enforcer of environmental regulations by the National Environmental Protection Act of 1969, 42 U.S.C. 4321 et seq., which was further strengthened in Appendix B of the Code of Federal Regulations Title 40. This latest edition is important to Gulf of Mexico operators for at least two reasons: 1) it sets the agency decision making process and 2) it explains the procedures for submitting Environmental Impact Statements (EIS). In short, the EPA is the primary agency for all environmental legislation. Next, the Coast Guard, especially with the passage of OPA '90, has expanded its duties from assisting clean up procedures to operating the National Pollution Funds Center in Arlington, Virginia.

The Department of Energy does not have the same direct or daily influence on Gulf of Mexico operators that MMS has, but rather a more detached and policy setting function as evidenced by Deputy Secretary of Energy William H. White's comments before the Senate Committee on Energy and Natural Resources held September 14, 1993. Here, White spoke of the need for royalty reduction, increased production, and technological advancement. Energy Secretary Hazel O'Leary spoke of the federal government guaranteeing "stable markets at home and abroad" when speaking in New Orleans to the Independent Petroleum Association meeting held November 8, 1993. Like other agencies, it sponsors research on broader based policy questions.

The Department of Labor's role is setting standards for occupational safety and health for offshore workers as authorized by 29 U.S.C. 651 et seq. It promotes worker safety and provides a channel for airing grievances. The secondary agencies, or those of lesser importance to OCS activity, include the Department of Commerce (National Oceanic and Atmospheric Administration and National Marine Fisheries Service) and the Federal Communications Commission (FCC).

**Employment.** Although the numbers of employees differed by type of company, there were three categories of employment that had relatively large numbers of employees regardless of the type of company - production/platform work, exploration, and administration. Major corporations and large integrated firms had about twice as many production/platform workers as exploration and administration employees whereas small integrated and both sizes of nonintegrated businesses had approximately equal numbers of people in these three categories. Nevertheless, these were the largest classifications of employment for all five types of companies. These three categories - exploration, administration, and production/platform work - were also the types of employment in which increases in employees from 1986 to the fall of 1994 tended to occur.

In the United States, employment in oil and gas exploration and production rose from 440,000 to 750,000 between 1979 and 1982 making employment in oil and gas comparable to that in automotive manufacturing (McLin 1988). Also, as the price of oil declined in the 1980s, employment in oil and gas exploration and production decreased by 150,000 between 1982 and 1983 and by 180,000 between 1985 and 1986 leaving the industry with just 420,000 employees in 1986 (McLin 1988). In Louisiana, employment in energy-related jobs decreased by approximately 45,000 during the 1980s (Judice 1991) and Houston experienced a decrease in jobs in oil and gas exploration (Feagin 1990).

**Differences in Characteristics, Environment and Practices by Integration.** Almost half of the differences by type of company in characteristics, views of the business environment, and operations occurred between integrated and nonintegrated firms. Fifteen of the total 31 variations by type of business depended on integration whereas only seven were between the major corporations and the independent firms, one occurred by size of company, two varied by integration and size, and one varied by all three dimensions. In addition, there were five differences that could not be attributed to integration, size, or major and independent companies.

**Technology.** When the executives were asked to report whether their firms used or were involved in deepwater projects, subsalt exploration, horizontal drilling and 3D seismic data, the results indicated that almost all of the businesses used 3D seismic data. In addition, over a third were involved in deepwater or subsalt exploration and almost half of the enterprises did horizontal drilling. Moreover, almost three quarters of the 51 responses concerning how the use of 3D seismic data had affected operations in the Gulf were about positive influences, particularly reduced risk and increased success. Similarly, 79 percent of the 24 comments about the influence of horizontal drilling on operations in the Gulf presented positive impacts, especially that horizontal drilling made extraction more economical particularly in shallow water. In contrast, subsalt and deepwater exploration were too new and too expensive for many of the officials to be able to discuss actual impacts of these technologies on the activity in the Gulf. Also, the use and effects of these technologies differed by type of company as will be shown in chapter 4.



The Gulf of Mexico is a mature region. Its profitability for most companies has been declining for several years. The recent subsalt plays and deepwater leasing, though expensive, do indicate that there could be increased interest in the region by the major and some of the larger independent companies. The days of total domination by the major corporations in Gulf of Mexico leasing, exploration, and production has shifted. A.D. Koen of The Oil & Gas Journal claimed that "evolving geophysical technology and savvy logistical tactics are reducing the upfront investment dollars needed to bring offshore wells on line and shortening project development timetables" (Koen 1993b, p.20). Thus, smaller companies with limited capital need not wait as long for a return on their investment; therefore, such firms can be more involved in Gulf extraction. Also, as long as there are moratoriums against offshore leasing in Florida and California, the western and central Gulf of Mexico may be the only place smaller independent firms can explore.

The major corporations are finding fewer and fewer 'Mars-like finds'; therefore, many have sought foreign opportunities. For example, number one on Chevron's "Eight Strategic Intents" list is to "shift exploration and production emphasis to international opportunities" (Stated in Chevron's 1993 Annual Report, p.12). For them, this means exploring in the newly independent Central Asian state of Kazakhstan. For other major firms this may mean stepping up production in Vietnam or Nigeria or Russia.

One important evolution in the Gulf of Mexico that is sometimes overlooked but very important in understanding how so many small independent firms can operate in the Gulf is the accumulation of a pipeline infrastructure. This has occurred over the past few decades and some believe this is "buttressing the growth of independent activity" (Koen 1993b, p.20). However, it should be noted, that this is an infrastructure that is aging. Some of the pipelines that are currently being used have been in place for as many as forty years. Considering the fact that new pipelines are built today with a life expectancy of about forty years, this pre-existing infrastructure may not last much longer, which could be very costly to some of the independent companies depending upon it.

Perhaps the biggest areas of technological advancement that have positively impacted the oil and gas industry are three dimensional seismic data and horizontal drilling. Three dimensional seismic data reduces the risk involved in the pre-leasing and development stages by providing the prospective lessee with more information than a simple 2D. But the use and need for 3D goes beyond the geophysical needs of those in the Gulf of Mexico. Jim Watkins, manager of commercial and business development for Aran Energy Corp., Houston, claimed that 3D consulting businesses have sprung up in the Gulf of Mexico and have allowed independent companies the chance to purchase the data from "real experts" (Koen 1993b, p.21). This gives the independent firms as much information on the Gulf of Mexico as the major corporations. Enron Oil & Gas, for example, relied on 3D data for about 75 percent of its offshore drilling in 1993 (Koen 1993b, p.21).

Horizontal drilling is a technology that has played an important role in Gulf of Mexico production, but its cost (estimated by Petroleum Engineering International), which is about

\$1 million per well to drill, still makes it too expensive for all Gulf of Mexico players. Yet the IPAA reports that by 1995, 41 percent of independent producers will have horizontal drilling technology, which is up from only 15 percent in 1990 (Staff 1992c, p.6). However, its growing importance concerns its ability to increase production. In 1990, the total expenditures on horizontal drilling was \$662 million, but that was only 6 percent of the total spent on drilling according to an Energy Information Administration Technical Report sponsored by the Department of Energy. Also, horizontal drilling has a potential impact for gas producers because it can: drain partially depleted reservoirs; increase production in naturally fractured formations; access greater lengths of pay; and reduce the number of wells required to fully exploit extensive reservoirs (Groten 1991, p.39). However, there is evidence that using horizontal drilling to redrill old wells has several advantages and can save money. According to Keith Fisher, senior drilling engineer for the Petroleum Club in New Orleans, "re-entry drilling costs can be as low as 37 percent of what it cost to drill the original well" (Judice, 1994e). Redrilling "by-passes zones that would produce water or are damaged," and also uses existing structures and pipelines (Judice, 1994e).

Deepwater drilling is another form of technology that is becoming more widely used by all types of companies, particularly in the Gulf of Mexico. According to MMS, deepwater is anything deeper than 1000 feet. Though it is more costly than shallow water drilling, it may well be the future of drilling in the Gulf of Mexico where there are fewer and fewer shallow water finds. According to a recent report in the Washington Post, geologists say that the Gulf of Mexico deep waters "could produce several billion barrels of oil, hundreds of millions of dollars in profits and tens of thousands of U.S. jobs" (Southerland 1995, A-1). There are obstacles to overcome in the deep waters of the Gulf, but some companies have already begun drilling. Shell Offshore, Inc. began installing Popeye Phase 1 in April of 1995. This deepwater gas well is expected to begin pumping in September of 1995 (Staff 1995, p.26). Shell has several other deepwater projects in the Gulf of Mexico, but Popeye is the most technologically sophisticated to date. Other companies who have made deepwater discoveries in the Gulf of Mexico include Exxon, Marathon, Texaco, Phillips, Chevron, Amerada, Oryx, Conoco, BP, Enserch, Amoco, and Tatham (LeBlanc 1993, p. 30). According to Robert Esser, a senior consultant to Cambridge Energy Research Associates, companies are doing things in the Gulf of Mexico "that five years ago nobody thought were economically possible. This could begin to noticeably slow the decline of U.S. oil output in the late 1990's into 2005" (Southerland 1995, p.A-4). Deepwater technological progress is advancing quickly, and if companies are able to develop the needed technologies, the Gulf of Mexico could produce as much as "700,000 barrels a day of oil and gas equivalents by 1999" (Southerland 1995, p.A-4).

## CHAPTER 3

### EXPLORATION AND PRODUCTION COMPANIES IN THE GULF OF MEXICO

In this chapter, the business characteristics, environment and practices of the companies involved in exploration and production in the Gulf of Mexico will be presented. Both the current (fall of 1994 usually, 1993 sometimes as specified in the text) and past (1986) characteristics of the 47 firms that answered all of the questions will be discussed. The characteristics examined include the amount and type of resource extracted, involvement in downstream integration activities and exploring, size of research and development spending, locations of headquarters and other offices, and the number of employees and their activities. The next topic will be the business environment, which consists of the federal agencies and regulations, technology, joint ventures, use of service companies, and views of the future of exploration and production in the Gulf. The final topic will be the companies' operations in the Gulf of Mexico.

#### BUSINESS CHARACTERISTICS

The results to be presented shortly will demonstrate the following. First, most of the companies extracted both oil and natural gas from the Gulf of Mexico. Second, for most of the businesses, production of oil and gas, exploration, and the number of employees increased since 1986. Third, the number of companies operating offshore in the Gulf increased since 1986. Fourth, research and development funds decreased since 1986.

The respondents were asked if their company extracted oil or natural gas or both from the Gulf of Mexico in the fall of 1994. The vast majority of the 47 companies extracted both petroleum and gas from the Gulf of Mexico (see figure 3.1). One firm obtained only gas and two businesses ceased exploration and production operations in the Gulf. The executives also were queried about the resource extracted in 1986. In 1986, only 33 enterprises derived both petroleum and gas while 13 endeavors collected neither resource, 12 of these companies began operating offshore in the Gulf after 1986 (see figure 3.2). The companies' representatives were questioned about the amount of oil and natural gas extracted in 1993 and in 1986. The median amount of petroleum derived from the Gulf in 1993 was 940 thousand barrel equivalents and the median amount of gas was 27.85 billion cubic feet. Most of the companies were obtaining more petroleum and more gas in 1993 than in 1986 (see figures 3.3 and 3.4). Yet, some of the businesses were collecting less oil and less gas. To determine if there is a tendency for operators in the Gulf to become integrated over time, the officials were questioned about their businesses' involvement in downstream integration activities such as petroleum refining, gas processing, wholesale and retail trade. Three more of the firms were involved in downstream integration activities in the fall of 1994 than in 1986. In 1994, 25 of the 47 firms participated in such operations while, in 1986, 22 companies took part in these activities (see figures 3.5 and 3.6).

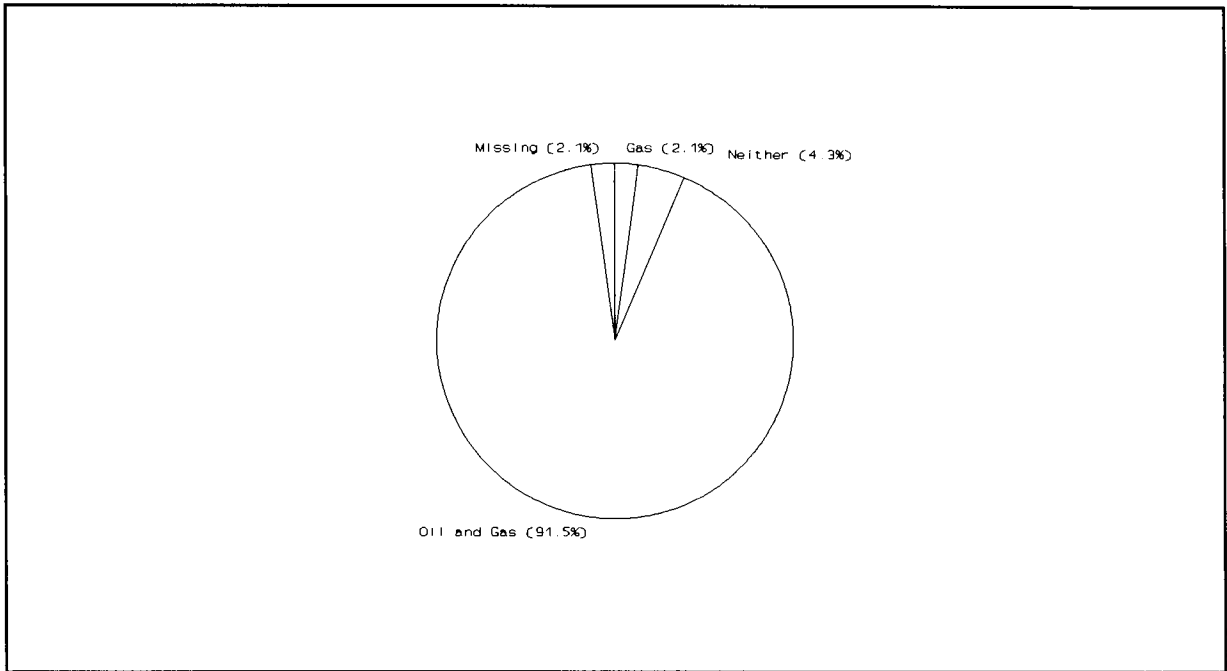


Figure 3.1 Resources Extracted in 1994

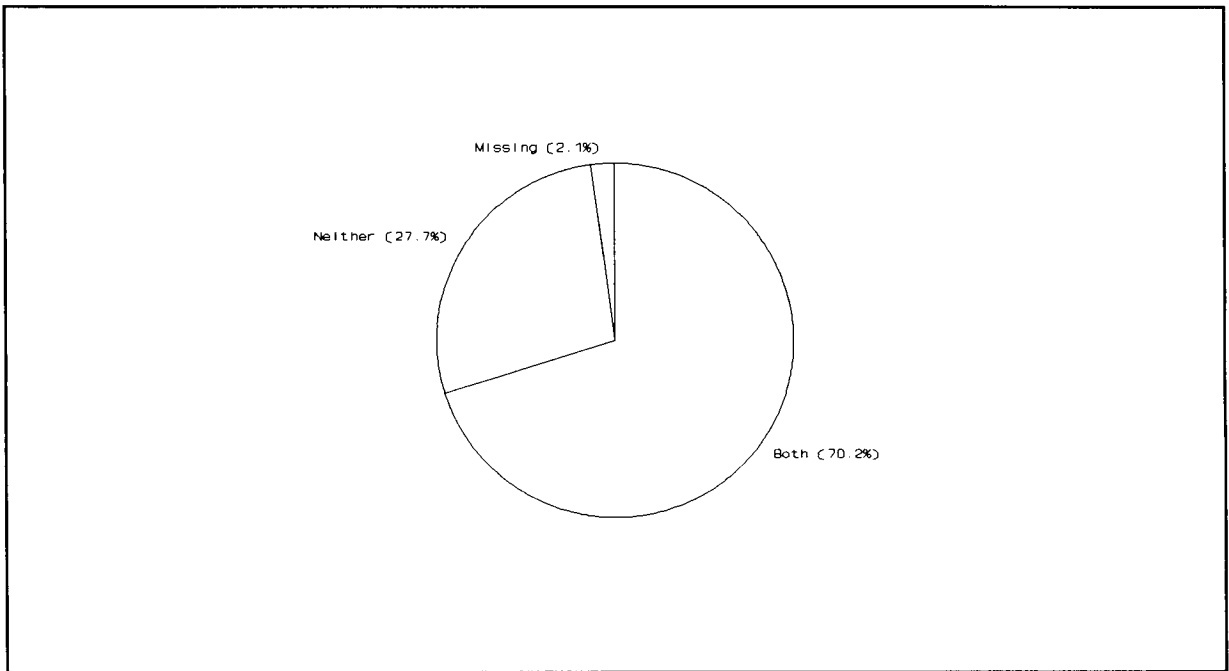


Figure 3.2 Resources Extracted in 1986

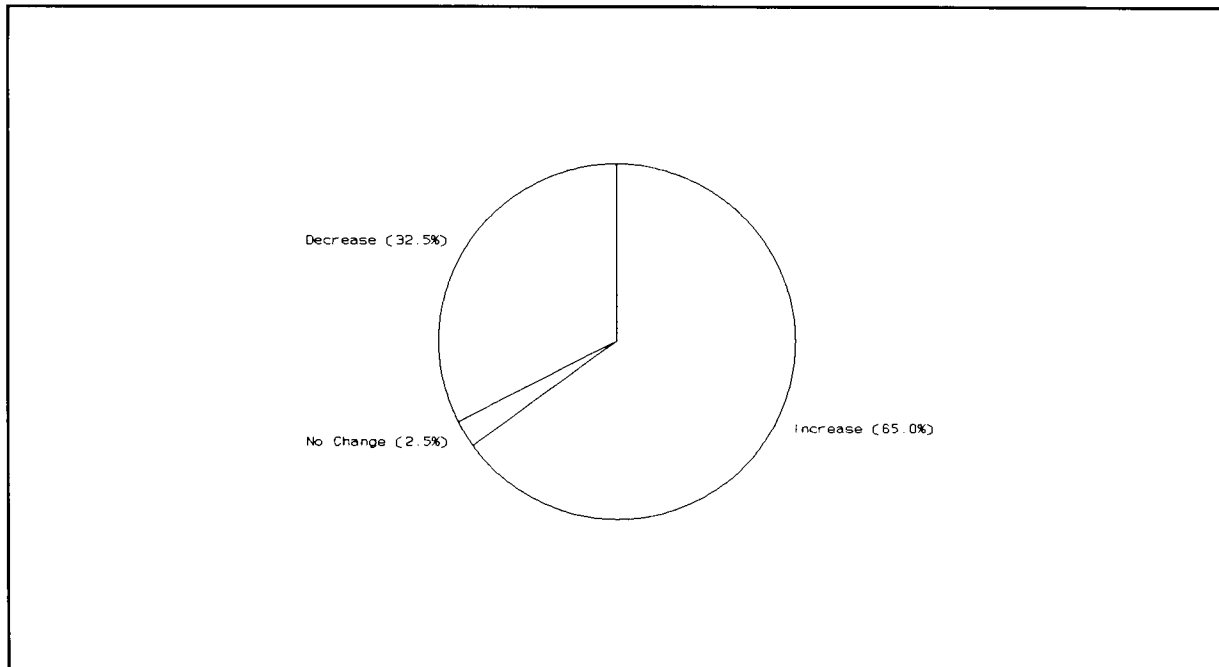


Figure 3.3 Change in Petroleum Extraction 1986 to 1993

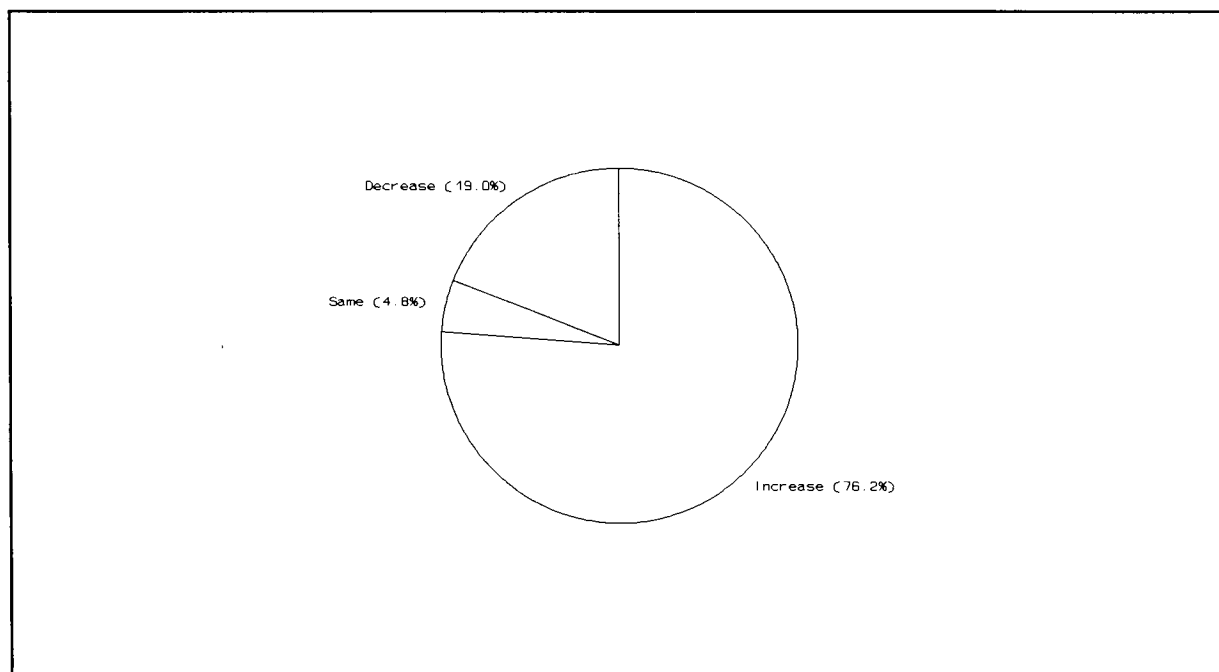


Figure 3.4 Change in Gas Extraction 1986 to 1993

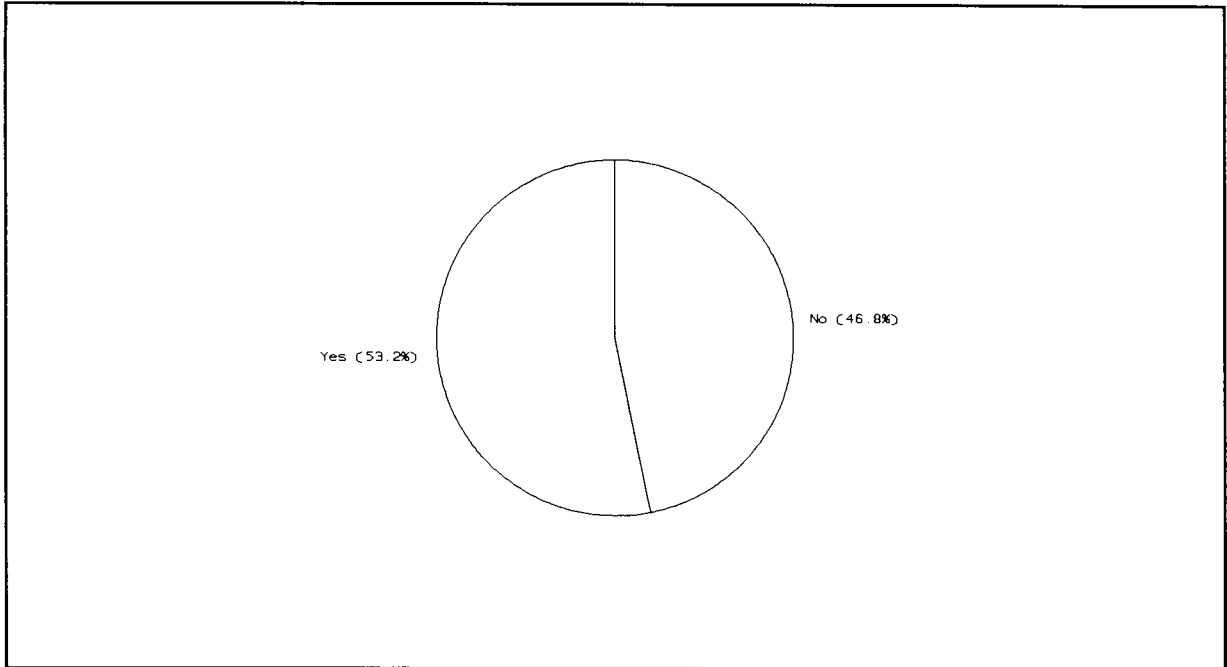


Figure 3.5 Downstream Integration in 1994

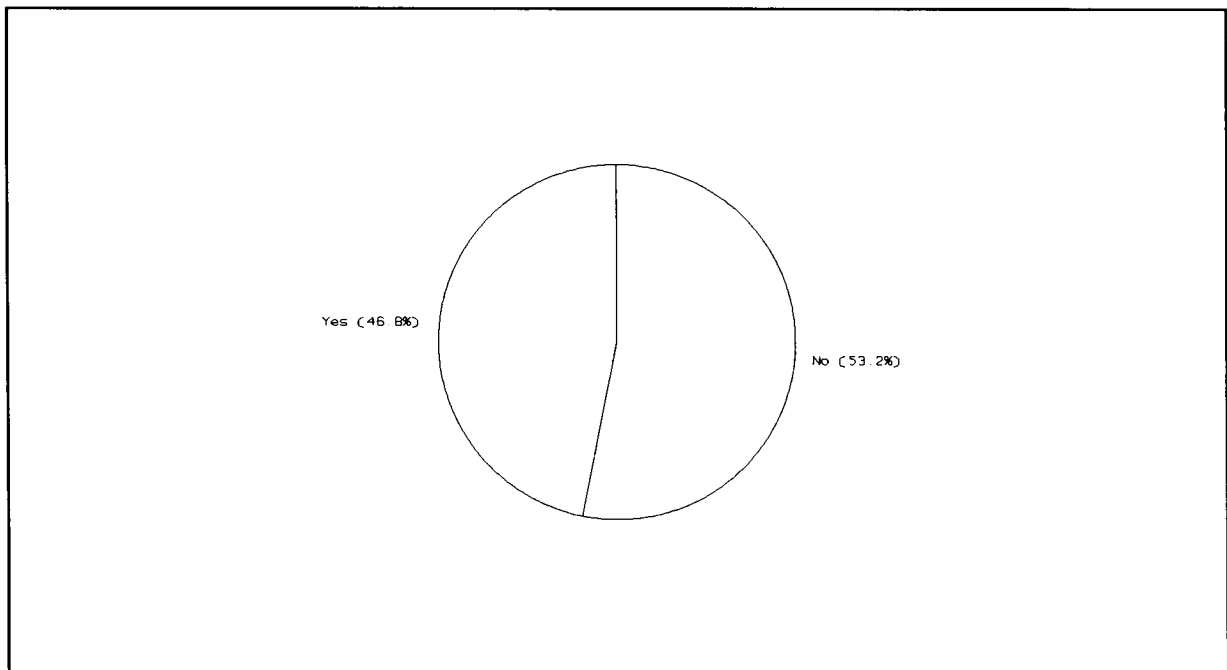


Figure 3.6 Downstream Integration in 1986

The respondents were requested to state if their businesses were more or less involved in exploring in the fall of 1994 than in 1986. Based on this information, there was more exploring for petroleum and gas in 1994 than in 1986 (see figure 3.7). Over two-thirds of the companies' representatives asserted that their firm was engaged in more exploration in 1994 while under one-fourth responded that their business was involved in less exploration. The executives also talked about the size of the firms' research and development spending in 1993 and in 1986. In contrast to the results concerning exploring, less money was spent on research and development in the Gulf in 1993 than in 1986. The median amount of dollars used for research and development in 1993 was 1 million while the median in 1986 was 1.2 million. However, caution should be exercised in interpreting these results. Only 13 of the companies' representatives gave dollar amounts for 1993 and only 10 gave dollar quantities for 1986. In answer to the item for 1993, 64 percent of the respondents said 0 dollars while 70 percent stated no dollars for the item concerning 1986. The medians reported are based only on the nonzero dollar amounts.

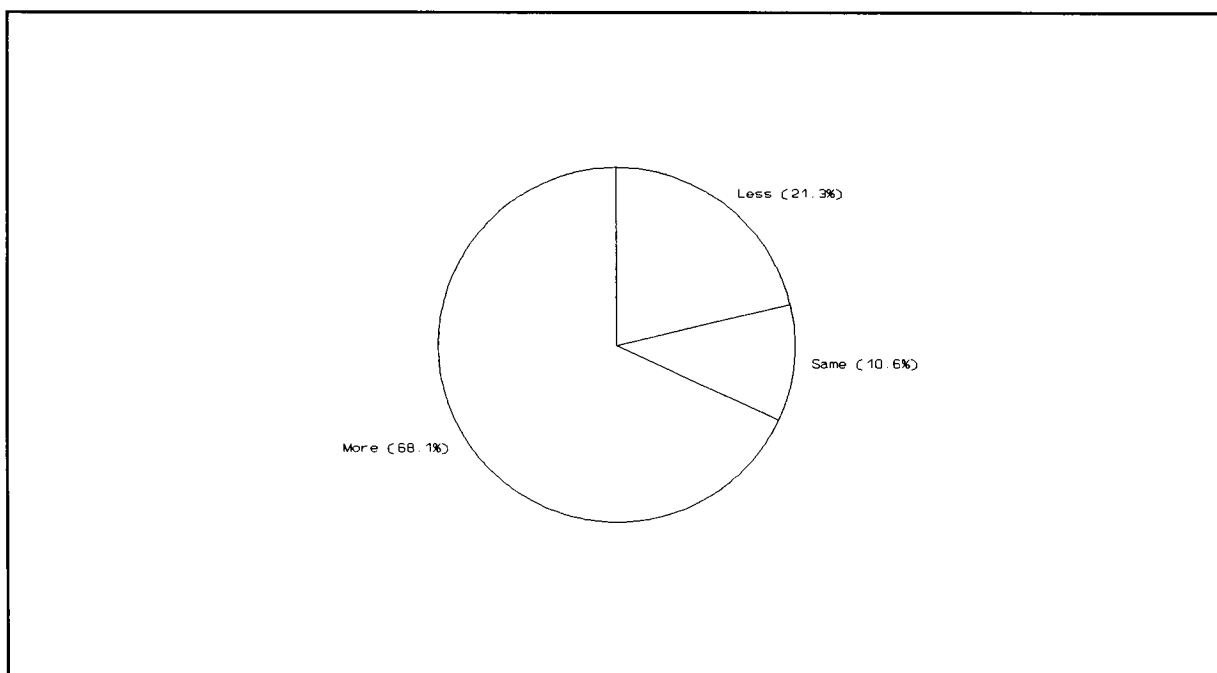


Figure 3.7 Change in Exploring 1986 to 1994

The executives also talked about the location of the companies' headquarters and other offices in 1994 and 1986. These results are summarized in figures 3.8 through 3.13. The majority of the companies had headquarters in a city in the Gulf of Mexico region (Texas, Louisiana, Mississippi, or Alabama), particularly in Houston, Texas. Those that operated out of Louisiana, had headquarters in New Orleans. Only four firms changed their headquarters between 1986 and 1994. Two enterprises moved from small cities in Texas to large cities in Texas, one moved from one large city in Texas to another, and one company added a

headquarters in Texas, although the corporate headquarters was not in the Gulf of Mexico. In addition, there were four businesses, all small nonintegrated ones, that had no headquarters in 1986 because they began operating after that year.

Fifty of the other offices were in the Gulf of Mexico, 33 were in Texas. Almost half (48 percent) of those in Texas were in Houston while approximately a third (30 percent) were in Midland, 9 percent were in Tyler, 6 percent were in Amarillo and another 6 percent were in Corpus Christi. Sixteen of the total other offices were in Louisiana; of these, 56 percent were in Lafayette and 38 percent were in New Orleans. Sixteen of the other offices were not in the United States. Many (44 percent) were in Calgary and 13 percent were in London. The most popular cities for the location of other offices were Houston, Midland and Lafayette. Nine companies had no offices other than their headquarters. The average number of other offices declined from 2.8 in 1986 to 2.4 in 1994 and the range decreased by 4 during the same period (0 to 11 in 1986 and 0 to 7 in 1994).

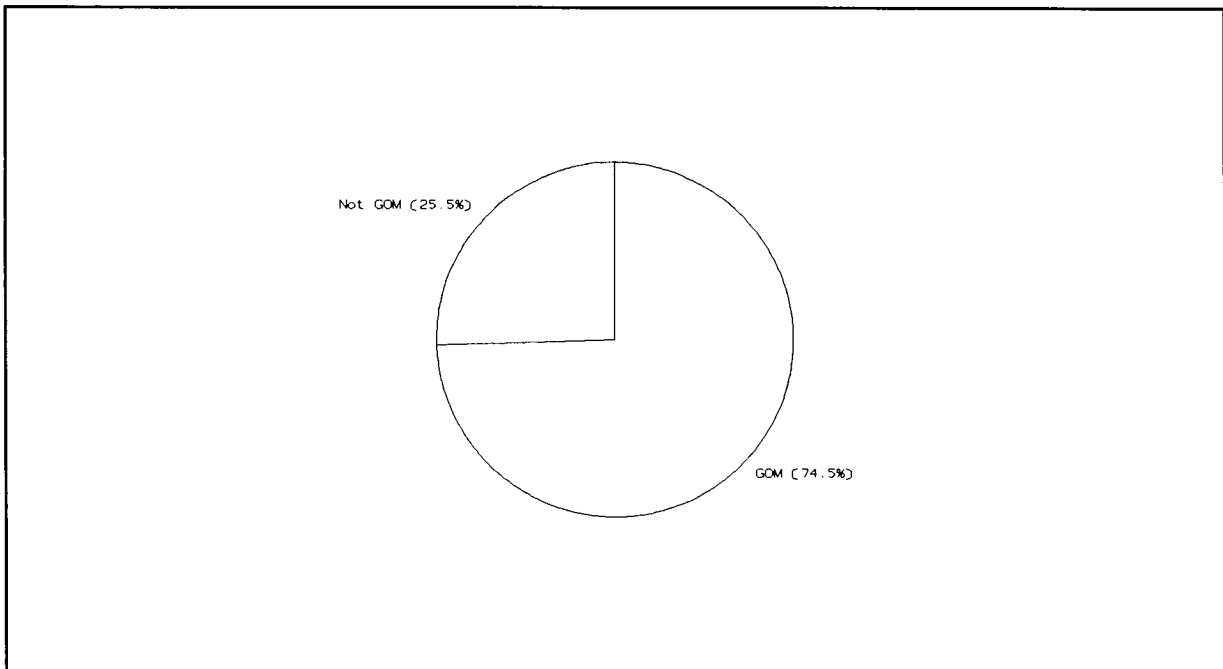


Figure 3.8 Location of Headquarters in 1994



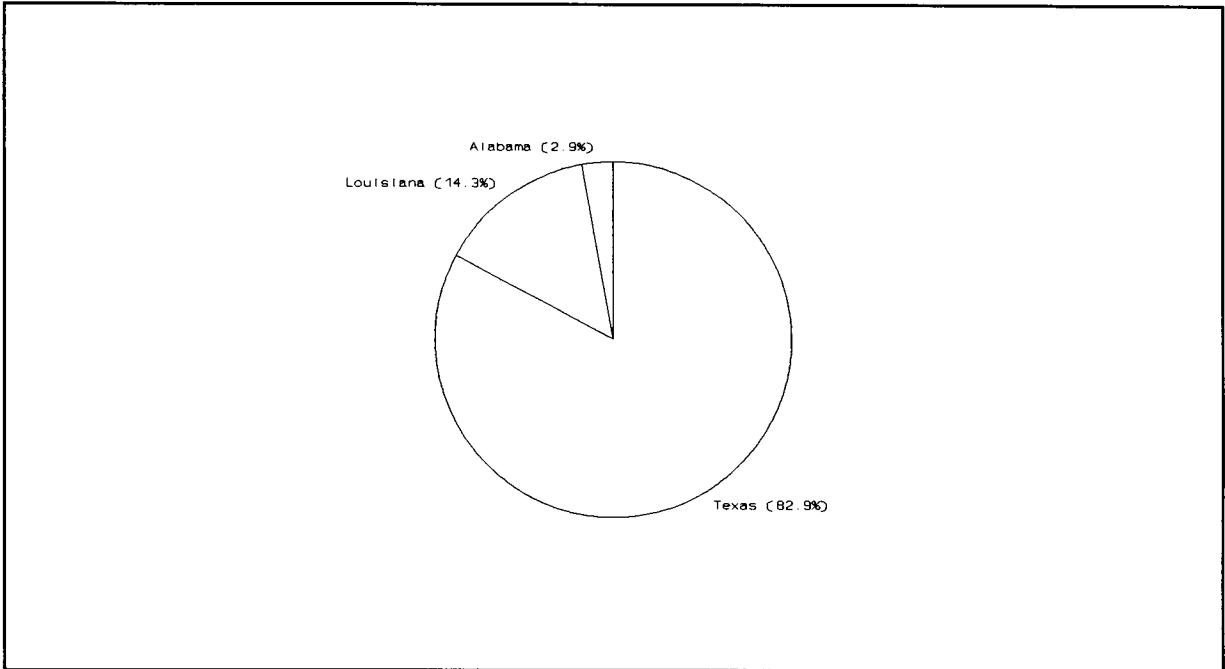


Figure 3.9 Location of GOM Headquarters by State in 1994

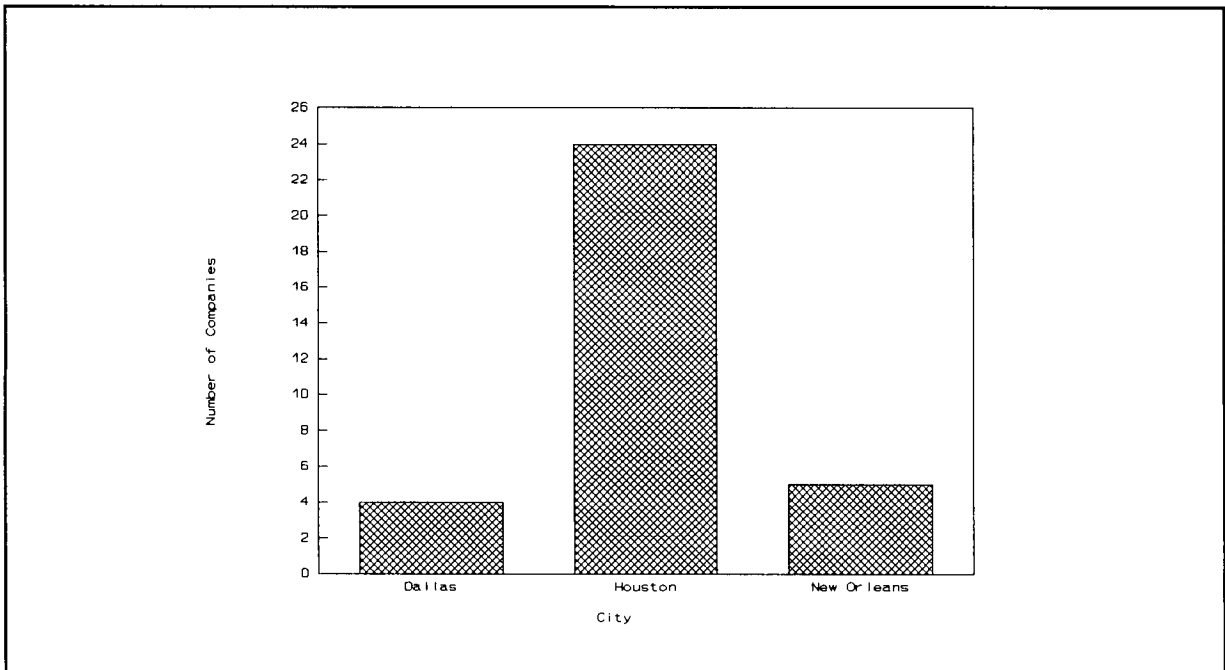


Figure 3.10 Common Cities for Headquarters in 1994

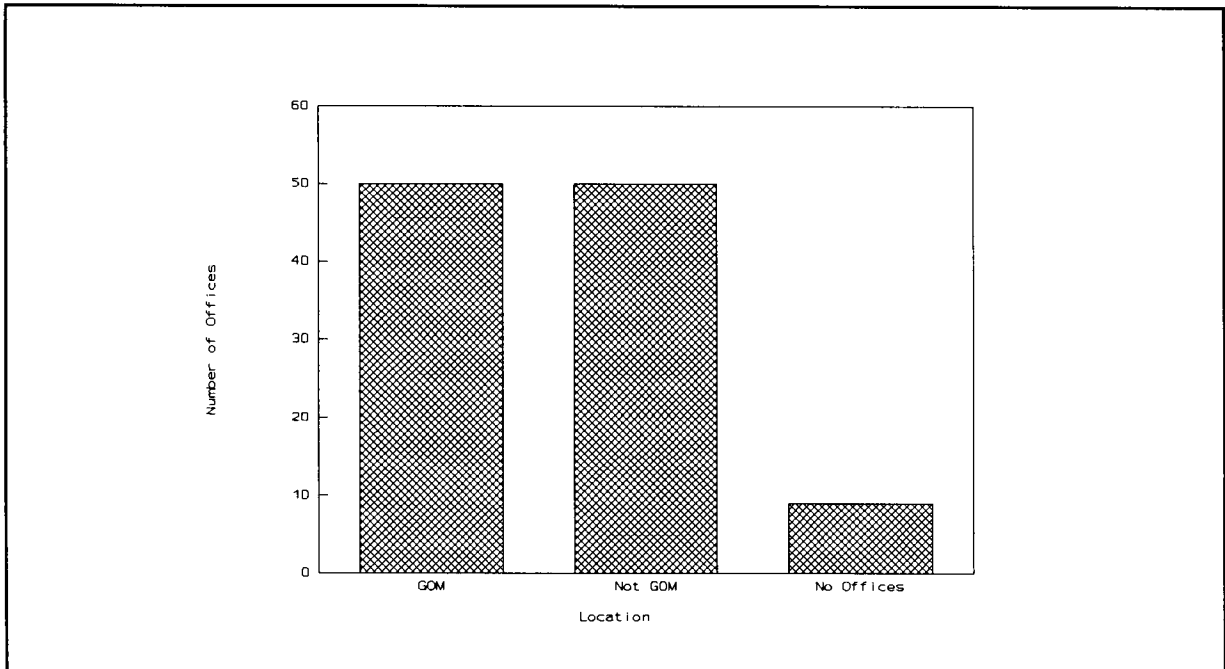


Figure 3.11 Location of Other Offices in 1994

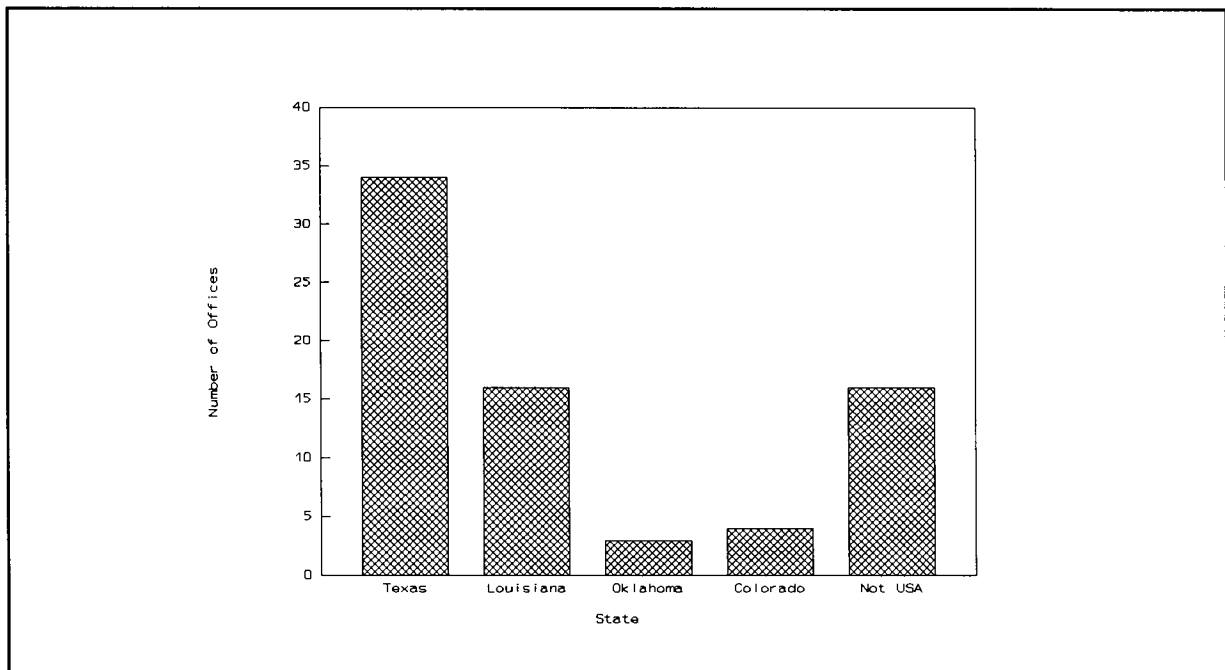


Figure 3.12 Location of Other Office by State in 1994

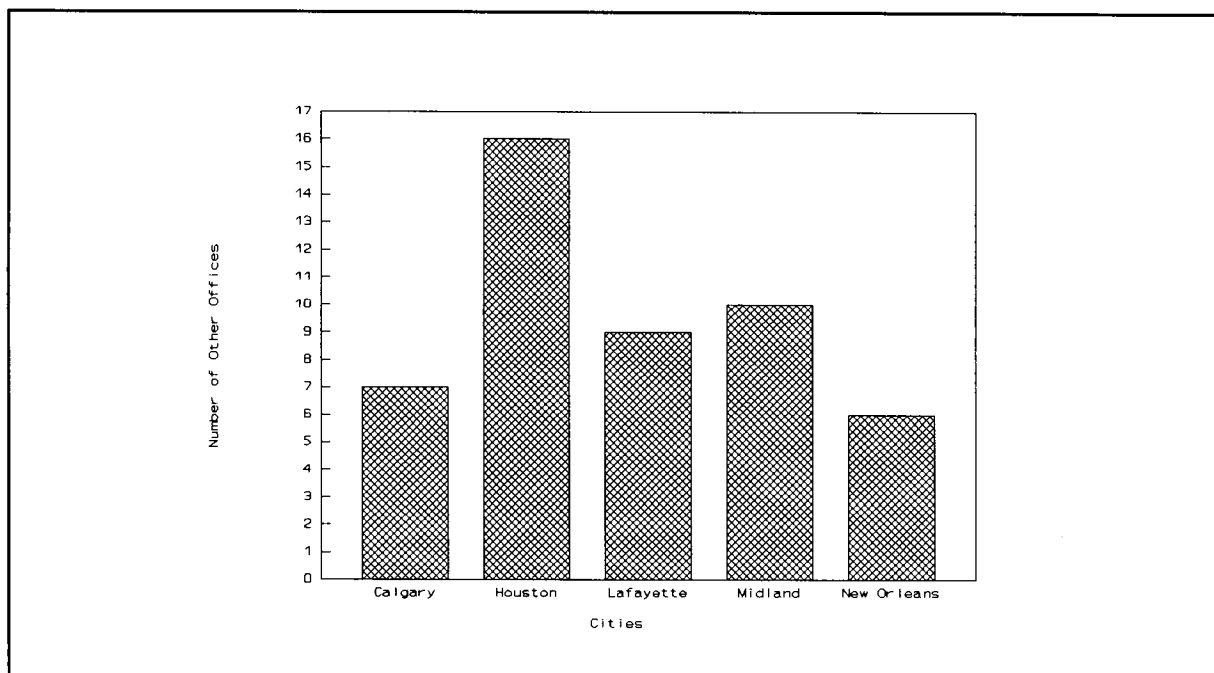


Figure 3.13 Common Cities for Other Offices in 1994

The executives responded to questions concerning the number of employees involved in offshore activities in the Gulf of Mexico. According to their answers, the offshore petroleum and gas companies had between 0 and 1,650 employees working in activities related to extraction in the Gulf (see table 3.1). The mean number of workers was 167 while the median was 40. Ninety percent of the companies employed more than 5 people while only 10 percent had more than 441 employees. Over half (53 percent) of the businesses increased their staff involved in activities in the Gulf since 1986 while 38 percent decreased their workforce and 9 percent had the same number of employees (see table 3.2).

Table 3.1  
Distribution of Employees in 1994

	Mean	Median	Mode	Minimum	Maximum
Total Workers	167	40	---	0	1650
Drilling	6	2	2	0	80
Exploration	23	10	3	0	290
Production/Platform Work	72	7	4	0	700
Research and Development	2	0	0	0	35
Administration	23	12	3	0	250
Engineering	16	3.5	0	0	330
Shipping/Pipelines	1	0	0	0	30

Note: Production and Platform work were combined because some companies could not report the number of employees in each category separately. One company was omitted because the respondent could not give only the number of offshore employees.

Table 3.2  
Changes in Workforce Distribution from 1986 to 1994

	Percentage of Companies		
	Increase	Decrease	Same Number
Total Workers	53	38	9
Drilling	48	30	22
Exploration	57	30	13
Production	49	29	22
Platform Work	37	30	33
Research and Development	4	17	78
Administration	50	35	15
Engineering	33	33	34
Shipping/Pipelines	9	15	76

Note: Most of the companies had no employees in research and development or shipping/pipelines in either year.

The officials were asked to indicate the number of people employed in each of the following activities in the Gulf: drilling, exploration, production, platform maintenance/operation, research and development, administration, engineering, and shipping/pipelines. Most of the employees who were involved in the Gulf were employed in administration, exploration, and production and platform maintenance/operation. The largest median numbers of employees were 12 for administration, 10 for exploration and 7 for production and platform maintenance/operation (see table 3.1). The median number of employees in the other

categories were lower: 3.5 for engineering, 2 for drilling, and 0 for shipping/pipelines and research and development. Very few companies had any employees in shipping/pipelines and research and development. The companies' representatives also discussed how the number of employees in the Gulf in each of these activities had changed (increased, decreased, or stayed the same) since 1986. Approximately 50 percent of the firms had increased the numbers of employees in exploration (57 percent), administration (50 percent), production (49 percent) and drilling (48 percent) since 1986 (see table 3.2). In addition, 37 percent of the respondents said that their business had more employees in platform maintenance/operation in 1994 than in 1986. In most of the companies, the number of employees in research and development (78 percent) and shipping/pipelines (76 percent) had not changed since 1986. However, few firms had any employees in either of these two categories in either 1994 or 1986. In addition, the numbers reported for 1994 should be considered approximate since some respondents had difficulty separating onshore from offshore employees.

### **BUSINESS ENVIRONMENT**

There are several aspects of the business environment of companies operating in the Gulf of Mexico. Some components of this business environment are the following: the federal agencies and regulations that control offshore oil and gas extraction, the technology available, the relationships among the companies that operate in the Gulf including their participation in joint ventures, the ability of service companies to assist oil and gas extraction firms with their activities, and the oil and gas extracting enterprises' views of the future of such operations in the Gulf of Mexico.

The findings can be summarized as follows. First, the five federal agencies with the greatest influence on oil and gas extraction companies' operations in the Gulf in descending order were: the Minerals Management Service, the Environmental Protection Agency, the Coast Guard, the Department of Transportation, and the Occupational Safety and Health Administration. Second, when asked about four pending regulations that would apply to offshore operations, the executives ranked the Clean Water Act as having the greatest impact on their procedures succeeded in descending order by the financial responsibility provisions of OPA '90, the Clean Air Act, and the increase in lease bonding to cover plug-and-abandon liabilities. Third, when queried about the employment of new technology, the respondents' answers demonstrated that almost all of the companies used 3D seismic data, almost half of them did horizontal drilling, and somewhat over a third of them were involved in deep water and subsalt exploration. Fourth, the outcome concerning joint ventures shows that almost all of the firms were involved in joint ventures, most participated in more joint ventures now than in 1986, and the type of company most frequently mentioned as a joint venture partner was major corporations. Fifth, the responses about hiring service companies indicated that almost all of the businesses contracted out some activities, the use of such companies increased since 1986, and the proportion of Gulf of Mexico operating costs expended in hiring service companies increased since 1986. Sixth, the executives views on the future of oil and gas exploration in the Gulf were optimistic.

## Federal Agencies and Regulations

Federal agencies and regulations are part of the business environment in which oil and gas extraction from the Gulf of Mexico occurs. The respondents were asked to list in order the five federal agencies whose policies and regulations have the most effect on their companies' operations in the Gulf of Mexico. Table 3.3 displays the results.

Table 3.3  
Federal Agencies with the Greatest Effect on Gulf Extraction

	Rankings					Total Mentions
	1	2	3	4	5	
Coast Guard	0	13	20	4	1	38
Coastal Zone Management	0	0	0	2	0	2
Corp of Engineers	0	0	1	1	1	3
Department of Commerce	0	0	0	0	1	1
Department of Transportation	0	0	6	12	4	22
Environmental Protection Agency	2	25	9	2	1	39
Federal Communication Commission	0	0	0	0	1	1
Federal Energy Regulatory Commission	0	2	0	0	1	3
Internal Revenue Service	0	0	0	1	0	1
Minerals Management Service	41	2	1	1	0	45
National Marine Fisheries Service	0	0	1	2	3	6
National Oceanic and Atmospheric Administration	0	0	0	1	1	2
Occupational Safety and Health Administration	1	0	2	6	5	14
Office of Central Compliance--Department of Labor	0	0	0	0	1	1
Total Companies	44	42	40	32	20	---

Examining the total number of mentions for each of the 14 agencies it is apparent that the five most important agencies were: the Minerals Management Service, the Environmental Protection Agency, the Coast Guard, the Department of Transportation, and the Occupational Safety and Health Administration. However, the problem with this analysis is that ignores the fact that the executives were asked to list the agencies in order from that with the most effect to that with the least and not just to list five federal agencies that are important in their operations in the Gulf. Therefore, it is necessary to examine the agencies within each rank to determine which agency is most often listed as having the greatest effect, which has the second largest influence and so forth. Comparing agencies within each of the five ranks, the most important agencies in terms of their impact on offshore oil and gas extraction in

descending order were: 1) the Minerals Management Service, which was the agency most frequently mentioned as having the greatest impact; 2) the Environmental Protection Agency, which was the agency most often referred to as having the second largest influence; 3) the Coast Guard; 4) the Department of Transportation (two respondents qualified their listing of this department by stating specifically the Office of Pipeline Safety); and 5) the Occupational Safety and Health Administration.

When examining the federal agencies listed in table 3.3, three other aspects of the findings should be noted. First, a plethora of federal agencies were involved in offshore oil and gas extraction in the Gulf. Fourteen agencies were mentioned as among the five having the most impact on these firms' operations. Second, the greater the rank (the less impact), the less consensus there was in the choice of agency. The Minerals Management Service was overwhelmingly mentioned as having the greatest effect; only two other offices were mentioned and neither was referred to more than twice. In contrast, the Environmental Protection Agency was the agency most often listed as second, but the Coast Guard received over half the mentions the Environmental Protection Agency got as being second in impact. In addition, more agencies were listed. The consensus became less with each successive rank. Third, the more rankings requested, the smaller number of respondents who gave an agency name. Forty-four company representatives listed an agency as first, 42 gave a name for the second rank, 40 submitted an agency as third, but only 32 officials mentioned an agency as fourth and only 20 gave an agency name for the fifth rank.

As stated previously, not only do federal agencies affect operations in the Gulf, but also regulations are of great importance in impact on these activities. There are four major regulations that are of concern for companies operating in the Gulf of Mexico: the increases in lease bonding to cover plug-and-abandon liabilities, the possibility of a water quality standard that would require reinjection of produced water (Clean Water Act as of the fall of 1994), the potential for an extension of onshore standards for air emission controls to the offshore Gulf (Clean Air Act), and the financial responsibility provisions of the Oil Pollution Act of 1990. The respondents were asked to rank these four regulations from 1 for the regulation that would have the greatest impact on their operations to 4 for the regulation that would have the least impact. When two regulations were given the same ranking by a respondent, the rankings were recalculated to enable the range of rankings to be from 1 to 4. For example, if a respondent said that the plug-and-abandon liabilities was 1, the implications of the clean water and air acts were both 2, and the financial responsibility provisions were 3, the ranks were reassigned as follows: the plug-and-abandon liabilities regulation was coded 1, the implications of the clean water and air acts were each coded 2.5 (the mean of the two ranks - 2 and 3), and OPA '90 was coded 4. This is the manner used to accommodate ties when calculating statistics such as Spearman's rho.

The summary statistics for the rankings by the respondents are in table 3.4. The regulation that the companies' representatives felt would have the greatest effect on their operations in the Gulf was the Clean Water Act followed closely by OPA '90. The Clean Water Act had the lowest mean while OPA '90 had the second lowest mean. Both regulations had the lowest

medians and modes. The other two regulations had much higher means, but the Clean Air Act elicited greater concern than did the increases in lease bonding to cover plug-and-abandon liabilities. The mean for the Clean Air Act was slightly lower than that for the plug-and-abandon liabilities, although the medians were the same. The Clean Air Act had two modes while the plug-and-abandon liabilities had the highest mode. However, each regulation was ranked as having the greatest impact by at least one company and each regulation was ranked as having the least impact by at least one company.

Table 3.4  
Rankings of Regulations

All Companies					
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.0	3	4	1	4
Reinjecting Produced Water	2.0	2	1	1	4
Air Emission Controls	2.9	3	-	1	4
Financial Responsibility in OPA '90	2.1	2	1	1	4
Major Corporations					
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.5	4	4	1	4
Reinjecting Produced Water	1.4	1	1	1	3
Air Emission Controls	2.4	2	2	1	4
Financial Responsibility in OPA '90	2.7	3	3	2	4
Large Integrated Businesses					
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.6	4	4	3	4
Reinjecting Produced Water	1.5	1	1	1	4
Air Emission Controls	2.3	2	2	1	4
Financial Responsibility in OPA '90	2.5	3	3	1	4



Table 3.4  
Rankings of Regulations  
(continued)

Small Integrated Firms					
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.0	3	3	3	3
Reinjecting Produced Water	1.7	1	1	1	3
Air Emission Controls	1.7	2	2	1	2
Financial Responsibility in OPA '90	3.7	4	4	3	4
Large Nonintegrated Enterprises					
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.1	4	4	1	4
Reinjecting Produced Water	2.3	2	2	1	4
Air Emission Controls	3.3	3	3	3	4
Financial Responsibility in OPA '90	1.2	1	1	1	2
Small Nonintegrated Endeavors					
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	1.7	2	2	1	3
Reinjecting Produced Water	3.0	3	3	2	3.5
Air Emission Controls	3.9	4	4	3.5	4
Financial Responsibility in OPA '90	1.4	1	1	1	2

## Technology

As oil and gas reserves in the Gulf shrink, better technology to extract the remaining oil and gas becomes more important. Therefore, the respondents were asked to report if their company: was currently involved in or planning to do deep water projects, used 3D seismic data, was involved in subsalt exploration, or did horizontal drilling. Somewhat more than a third of the businesses were involved in or planning to do deep water projects and the same amount were involved in subsalt exploration (see figure 3.14). A slightly greater percentage of the firms did horizontal drilling in the Gulf. In contrast, almost all of the enterprises employed 3D seismic data.

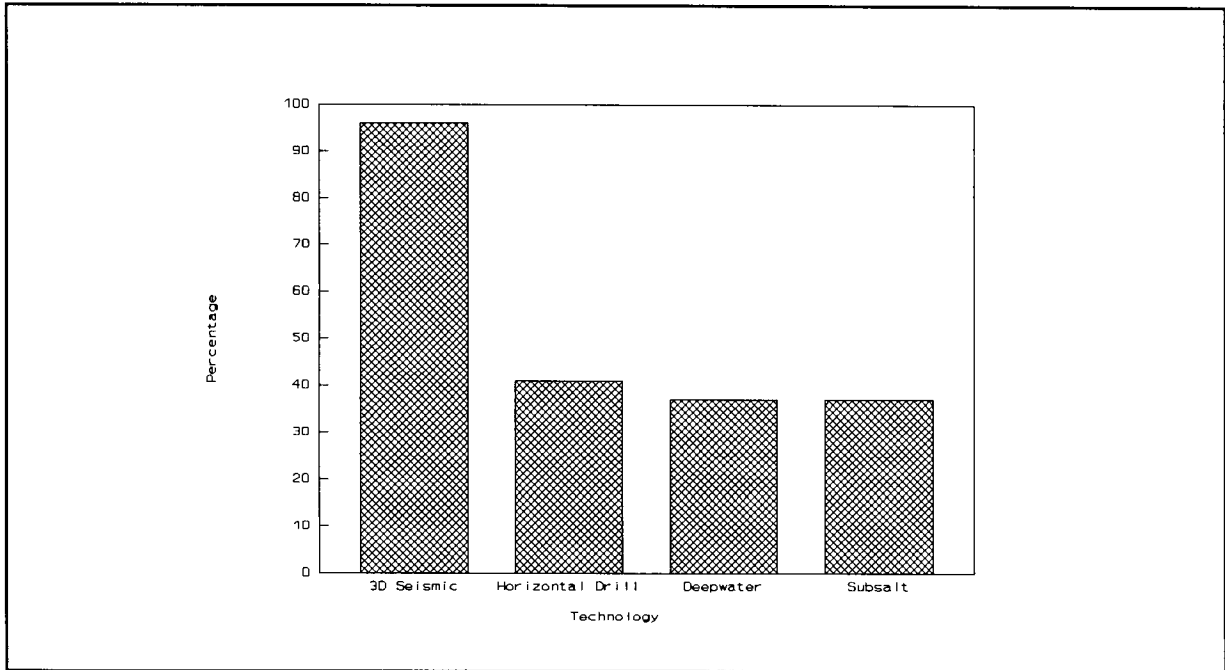


Figure 3.14 Use of New Technology

### Joint Ventures

As oil and gas exploration in the Gulf of Mexico becomes more expensive and entails greater risk, ways to share expenses and reduce risk become more important. One way to accomplish both objectives is to participate in joint ventures. The executives were asked if their company had conducted any joint ventures in the past year and in 1986. The responses indicated that almost all of the companies were involved in joint ventures in the last year (see figure 3.15) and most of the firms participated in joint ventures in 1986 (see figure 3.16). For the pretest, the respondents were asked to list the names of the companies with which they conducted joint ventures, although some mentioned a few companies and then stated a total number of joint ventures. The number of companies listed by name or given as a total number ranged from 2 to 50 with a mean of 16 and a median of 8.5. On the interview, the representatives of the firms were asked the total number of companies with which they had conducted joint ventures. These answers ranged from 0 to 90 with a mean of 11, a median of 8 and a mode of 10. On the interview, the respondents answered a question concerning how the number of joint ventures had changed since 1986. The majority said that their firm was involved in more joint ventures now while some stated that the number of joint ventures had decreased since 1986 and others claimed that the number had not changed since 1986 (see figure 3.17).

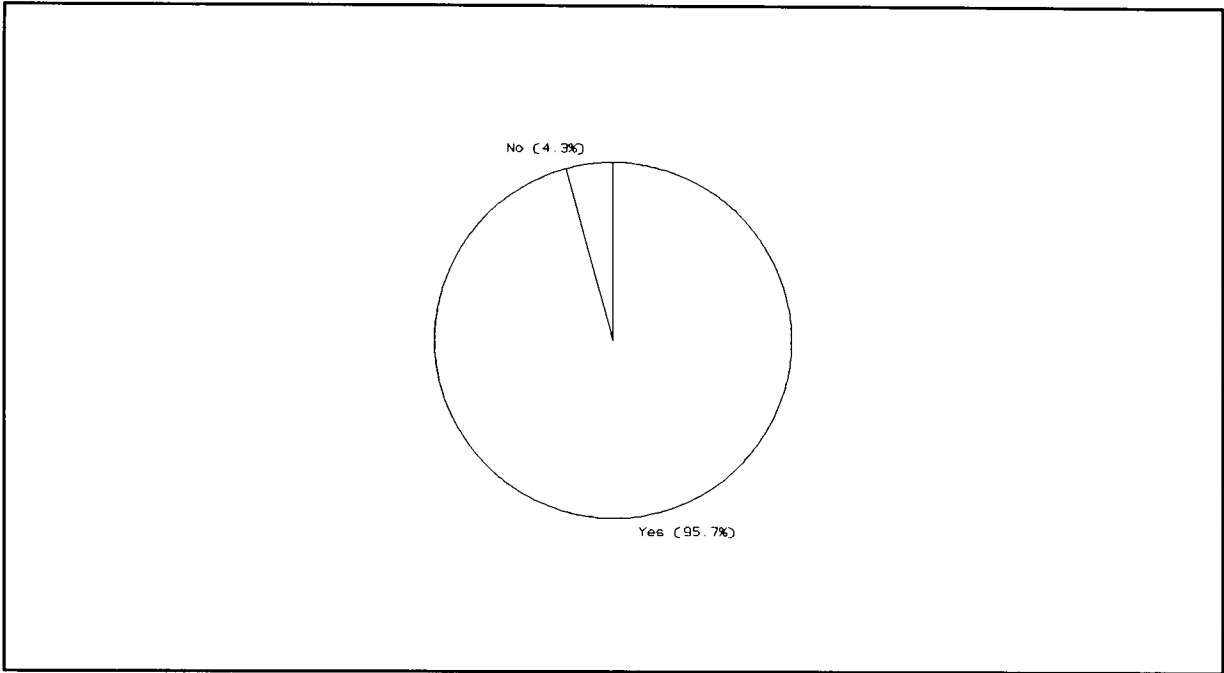


Figure 3.15 Participation in Joint Ventures in 1994

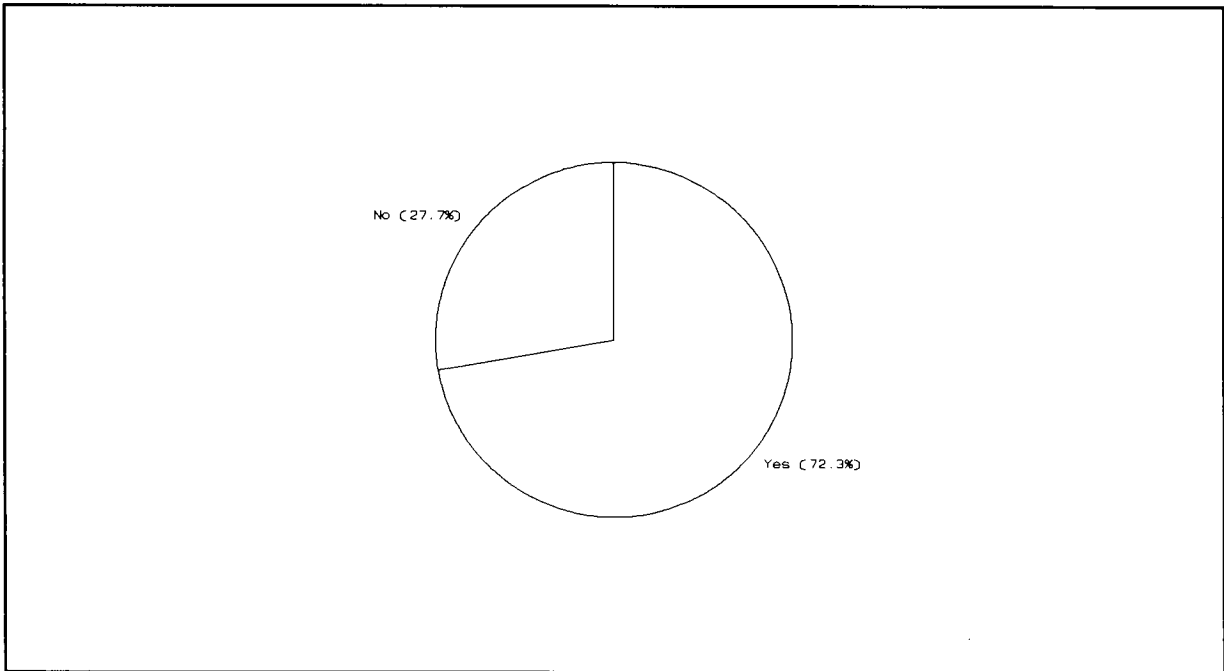


Figure 3.16 Participation in Joint Ventures in 1986

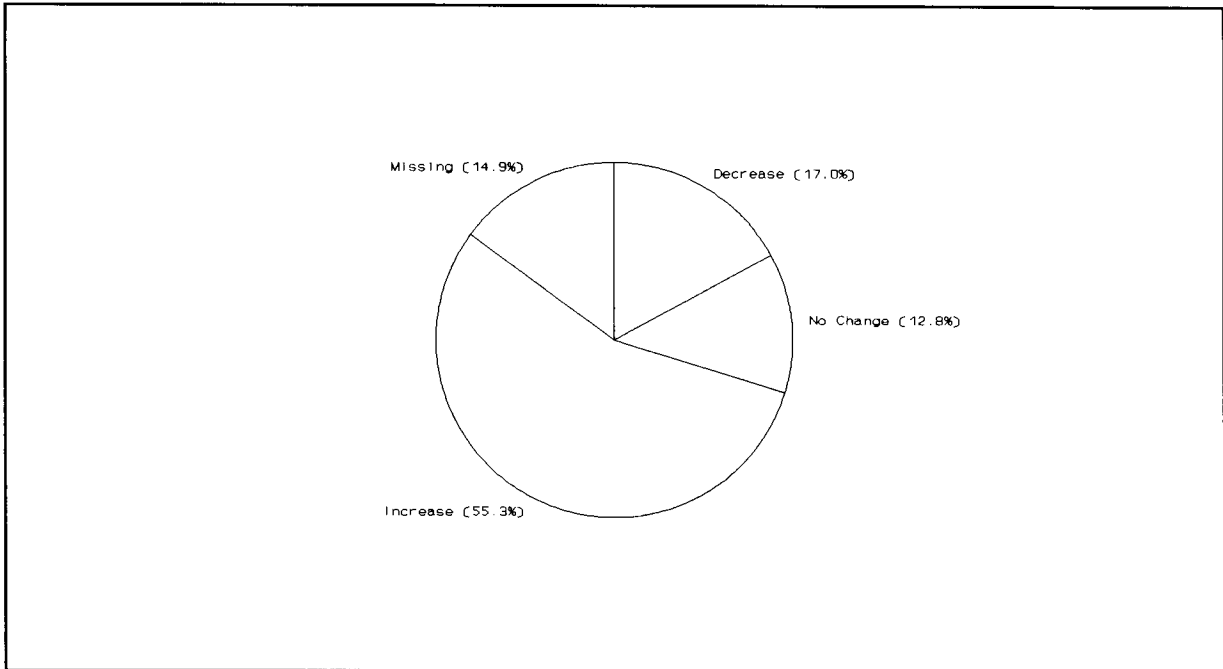


Figure 3.17 Changes in Joint Venture Participation 1986 to 1994

For the interview, the respondents were asked to list their company's most frequent joint venture partners. The findings were examined to determine three things: 1) what type of company was most often mentioned as the most common joint venture associate, 2) did the type of company stated as the most frequent partner differ by the type of company the respondent was employed by, and 3) if any particular company(ies) were listed repeatedly as the most habitual partner. First, the type of company most often listed as the most regular partner was a major corporation (see table 3.5). Second, with one exception, large concerns mentioned major corporations as their most common partner. In contrast, with one exception, large and small nonintegrated enterprises gave the names of small nonintegrated businesses as their most frequent colleague. Third, the company declared most often as the most regular partner was a major company; however, two large nonintegrated firms and one small nonintegrated business were mentioned almost as often.

Table 3.5  
Most Frequent Joint Venture Partner

---

Most Frequently Mentioned Companies by Type	Number of Mentions
Major	11
Large Integrated	4
Small Integrated	2
Large Nonintegrated	6
Small Nonintegrated	4
Commonly Selected Companies	Number of Mentions
Major A	3
Large Nonintegrated A	2
Large Nonintegrated B	2
Small Nonintegrated A	2

---

Table 3.6  
Joint Venture Partners

---

Most Frequently Mentioned Companies	Number of Mentions
Major 1	10
Major 2	5
Major 3	6
Major 4	9
Major 5	6
Major 6	6
Major 7	5
Major 8	5
Large Integrated 1	7
Large Integrated 2	8
Large Nonintegrated 1	5
Large Nonintegrated 2	5
Small Nonintegrated 1	9
Small Nonintegrated 2	7

---

Although the pretest and interview used slightly different questions (the pretest asked for the names of all partners and the interview elicited the names of the five most frequent partners), the responses concerning who is participating with whom were the same. There were 14 companies that were listed as common joint venture partners by five or more other businesses. Of these 14, 8 were major corporations, 2 were large integrated concerns, 2 were large nonintegrated firms, and 2 were small nonintegrated businesses (see table 3.6).

### Use of Service Companies

Another way to reduce investment in the Gulf is to hire service companies to undertake some aspects of oil and gas exploration and production. Thus, the executives were queried about their firms' use of outside contractors in the fall of 1994 and in 1986, the cost of hiring outside companies and the types of activities for which these companies were hired. Almost all of the businesses used outside companies to conduct some of their activities in the Gulf (see figure 3.18). Most of the firms' representatives reported that their use of outside companies had increased since 1986, while some claimed that their use had not changed and others stated that they used outside companies less now (see figure 3.19). The respondents answered a question concerning the current cost of their use of outside companies as a percentage of their costs of operations in the Gulf. The percentages ranged from 0 to 100 percent with a mean of 60, a median of 75, and a mode of 90. In addition, most of the officials indicated that the percentage of operating costs in the Gulf incurred by hiring outside companies had increased since 1986 while another large group stated that the percentage had not changed and a few claimed that the percentage had decreased (see figure 3.20).

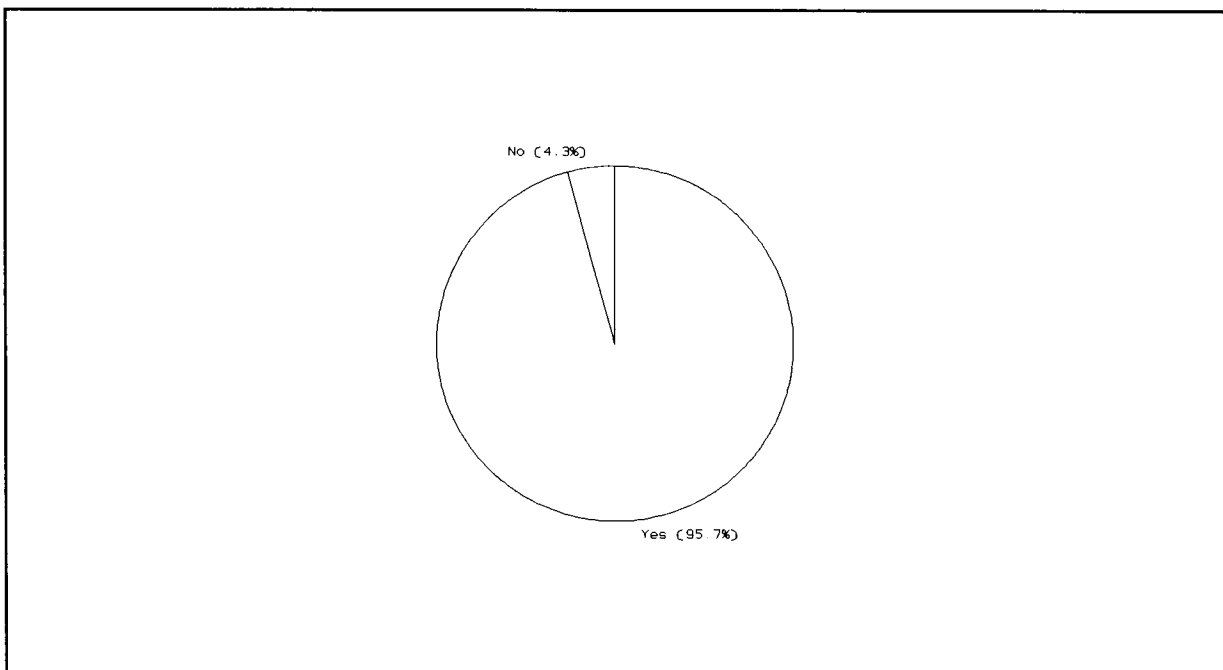


Figure 3.18 Use of Contractors in 1994

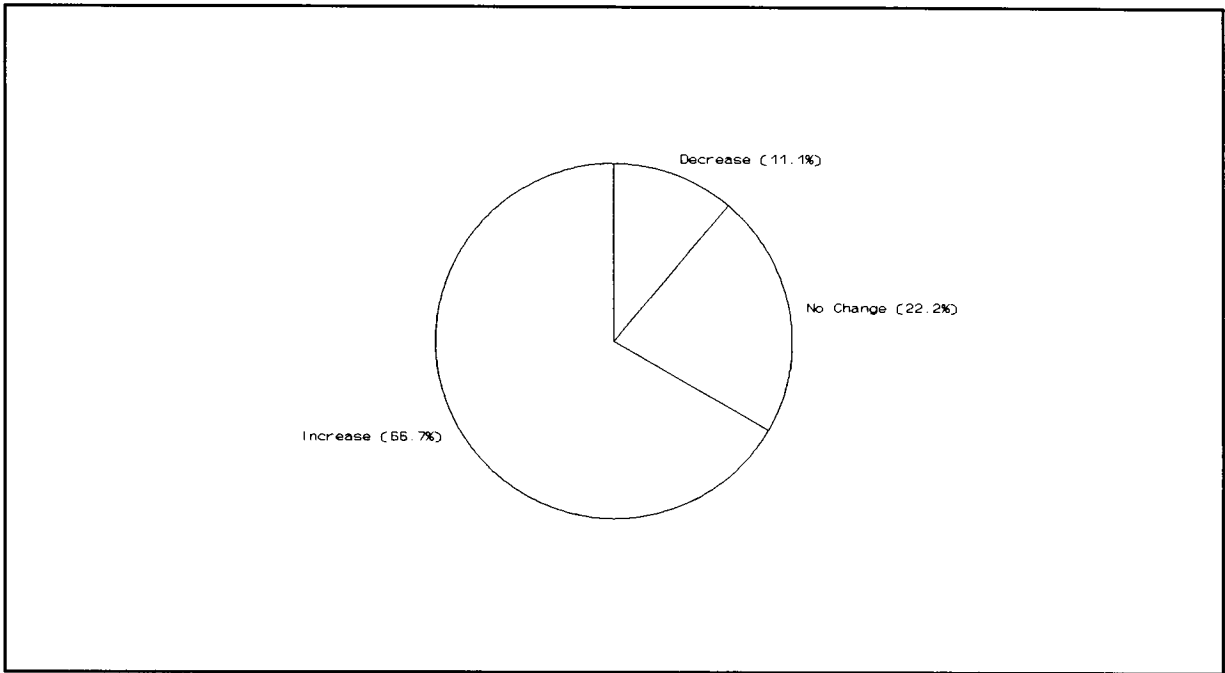


Figure 3.19 Change in the Use of Contractors 1986 to 1994

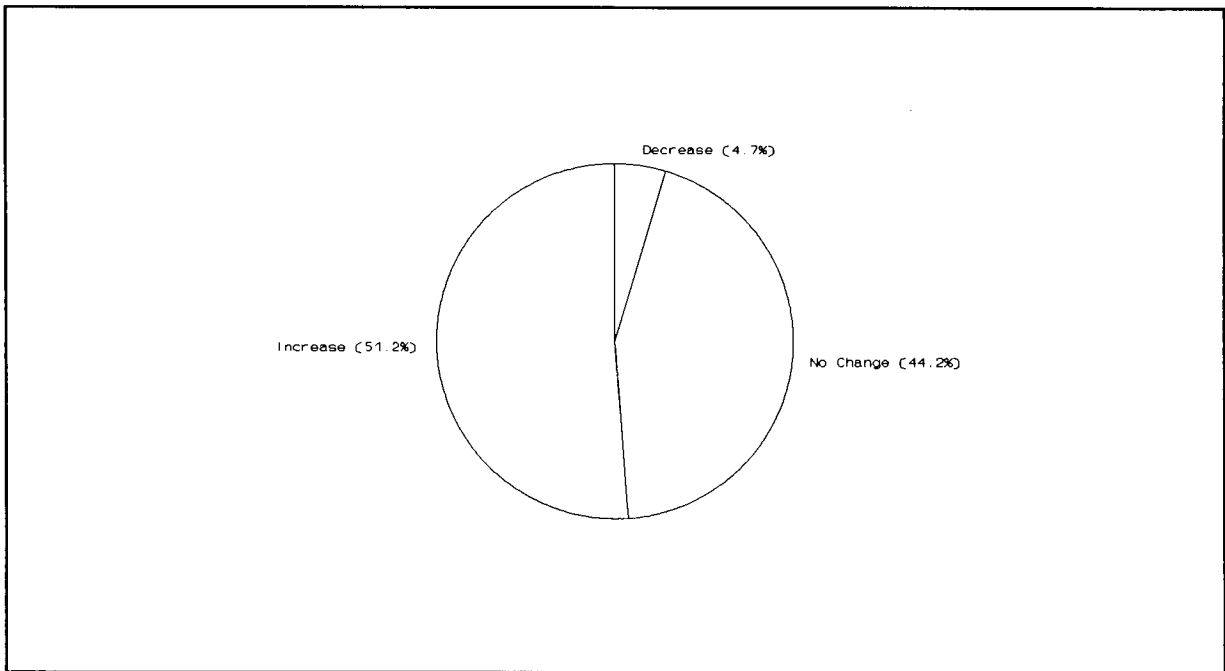


Figure 3.20 Change in Percentage of GOM Cost 1986 to 1994

The respondents were asked about whether they hired outside companies to engage in specific tasks. The responsibilities differed on the interview and the pretest; therefore the results will be discussed separately. For the interview (N=37), the activities that the companies were most likely to contract out were (in descending order): seismic and other geophysical (94 percent), drilling (91 percent), platform maintenance/operation (86 percent), and other (82 percent). Some respondents listed the types of work they were including in the category "other": field study, logging, evaluation, construction design, consulting, helicopter transportation and other transportation. Seventy-four percent of the companies contracted out the following activities: production, engineering, and shipping/pipelines. Very few businesses (9 percent) hired outside companies to do accounting. For the pretest (N=10), the operations most likely to be contracted out were (in descending order): drilling (90 percent), exploration (80 percent), platform work (80 percent) and engineering (70 percent). A moderate percentage of businesses employed outside companies to work on shipping and pipelines (60 percent), to do research and development (50 percent) and to do production (44 percent). Very few of the oil and gas extracting enterprises contracted out administration activities (22 percent).

### **Outlook on the Future of Oil and Gas in the Gulf**

Another aspect of the business environment is the prospect for future oil and gas exploration and production in the Gulf of Mexico. If the companies perceive the outlook to be dismal, this prediction is likely to affect their current operations as would the perception that the outlook is bright. To ascertain the outlook for the future of these activities, the respondents were asked to compare the amount of exploring in which their company would be engaged in 1998, the size of the workforce in 1998, and the independent companies' share of Gulf activity in 1998 with the status of these three factors in the fall of 1994. Overall, the officials involved in this study were optimistic about the future of oil and gas exploration in the Gulf of Mexico. Most of the executives felt that their companies would be more engaged in exploring for oil and gas in 1998 than in 1994 and half of the officials thought that the workforce would be larger in 1998 than in 1994. Specifically, when the respondents were asked if they thought their company would be more or less involved in oil and gas exploration in the Gulf in 1998, the majority said that their company would be more involved (see figure 3.21).

For the interview, the respondents were also asked why they predicted the level of involvement in exploration that they anticipated. These answers were quite diverse. The reasons why their firm would be doing more exploring in 1998 included: the anticipated prices of oil and gas, particularly gas (4 people); the opportunities available due to subsalt technology (2); other growth opportunities in the Gulf (3); the characteristics of the Gulf (1); the leases they have and the drilling requirements necessary to keep these leases (1); their ability to participate in joint ventures (2); and their company's commitment to the Gulf (2). The explanations for less involvement in exploration were: the fact that the Gulf is a mature resource extraction area (1 person); the expense of deep water projects (1); their particular



firms' characteristics (2); and regulations for extraction in the Gulf (1). Some executives expected their firms to continue exploring at the same rate that they were exploring in 1994. Their arguments for this prediction consisted of their company's particular focus (1 person); the anticipated prices of oil and gas, particularly gas (3); and other miscellaneous reasons (3).

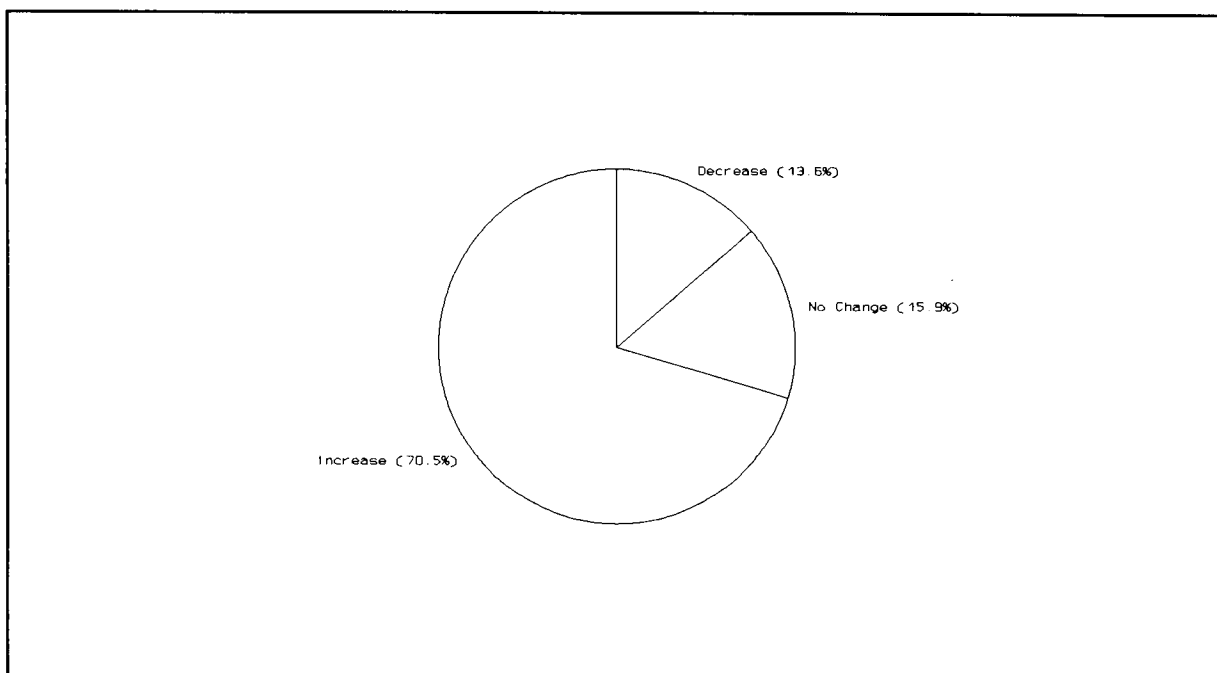


Figure 3.21 Expected Change in Exploration 1994 to 1998

Over half of the respondents felt that the workforce involved in offshore oil and gas exploration and production in the Gulf in 1998 would be larger than it is presently (see figure 3.22). Their rationales for their predictions varied greatly. Their explanations for the expectation of a larger workforce consisted of the following: there will be more fields and development (3 people); the anticipated prices and payoff for new technology employed in the Gulf (4); the greater exploration expected in 1998 (1); the idea that the workforce now is as small as possible (2); the presumption that there will be more companies in 1998 (3); the anticipated expansion of Gulf activities (3); and the complexity of projects in the Gulf (1). Some executives predicted that the workforce will be smaller for the following reasons: the disposition of properties by the major corporations (1 person); reduced exploration and production (2); streamlining of the workforce (1); and new regulations (1). Those who thought that the workforce would be the same size in 1998 as in 1994 cited streamlining of the workforce (3 people) and outsourcing (1).

The company representatives were also queried about the independent companies' share of activity in the Gulf in 1998. Most of the respondents thought that the independents' proportion of activity in the Gulf in 1998 would be larger than it currently is while a few

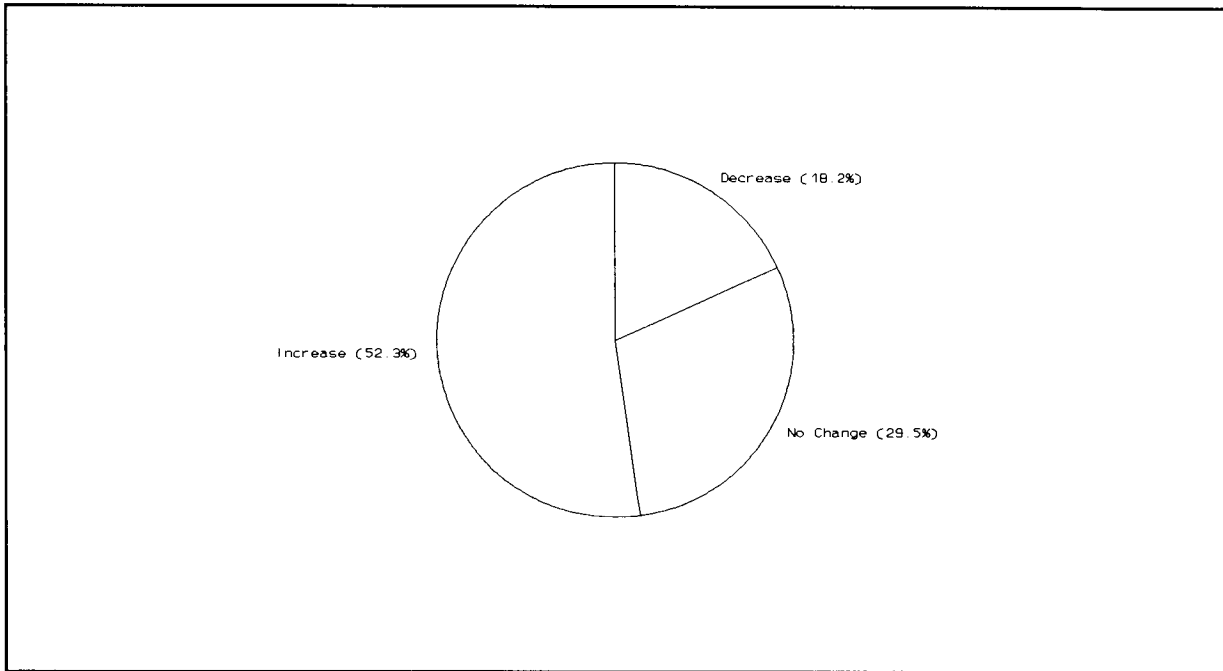


Figure 3.22 Expected Change in Workforce 1994 to 1998

declared that it would be smaller and one felt that it would remain the same (see figure 3.23). Again the reasons varied widely. Those who predicted that the independent firms' share would be larger gave the following explanations: the general trend in this direction in the Gulf (3 people); the marginal and mature nature of the fields in the Gulf (7); the trend of the major corporations to leave the Gulf (6); the competitive strategies of the independent firms (4) and the overall approach of the major corporations (2). In addition, one person stated that the independent businesses viewed the Gulf as a rapid growth opportunity and another claimed that 3D seismic data would assist the independents. Some executives pointed out that the independent firms' share in the Gulf as a whole might be greater, but the major corporations' participation would be greater in subsalt areas (1 person) and deep water (5). One representative from a major company suggested that the independent companies' allotment of the activity would be smaller in 1998 due to regulations, particularly financial responsibility and bonding while one official from a large integrated concern stated that the shares would remain as they were in 1994 because the major corporations were taking note of the success of the independent firms and changing their operations accordingly. In fact, in answers to the questions about exploration, the workforce, and the independent companies' share of activity, an executive from one major corporation repeatedly stated that his/her company operated in the Gulf like a small independent company but had the financing of a

major corporation. Five executives were unwilling to predict the size of the independent firms' share of activity in the Gulf and one of these stated that the portions depended on the major corporations' divestitures and federal regulations.

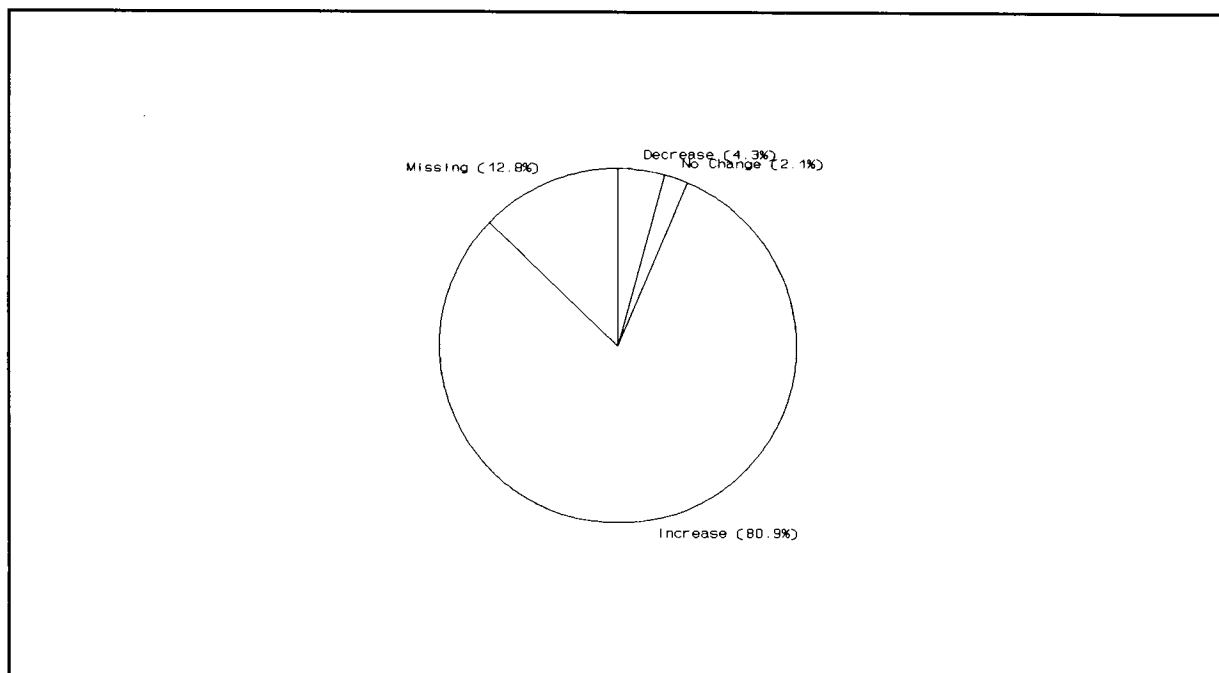


Figure 3.23 Expected Change in Independents' Share 1994 to 1998

### BUSINESS PRACTICES

Another purpose of this study was to ascertain how business characteristics affect business practices. The respondents were not asked directly how their companies' characteristics are related to business practices because it is doubtful that they could have answered this question. However, some of the information obtained can be used to examine this issue. It is not possible to discuss how business traits affect practices overall because the influence of these traits on operations differed by type of company. Thus, the impact of characteristics on practices will be presented in the next chapter.

An additional purpose of the investigation was to examine how the business environment in the Gulf of Mexico is associated with the companies' practices. Some of the questions directly obtain this information in that the executives were asked how prices, leasing policies, technology, and regulations affect their companies' operations in the Gulf. Further, it is possible to present how the business environment influenced practices of the companies in general and this information will be presented here.

The findings concerning the effect of the business environment on practices in the Gulf showed the following. First, the largest group of respondents suggested that the current prices of oil and gas reduced exploration and production activity in the Gulf. Second, almost half of the executives were not optimistic about future prices and expected these prices to decrease activity in the Gulf. Third, the officials overwhelmingly supported two leasing policies: areawide leasing and the reduction of the minimum bid to \$25. Some of the study participants credited these two policies for increasing operations in the Gulf. Fourth, the respondents viewed the influence of 3D seismic data on operations very positively and those familiar with horizontal drilling were favorable about this technology's impact on activity, but deep water and subsalt exploration technologies are too expensive and too new for many of the executives to be able to discuss the effects on procedures in the Gulf. Fifth, as would be expected, the officials were overwhelmingly against the four pending regulations.

### **Practices as Affected by the Business Environment**

Business practices can be affected by aspects of the business environment. The executives were queried about how some factors of the environment affected the oil and gas extraction companies' operations in the Gulf. These facets were: 1) the current prices of oil and gas and the firms' predictions of future prices; 2) leasing policies, specifically the switch to areawide leasing in 1983 and the reduction of the minimum bid to \$25 per acre in 1987; 3) technologies to enhance extraction in the Gulf, particularly deep water technology, 3D seismic data, technology used in subsalt exploration, and horizontal drilling; and 4) regulations, especially the financial responsibility provisions of OPA '90, the increases in lease bonding to cover plug-and-abandon liabilities, and the Clean Air and Water Acts. The effect of these four aspects of the business environment on operations in the Gulf will be discussed in the order listed.

**The Effects of Prices on Operations.** Both the current prices of oil and gas and the expectations for future prices of oil and gas can affect business practices of oil and gas extraction companies in the Gulf of Mexico. To ascertain how the prices of oil and gas affect operations in the Gulf, the respondents were asked to talk about how the current prices of oil and gas have affected operations in the Gulf. Almost half of the company representatives discussed how activities in the Gulf slowed down due to the deflated prices of oil and gas (see figure 3.24). For example, one executive said, "Current prices slow operations down, stretched out the process and prevented us from some development". Other officials pointed out that low prices: slowed down exploration and production; caused the firm to sell some properties or to forego exploration, drilling, lease sales and new projects; and prompted the business to examine more closely all properties, development and exploration. Another common response focused on the company's other economic problems due to the low prices. These difficulties included: budgeting issues, decline in the capital budget, the cost of exploratory drilling due to the way dry holes are charged to budgets, the decrease in investments and profits, curtailed cash flow, the hardship in trying to make a return, the increased economic limits of early abandonment, and banks demanding faster loan repayments which decreases the money available.

Another large group of respondents claimed that the current prices had no effect on their businesses' operations. Similarly, some of the representatives pointed out that their company focuses only on future prices. For instance, one person said, "We made our exploration and development expenditures based on long-term prices. What happens this month generally

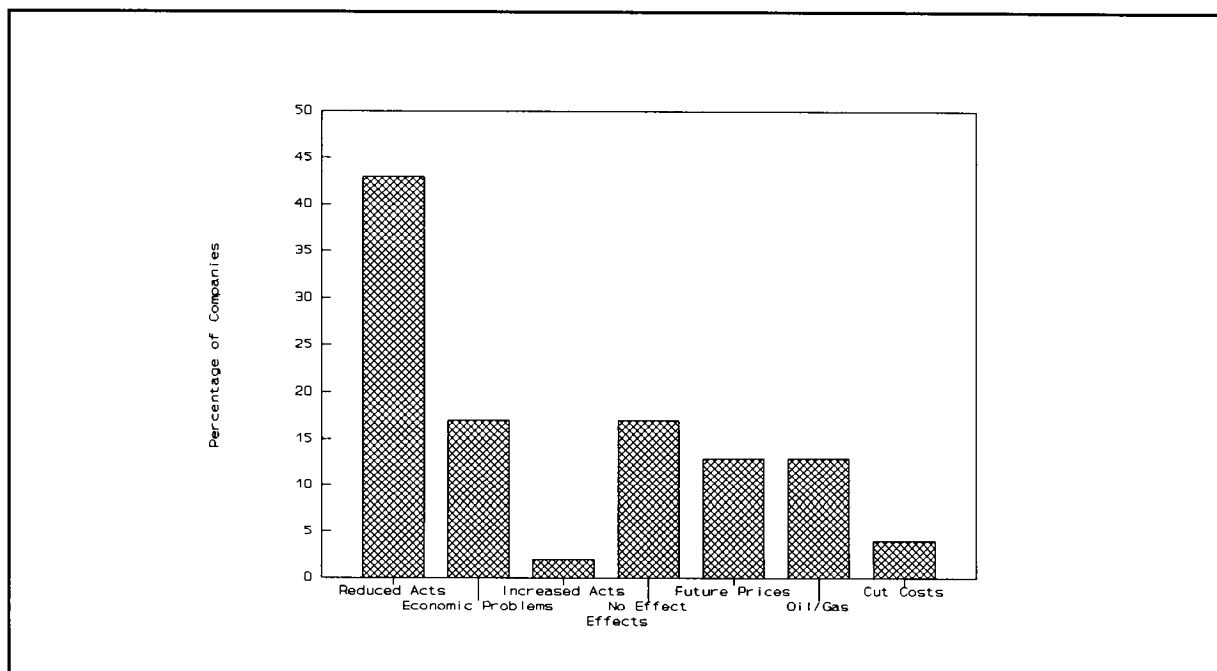


Figure 3.24 Effects of Current Prices in Percentages

does not affect our long-term policy. We don't jockey our program around unless it is a trend." Another respondent stated, "Prices have not affected our operations due to our position. We look to future prices right now." Six people discussed the tradeoff between oil and gas operations. Two of these declared that oil prices were acceptable and that their activity fluctuated currently due to gas prices. Four others asserted that gas prices were firmer now and one of these said that the company had decreased its interest in oil. In addition, two people answered the question by presenting the ways that their firms were reducing costs. An illustrative statement is the following, "Some effects of the lower prices are: reduced work force. We operate with 40 percent less personnel than in 1986. ... Less than 24 hour surveillance of production platforms (platform is unsupervised at night). Less food service for field personnel (galley services people cook for themselves). Less supervisors (15 percent). ... Extending of platform maintenance (e.g., paint job intervals, electric/pneumatic upgrades and revamps). More preplanning in response to less transportation availability (35-45 percent less)." Only one person expressed a very positive view of the current prices, "Increased our activity - we are taking advantage of low prices."

The respondents also discussed the effect of their companies' projections of the future prices of oil and gas on operations in the Gulf. Almost half of the replies suggested that projections for future prices of oil and gas were not optimistic (see figure 3.25). Twenty-eight percent of the executives stated that the projections for future prices of oil and gas had reduced their businesses' activities in the Gulf. Some of the ways in which these predictions reduced activity were: property sales, declines in exploration activity, slowed down fields, delayed field production, curtailed drilling activities, and curtailed or lessened production. Similarly, three people discussed their firms' cautious approach toward operations. These people said: "Cautious, projects are awarded based upon rate of returns and reserve replacement.", "Future prices caused us to be more selective of projects. We have not stepped up activity.", and "No increase in 1995 activity - we may slow down". In a like manner, three respondents presented ways that their companies are cutting costs including: "Our view that oil and gas prices will be relatively flat has caused us to focus much more intently on improving the margin. We are: actively measuring our performance in overall profitability, finding and development cost and operating cost; setting targets for improvements; establishing work teams to analyze processes and recommend and implement improvements; and disposing of non-performing or non-material assets." Another three executives mentioned economic issues related to low prices such as "Had to get into our reserves and seek other ways to make money."

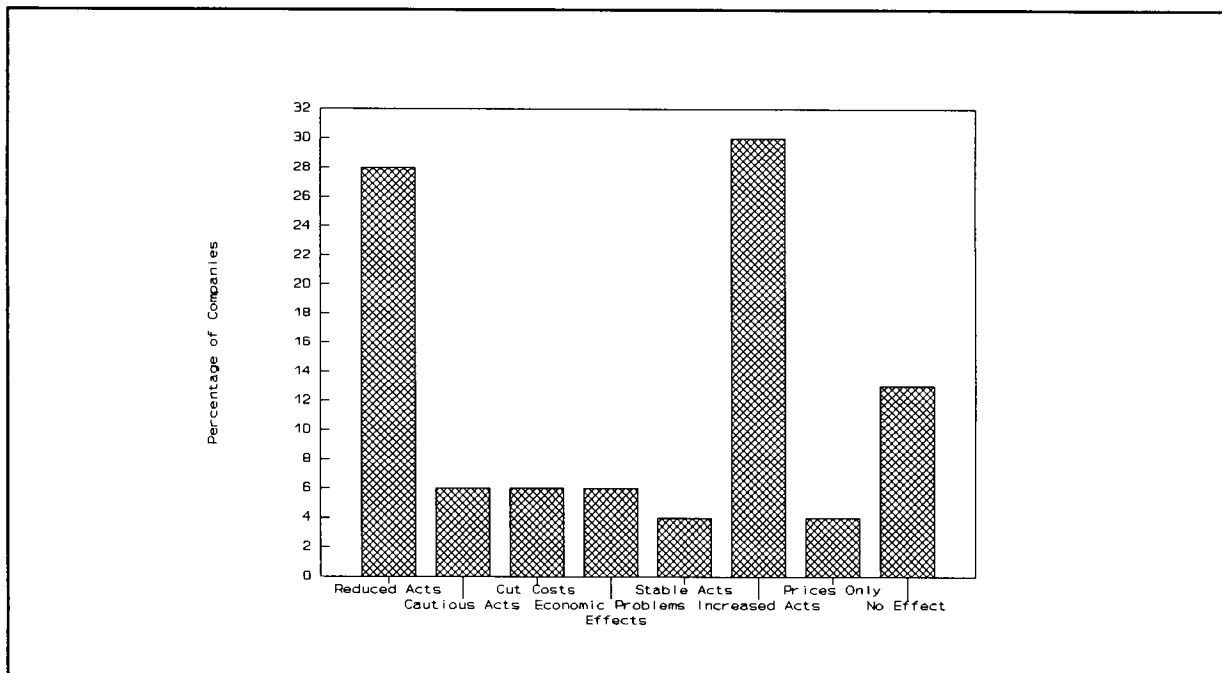


Figure 3.25 Effects of Future Prices in Percentages

Some respondents had a brighter outlook for the prices of oil and gas. Two people made statements that implied that prices were expected to stabilize. In addition, thirty percent of the executives felt that prices would rise, especially the price of natural gas, and that activity would increase accordingly. Examples of these responses included: "The industry projections of higher gas prices in the future have increased the company's exploration and production activities in the Gulf of Mexico.", "Increased acquisitions for the future.", "Although short term pricing is not good, we are optimistic about long term gas prices. This optimism has allowed us to budget funds for offshore blocks and seismic data to drill wells in coming years.", "Projections have made us more active, more involved in the Gulf of Mexico. It is the best place for gas reserves." and "We believe that the situation will be better especially in gas pricing. We look to the Gulf for resources."

Further, two respondents talked about prices stating that "Prices in the short term will be slow" and "The cost of operating has had and will have an impact on prices". Six people stated that projections of future prices did not affect their company's operations. One of these said, "Opportunities have more to do with our activity than prices." Two executives did not respond to the question.

**The Effects of Leasing Policies on Gulf Operations.** The respondents were asked to discuss how two leasing policies affected their firms' operations in the Gulf of Mexico. The first leasing policy was the use of areawide leasing beginning in 1983. The second policy was the reduction of the minimum bid to \$25 per acre, which became effective in 1987. The impact of these two changes in leasing strategies will be presented in turn.

In 1983, areawide leasing was used instead of nominated leasing. The company representatives overwhelmingly found this change in leasing policy to be positive. Sixty-eight percent of the officials discussed positive impacts of areawide leasing while only 2 percent talked about negative effects. These positive effects consisted of: stimulating activity, reducing risk, justifying the purchase of new technology for extraction, increasing the potential for finding oil and gas, ease and increased fairness in the leasing procedure, reducing costs, increasing exploration, increasing the number of leases, enabling some companies to become active in Gulf extraction, and farmouts and farm-ins. The most commonly mentioned positive impacts were: increasing activity, increasing leasing, increasing the potential for finding oil and gas, and easing bidding and making the process fairer (see figure 3.26).

For instance, one representative from a major corporation stated, "Dramatically impacted our activity, especially for deep water. It is very positive. It allowed us to pursue innovative ventures, more predictability, less risk. It justified extensive 3D use in the GOM and justified other technology purchases." while another said "Operations were made more convenient because we were exposed to a wider area. Often our analysis of leases are not completed until shortly before the lease sales and it allows us to narrow down our focus on a subset of the leases initially reviewed. Also, it allows us to look at GOM in a regional context rather than a block by block basis." An official from a large integrated firm was also in favor of

areawide leasing, "It helped our operations by allowing us to put together multiblock prospects. Prior to this change, this was a nomination process, now we have a better chance at assembling blocks." A statement made by an executive from a large nonintegrated concern was similar, "Advocate of areawide leasing, it made more prospects drillable. It helped us to be a larger player much faster and to build focus areas, more competitive. It encouraged better and faster evaluation of the GOM." An analogous statement was made by a member of a small nonintegrated enterprise, "This was an incentive for medium sized independents to become involved in offshore exploration when leased lands were offered in the entire Gulf. This allowed us to participate in generation of prospects Gulfwide without having to necessarily compete with companies that nominated blocks or try and generate prospects only on lands not nominated by others."

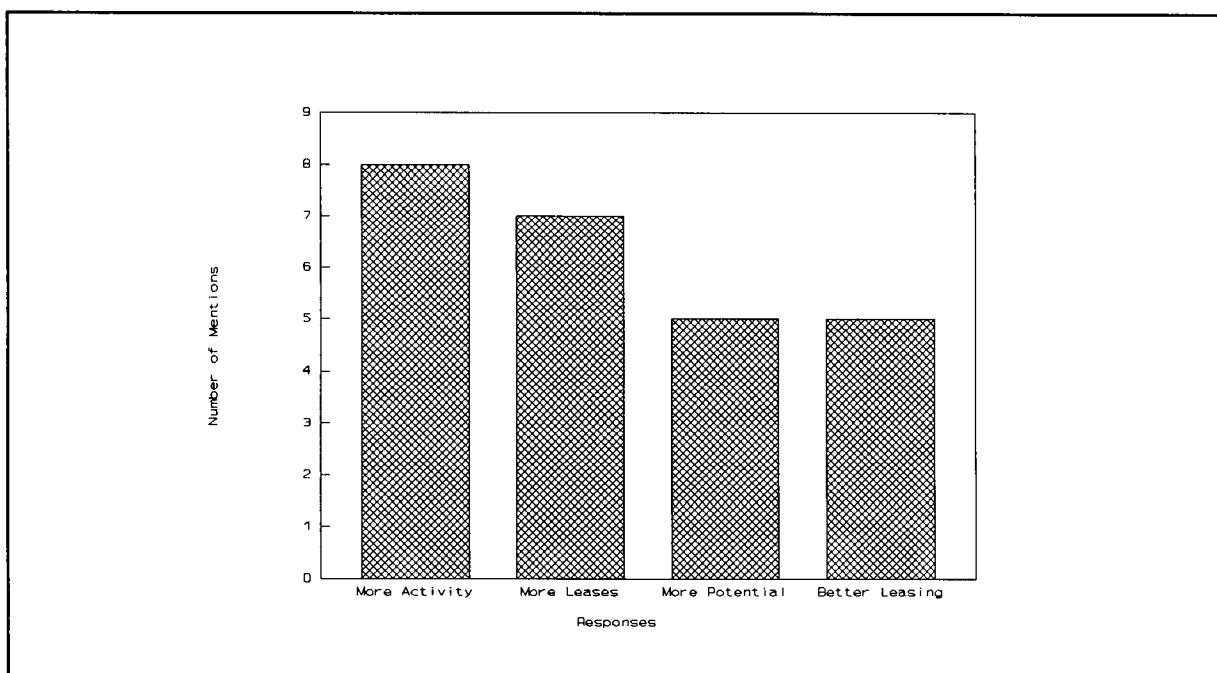


Figure 3.26 Most Common Positive Responses to Areawide Leasing

One person from a major corporation said that the effect of areawide leasing was negative. This person said, "More companies are competing for properties. We stopped with lease sales due to the low return on investment". In addition, 30 percent of the respondents made statements that did not suggest either positive or negative effects. The most common response was that the switch to areawide leasing was not applicable to their company. Some of these executives stated that their firms started leasing and operating in the Gulf after 1983 (4 people) or their businesses were not actively leasing (2 people).

The executives were also queried about how the reduction of the minimum bid to \$25 per acre in 1987 affected their operations in the Gulf of Mexico. Again the reaction was



overwhelmingly positive. Two-thirds of the respondents discussed positive impacts of this policy including: more activity; increased bids, leases, and acres; greater exploration; reduced costs; enabling entry into extraction in the Gulf; and allowing funds to be used for extraction activities rather than acquiring lands (see figure 3.27). The most commonly mentioned positive influence was the increase in bids, leases and acreage. Some examples of these favorable statements were: "Positively, more leases could be bought and matured marginal properties could be developed" and "Overall, allowed us to bid on high risk prospects many of which didn't get drilled" (both from large integrated firms); "Helped independents" (small integrated endeavor); and "The minimum bid allowed limited funds companies to invest more in exploration and drilling as opposed to having a larger investment in land, limiting evaluation funds."

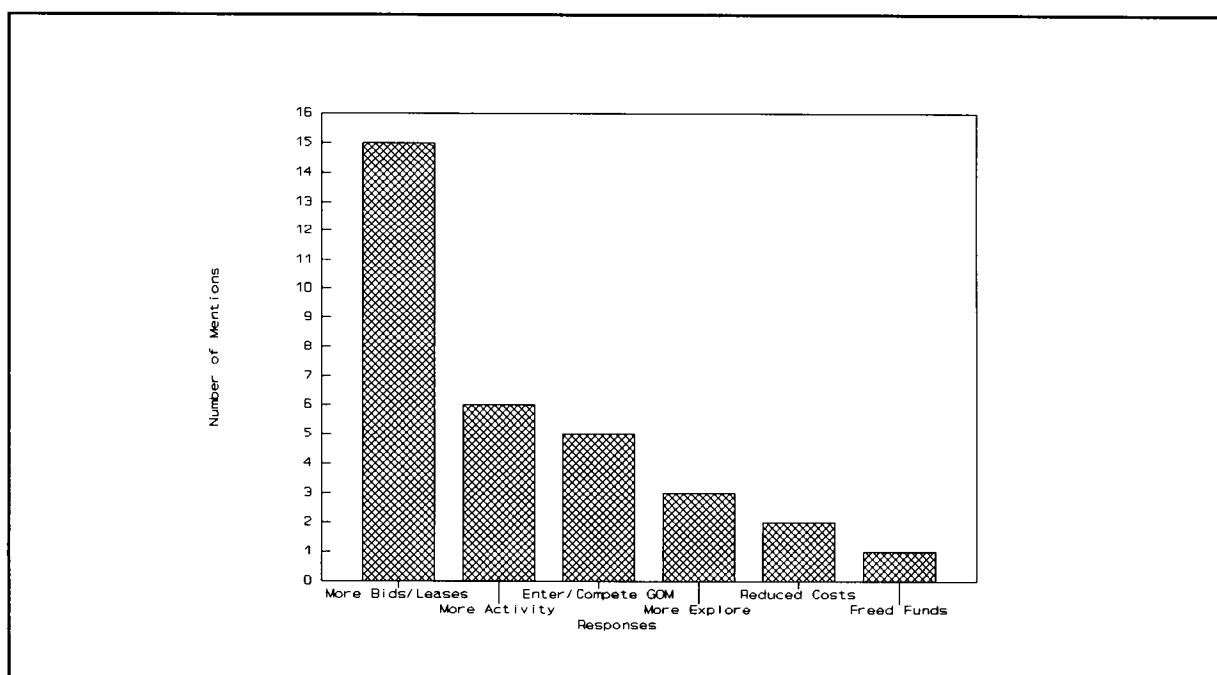


Figure 3.27 Positive Responses to Reduced Minimum Bid

Three representatives made statements that could not be coded as either positive or negative effects, such as the change in expectations, "It only served to raise the threshold and change expectation ratios" (large integrated business). Another officer said, "We acquire small prospects for smaller leases. Our focus is gas" (small nonintegrated enterprise). Nineteen percent of the executives stated that the reduced minimum bid had no effect on their companies' operations. Examples of these statements were: "It doesn't affect us because we don't make bids on blocks unless we see significant opportunity and value" (major corporation) and "No effect. A lease is judged on merits and profitability. No real impact" (large integrated firm). There were no negative reactions to the decrease in the minimum bid.

**The Effects of Technology on Operations.** Earlier the number of companies using each type of technology was presented. In addition to obtaining information from the executives concerning their companies use of each of four specific technologies in exploration and production in the Gulf, the respondents were asked about the impacts of these four technologies on operations in the Gulf. Therefore, the focus in this section is on the influence of the technologies on operations and the responses reported are those of firms who use each of the four technologies -deep water, 3D seismic data, subsalt exploration, and horizontal drilling. As will be shown, deep water projects and subsalt exploration are too new for the executives to know how the technologies involved in these activities will affect their businesses' operations. Moreover, the results will demonstrate that the respondents feel very positively about the impacts of 3D seismic capabilities and horizontal drilling upon their enterprises' operations.

During the interview, but not the pretest, the respondents were asked about the effect of deep water projects on their companies' operations in the Gulf of Mexico. The comments are summarized in figure 3.28. Some of the officials were optimistic about deep water projects. One representative of a major corporation pointed out that the company had several projects in the 1,000 feet range while another executive stated that deep water was a major growth opportunity. One major corporation was involved in such projects only as a joint venture because these activities tax capital and slow down shallow water projects. Officials from large integrated companies had similar comments. One stated that deep water projects require partners. Another mentioned that such projects are expensive and that tax incentives would be helpful. A member from a third large integrated concern, like the representative from a major corporation, asserted that deep water is a growth opportunity. An executive from a small integrated company declared that the firm was planning to become involved in deep-water extraction.

On the other hand, some respondents were less optimistic about deep water activities in general or their businesses' ability to undertake such projects. A person from a large nonintegrated enterprise stated that the company had no plans to get involved in deep water because it was not economical. This respondent added that risky ventures should not be subsidized at the expense of proven plays and that the market should set the limits. An executive from a small nonintegrated firm felt that the company might be able to farm out its acreage if success occurs nearby. Overall, it seems that deep-water projects are too new and too expensive for most of the respondents to know what the impacts will be.

The opposite is the case with 3D seismic data. All but two of the companies currently use such data and one small integrated firm is planning to obtain this data. The respondents were overwhelmingly positive about the effects of this technology on their companies' operations in the Gulf (see figure 3.29). Thirty-seven representatives discussed the positive effects of 3D seismic data on their activities. These impacts were reduced risk and increased success, increased activity, and the cost effectiveness of using 3D data (see figure 3.30). For example, one official stated that the company does not do anything without 3D data because it is helpful in defining reserves in a mature region like the Gulf (major corporation) while

another declared that the company's operations had been drastically affected and that 3D data was critical to developing offshore acreage. Executives from nonintegrated concerns (1 large and 2 small) felt that 3D seismic data allowed their firms to be more aggressive and competitive.

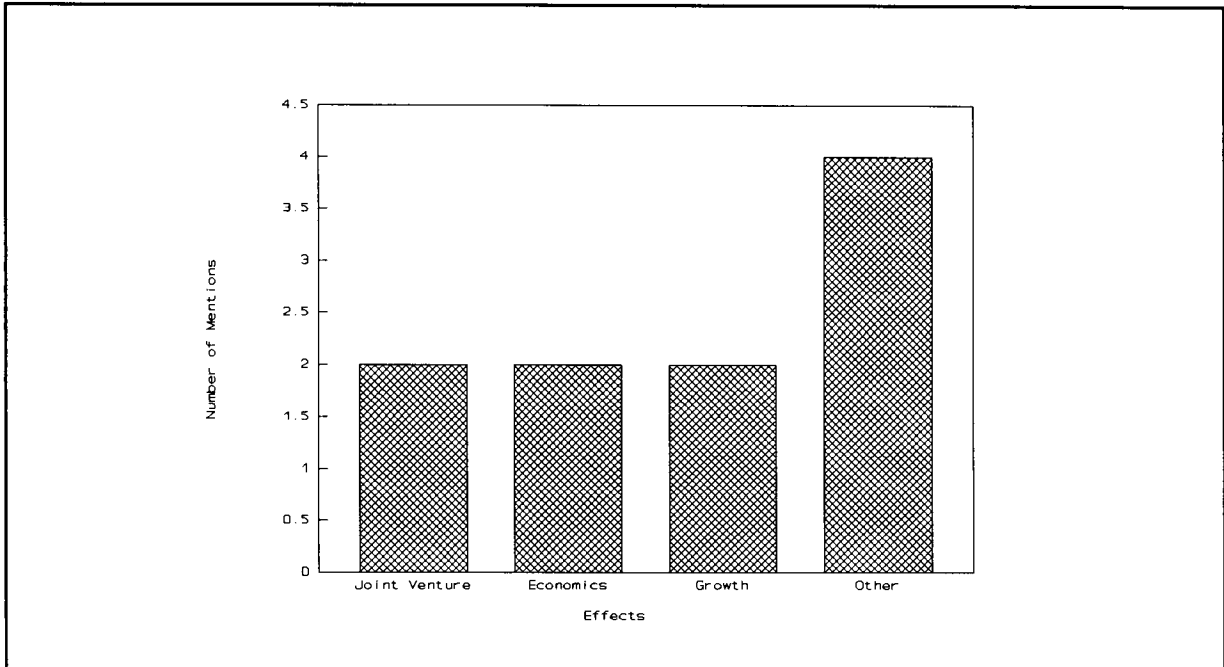


Figure 3.28 Effect of Deep Water Projects

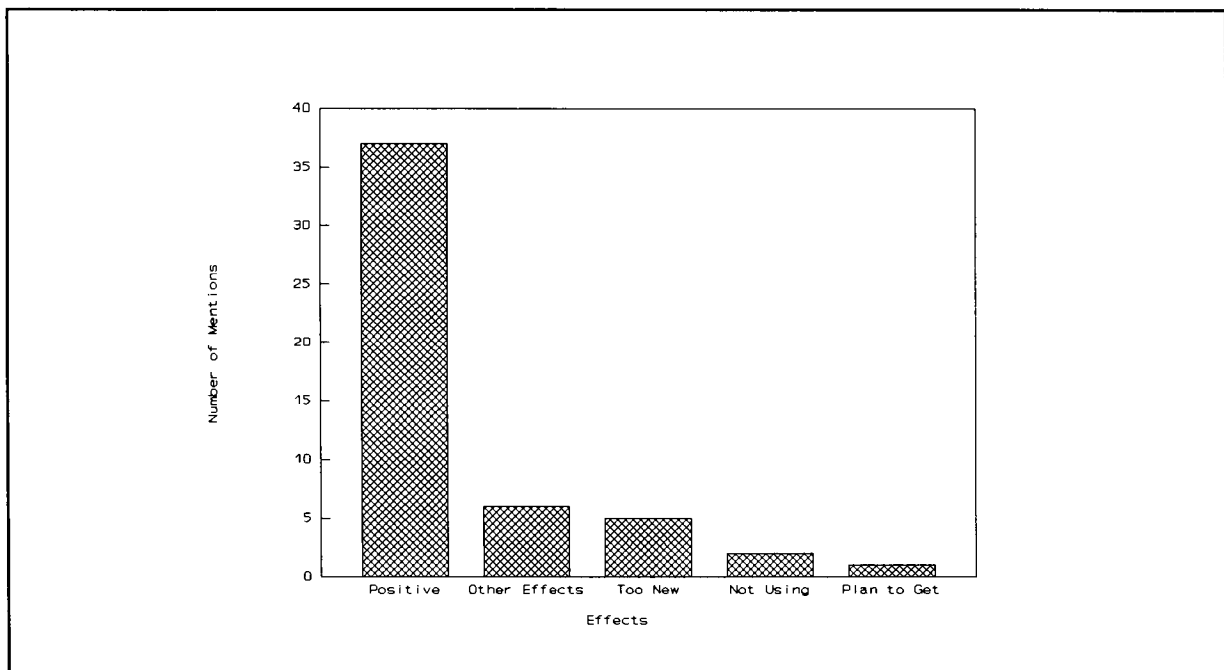


Figure 3.29 Effect of 3D Seismic Data

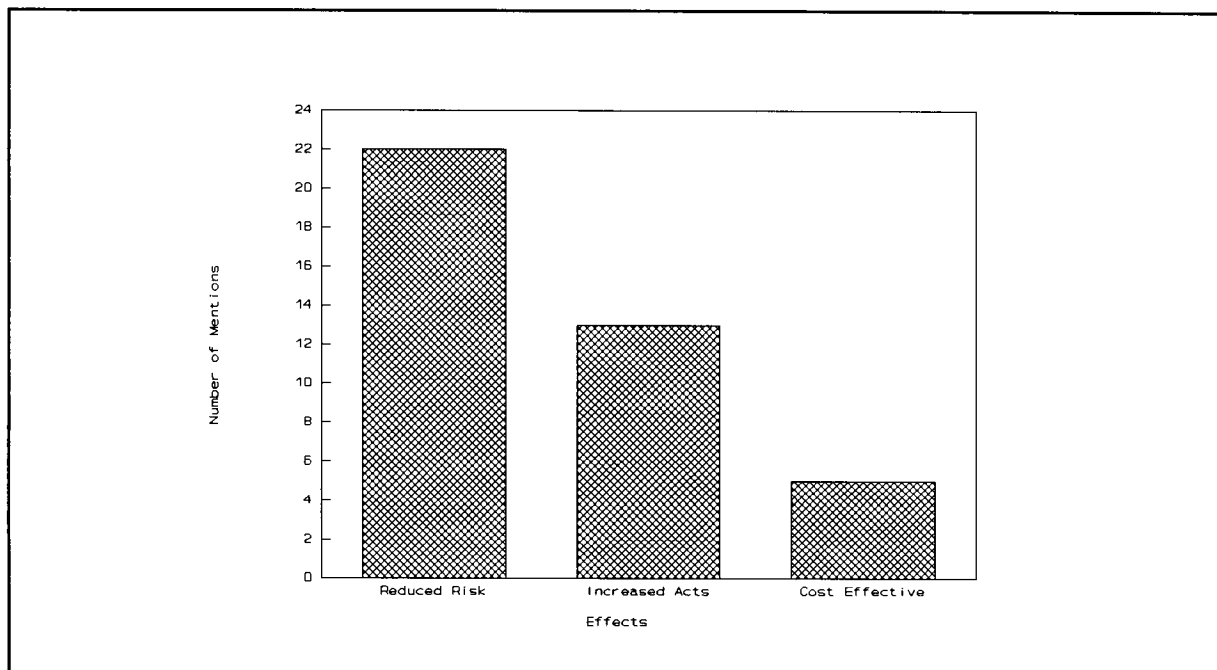


Figure 3.30 Positive Effects of 3D Seismic Data

Besides the positive effects of 3D seismic data on Gulf extraction, a few respondents pointed out that use of such data affected evaluation time, increased costs because expenses for 3D data have gone up, increased staff, and increased hardware and software needed. A few executives did not know the effect of 3D data as yet because they just started using it. However, the most common impacts mentioned were positive.

The interview included a question concerning the effect of subsalt exploration on operations in the Gulf of Mexico. Like deep water technology, subsalt exploration technology is too new for many companies to have experience with it. Most of the executives from firms that have some involvement in subsalt exploration stated that it was too early for them to know the impacts of such endeavors (see figure 3.31). Officials from major corporations were the most likely to mention positive effects including: greater exploration, increased activity, increased operations, and that subsalt technology was a key issue for deep water exploration. Two other representatives of major corporations pointed out that subsalt activity is a long-term activity and that it requires a large capital investment. Executives from large integrated firms tended to mention either a positive effect (increased activity) or the requirements of subsalt exploration (increased staff as well as hardware and software). Officials from nonintegrated businesses stated that they have subsalt acreage and one of these officers said that they would let others pioneer first.

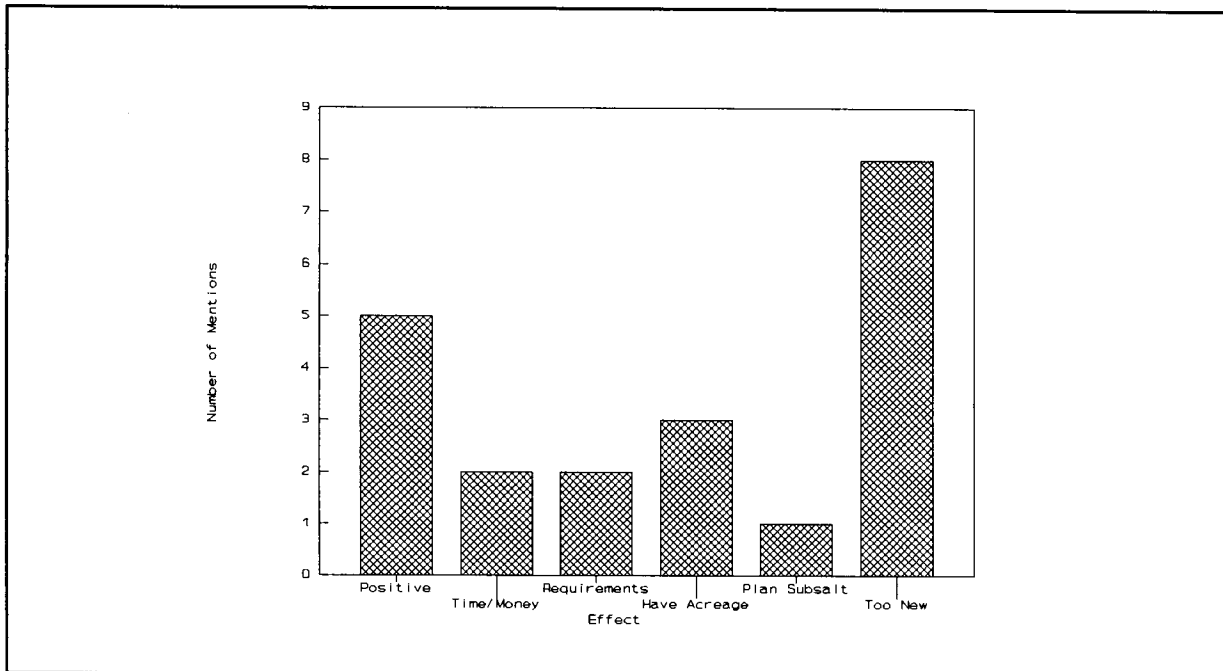


Figure 3.31 Effect of Subsalt Exploration

As demonstrated previously, some companies have used horizontal drilling offshore in the Gulf of Mexico. Nineteen officials from these firms felt positively about the effects of this technology on their operations (see figure 3.32). The most common favorable response was that horizontal drilling made extraction more economical, particularly in shallow water. Many officers who mentioned the economic impacts also stated that it was used in shallow waters. In fact, one company, a large nonintegrated business, has one field based solely on horizontal drilling and two more coming on line soon. Other positive effects of this technology included the creation of additional finds, improved production rates, and increased activity. A couple of respondents pointed out that horizontal drilling has limited uses, but one of these representatives said that the company used it when necessary. One officer stated that horizontal drilling had had a minimal impact on the firm's operations thus far and four claimed that their businesses were planning to use this technology or would use it if it were advantageous.

In summary, with the exception of 3D seismic data, which almost every company uses, the technology studied was too new for the respondents to really know what the impacts on their operations in the Gulf would be. However, representatives of firms that were using these new technologies seemed optimistic about them and some were able to mention at least a few positive effects of these technologies.

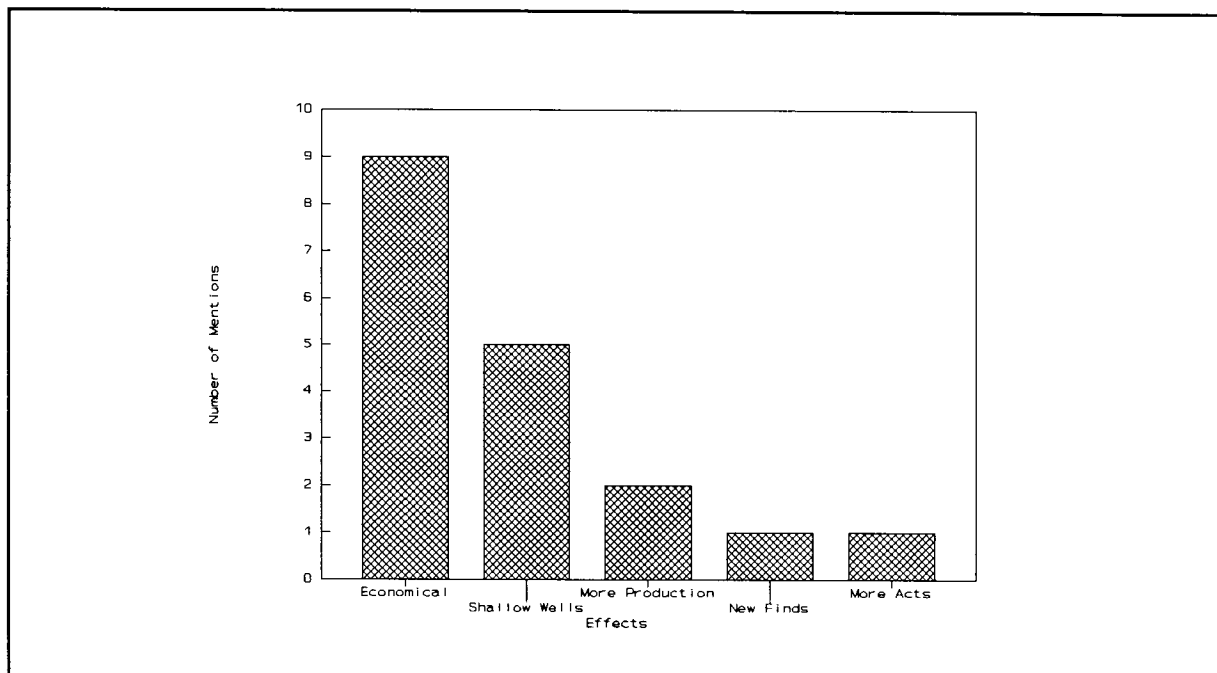


Figure 3.32 Positive Effects of Horizontal Drilling

**The Effects of Regulations on Operations.** Earlier the results concerning the federal agencies with the most impact on oil and gas extracting companies in the Gulf were presented as well as the respondents' rank ordering of four pending regulations: 1) the financial responsibility provisions of OPA '90, 2) the increase in lease bonding to cover plug-and-abandon liabilities, 3) the Clean Water Act, and 4) the Clean Air Act. The officials were also asked to consider the impacts of these regulations on their firms' activities in the offshore Gulf. In this section, the findings concerning how the four regulations will affect the oil and gas firms' operations will be presented. As will be displayed shortly, the overall outcome demonstrates that, although some reactions to these four regulations were neutral, most of the comments were negative, some extremely negative, and none of the responses were favorable toward these regulations, as was anticipated. Moreover, the results concerning the impacts of the financial responsibility provisions of OPA '90 and the increase in lease bonding to cover plug-and-abandon liabilities were very similar probably because both regulations have the potential to increase the costs of operating in the Gulf. The findings concerning the effects of the Clean Water and Air Acts were also comparable possibly because both of these could necessitate retrofitting platforms or abandoning some wells and platforms where retrofitting is not economically feasible. One respondent, while discussing OPA '90, summarized the effects of these four regulations as follows: "All of these regulations will have a very [respondent emphasized this] negative effect on continuing to explore in the Gulf. OPA '90 will, in effect, put most independents out-of-business in the Gulf. This is an onerous act that was an over-reaction to the Exxon *Valdez*

spill. This must be changed for operations to continue in the Gulf. Most companies cannot show financial responsibility up to \$150 million." (large nonintegrated company).

The executives were asked about the effects of the financial responsibility provisions of OPA '90 on their companies' operations in the Gulf. The results are summarized in figure 3.33. A large variety of impacts were discussed by the respondents. The most common group of effects was economic impacts while the second was indirect impacts and the third was that some companies would be out-of-business. Responses by two representatives of small nonintegrated companies summarized the comments by the 10 executives that feared that OPA '90 would put them out-of-business, "This will put people out-of-business because no one will bond or insure us. The only people in the Gulf of Mexico will be the majors." and "It depends on the writing of the legislation. One hundred and fifty million dollar liability is too strict. We will be out-of-business." Although some executives stated that their particular firms would not be directly affected because they could self-insure, these officers were quite concerned about the consequences for other smaller businesses in the Gulf. Responses of this type were common and similar to the following: "The primary effect is the impact on independents and service companies. We do business with them so it indirectly impacts us." (major corporation) and "The immediate impact will be somewhat small because we are large enough for self-insurance. ... Business is helped and supported by healthy independents, that will indirectly and adversely affect them." (large integrated firm). Other outcomes presented were influences on activity and administrative impacts.

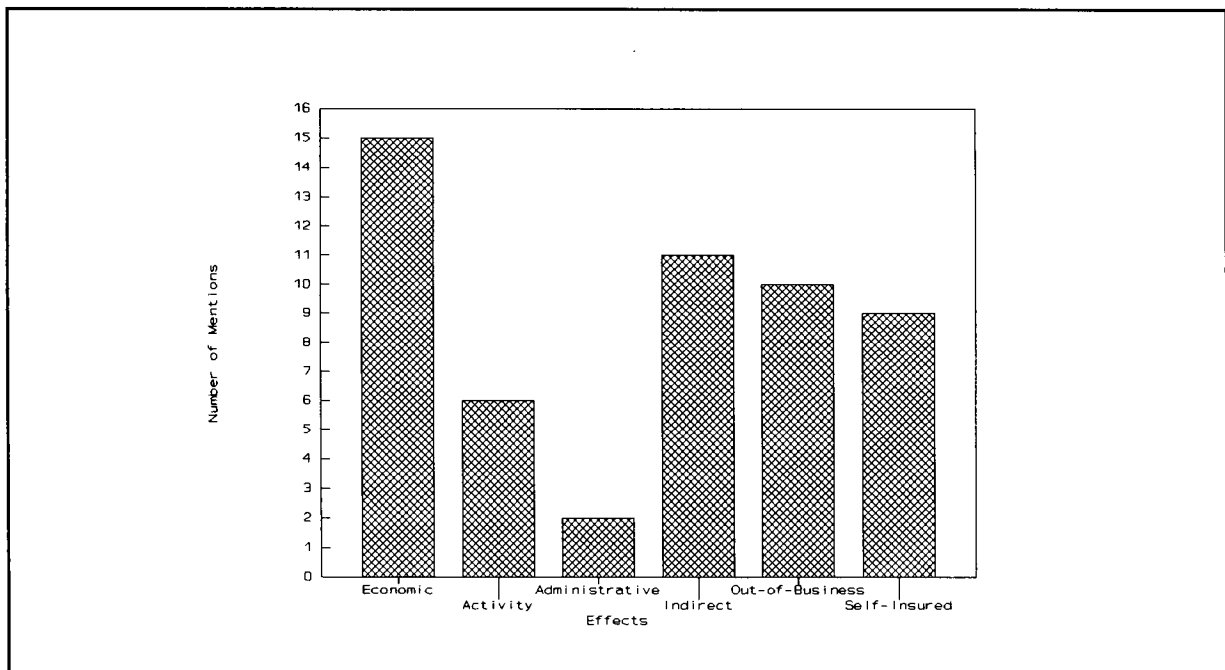


Figure 3.33 Effect of OPA '90



Of the economic aftermaths, the one most frequently referred to was additional costs; nine respondents mentioned additional costs. The other economic consequences were less often reported: the tying up of money (3), the reduced profit margin (1), the inability to self-insure or get bonding (2), the need for additional bonding (1), and the reduced ability to sell properties (1). The most commonly referred to indirect impact was that this regulation would hurt the independent firms, particularly the small ones (10). The executives also stated that their companies would be adversely affected because the service and contracting businesses would be negatively impacted (3) and that there would be a reduction in available partners because some enterprises would be out-of-business (2). Some officials discussed consequences for activity including reduced activity (5); reduced partnering (1), which is important in Gulf operations as was discussed previously in the section on joint ventures; reduced growth of companies that can remain in the Gulf (1); and the possibility of increased opportunities for some companies that will still be able to operate in the Gulf (1). A couple of respondents discussed administrative consequences, particularly increased paperwork.

When the respondents were queried about the effects of the increase in lease bonding to cover plug-and-abandon liabilities on operations in the Gulf, the results were similar to those concerning the consequences of OPA '90. Again, there was a large diversity in the responses, although not as much as there was for OPA '90. As occurred in the comments concerning OPA '90, economic impacts were the most commonly mentioned aftermaths (see figure 3.34), particularly additional costs, but also reduced profits and the tying up of money. Unlike the responses to OPA '90, the impacts on activity in the Gulf were the second most frequently presented results of the increase in lease bonding to cover plug-and-abandon liabilities while indirect effects were the third most often voiced outcomes. Another dissimilarity in the findings for these two regulations was that none of the representatives stated that their firm would be out-of-business due to the increase in lease bonding and a large number of them asserted that their company would not be directly affected.

The most frequently discussed influence of the increase in lease bonding to cover plug-and-abandon liabilities on activity was reduced activity succeeded by selectivity concerning which wells and properties would be exploited; reduced competition, which was not presented as a positive result; and reduced company growth. Only two indirect impacts were referred to, the most common being the adverse influence on independent businesses, particularly small ones, and the reduction in partnering, which is an important, negative effect. Examples of responses concerning the negative impact on independent firms were, "A large effect. Plug-and-abandon escrows make it tough for independents. We are very concerned." (large nonintegrated company) and "It doesn't put us out-of-business. We don't want our competitors out-of-business, this adversely affects us." (large integrated firm). Three good statements to summarize the feelings of the respondents toward this regulation were the following: "It negatively affects the profitability of the company for no apparent added benefit. Because we act as a prudent operator, we behave in a manner that will not jeopardize our long-term standing in the Gulf of Mexico. We believe we have a track record to prove it. Additionally, when we sell nonmaterial properties it is to the tier of producers

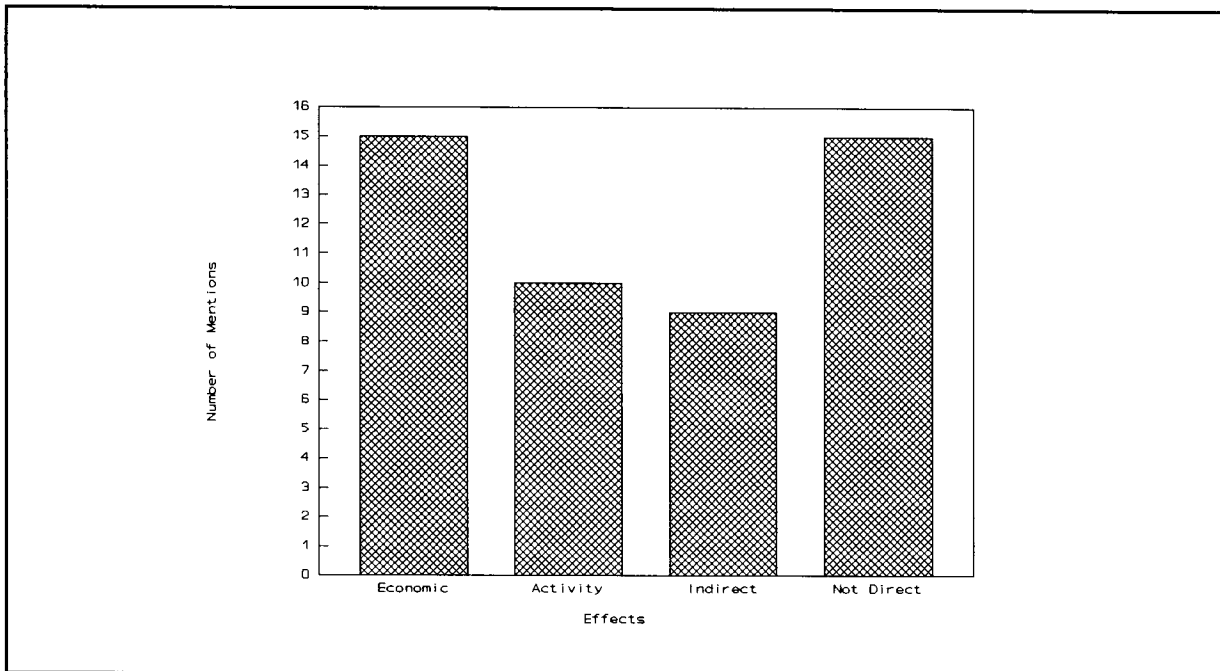


Figure 3.34 Effect of Plug and Abandon Liabilities

directly below us and we take care in ensuring that the recipient is financially responsible." (major corporation), "... This could take away additional money for development. We honor our obligations. Too many don't honor their obligations with plug-and-abandon costs. Levies placed on all may increase the problem. More marginal companies may not honor their commitments. It's stupid, get them out of the Gulf of Mexico." (large integrated company) and "It makes life difficult. We have always had a sinking fund, but now MMS has an arbitrary number to cover this." (small nonintegrated firm).

When the respondents were questioned concerning how a water quality standard that would result in requiring reinjection of produced water (a potential implication of the Clean Water Act in the fall of 1994) would affect their companies' operations in the Gulf, the most common answer was that such a regulation would increase the costs of operating and would lead to premature abandonment of wells, fields and projects. The comments are summarized in figure 3.35. The most frequently mentioned impacts were economic effects. Seventy-seven percent of the 47 respondents discussed economic outcomes, primarily additional costs, but also reduced profits and the tying up of funds. The second most often remarked upon consequences were those related to activity in the Gulf. Forty-nine percent of the executives discussed such outcomes, particularly premature abandonment, but also some similar results including the reduction of reserves and their recovery, the avoidance of marginal wells, and the decrease in overall activity. Influences on operations were also presented; these consisted of more unmanned wells, space problems on the platforms, and increased downtime. Only one officer said that the company had not been affected yet because the firm was so small and two representatives were not sure what the aftermath of such a regulation would be.

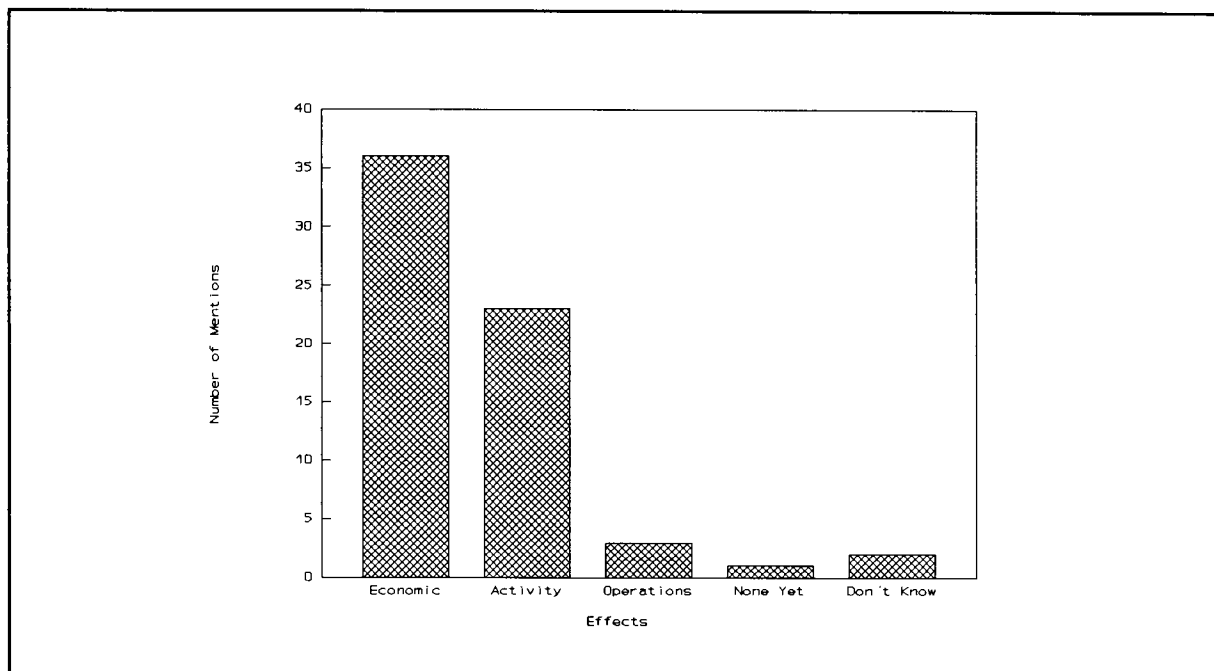


Figure 3.35 Effect of the Clean Water Act

The respondents own comments best illustrate their concern about the possibility of being required to reinject produced water. Two representatives of major corporations stated, "The EPA has estimated costs for all this as over \$2 billion. Our part would be \$234 million [one time] plus \$14 million a year. Such a profound effect would cause many properties to be unprofitable." and "This will have the most impact. This will cost us about 2 to 5 million dollars per platform if we do not have to enlarge some of the platforms. If a structure does not have enough space for the tanks, injection pumps, etc., we may have to shut in the water producing wells on that platform. Some of the fields producing lots of water could have a larger investment of 10 million." Similarly, respondents from large integrated firms commented, "This is potentially a major issue, this could decrease profitability, especially if existing platforms have to be retrofitted. Some leases could be closed." and "We will have to shut in and plug-and-abandon more than one-third of our platforms." An executive of a large nonintegrated company had this to say, "It depends on how it is written. If it applies to existing wells, then we would have to abandon wells and keep marginal prospects off line." while an officer of a small nonintegrated company declared, "This could kill small projects. It hurts many small projects, production would be hurt. For example, we have considered not drilling an eight billion cubic feet well due to probable costs." These quotes demonstrate the degree of concern elicited by the requirement to reinject produced water.

The executives interviewed were next asked how an extension of onshore standards for air emission controls to the offshore Gulf would affect their companies' operations, which was a possible implication of the Clean Air Act. The responses were similar to those concerning the Clean Water Act discussed above. Again, the most frequent comments concerned economic impacts (see figure 3.36), mainly additional capital and operating costs, but also

reduced profits, the tying up of funds, and the slowed rate of return. As occurred for the Clean Water Act, the second most common remarks concerning the extension of the Clean Air Act were about impacts on activity. These impacts consisted of reduced overall activity, premature abandonment, the avoidance of marginal wells, and the cut in reserves and their recovery. The least frequently alluded to results were influences on operations, which included increases in equipment, maintenance, and personnel as well as the slowing down of the permit process. Two executives mentioned that the consequences would be less than those of the Clean Water Act and three pointed out that gas driven and producing platforms would not be affected. More officers were not sure how the extension of the Clean Air Act would affect their operations than were unsure about the effects of the Clean Water Act and more representatives stated that their firms were not affected than did so in response to the Clean Water Act.

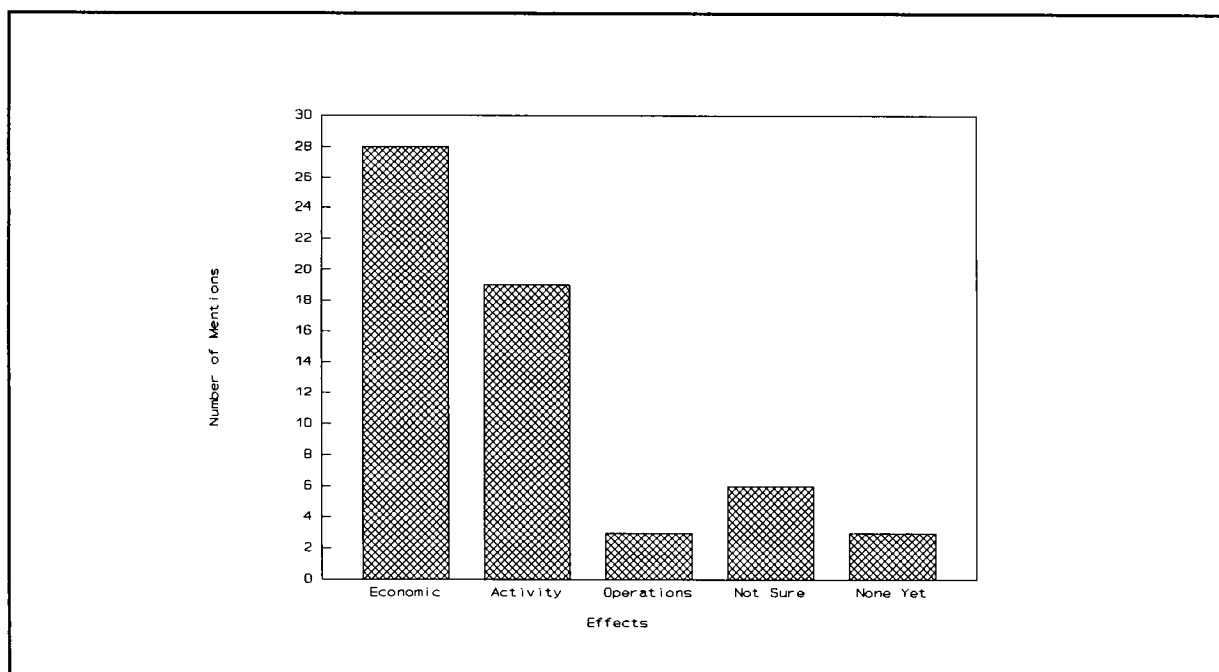


Figure 3.36 Effect of the Clean Air Act

The respondents own comments about the Clean Air Act best illustrate their concerns. Two executives of major corporations declared, "We anticipate a significant negative impact, \$100 million [one time] and \$16 million [annually], to comply. Many of our fields would become unprofitable. We have no direct estimate for the number of fields that are closed." and "Air emissions could be very costly to us. Some of the estimates are \$200,000 per compressor to install catalytic converters. ...that is \$12 million. Also, the upkeep cost of these systems are expensive since some need replacing every two to five years." A response from an officer of a large integrated business was similar, "This is potentially a major issue, this could decrease profitability, especially if existing platforms have to be retrofitted. Some leases could be

closed. We have to install new equipment to meet these standards, one-fourth to one-half a million per facility. Strict control would curtail new production." as was a comment from a representative of a small nonintegrated firm, "It would cause some increase in operation costs. Hopefully, it won't affect current projects. In the future it may."

### SUMMARY

The results concerning the firms' characteristics demonstrated the following. First, most of the companies extracted both oil and natural gas from the Gulf of Mexico. Second, for most of the businesses, production of oil and gas, exploration, and the number of employees, increased since 1986. Third, the number of companies operating offshore in the Gulf rose between 1986 and 1994. Fourth, research and development funds decreased since 1986.

The findings about the business environment can be summarized as follows. First, the five federal agencies with the greatest effect were: the Minerals Management Service, the Environmental Protection Agency, the Coast Guard, the Department of Transportation, and the Occupational Safety and Health Administration. Second, the executives ranked the four pending regulations in descending order as the Clean Water Act, the financial responsibility provisions of OPA '90, the Clean Air Act, and the increase in lease bonding to cover plug-and-abandon liabilities. Third, almost all of the companies used 3D seismic data, almost half of them did horizontal drilling, and somewhat over a third of them were involved in deep water and subsalt exploration. Fourth, almost all of the firms were involved in joint ventures, most participated in more joint ventures now than in 1986, and the type of company most frequently mentioned as a joint venture partner was major corporations. Fifth, almost all of the businesses contracted out some activities to service companies, the use of such companies increased since 1986, and the costs of hiring service companies increased since 1986. Sixth, the executives were optimistic about the future of oil and gas exploration in the Gulf.

The outcome concerning the effect of the business environment on practices in the Gulf showed the following. First, the largest group of respondents believed the current prices of oil and gas have reduced exploration and production activity in the Gulf. Second, almost half of the executives were not optimistic about future prices and expected these prices to decrease activity in the Gulf. Third, the officials overwhelmingly supported areawide leasing and the reduction of the minimum bid to \$25. Fourth, the respondents viewed the influences of 3D seismic data and horizontal drilling on operations very positively, but deep water and subsalt exploration technologies are too expensive and too new to be evaluated at this time. Fifth, as would be expected, the officials were overwhelmingly against the four pending regulations.

## CHAPTER 4

### COMPARISONS AMONG THE FIVE TYPES OF COMPANIES

The purpose of the last chapter was to describe the business characteristics and business environment for the entire sample of companies without regard to the type of company. The focus of this chapter is the similarities and differences across the five types of companies in their business characteristics, environment, and practices. Due to the complexity of some issues, particularly the characteristics and joint ventures, it will be necessary to first present the results for each type of company separately and then discuss the similarities and differences.

#### BUSINESS CHARACTERISTICS

Due to the fact that the largest section of the study concerned the business characteristics of the companies, it will be necessary to characterize each of the five types of companies separately before discussing their similarities and differences. The five kinds will be examined in the following order: major corporations, large integrated independent companies, small integrated independent firms, large nonintegrated independent enterprises and small nonintegrated independent concerns. Then, the similarities across the five categories of offshore oil and gas exploration and production companies will be discussed followed by a demonstration of the differences across the five classifications. The characteristics examined were the following: the type and quantity of resource extracted from the Gulf of Mexico, the amount of exploration and the companies' involvement in downstream integration, the location of headquarters and other offices, and the number and tasks of offshore employees.

The results to be discussed will show that there were three similarities across the five types of companies in business characteristics. First, almost all of the enterprises extracted both oil and gas. Second, the vast majority of the concerns obtained more gas in 1993 than in 1986. Third, the largest categories of employment were production/platform maintenance and operation, exploration, and administration. The outcome also will demonstrate that there were several differences by type of company. Four of the differences in business characteristics varied by integration. Most of the nonintegrated businesses obtained more oil in 1993 than in 1986 while the majority of the integrated enterprises extracted less oil. The majority of the other offices established by the integrated companies were outside of the Gulf zone while the majority of the other offices of the nonintegrated firms were in this area. The integrated businesses tended to close offices in the Gulf region, but the nonintegrated enterprises increased their numbers of other offices in this area. The integrated companies had more employees than did the nonintegrated firms, especially the majors, and the integrated businesses decreased their workforces between 1986 and 1994 whereas the nonintegrated endeavors increased the size of their staffs. One variation by type of company demonstrated a difference between major and independent firms. Most of the major corporations' headquarters were outside the Gulf of Mexico region whereas the bulk of the

independent endeavors had headquarters in the Gulf area. Two differences by type of company could not be explained by any of the three dimensions that distinguish the five types of companies. First, the quantities of oil and gas extracted in 1993 varied by type of company. Second, the nonintegrated firms and the large integrated concerns were more involved in exploring in 1994 than in 1986 while the major corporations and small integrated businesses were not.

### Business Characteristics of Major Corporations

All of the major corporations extracted both oil and natural gas from the Gulf of Mexico in 1994, but only 10 of the 11 companies removed both in 1986 (see table 4.1). The other company obtained neither resource in 1986. The median amount of oil derived from the Gulf in 1993 was 9.855 million barrels while the median quantity of natural gas was 109.5 billion cubic feet. Five of these businesses extracted more oil in 1993 than in 1986 while 4 obtained less oil and one got the same amount of oil. In contrast, 8 of these firms obtained more natural gas in 1993 than in 1986 while only 1 removed less gas.

Table 4.1  
Major Corporations

	Oil and Gas 1994	Oil and Gas 1986	More Oil	More Gas	More Exploring
Yes	11	10	5	8	6
No	0	1	5	2	5
Total	11	11	10	10	11
	Downstream Integration 1994	Downstream Integration 1986	Headquarters GOM 1994	Other Offices* GOM 1994	
Yes	9	9	5	14	
No	2	2	6	18	
Total	11	11	11	32	

\*Total number of offices, not companies.

Six of the major companies were doing more exploring for oil and gas now than in 1986 while 5 were less involved in exploring now (see table 4.1). Currently and in 1986, only 9 of the 11 companies were involved in downstream integration activities such as petroleum refining, gas processing, wholesale trade and retail trade in the Gulf of Mexico. This finding does not suggest that the firms were misclassified since the categorization into the five kinds of businesses was based on their operations worldwide. Too few of the companies gave dollar amounts for the questions concerning research and development funds to enable these quantities to be analyzed. Slightly over half of the major firms had their headquarters outside of the Gulf of Mexico region. The five companies with headquarters in the Gulf region were

based in Houston. Similarly, most of the other offices of the major enterprises were located outside the Gulf area and these firms closed offices located in the Gulf zone between 1986 and 1994.

The major corporations employ large numbers of people in the Gulf of Mexico (see table 4.2). The largest number of employees were employed in production and platform maintenance/operation. The categories that had moderate numbers of employees were administration, exploration and engineering. The remaining types of work had very few employees, particularly shipping/pipelines and research and development. Most of the major firms had fewer employees in 1994 than in 1986 (see table 4.2). Not only did the total number of workers decrease in most of the companies, but for every type of employment except research and development and shipping/pipelines, the modal change in number of employees was a decrease. Research and development and shipping/pipelines tended not to lose workers partly because some of the companies had no workers in either category in either year.

Table 4.2  
Major Corporations' Employees

	1994			
	Mean	Median	Minimum	Maximum
Total Workers	465	277	40	1650
Drilling	16	8.5	1	80
Exploration	61	33	5	290
Production/Platform Work	210	155.5	14	700
Research and Development	6	0	0	35
Administration	55	36.5	10	250
Engineering	52	22	3	330
Shipping/Pipelines	4	0	0	30



Table 4.2  
Major Corporations' Employees  
(continued)

	Change Since 1986		
	Increase	Decrease	Same
Total Workers	3	7	1
Drilling	4	6	1
Exploration	4	7	0
Production	4	5	2
Platform Work	4	6	1
Research and Development	1	5	5
Administration	2	7	2
Engineering	4	6	1
Shipping/Pipelines	0	4	7

### Business Characteristics of Large Integrated Companies

Twelve of the 13 large integrated enterprises extracted both oil and gas from the Gulf of Mexico in 1994 and in 1986 (see table 4.3). The other firm is no longer involved in exploration and production in this area. The median amount of oil extracted in 1993 was 400,000 barrels while the median amount of gas was 10 billion cubic feet. Five of the companies obtained more oil and 7 got less oil now than in 1986 while eight derived more gas and 4 extracted less gas now than in 1986. Eight of the enterprises were involved in more exploration activities now while two were less involved and three were doing about the same amount of exploring now as in 1986. Nine of the respondents stated that their companies were engaged in downstream integration activities currently in the Gulf of Mexico and only eight declared that their firms were so engaged in 1986. Most of the large integrated businesses were based in the Gulf region, especially Houston. In contrast, these companies located most of their other offices outside the Gulf area. In general, the large integrated concerns closed offices in the Gulf region between 1986 and 1994.

Table 4.3  
Large Integrated Independent Companies

	Oil and Gas 1994	Oil and Gas 1986	More Oil 1993	More Gas 1993	More Exploring 1994
Yes	12	10	5	8	8
No	1	1	7	4	5
Total	13	13	12	12	13

Table 4.3  
Large Integrated Independent Companies  
(continued)

	Downstream Integration 1994	Downstream Integration 1986	Headquarters GOM 1994	Other Offices <sup>a</sup> GOM 1994
Yes	9	8	12	16
No	4	5	1	23
Total	13	13	13	39

<sup>a</sup>Total number of offices, not companies.

Large integrated companies employed fewer workers than did the major companies (see table 4.4). Like the major corporations, the largest number of employees were engaged in production and platform work and a moderate number were working in exploration and administration. Also, similar to the major businesses, very few of the workers were engaged in drilling and research and development and none of the employees worked on shipping and pipelines. Although seven of the large integrated companies experienced a decline in the total number of employees, six enlarged their workforces (see table 4.4). In contrast to the major corporations, in some employment categories the modal change was an increase since 1986: drilling, exploration, production, platform work and administration. However, the number of firms that decreased their workers in each of these categories was almost as large as the number that increased the number of employees. The largest number of businesses decreased their engineering staffs while employment in research and development and shipping/pipelines did not change. Again, very few of the companies had any workers in the latter two categories in either year.

Table 4.4  
Large Integrated Firms' Employees

	1994			
	Mean	Median	Minimum	Maximum
Total Workers	156	90	0	420
Drilling	7	4	0	21
Exploration	23	20	0	70
Production/Platform Work	76	45	0	245
Research and Development	2	0	0	26
Administration	21	13	0	59
Engineering	10	3	0	50
Shipping/Pipelines	0	0	0	0

Table 4.4  
Large Integrated Firms' Employees  
(continued)

	Change Since 1986		
	Increase	Decrease	Same
Total Workers	6	7	0
Drilling	7	5	1
Exploration	6	4	3
Production	6	5	2
Platform Work	7	6	0
Research and Development	1	1	11
Administration	7	6	0
Engineering	4	6	3
Shipping/Pipelines	0	1	12

### Business Characteristics of Small Integrated Companies

Only three of the five small integrated independent companies answered the questions of the interview. One firm refused to participate and the other one does not do exploration and production in the Gulf and thus did not answer the interview questions. All three of the businesses were extracting oil and gas from the Gulf both currently and in 1986 (see table 4.5). The amount of oil obtained ranged from 219,000 to 1,275,000 barrels and the quantity of gas ranged from 6.5 to 34.97 billion cubic feet. Two of the firms extracted more oil and one got less oil in 1993 than in 1986 while one firm obtained more gas, one derived less gas and one extracted the same amount of gas. One enterprise had the same level of involvement in exploration in 1994 as in 1986 while two were less engaged in exploration activities. All three businesses were engaged in downstream integration activities in 1994, but two were not in 1986. Most of these companies located their headquarters in the area around the Gulf of Mexico, particularly in Texas. Half of the other offices maintained by the small integrated firms were in the Gulf region, although these businesses had fewer other offices in this area in 1994 than in 1986.

Table 4.5  
Small Integrated Independent Companies

	Oil and Gas 1994	Oil and Gas 1986	More Oil 1993	More Gas 1993	More Exploring 1994
Yes	3	3	2	1	0
No	0	0	1	2	3
Total	3	3	3	3	3

Table 4.5  
Small Integrated Independent Companies  
(continued)

	Downstream Integration 1994	Downstream Integration 1986	Headquarters GOM 1994	Other Offices <sup>a</sup> GOM 1994
Yes	3	1	2	3
No	0	2	1	3
Total	3	3	3	6

<sup>a</sup>Total number of offices, not companies.

As expected, the number of employees in small integrated independent companies was much smaller than the numbers in major corporations and large integrated independent businesses (see table 4.6). Unlike major corporations and large integrated independents who had their largest numbers of employees in production and platform work, the largest category for small integrated independent firms was administration. Yet, the median number of workers was five for three types of employment: administration, exploration and production/platform work. Unlike the other integrated types of firms, these companies had no employees in research and development, but, like the large integrated enterprises, there were few workers in shipping and pipelines. In contrast to the two other kinds of integrated concerns, all of these enterprises decreased their workforces since 1986 and none of these companies increased the number of employees in any type of employment since 1986 (see table 4.6).

Table 4.6  
Small Integrated Firm's Employees

	1994			
	Mean	Median	Minimum	Maximum
Total Workers	73	20	12	187
Drilling	2	1	1	4
Exploration	4	5	3	5
Production/Platform Work	6	5	2	12
Research and Development	0	0	0	0
Administration	14	5	1	35
Engineering	2	1	1	5
Shipping/Pipelines	0	0	0	1

Table 4.6  
Small Integrated Firm's Employees  
(continued)

	Change Since 1986		
	Increase	Decrease	Same
Total Workers	0	3	0
Drilling	0	2	1
Exploration	0	2	1
Production	0	2	1
Platform Work	0	2	1
Research and Development	0	2	1
Administration	0	2	1
Engineering	0	2	1
Shipping/Pipelines	0	2	1

### Business Characteristics of Large Nonintegrated Companies

Eight of the nine large nonintegrated independent enterprises extracted both oil and gas from the Gulf in 1994 while one obtained only gas (see table 4.7). In contrast, only six of these nine businesses derived both resources from the Gulf in 1986 and three obtained neither oil nor gas. Based on the respondents answers to other questions, these three companies recently became involved in exploration and production in the offshore Gulf of Mexico although all three of these firms existed in 1986. The median quantity of oil extracted by these firms in 1994 was 702,500 barrels while the median for gas was 22 billion cubic feet. The majority of these enterprises extracted more oil and more gas in 1993 than in 1986. All nine of these companies were more involved in exploring currently than in 1986. In both 1994 and 1986, four of these companies were involved in some downstream integration activities. These firms' headquarters were in the Gulf area, especially Houston. In addition, most of the other offices of these enterprises were also in the Gulf zone, mainly Texas, and this set of businesses gained offices in the Gulf region between 1986 and 1994.

Table 4.7  
Large Nonintegrated Independent Companies

	Oil and Gas 1994	Oil and Gas 1986	More Oil 1993	More Gas 1993	More Exploring 1994
Yes	8	6	6	8	9
No	1 (gas)	3	1	1	0
Total	9	9	7	9	9

Table 4.7  
Large Nonintegrated Independent Companies  
(continued)

	Downstream Integration 1994	Downstream Integration 1986	Headquarters GOM 1994	Other Offices <sup>a</sup> GOM 1994
Yes	4	4	9	8
No	5	5	0	5
Total	9	9	9	13

<sup>a</sup>Total number of offices, not companies.

In general, the large nonintegrated companies employed fewer people than did the integrated businesses (see table 4.8). Like the small integrated firms, the largest employment categories in the large nonintegrated firms were administration, exploration and production/platform work, especially administration. The enterprises reported few employees in the other kinds of work; many had no workers in shipping and pipelines and none had employees involved in research and development. In contrast with the integrated businesses, the total size of the staffs at most of the large nonintegrated companies increased between 1986 and 1994 (see table 4.8). However, the increases were mainly in two categories - exploration and administration. In five types of positions, the modal direction of change was no change since 1986: drilling, platform work, research and development, engineering, and shipping/pipelines. Again, none of these firms had workers in research and development in either year and most had no employees involved with shipping and pipelines in either year.

Table 4.8  
Large Nonintegrated Firms' Employees

	1994			
	Mean	Median	Minimum	Maximum
Total Workers	32	29	0	70
Drilling	2	1.5	0	6
Exploration	7	6.5	3	12
Production/Platform Work	8	2.5	0	35
Research and Development	0	0	0	0
Administration	15	6.5	0	70
Engineering	4	3.5	0	10
Shipping/Pipelines	2	0	0	12

Table 4.8  
Large Nonintegrated Firms' Employees  
(continued)

	Change Since 1986		
	Increase	Decrease	Same
Total Workers	6	1	2
Drilling	3	1	4
Exploration	6	1	1
Production	3	1	3
Platform Work	2	0	6
Research and Development	0	0	8
Administration	4	1	3
Engineering	2	1	5
Shipping/Pipelines	2	0	6

### Business Characteristics of Small Nonintegrated Companies

The small nonintegrated independent endeavors are the most numerous and least documented businesses in the Gulf of Mexico. Of the eleven firms examined, nine collected both oil and gas in 1994 and one extracted neither resource (see table 4.9). Only two of these enterprises obtained both oil and gas in 1986 while eight derived neither oil nor gas. Based on other information obtained, seven of these firms recently began offshore extraction in the Gulf of Mexico and four of these seven may be new businesses because they had no headquarters in 1986. The other small nonintegrated concern collected neither resource in either year. The median quantity of oil extracted was 110,000 barrels and the median amount of natural gas was 10.9 billion cubic feet. Eight of the companies collected more oil in 1994 than in 1986 while seven obtained more gas. Nine of these businesses were more involved in exploring for oil and natural gas presently than in 1986 while one was conducting the same amount of exploring and the final one had decreased its exploration activities. None of these enterprises were involved in downstream integration activities in either year. Most of the headquarters of these businesses were in the Gulf zone, especially Houston. The bulk of their other offices were in the Gulf area as well, about half in Texas and about half in Louisiana. This group of companies had more other offices in the Gulf region in 1994 than in 1986.

Table 4.9  
Small Nonintegrated Independent Companies

	Oil and Gas 1994	Oil and Gas 1986	More Oil 1993	More Gas 1993	More Exploring 1994
Yes	9	2	8	7	9
No	1	8	0	1	2
Total	10	10	8	8	11
	Downstream Integration 1994	Downstream Integration 1986	Headquarters GOM 1994	Other Offices <sup>a</sup> GOM 1994	
Yes	0	0	7	8	
No	11	11	4	3	
Total	11	11	11	11	

<sup>a</sup>Total number of offices, not companies.

The small nonintegrated independent enterprises had the smallest workforces (see table 4.10). The largest categories of employment were: production/platform work, administration and exploration. Identical to small integrated firms, none of the businesses had any employees assigned to research and development and the largest number of workers involved in shipping and pipelines was one. The small nonintegrated independent enterprises is the group that is growing in the Gulf. These firms were the most numerous in the sampling frame (discussed previously) and, like the large nonintegrated businesses, they experienced increases in their labor forces. Ten of the eleven companies had increased their total number of workers since 1986 (see table 4.10). The majority of the companies reported having more people involved in the following types of positions in 1994 than in 1986: drilling, exploration, production, and administration. In four categories, the numbers of employees did not change: platform work, research and development, engineering, and shipping/pipelines.



Table 4.10  
Small Nonintegrated Firms' Employees

	1994			
	Mean	Median	Minimum	Maximum
Total Workers	17	13	2	51
Drilling	1	1.5	0	3
Exploration	6	4	2	12
Production/Platform Work	7	4	1	40
Research and Development	0	0	0	0
Administration	7	4	2	19
Engineering	2	1.5	0	6
Shipping/Pipelines	0	0	0	1

	Change Since 1986		
	Increase	Decrease	Same
Total Workers	10	0	1
Drilling	8	0	3
Exploration	10	0	1
Production	9	0	2
Platform Work	4	0	7
Research and Development	0	0	11
Administration	10	0	1
Engineering	5	0	6
Shipping/Pipelines	2	0	9

### Similarities Across Type of Company

The firms in the five categories were similar in a few ways. Regardless of type of company, the majority of the businesses extracted both oil and natural gas. Only a few enterprises obtained only one resource, but the few that focused on one mineral collected natural gas and not oil. The firms were also similar in that the vast majority of them, regardless of the type of company, extracted more gas in 1993 than in 1986. The distribution of employees among the types of work was comparable, regardless of the type of company (see table 4.11). The three categories with the largest numbers of employees were production/platform maintenance and operation, exploration and administration.

Table 4.11  
Distribution of Employees in 1994 by Type of Company

	Major			
	Mean	Median	Minimum	Maximum
Total Workers	465	277	40	1650
Drilling	16	8.5	1	80
Exploration	61	33	5	290
Production/Platform Work	210	155.5	14	700
Research and Development	6	0	0	35
Administration	55	36.5	10	250
Engineering	52	22	3	330
Shipping/Pipelines	4	0	0	30
	Large Integrated			
	Mean	Median	Minimum	Maximum
Total Workers	156	90	0	420
Drilling	7	4	0	21
Exploration	23	20	0	70
Production/Platform Work	76	45	0	245
Research and Development	2	0	0	26
Administration	21	13	0	59
Engineering	10	3	0	50
Shipping/Pipelines	0	0	0	0
	Small Integrated			
	Mean	Median	Minimum	Maximum
Total Workers	73	20	12	187
Drilling	2	1	1	4
Exploration	4	5	3	5
Production/Platform Work	6	5	2	12
Research and Development	0	0	0	0
Administration	14	5	1	35
Engineering	2	1	1	5
Shipping/Pipelines	0	0	0	1

Table 4.11  
Distribution of Employees in 1994 by Type of Company  
(continued)

Large Nonintegrated				
	Mean	Median	Minimum	Maximum
Total Workers	32	29	0	70
Drilling	2	1.5	0	6
Exploration	7	6.5	3	12
Production/Platform Work	8	2.5	0	35
Research and Development	0	0	0	0
Administration	15	6.5	0	70
Engineering	4	3.5	0	10
Shipping/Pipelines	2	0	0	12
Small Nonintegrated				
	Mean	Median	Minimum	Maximum
Total Workers	17	13	2	51
Drilling	1	1.5	0	3
Exploration	6	4	2	12
Production/Platform Work	7	4	1	40
Research and Development	0	0	0	0
Administration	7	4	2	19
Engineering	2	1.5	0	6
Shipping/Pipelines	0	0	0	1

Note: One major company was omitted from this analysis because the respondent definitely could not separate offshore and onshore employees.

### Differences by Type of Company

The businesses were different by the type of company in many ways. First, the quantities of oil and gas extracted from the Gulf differed. In general, based on the medians, the major corporations obtained the most oil followed by the various kinds of independent businesses in descending order: the small integrated independent enterprises, the large nonintegrated businesses, the large integrated firms and the small nonintegrated endeavors. The amount of gas extracted differed somewhat from that for oil (in descending order): major corporations, large nonintegrated firms, small integrated enterprises, small nonintegrated endeavors, and

large integrated businesses. Second, the change in the amount of oil extracted varied by type of company. A large majority of firms in the small and large nonintegrated groups were extracting more oil currently than in 1986 while the number of firms obtaining more oil now and less oil now were almost equal for small integrated enterprises and major corporations. In further contrast, the majority of the large integrated businesses were obtaining less oil currently. A third distinction was involvement in exploration activities. The number of major corporations doing more exploring and that doing less were almost equal. In contrast, the majority of the small integrated independent endeavors were conducting fewer exploration operations while the vast majority of the other three types of companies - large integrated and large and small nonintegrated independent businesses - were more involved in exploring currently than in 1986.

Some variations by type of company concerned the locations of headquarters and other offices. The only difference in the location of the businesses' headquarters by type of company was that the majority of the major corporations had their headquarters outside of the Gulf of Mexico region while the bulk of each of the other types of companies had their headquarters in the Gulf (see table 4.12). Yet, regardless of the type of company, almost all of those that were based in the Gulf had headquarters in Texas, usually Houston. The changes in the location of the headquarters also varied little by type of company. Two nonintegrated companies moved their headquarters from small cities in Texas to large cities in Texas. In addition, four small nonintegrated endeavors had no headquarters in 1986.

Table 4.12  
Headquarters in 1994

	All	M.	L.I.	S.I.	L.N.	S.N.
Gulf of Mexico	35	5	12	2	9	7
Texas	29	5	8	2	8	6
Louisiana	5	0	4	0	0	1
Alabama	1	0	0	0	1	0
Not in the Gulf	12	6	1	1	0	4
Oklahoma	4	2	1	0	0	1
Not in the USA	3	1	0	0	0	2
Common Cities						
Dallas	4	0	1	1	2	0
Houston	24	5	7	1	6	5
New Orleans	5	0	4	0	0	1

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large nonintegrated and S.N. stands for small nonintegrated.

There were four disparities by type of company in the location of other company offices. First, slightly more than half of the offices occupied by major corporations and large integrated concerns were not in the Gulf of Mexico region (56 and 60 percent, respectively) while more than half of the other offices belonging to the large and small nonintegrated businesses were in this area (62 and 73 percent, respectively) (see table 4.13). Second, major and large integrated companies had more other offices in other countries than did the other types of firms. Yet, regardless of the type of company, the majority of the other offices that were in the Gulf area were in Texas, especially Houston. The remaining offices in the Gulf region were in Louisiana, particularly Lafayette and New Orleans.

Table 4.13  
Other Offices in 1994

	All	M.	L.I.	S.I.	L.N.	S.N.
Gulf of Mexico	50	14	16	3	9	8
Texas	34	8	14	2	6	4
Louisiana	16	6	2	1	3	4
Not in the Gulf	50	18	23	3	3	3
Oklahoma	3	1	2	0	0	0
Colorado	4	0	4	0	0	0
Not in the USA	16	5	7	0	1	3
Common Cities						
Amarillo	2	0	0	0	2	0
Calgary	7	2	4	0	1	0
Corpus Christi	2	0	2	0	0	0
Denver	4	0	4	0	0	0
Houston	16	5	6	0	2	3
Lafayette	9	3	2	1	2	1
London	2	0	2	0	0	0
Midland	10	3	4	1	2	0
New Orleans	6	3	0	0	0	3
Oklahoma City	3	1	2	0	0	0
Tyler	3	0	2	1	0	0
No Other Offices	9	1	1	1	2	4

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large nonintegrated and S.N. stands for small nonintegrated.

The third disparity concerned the change in the numbers of other offices. The findings indicated that the small nonintegrated firms established new other offices between 1986 and 1994 whereas the other types of businesses closed some of their other offices. The mean number of other offices for small nonintegrated independent firms increased while the means for the other types of companies decreased (see table 4.14). Similarly, the range in the number of other offices increased for the small nonintegrated firms and decreased for the other types of concerns. Fourth, a comparison of the actual location of other offices in 1986 and 1994 revealed that the integrated concerns tended to remove offices from the Gulf area while the nonintegrated businesses gained offices in this region. The net reductions of cities in the Gulf that were the host of other offices were 3 for the major corporations, 6 (removed 7 and added 1) for the large integrated enterprises and 2 for the small integrated firms. The net increases in the use of cities in the Gulf for other offices were 2 for the large nonintegrated businesses and 6 (1 removed and 7 added) for the small nonintegrated endeavors. Therefore, it appears that the nonintegrated companies are more committed to extraction in the Gulf of Mexico than are the integrated concerns.

Table 4.14  
Change in Numbers of Other Offices 1986 to 1994

Type of Company	1994			1986		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
All Companies	2.4	0	7	2.8	0	11
Major	3.4	0	7	4.2	0	11
Large Integrated	3.5	0	7	4.2	1	9
Small Integrated	2.0	0	4	3.3	0	5
Large Nonintegrated	1.4	0	4	1.9	0	6
Small Nonintegrated	1.0	0	4	0.4	0	1

Another difference by type of company was the size of the workforces. As expected, the major corporations had the largest numbers of employees, the large integrated independent businesses had the second highest numbers of workers, followed in descending order by the small integrated, large nonintegrated, and small nonintegrated independent firms. The biggest disparity was between the major corporations and the large integrated independent businesses. The final dissimilarity was in the change in the number of employees between 1986 and 1994 (see table 4.15). Overall, integrated companies tended to reduce their staffs whereas nonintegrated firms enlarged theirs. The clearest changes were in the small enterprises. The small nonintegrated endeavors were clearly increasing their labor forces during these eight years. The vast majority of these firms increased their total workforce and the numbers of employees in several categories rose as well. In sharp contrast, the small integrated enterprises lost employees during this period. All three firms had fewer total

workers and two businesses experienced declines in each of the types of positions examined. The changes were less distinct for the large companies. In the major corporations, the modal number of companies had a decrease in total workers and in most of the employment types; however, there were a few companies that experienced increases in each of the kinds of employment except shipping and pipelines. Yet another pattern of changes occurred in the large integrated cluster. The numbers of firms increasing and decreasing employment were similar in all categories except research and development and shipping/pipelines. The final configuration of changes in workers in the last eight years happened in the large nonintegrated set. Although most of the companies increased their total workforces, the modal type of change was no change for five of the eight employment types.

Table 4.15  
Changes in Workforce Distribution from 1986 to 1994  
by Type of Company

	Major Companies			Large Integrated		
	Increase	Decrease	Same	Increase	Decrease	Same
Total Workers	3	7	1	6	7	0
Drilling	4	6	1	7	5	1
Exploration	4	7	0	6	4	3
Production	4	5	2	6	5	2
Platform Work	4	6	1	7	6	0
Research and Development	1	5	5	1	1	11
Administration	2	7	2	7	6	0
Engineering	4	6	1	4	6	3
Shipping/Pipelines	0	4	7	0	1	12

	Small Integrated			Large Nonintegrated		
	Increase	Decrease	Same	Increase	Decrease	Same
Total Workers	0	3	0	6	1	2
Drilling	0	2	1	3	1	4
Exploration	0	2	1	6	1	1
Production	0	2	1	3	1	3
Platform Work	0	2	1	2	0	6
Research and Development	0	2	1	0	0	8
Administration	0	2	1	4	1	3
Engineering	0	2	1	2	1	5
Shipping/Pipelines	0	2	1	2	0	6

Table 4.15  
Changes in Workforce Distribution from 1986 to 1994  
by Type of Company  
(continued)

	Small Nonintegrated		
	Increase	Decrease	Same
Total Workers	10	0	1
Drilling	8	0	3
Exploration	10	0	1
Production	9	0	2
Platform Work	4	0	7
Research and Development	0	0	11
Administration	10	0	1
Engineering	5	0	6
Shipping/ Pipelines	2	0	9

---

Note: Most of the companies had no employees in research and development and shipping/pipelines in either year.

## BUSINESS ENVIRONMENT

Although all of the companies examined in this study were operating in the Gulf of Mexico, aspects of the environment were sometimes viewed similarly and sometimes differently by the type of company. The purpose of this section of this chapter is to present these similarities and differences. The factors of the business environment examined were: federal agencies and regulations, technology, joint ventures, use of service companies, and outlook for the future of oil and gas exploration and production in the Gulf of Mexico.

The results can be summarized as follows. There were five similarities across the five types of companies. The first similarity involved the respondents' views of federal agencies that oversee oil and gas exploration and production in the Gulf of Mexico. The executives overwhelmingly chose the Minerals Management Service as the agency with the greatest influence on their activities and they tended to mention the Department of Transportation as the agency with the fourth largest impact. The second resemblance concerned the use of technology; almost all of the companies used 3D seismic data. The third thing the companies had in common regardless of type was that almost all of them participated in joint ventures in the last year. The fourth similarity was about the use of service companies. Almost all of the companies contracted out some activities in 1994, almost all of them increased their use of service companies between 1986 and 1994, they contracted out the same types of activities,



and the ranges of the percentage of their Gulf of Mexico budgets expended on service companies were similar across the five categories of firms.

The differences by the type of company were more numerous than the similarities. Some of these variations were due to integration. First, integration had some effect on the rankings of the federal agencies; representatives of integrated firms ranked the Environmental Protection Agency as the agency with the second largest impact on their operations while those from nonintegrated businesses selected the Coast Guard. Second, integration influenced the rankings of regulations; integrated firms ranked the Clean Water Act as the one with the greatest potential impact on their operations and the Clean Air Act as second while nonintegrated firms ranked the financial responsibility provision of OPA '90 as the most influential regulation. Third, integration was related to joint ventures as demonstrated by the finding that the majority of nonintegrated firms participated in more joint ventures in 1994 than in 1986 while integrated firms did not and nonintegrated businesses partnered with large and small companies while integrated enterprises overwhelmingly partnered with large companies. Fourth, integration was associated with service company use in that officers from nonintegrated concerns reported spending a greater percentage of their Gulf operating budgets contracting out activities than did integrated firms. Fifth, integration affected the respondents' views of the future of Gulf extraction of oil and gas because representatives of integrated concerns were less optimistic about the size of the workforce in the Gulf in 1998 than were those of nonintegrated businesses.

Two variations seemed to be related to both integration and size. One occurred in the ranking of regulations - major and large integrated corporations (two largest types of firms and both are integrated) ranked the financial responsibility provisions of OPA '90 as third. The other variation showed up in the companies' involvement in deep water projects; approximately half of the integrated firms were engaged in these projects while almost all of the small nonintegrated businesses and almost none of the large nonintegrated concerns were engaged in deep water exploration. One variation depended on size - large companies ranked the increase in lease bonding to cover plug-and-abandon costs as fourth. One difference varied along the typical dimension used to examine oil and gas companies - major corporations vs independent firms. Major corporations were more likely to be engaged in subsalt exploration than were independent businesses. Three other differences cannot be explained by size, integration or the difference between major and independent corporations. These are: 1) major corporations and nonintegrated businesses were the most likely to use horizontal drilling, 2) major corporations were the most involved in joint ventures followed in descending order by the nonintegrated firms and then the integrated independent companies, and 3) the majority of executives from large integrated and small nonintegrated businesses reported spending a greater percentage of their Gulf operating budgets on service companies in 1994 than in 1986 while the majority of the other three types of firms did not. Now that the results have been summarized, they will be presented in greater detail.

## Federal Agencies and Regulations

As pointed out in the previous chapter, federal agencies and regulations can have an enormous impact on the operating conditions and activities of exploration and production companies in the Gulf of Mexico. The respondents' rankings of the five agencies with the most influence on their operations in the Gulf by type of company are shown in table 4.16. Examining the table, it is difficult to discern similarities and variations by type of company in the relative impact of these agencies on operations. Nevertheless, by analyzing the modal choice of agency by type of company within each rank the similarities and differences can be found.

Table 4.16  
Federal Agencies with the Greatest Effect on Gulf Extraction

---

Agencies Ranked First						
	All	M.	L.I.	S.I.	L.N.	S.N.
Environmental Protection Agency	2	1	0	0	0	1
Minerals Management Service	41	9	11	3	8	10
Occupational Safety and Health Administration	1	1	0	0	0	0
Total Companies	44	11	11	3	8	11
Agencies Ranked Second						
	All	M.	L.I.	S.I.	L.N.	S.N.
Coast Guard	13	0	3	0	4	6
Environmental Protection Agency	25	9	5	3	4	4
Federal Energy Regulatory Commission	2	0	2	0	0	0
Minerals Management Service	2	2	0	0	0	0
Total Companies	42	11	10	3	8	10

Table 4.16  
Federal Agencies with the Greatest Effect on Gulf Extraction  
(continued)

## Agencies Ranked Third

	All	M.	L.I.	S.I.	L.N.	S.N.
Coast Guard	20	11	2	2	3	2
Corp of Engineers	1	0	0	0	0	1
Department of Transportation	6	0	2	0	1	3
Environmental Protection Agency	9	0	5	0	1	3
Minerals Management Service	1	0	0	0	0	1
National Marine Fisheries Service	1	0	0	1	0	0
Occupational Safety and Health Administration	2	0	0	0	2	0
Total Companies	40	11	9	3	7	10

## Agencies Ranked Fourth

	All	M.	L.I.	S.I.	L.N.	S.N.
Coastal Zone Management	2	0	0	1	0	1
Coast Guard	4	0	1	0	1	2
Corp of Engineers	1	0	1	0	0	0
Department of Transportation	12	5	3	0	2	2
Environmental Protection Agency	2	1	0	0	0	1
Internal Revenue Service	1	0	1	0	0	0
M M S	1	0	0	0	1	0
National Marine Fisheries Service	2	1	1	0	0	0
National Oceanic and Atmospheric Agency	1	1	0	0	0	0
Occupational Safety and Health Administration	6	2	2	0	1	1
Total Companies	32	10	9	1	5	7

Table 4.16  
Federal Agencies with the Greatest Effect on Gulf Extraction  
(continued)

Agencies Ranked Fifth

	All	M.	L.I.	S.I.	L.N.	S.N.
Coast Guard	1	0	1	0	0	0
Corp of Engineers	1	0	1	0	0	0
Department of Commerce	1	0	0	0	1	0
Department of Transportation	4	2	1	0	1	0
Environmental Protection Agency	1	0	0	0	0	1
Federal Communication Commission	1	1	0	0	0	0
Federal Energy Regulatory Commission	1	0	0	0	1	0
National Marine Fisheries Service	3	2	1	0	0	0
National Oceanic and Atmospheric Administration	1	1	0	0	0	0
Occupational Safety and Health Administration	5	2	2	0	0	1
Office of Contract Compliance- Department of Labor	1	0	0	0	0	1
Total Companies	20	8	6	0	3	3

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large nonintegrated and S.N. stands for small nonintegrated.

**Similarities in Selection of Agencies Across Type of Company.** There were two similarities in the modal choice of agency by type of company. First, representatives of all types of companies overwhelmingly chose Minerals Management Service as the federal agency with the most effect on their firms' operations. Second, for the types of company where more than half of the respondents picked a fourth agency, the Department of Transportation was selected as the agency having the fourth largest impact on operations in the Gulf.

**Differences in Selection of Agencies by Type of Company.** The choice of the second agency varied by integration; respondents from the integrated businesses picked the Environmental Protection Agency as the second most influential agency whereas those from the nonintegrated enterprises tended to mention the Coast Guard. The third selection did not differ by any of the three dimensions that separate the companies into the five categories. Officials from major, small integrated and large nonintegrated endeavors favored the Coast Guard as being the third most influential federal agency. On the other hand, members of large integrated firms picked the Environmental Protection Agency and those from small nonintegrated businesses tended to choose either the Environmental Protection Agency or the Department of Transportation. The fifth choice realistically cannot be analyzed due to the scarcity of mentions of any agency.

**Differences in Regulations by Type of Company.** As would be expected, the rankings of the four regulations differed by type of company. Both integration and size of company influenced the representatives' rankings of the four regulations. This result can be discerned most clearly by comparing either the median or modal rank across the five groups of companies (see table 4.17). The integrated firms ranked the Clean Water Act as first and the Clean Air Act as second while the nonintegrated businesses ranked the financial responsibility provisions as first. Complying with the Clean Water and Air Acts might require retrofitting platforms, which was a big concern of the integrated firms, while obeying OPA '90 necessitates a large amount of insurance, which was a major issue for the nonintegrated businesses. The large nonintegrated concerns, of which four were involved in some downstream integration activities, ranked the Clean Water and Air Acts as second and third while the small nonintegrated enterprises ranked them as third and fourth. Size was a factor in the selection of the fourth regulation possibly because size determines ability to establish large escrows. The large companies ranked the increases in lease bonding to cover plug-and-abandon liabilities as fourth whereas the small firms, which might have fewer resources for this kind of escrow, ranked this regulation as second (small nonintegrated firms) or third (small integrated concerns). Also, it is noteworthy that the rankings for the major corporations and the large integrated businesses were identical possibly because these two kinds of firms are similar in many ways. The manner in which these regulations are expected to affect the companies' operations in the Gulf will be discussed later.

Table 4.17  
 Rankings of Regulations for All Companies and by Type of Company

	Major Corporations				
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.5	4	4	1	4
Reinjecting Produced Water	1.4	1	1	1	3
Air Emission Controls	2.4	2	2	1	4
Financial Responsibility in OPA '90	2.7	3	3	2	4
	Large Integrated Businesses				
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.6	4	4	3	4
Reinjecting Produced Water	1.5	1	1	1	4
Air Emission Controls	2.3	2	2	1	4
Financial Responsibility in OPA '90	2.5	3	3	1	4
	Small Integrated Firms				
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.0	3	3	3	3
Reinjecting Produced Water	1.7	1	1	1	3
Air Emission Controls	1.7	2	2	1	2
Financial Responsibility in OPA '90	3.7	4	4	3	4
	Large Nonintegrated Enterprises				
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	3.1	4	4	1	4
Reinjecting Produced Water	2.3	2	2	1	4
Air Emission Controls	3.3	3	3	3	4
Financial Responsibility in OPA '90	1.2	1	1	1	2

Table 4.17  
Rankings of Regulations for All Companies and by Type of Company  
(continued)

	Small Nonintegrated Endeavors				
	Mean	Median	Mode	Minimum	Maximum
Plug and Abandon Liabilities	1.7	2	2	1	3
Reinjecting Produced Water	3.0	3	3	2	3.5
Air Emission Controls	3.9	4	4	3.5	4
Financial Responsibility in OPA '90	1.4	1	1	1	2

## Technology

As mentioned in the previous chapter, technology can be an important ally in exploration and extraction in the Gulf of Mexico. The companies' employment of four types of technology revealed one similarity across the five kinds of firms and three differences (see table 4.18).

Table 4.18  
Technology Use by Company Type

Technology	M.	L.I.	S.I.	L.N.	S.N.
Deepwater Projects	6	7	2	1	10
3D seismic Data	11	12	2	8	11
Subsalt Exploration	9	5	1	2	0
Horizontal Drilling	6	4	0	4	5
Number of Companies	11	13	3	8	11

Note: Numbers in the table are the numbers of companies currently engaged in or currently planning to become engaged in projects using these technologies. In addition, M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large nonintegrated and S.N. stands for small nonintegrated.

**Similarities in Use of Technology Across Type of Company.** Almost every company used 3D seismic data (only 1 large and one small integrated firm did not). The importance of this technology will be elucidated in the section concerning how the business environment affects operations in the Gulf.

**Differences in Use of Technology by Type of Company.** Integration seems to influence involvement in deep water projects. A moderate number of the integrated firms were involved in such projects while the nonintegrated businesses demonstrated the two extremes

of involvement. Slightly more than half of the integrated businesses were involved in deep water activities while almost all (10 of 11) of the small nonintegrated endeavors indicated that they were involved in or planning to do deep water projects while almost all (7 of 8) of the large nonintegrated firms claimed that they were not. Interest in subsalt exploration demonstrated a difference between the major corporations and independent companies. In general, only major corporations were involved in subsalt exploration. The majority of the representatives of major corporations stated that their firm was conducting subsalt explorations while the bulk of the independent businesses claimed that their companies were not. The use of horizontal drilling did not vary by any of the three factors that identify the five types of companies. Overall, nonintegrated firms and the major corporations were the most likely to use this technology. Over half of these three types of firms did horizontal drilling while less than half of the integrated independent enterprises used this technique. The effects of these technologies on the companies' operations will be discussed later.

### **Joint Ventures**

Joint ventures are important in offshore oil and gas exploration and extraction in the Gulf of Mexico. These partnerships reduce each company's risk and provide funds for expensive exploration that none of the firms could have obtained on their own. Therefore, it is important to examine participation in joint ventures by type of company to understand activity in the Gulf of Mexico. Due to the complexity of examining which companies were involved in joint ventures with which other companies, it is necessary to first describe the results for each of the five types of companies before discussing the similarities and differences by type of company. The five categories will be discussed in the following order: major corporations, large integrated concerns, small integrated firms, large nonintegrated businesses, and small nonintegrated companies. Due to differences between the pretest and the interview in some of the questions and the small number of companies in each group examined during the pretest, only the interview findings will be reported here. Thus, the outcome for participation in joint ventures in 1986 and 1994 is based on the entire sample while the findings for the number of partners and the change in involvement in joint ventures since 1986 are from the companies studied during the interview only.

**Major Corporations.** The company representatives were questioned concerning their firms' participation in joint ventures. All of the major corporations were involved in joint ventures in 1994 and in 1986. During the interview, the representatives were asked to give the total number of joint venture partners in the last year. These numbers ranged from 2 to 90 with a median of 11.5. These respondents were queried about how the number of joint ventures had changed since 1986. Five firms were involved in more joint ventures in the last year while four were involved in fewer joint ventures.

**Large Integrated Companies.** Eleven of the 13 large integrated independent enterprises were involved in joint ventures in the last year whereas only 9 of these businesses conducted joint ventures in 1986. The number of joint venture partners given ranged from 0 to 10 with a median of 5.5. Four executives reported an increase in joint ventures since 1986 while two



claimed that joint venture activity had decreased and two said their companies were involved in the same number of joint ventures in both years.

**Small Integrated Concerns.** All three of the small integrated businesses were engaged in joint ventures in both 1986 and 1994. The range of the number of joint venture associates was from 3 to 20, the median was 5. Two of the companies were involved in the same number of joint ventures in the last year as in 1986 while one firm was involved in more of these activities.

**Large Nonintegrated Businesses.** All nine large nonintegrated independent enterprises were involved in joint ventures in the last year; seven businesses conducted joint ventures in 1986. The range of the number of joint venture partners was from 3 to 30 and the median number was 8. Five were engaged in more of these activities in 1994 than in 1986, one conducted the same number of joint ventures and two were less involved in such operations.

**Small Nonintegrated Firms.** All eleven small nonintegrated independent enterprises were involved in joint ventures in 1994 whereas only four small nonintegrated enterprises were thus engaged in 1986. The number of partners ranged from 2 to 20 with a median of 10. Eight of the respondents reported that their firms were conducting more joint ventures now than in 1986 while one stated that the number of these operations had not changed since 1986.

Table 4.19  
Joint Venture Involvement by Type of Company

Participation in Joint Ventures in 1994 <sup>a</sup>					
	M.	L.I.	S.I.	L.N.	S.N.
Yes	11	11	3	9	11
No	0	2	0	0	0
Total	11	13	3	9	11
Number of Partners <sup>b</sup>					
	Median		Minimum		Maximum
Major Corporations	11.5		2		90
Large Integrated	5.5		0		10
Small Integrated	5.0		3		20
Large Nonintegrated	8.0		3		30
Small Nonintegrated	10.0		2		20
Change in Joint Ventures <sup>b</sup>					
	M.	L.I.	S.I.	L.N.	S.N.
Increase	5	4	1	5	8
Same	0	2	2	1	1
Decrease	4	2	0	2	0
Total	9	8	3	8	9

Note: M. stands for major corporations, L.I. represents large integrated, S.I. means small integrated, L.N. is large nonintegrated and S.N. indicates small nonintegrated firms.

<sup>a</sup>All respondents were asked this question.

<sup>b</sup>The results are from the interview only since this question differed on the pretest.

Table 4.20  
Joint Venture Partners by Type of Company

---

Type of Company	Partners
Majors	Large, mainly majors Three partner with at least one small non-integrated
Large Integrated	Large Five partner with at least one small non-integrated One partners mainly with small non-integrated
Small Integrated	Mainly majors
Large Non-integrated	Mix of Partners Four mainly large One mainly majors Four mix all types One mainly small non-integrated
Small Non-integrated	Mix of Partners Three mainly large One mainly majors Six mix all types One mainly small

---

## Use of Service Companies

**Similarities in Service Company Use Across Type of Company.** Employment of service companies did not vary by type of company. Only two firms did not contract out some activities - one large integrated and one large nonintegrated. In addition, with the exception of the small integrated endeavors, the majority of every type of company reported an increase in their use of outside companies (see table 4.21). Moreover, the kinds of activities contracted out were very similar across the five types of companies (see table 4.21). The only activity that the businesses rarely hired outside companies to complete was accounting. The majority of the executives reported contracting out the other activities. Further, the ranges of the percentages of Gulf operating costs expended on using outside contractors were similar. These percentages ranged from at least 17 to 90. The percentages for nonintegrated firms varied between 0 and 100 while those for integrated businesses were between lows of 0 (small integrated), 5 (large integrated) or 17 (major corporations) and highs of 90 (integrated independents) or 100 (major corporations).

Table 4.21  
Use of Contractors by Type of Company

---

Change in Use of Service Companies 1986 to 1994 <sup>a</sup>					
	M.	L.I.	S.I.	L.N.	S.N.
Increase	7	8	1	5	9
Same	0	3	2	3	2
Decrease	4	1	0	0	0
Total	11	12	3	8	11
Activities Contracted Out <sup>b</sup>					
	M.	L.I.	S.I.	L.N.	S.N.
Drilling	9	6	2	7	8
Seismic/Other Geophysical	9	7	2	7	8
Production	7	5	2	6	6
Platform Work	7	6	3	7	7
Accounting	1	0	0	1	1
Engineering	6	5	3	7	5
Shipping/Pipelines	6	4	3	6	7
Number of Companies	9	8	3	7	9
Change in Percentage of Operating Costs 1986 to 1994 <sup>a</sup>					
	M.	L.I.	S.I.	L.N.	S.N.
Increase	4	7	1	2	8
Same	4	4	2	6	3
Decrease	2	0	0	0	0
Total	10	11	3	8	11

---

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large nonintegrated and S.N. stands for small nonintegrated.

<sup>a</sup>The results are from all of the companies.

<sup>b</sup>The results are from the interview only because the activities were different on the pretest.

**Differences in Service Company Use by Type of Company.** Although the ranges of the percent of Gulf operating costs incurred by hiring outside companies were similar across the type of company, the average costs and their change since 1986 varied by the kind of company. In general, nonintegrated enterprises spent more of their Gulf budgets on outside companies than did integrated businesses. The median percentages of Gulf operating costs expended on outside companies were (in descending order): 90 for the small nonintegrated

group, 82.5 for the large nonintegrated set, 67.5 for the major corporations, 60 for the small integrated firms, and 27 for the large integrated businesses. The change in the percentage of operating costs expended by hiring outside companies did not vary along any of the three dimensions. The majority of large integrated and small nonintegrated firms increased their percentages between 1986 and 1994 while the bulk of the large nonintegrated businesses held their percentages steady (see table 4.21).

### Future of Gulf Activity

**Similarities in Future Across Type of Company.** The outlook on the future of oil and gas in the Gulf did not vary much by type of company. The majority of each type of company expected to be more engaged in exploring for oil and gas in the Gulf in 1998 than at present (see table 4.22). The large integrated and major businesses were a little less optimistic since two firms of each type expected to do the same amount of exploring and two enterprises of each type anticipated doing less exploring. In addition, there was no pattern in the explanations for the predictions about exploration in 1998 (see table 4.23).

Table 4.22  
Future of Gulf Activities by Type of Company

---

A. Oil and Gas Exploration in 1998 by Type of Company					
	M.	L.I.	S.I.	L.N.	S.N.
More	7	8	2	8	6
Same Amount	2	2	0	0	3
Less	2	2	1	0	1
B. Workforce in 1998 by Type of Company					
	M.	L.I.	S.I.	L.N.	S.N.
Larger	2	5	2	8	6
Same Amount	5	5	1	0	2
Smaller	4	3	0	0	1
C. Independents' Share of Gulf Activity in 1998 by Type of Company					
	M.	L.I.	S.I.	L.N.	S.N.
Larger	8	10	3	7	10
Same Amount	0	1	0	0	0
Smaller	1	1	0	0	0

---

Note: M stands for major, L.I. is for large integrated, S.I. means small integrated, L.N. represents large nonintegrated and S.N. stands for small nonintegrated.

Table 4.23  
Exploration in the Gulf in 1998

A. Why More Exploration						
	All	M.	L.I.	S.I.	L.N.	S.N.
Prices	4	1	1	0	2	1
Subsalt	2	1	0	1	0	0
Growth Opportunities	3	1	1	0	1	0
Gulf Characteristics	1	0	1	0	0	0
Current Leases	1	0	1	0	1	0
Collaborative Efforts	2	0	0	1	0	1
Company Commitment to Gulf	2	0	0	0	0	2
Other	7	3	1	0	3	0
Total Responses	24	6	5	2	7	4
B. Why Less Exploration						
	All	M.	L.I.	S.I.	L.N.	S.N.
Mature Area	1	1	0	0	0	0
Economics of Deep Water	1	0	0	1	0	0
Company Characteristics	2	0	1	0	0	1
Regulations	1	0	0	0	0	1
Total Responses	5	1	1	1	0	2
C. Same Amount of Exploration						
	All	M.	L.I.	S.I.	L.N.	S.N.
Company Focus	1	1	0	0	0	0
Prices	3	0	2	0	0	1
Other	3	1	0	0	0	2
Total Responses	7	2	2	0	0	3

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large non-integrated and S.N. stands for small nonintegrated.

There was little variation by type of company concerning the independents' share of Gulf activity in 1998. The majority of representatives from all five types of companies claimed that the independent firms' proportion would be greater and all of the respondents from small integrated and large and small nonintegrated firms predicted that the independents' share would be greater (see table 4.22). Further, there were no differences in the reasons given for these predictions (see table 4.24).

Table 4.24  
Independents' Share in the Gulf in 1998

	A. Larger					
	All	M.	L.I.	S.I.	L.N.	S.N.
General Trend	3	1	0	1	1	0
Marginal/Mature GOM	7	1	1	0	3	2
Independents Overall/Majors in:	6	2	0	1	2	1
Subsalt	1	1	0	0	0	0
Deepwater	5	1	0	1	2	1
GOM Rapid Growth for Independents	1	1	0	0	0	0
Majors Leaving Gulf	6	1	1	1	2	1
3-D Seismic Helps	1	0	1	0	0	0
Independents' Competitive Advantage	4	0	1	0	0	3
Majors' Strategies	2	0	1	0	0	1
Other	3	1	1	0	0	1
Total Responses	39	9	6	4	10	10
	B. Smaller					
	All	M.	L.I.	S.I.	L.N.	S.N.
Regulations	1	1	0	0	0	0
Total Responses	1	1	0	0	0	0
	C. Same					
	All	M.	L.I.	S.I.	L.N.	S.N.
Majors Changing Operations	1	0	1	0	0	0
Total Responses	1	0	1	0	0	0

Note: Five executives had no opinion. One of these said the share depends on majors' divestitures and regulations. Also, M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large non-integrated and S.N. stands for small nonintegrated.

**Differences in Future by Type of Company.** There was some difference by type of company in expectations concerning the size of the workforce in 1998. Executives from integrated companies were less optimistic about the potential for an increase in the Gulf workforce than were those from nonintegrated businesses (see table 4.22). The modal answer for the major corporations was that the workforce would be the same size as it currently is while the modal response for the small integrated and large and small nonintegrated firms was that the workforce would be larger. There was no modal reply for the large integrated businesses, five of the respondents felt that the labor force would be larger and five thought it would be smaller. In addition, representatives of the major corporations and large integrated independent firms were more likely to expect that the workforce would be smaller

in 1998 - four of the respondents from major corporations and three of those from large integrated firms stated that the labor force would be smaller. Moreover, there was some divergence in the reasons for their expectations concerning the size of the workforce in 1998 (see table 4.25). Representatives of major corporations exclusively stated the following reasons for either a smaller workforce or one that was unchanged in size: disposition of properties, reductions in exploration and production, and outsourcing.

Table 4.25  
Workforce in the Gulf in 1998

---

A. Why Workforce Larger						
	All	M.	L.I.	S.I.	L.N.	S.N.
More Fields and Development	3	0	2	0	1	0
Gas Prices/Technology	4	0	1	0	3	0
New Exploration	1	0	0	1	0	0
Now as Small as Possible	2	0	0	1	0	1
More Companies	1	0	0	0	1	0
Expansion	3	1	0	0	1	1
Complexity of Projects	1	0	0	0	0	1
Other	2	0	0	0	1	1
Total Responses	17	1	3	2	7	4
B. Why Workforce Smaller						
	All	M.	L.I.	S.I.	L.N.	S.N.
Disposition of Properties	1	1	0	0	0	0
Reduced Exploration	1	1	0	0	0	0
Reduced Production	1	1	0	0	0	0
Streamlining	1	1	0	0	0	0
New Regulations	1	0	0	0	0	1
Other	1	0	1	0	0	0
Total Responses	6	4	1	0	0	1



Table 4.25  
Workforce in the Gulf in 1998  
(continued)

C. Why Workforce will be the Same

	All	M.	L.I.	S.I.	L.N.	S.N.
Streamlining/"Right sizing"	3	1	1	0	0	1
Outsourcing	1	1	0	0	0	0
Other	7	2	3	1	0	1
Total Responses	11	4	4	1	0	2

Note: One large nonintegrated company and two small nonintegrated firm did not have an opinion on this question. The respondents from the small nonintegrated businesses said it depends on prices and one added that it depends on the results of exploration. Also, M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large non-integrated and S.N. stands for small nonintegrated.

## BUSINESS PRACTICES

Business practices can be affected by both the characteristics of the companies themselves and by the environment in which the companies operate. In the last chapter, the effect of the environment on practices for the companies as a group was presented, in this chapter the similarities and differences in practices by characteristics and the environment will be discussed. Each of the similarities were about the effect of the environment on operations. The texts of the respondents' answers concerning how the current prices of oil and gas reduced activity in the Gulf were comparable, regardless of the type of company, as were the texts of the replies about the effects of future prices on activity. Moreover, the majority of the executives were in favor of areawide leasing and the reduction of the minimum bid. In addition, most of the officers talked favorably about the impacts of 3D seismic data and horizontal drilling on the operations in the Gulf. Further, all of the representatives were against each of the four regulations examined.

The differences largely concerned the effect of business characteristics on practices, although there were some minor variations in the responses about the impacts of the environment. Some of the dissimilarities occurred along the dimension distinguishing the major corporations from the independent firms. First, the major corporations extracted more oil and gas in 1994 than did the independent businesses. Second, the majority of the independent companies were more involved in exploring in 1994 than in 1986 while most of the major corporations were not. Third, the bulk of the major corporations did not have their headquarters in the Gulf region while the headquarters of the independent enterprises were in this area. Fourth, in response to the question concerning how current prices affect operations, representatives of major businesses tended to mention cost cutting and the trade off between oil and gas while those from independent firms did not. Fifth, when discussing the effect of future prices on activities, executives from major corporations mentioned cost cutting while those from independent businesses did not. Sixth, people from major firms responded favorably to the question concerning how subsalt technology had influenced their

operations while those from independent companies responded that they were waiting to see how subsalt affected others before they would decide to become involved.

Other variations demonstrated the differences between integrated and nonintegrated companies. Most of the nonintegrated businesses extracted more oil in 1993 than in 1986 while most of the integrated firms did not. Also, the nonintegrated firms had a greater proportion of their other offices in the Gulf area and tended to establish more other offices in this region while integrated companies had more other offices outside the Gulf zone and tended to close offices in this region between 1986 and 1994. In addition, nonintegrated enterprises increased their workforces between 1986 and 1994 while integrated endeavors did not. Moreover, the answers concerning some aspects of the business environment differed along this dimension. First, respondents from nonintegrated firms often stated that the reduced minimum bid allowed them to begin operations in the Gulf while those from integrated businesses tended to reply that the reduced minimum bid had no influence on their operations. Second, members of nonintegrated companies repeatedly said that they were waiting to see how other firms were affected by deep water projects while those from integrated corporations were more likely to mention actual impacts of these projects on their operations. Third, when responding to the question concerning the effect of the financial responsibility provisions of OPA '90 on activities in the Gulf, executives from nonintegrated enterprises frequently declared that this regulation would put their firms out-of-business whereas those from integrated companies asserted that they could self-insure.

One difference in business practices occurred along all three dimensions - workforce size. Major companies had the largest labor forces in the offshore Gulf followed by large integrated, small integrated, large nonintegrated and small nonintegrated. Thus, major corporations had larger numbers of employees than did independent firms, integrated businesses had more workers than did nonintegrated firms, and, within integration, larger companies had more employees than did smaller firms.

### **Differences in Practices by Characteristics**

The respondents were not questioned directly about how their characteristics affected their practices; however, some of the information gleaned about their businesses suggests how these traits affect practices. The distinctions among the five groups include 1) the capability to conduct extraction activities in other countries (major vs independent), 2) downstream integration (major and integrated independents vs nonintegrated independents) and 3) size (major and large independents vs small independents). Practices in the Gulf seem to vary by these dimensions, although not in consistent ways.

For example, the amounts of oil and gas extracted in 1993 varied by the type of company. As would be expected, major corporations obtained the most oil and gas. However, the reported amounts of oil and gas derived by the other types of companies did not vary in a consistent or anticipated manner. The major corporations obtained the most oil followed in descending order by the: small integrated firms, large nonintegrated enterprises, large

integrated businesses and small nonintegrated endeavors. The pattern for gas extracted differed from that for oil. Again the major corporations derived the largest amounts succeeded by: the large nonintegrated concerns, the small integrated businesses, the small nonintegrated operations, and the large integrated firms. Thus, there is a difference by type of company in the quantities of oil and gas extracted, major companies derived more oil and gas than did independent firms. The change from 1986 to 1993 in the quantity of oil obtained varied by integration. In general, most of the nonintegrated firms obtained more oil in 1993 than in 1986 while the majority of the integrated companies did not.

In contrast, the change in involvement in exploration operations differed along the major vs independent distinction. The majority of the independent firms were doing more exploring in 1994 than in 1986 while approximately equal numbers of the major companies were doing more and less exploring in 1994. In addition, the location of headquarters differed along the same dimension. The majority of the major companies had their headquarters outside of the Gulf of Mexico region while the bulk of the other four types of companies had their headquarters in the Gulf area. The location of other offices varied more by integration. The integrated firms had more other offices than did the nonintegrated concerns and many of these other offices were outside the Gulf region while those of the nonintegrated businesses were in this area. Moreover, the integrated firms were more likely than the nonintegrated enterprises to have other offices in other countries than the United States. Further, integrated companies tended to close offices in the Gulf area while the nonintegrated endeavors tended to open offices in this region.

The size of the workforce of oil and gas extracting companies varied by all three dimensions. The major corporations had the largest staffs followed by: the large integrated concerns, the small integrated operators, the large nonintegrated endeavors and the small nonintegrated enterprises. The same statement cannot be made concerning the change in the numbers of employees from 1986 to 1994. The nonintegrated businesses tended to gain workers; in contrast, the integrated firms tended to lose workers.

In summary, there appears to be some difference by type of company in operations - quantities of oil and gas extracted, changes in the amount of exploring between 1986 and 1994, location of headquarters and other offices, and workforce size. However, only some of these can be attributed to the three dimensions that differentiate the five types of companies.

### **Similarities and Differences in the Influence of the Environment on Business Practices**

As discussed in the previous chapter, the respondents were asked to discuss how some aspects of the business environment affected their companies' operations in the Gulf of Mexico. The results for the companies without regard to type of company were presented in the last chapter. In this chapter, the focus is on the similarities and differences in the impact of aspects of the business environment on practices. These factors are: current and anticipated future prices of oil and gas, leasing policies, technology and regulations.

**Similarities in the Effect of Current Prices Across Type of Company.** The text of the answers did not vary by type of company (see table 4.26). When discussing how current prices slowed down operations, representatives from all company types stated that the prices reduced their activities; slowed down exploration activities; induced them to sell some properties; prompted them to delay and stall drilling and development; and even prompted them to forego exploration, lease sales and new projects. The one disparity was that respondents from large integrated businesses tended to add that low prices slowed production and even curtailed production on some properties. Four of the seven executives from large integrated concerns talked about reduced production while none of the those from major corporations, small integrated firms, and large nonintegrated businesses referred to reduced production and only one person from a small nonintegrated endeavor mentioned production. There were no distinctions in the text of the comments by type of company for the other impacts of the current prices on operations.

Table 4.26  
The Effect of Prices on Operations

---

	A. Current Prices					
	All	M.	L.I.	S.I.	L.N.	S.N.
Reduced Activity	20	3	7	1	4	5
Other Economic Problems	8	1	3	1	2	1
Cut Costs	2	2	0	0	0	0
Tradeoff Between Oil and Gas	6	5	0	0	1	0
Increased Activity	1	0	0	1	0	0
No Effect	8	1	2	0	1	4
No Effect-Focus on Future Prices	6	1	2	0	1	2
Number of Statements	51	13	14	3	9	12

Table 4.26  
The Effect of Prices on Operations  
(continued)

	B. Future Prices					
	All	M.	L.I.	S.I.	L.N.	S.N.
Reduced Activity	13	2	5	0	2	4
Cautious Level of Activity	3	0	1	0	0	2
Cut Costs	3	3	0	0	0	0
Economic Issues	3	0	1	0	1	1
Stable Activity	2	0	2	0	0	0
Increased Activity	14	4	2	2	4	2
Projections of Prices Only	2	1	0	0	1	0
No Effect	6	2	1	1	0	2
No Response	2	0	1	0	1	0
Number of Statements	48	12	13	3	9	11

Note: The number of statements are greater than the number of companies because some companies gave answers that had elements that fit in more than one category. Also, M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large non-integrated and S.N. stands for small nonintegrated.

**Differences in the Effect of Current Prices by Type of Company.** There were few differences by type of company in the responses to the question concerning how current prices affect operations in the Gulf. Yet, the most frequent answer varied somewhat by type of company (see table 4.26). The most common reply for the large integrated firms and the large and small nonintegrated businesses was that the current prices slowed down their operations. However, an almost equal number of respondents from small nonintegrated endeavors claimed that the current prices had no impact on their activities. The most frequent answer for the major corporations included discussions of the tradeoff between oil and gas activities. There was no reaction that occurred more often than any other for the respondents from small integrated enterprises. Moreover, only representatives of major corporations presented strategies for reducing costs as their response to the price situation and only executives from large companies (5 major and 1 large nonintegrated businesses) mentioned the tradeoff between oil and gas.

**Similarities in the Effect of Future Prices Across Type of Company.** The text of the responses to the question concerning the effect of future prices on operations in the Gulf did not vary by type of company (see table 4.26). When respondents discussed reductions in operations, they sounded similar regardless of the type of company in which they were employed. The executives used phrases such as: "...Development has slowed. ..." (major corporation); "Curtailed drilling activities, postponed development decisions." (large integrated independent); "Reduced activity level..." (large integrated independent);

"...Curtailed some activity." (large integrated independent); "Limits prospects." (large nonintegrated independent); "Restricted our operations." (small nonintegrated independent); "Slowing down activity." (small nonintegrated independent); and "Curtailed existing production for future prices..." (small nonintegrated independent).

When the executives mentioned ways that projections of future prices led to increased activity, again, there was no difference by type of company in the text of the answers. For instance, the representatives made statements such as the following: "Bright outlook for shelf exploration and subsalt." and "Increased acquisitions for the future." (major corporations); "The industry projections of higher gas prices in the future have increased the company's exploration and production activities in the Gulf of Mexico." (large integrated independent); "Increased activity." (small integrated independent); "Projections have made us more active, more involved in the Gulf of Mexico. It is the best place for gas reserves." (large nonintegrated independent); and "We believe that the situation will be better especially in gas pricing. We look to the Gulf for resources." (small nonintegrated independent). Thus, there were few differences by type of company in the kind of responses and no variations in the text of the answers.

**Differences in the Effect of Future Prices by Type of Company.** There were very few differences by type of company in the responses concerning how projections of future prices affect operations in the Gulf (see table 4.26). Only representatives of major corporations discussed cutting costs due to forecasts of prices. Moreover, only people from large integrated concerns made statements that indicated that their company expected prices to be more stable.

**Similarities in the Effects of Leasing Policies Across Type of Company.** Given the similarity in the overall results - the fact that over two-thirds of the respondents said that areawide leasing had positive effects - and the diversity in the actual favorable impacts, it is difficult to discern any differences by type of company in the influence of areawide leasing (see table 4.27). The text of the answers did not vary by type of company as demonstrated by the quotes in the previous chapter. As occurred for the responses to the switch to areawide leasing, there were few discernable differences by type of company in the manner in which the reduced minimum bid affected the firms' operations in the Gulf (see table 4.28).

Table 4.27  
Effects of Areawide Leasing

---

	All	M.	L.I.	L.N.	S.I.	S.N.
Positive Effects	32	8	12	1	5	6
More Activity	8	4	4	0	0	0
Reduced Risk	3	3	0	0	0	0
Justified Technology Purchases	1	1	0	0	0	0
More potential for finds	5	1	3	0	1	0
Easier/Fairer way to Lease	5	1	2	0	2	0
Reduced Costs	2	0	2	0	0	0
Increased Exploration	1	0	1	0	0	0
More Leases	7	0	4	0	0	3
Enabled entry into GOM	2	0	0	0	1	1
Farmouts from Majors	1	0	0	0	1	0
Farm-ins	1	0	0	0	0	1
Negative Effects	1	1	0	0	0	0
Low Return on Investment	1	1	0	0	0	0
Other	14	2	1	2	4	5
More Farmouts	1	0	0	1	0	0
No Response	1	0	1	0	0	0
Not Applicable/Not Leasing	8	0	0	0	3	5
No Effect	2	0	0	1	1	0
Total Responses	47	11	13	3	9	11

---

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large non-integrated and S.N. stands for small nonintegrated.

Table 4.28  
Reduction of the Minimum Bid

	All	M.	L.I.	S.I.	L.I.	S.N.
Positive	31	8	9	1	6	7
More Activity	6	3	0	0	1	2
Increased Bids/ Leases/Acres	15	4	7	0	2	2
More Exploration	3	0	2	0	0	0
Reduced Costs	2	0	2	0	0	0
Enabled Entry/ Competition in GOM	5	0	0	0	2	3
Freed Funds for Activity	1	0	0	0	0	1
Other	3	0	1	1	0	1
Changed Expectations	1	0	1	0	0	0
No Effect	9	3	3	1	1	1
Not Applicable/Not Leasing	3	0	0	0	1	2
No Response	1	0	0	0	1	0
Total Responses	47	11	13	3	9	11

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large non-integrated and S.N. stands for small nonintegrated.

**Differences in the Effects of Leasing Policies By Type of Company.** One difference in the effects of areawide leasing as discussed by the respondents was the fact that major corporations and large integrated concerns focused on how areawide leasing made operating in the Gulf easier (more activity, reduced risk, greater potential for obtaining oil and gas, easier leasing strategy) while the nonintegrated firms tended to state either that areawide leasing was a better way to do leasing and increased leases or that the question was not applicable to their company because they were not operating or leasing in the Gulf prior to 1983. One obvious variation in the responses to the reduced minimum bid was that only nonintegrated businesses stated that this policy enabled their company to become active or competitive in the Gulf. Another disparity was the finding that respondents from major corporations and large integrated firms were more likely to claim that the reduced bid had no effect. Two-thirds of the people who stated that this policy had no influence were from major or large integrated companies.

**Similarities in the Effects of Technology Across Type of Company.** There were few variations in the responses concerning the influence of 3D seismic data on operations in the Gulf by type of company (see table 4.29). The majority of the executives from each kind of business discussed positive effects of 3D seismic data, particularly reduced risk and increased



success as well as increased activity. Members of large integrated firms were the most likely to mention other impacts including increases in: costs, staff, and hardware and software. Nevertheless, the overall response to the use of 3D seismic data in operations in the Gulf was favorable.

Table 4.29  
The Effect of Technology on Operations in the Gulf

A. Deep Water Projects						
	All	M.	L.I.	S.I.	L.N.	S.N.
Joint Venture	2	1	1	0	0	0
Economic Impacts	2	1	1	0	0	0
Major Growth Opportunity	2	1	1	0	0	0
Other	4	1	0	1	1	1
Total Responses	10	4	3	1	1	1
B. 3D Seismic Data						
	All	M.	L.I.	S.I.	L.N.	S.N.
Positive Effects	37	12	8	2	6	9
Reduced Risk/Increased Success	22	9	6	1	2	5
Increased Activity	13	4	1	1	4	3
Reduced Cost/Cost Effective	5	1	2	0	1	1
Other Effects	6	1	4	0	0	1
Evaluation Time	1	1	0	0	0	0
Increased Costs	1	0	1	0	0	0
Increased Staff	3	0	2	0	0	1
Increased Hardware and Software	1	0	1	0	0	0
Little/No Effect yet/Too new	5	0	1	0	1	3
No Effect/Not Involved	2	0	2	0	0	0
Plan to get 3-D data	1	0	0	1	0	0
Total Responses	51	13	15	3	7	1

Table 4.29  
The Effect of Technology on Operations in the Gulf  
(continued)

C. Subsalt Exploration						
	All	M.	L.I.	S.I.	L.N.	S.N.
Increase Exploration	1	1	0	0	0	0
Increase Activity	2	1	1	0	0	0
Increase Operations	1	1	0	0	0	0
Key Issue for Deep Water	1	1	0	0	0	0
Long-term Activity	1	1	0	0	0	0
Large Capital Expenditure	1	1	0	0	0	0
Increase Hard and Software	1	0	1	0	0	0
Increase Staff	1	0	1	0	0	0
Have Subsalt Acreage	3	0	0	0	2	1
Planning to do Subsalt	1	0	0	0	0	1
Too Early to Know Impacts	8	4	3	1	0	0
Total Responses	21	10	6	1	2	2
D. Horizontal Drilling						
	All	M.	L.I.	S.I.	L.N.	S.N.
Positive Effects	19	6	4	0	4	5
Created Additional Finds	1	1	0	0	0	0
Made Extraction Economical	9	1	3	0	2	3
Improved Production Rates	2	1	0	0	1	0
Develop Shallow Wells	5	2	0	0	2	1
Increased Activity	1	0	0	0	0	1
Use Limited/Done when needed	1	0	1	0	0	0
Minimal Effect thus far	1	0	0	0	0	1
Planning/Will use if needed	4	0	2	0	1	1
Total Responses	24	6	6	0	5	7

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large non-integrated and S.N. stands for small nonintegrated.

There were no differences by type of company in the responses concerning the impacts of horizontal drilling (see table 4.29). The majority of the executives from each type of firm presented favorable effects of this technology. With the exception of the major corporations, the most common positive influence of horizontal drilling was the fact that it made extraction from some fields economical. Yet, the overall response, regardless of type of company, was positive.

**Differences in the Effects of Technology by Type of Company.** Due partly to the small number of responses concerning the influence of deep water projects on operations, there were few discernable patterns by type of company in these comments (see table 4.29). Yet, the people from major corporations and large integrated companies were more likely to mention actual impacts while those from the nonintegrated firms were either against it (1 person) or were waiting to see the results that other businesses achieve in deep water projects. As pointed out in the previous chapter, deep water technology appears to be too new and too expensive for most of the executives to know how it will affect their companies' operations.

There was some difference by type of company in the comments about subsalt exploration; however, due to the small number of responses, this difference should not be given much importance (see table 4.29). People from major corporations were the most positive about subsalt exploration in the Gulf (four comments) while those from large integrated concerns tended to mention the costs of this exploration and those from nonintegrated enterprises were more likely to say that their company was waiting to see the results of other firms' projects.

**Similarities in the Effects of Regulations Across Type of Company.** There were some similarities in the executives' replies when asked about the influence of OPA '90 on their businesses' activities in the Gulf (see table 4.30). People from all five types of companies discussed either additional costs or reduced profits due to OPA '90. Moreover, respondents from large and small firms as well as integrated and nonintegrated concerns discussed impacts on activity, particularly reduced activity. In summary, the effects of the financial responsibility provisions of OPA '90, as presented by the executives of Gulf extraction firms, were overwhelmingly negative, and some were severely adverse including the possibility of putting companies out-of-business.

Table 4.30  
The Effect of Regulations on Gulf Operations

---

	A. OPA '90					
	All	M.	L.I.	S.I.	L.N.	S.N.
Economic Impacts	15	4	6	1	3	1
Added Costs	9	0	5	1	2	1
Reduced Profit Margin	1	1	0	0	0	0
Unable to Self Insure or Get Bonding	2	0	2	0	0	0
Additional Bonding	1	1	0	0	0	0
Ties up Money	3	1	1	0	1	0
Reduced Ability to Sell Properties	1	1	0	0	0	0
Activity Impacts	6	1	2	0	0	3
Reduced Partnering	1	1	0	0	0	0
Reduced Activity	5	0	3	0	0	2
Increase Opportunities some Company	1	0	0	0	0	1
Reduced Growth	1	0	0	0	0	1
Administrative Impacts	2	1	1	0	0	0
Increased Paperwork	2	1	1	0	0	0
Indirect Impacts	11	4	4	0	3	0
Hurt Independents, especially small	10	3	4	0	3	0
Hurt Contractors/Service Company	3	3	0	0	0	0
Reduced Partnering	2	2	0	0	0	0
Other	1	0	0	0	0	1
Out of Business	10	0	0	0	3	7
No Direct Effect/Self-Insured	9	3	3	3	0	0
Total Responses	54	13	16	4	9	12

Table 4.30  
The Effect of Regulations on Gulf Operations  
(continued)

	B. Plug and Abandon Liabilities					
	All	M.	L.I.	S.I.	L.N.	S.N.
Economic Impacts	15	4	4	1	2	4
Added Costs	10	2	3	0	2	3
Reduced Profits	3	2	0	0	1	0
Ties up Money	3	0	1	1	0	1
Activity Impacts	10	3	2	0	1	4
Reduced Activity	6	2	0	0	1	3
Selective About Leases/Wells	3	1	1	0	0	1
Reduced Competition	1	0	1	0	0	0
Reduced Growth	1	0	0	0	0	1
Indirect Impacts	9	3	2	0	3	1
Hurt Independents, especially small	8	3	1	0	3	1
Hurts Partnering	4	3	1	0	0	0
Other	2	0	0	0	0	2
No Direct Effect	15	3	5	2	4	1
Total Responses	51	13	13	3	10	12

Table 4.30  
The Effect of Regulations on Gulf Operations  
(continued)

C. Clean Water Act						
	All	M.	L.I.	S.I.	L.N.	S.N.
Economic Impacts	36	11	10	2	6	7
Added Capital Costs	32	9	9	2	6	6
Reduced Profits	5	2	1	0	2	0
Ties Up Money	1	0	0	0	0	1
Activity Impacts	23	6	7	0	5	5
Premature Abandonment	16	3	6	0	4	3
Cut Reserves and Their Recovery	3	1	1	0	1	0
Reduce Activity	7	2	0	0	1	4
Avoid Marginal Wells	1	0	1	0	1	0
Operations Impacts	3	2	0	0	0	1
More Unmanned Wells	1	1	0	0	0	0
Space Problems	3	2	0	0	0	1
More Downtime	1	1	0	0	0	0
No Impact Yet	1	0	0	1	0	0
Not Sure	2	0	0	0	1	1
Total Responses	65	19	17	3	12	15

Table 4.30  
The Effect of Regulations on Gulf Operations  
(continued)

D. Clean Air Act						
	All	M.	L.I.	S.I.	L.N.	S.N.
Economic Impacts	28	7	10	2	4	5
Added Costs/Capital and Operation	24	6	9	2	4	3
Reduced Profits	5	1	2	0	2	0
Ties up Money	1	0	0	0	0	1
Slows Rate of Return	1	0	0	0	0	1
Activity Impacts	19	3	8	0	5	3
Premature Abandonment	7	1	4	0	2	0
Cut Reserves and Recovery	2	0	1	0	1	0
Reduce Activity	9	2	2	0	2	3
Avoid Marginal Wells	6	1	3	0	2	0
Operations Impacts	3	0	2	0	0	1
Equipment	2	0	2	0	0	0
Maintenance	2	0	2	0	0	0
Personnel	2	0	2	0	0	0
Slows Permit Process	1	0	0	0	0	1
Not as Much as CWA	2	2	0	0	0	0
Gas Platforms not affected	3	1	0	0	0	2
Not sure yet	6	2	0	0	2	2
No Impact	3	0	0	1	1	1
Total Responses	64	15	20	3	12	14

Note: M. stands for major, L.I. is large integrated, S.I. means small integrated, L.N. represents large non-integrated and S.N. stands for small nonintegrated.

There were no discernable variations by type of company in the comments concerning the effects of the increase in lease bonding to cover plug-and-abandon liabilities (see table 4.30). Representatives of all types of companies mentioned economic impacts and officials from all five kinds of firms stated that this regulation would have no direct effect on their operations in the Gulf. In addition, respondents from both large and small and both integrated and nonintegrated businesses discussed effects on activity and indirect consequences. Again, the people interviewed were overwhelmingly against this regulation, even when they stated that their firm would not be directly affected, and many pointed out that it was unnecessary since they already set aside enough money to cover these costs as demonstrated by the following comment from a representative of a small nonintegrated firm, "It makes life difficult. We have always had a sinking fund, but now MMS has an arbitrary number to cover this."

The responses to the potential requirement to reinject produced water (the Clean Water Act in the fall of 1994) were similar in that the majority of officials from each type of company referred to economic outcomes and a large number of people from both large and small as well as integrated and nonintegrated businesses discussed influences on activity (see table 4.30). In addition, the text of the comments did not vary by type of company.

There were similarities in the officials comments concerning the possible extension of onshore air quality standards to the offshore Gulf of Mexico (see table 4.30). Executives from every type of company presented economic consequences of the Clean Air Act and members of both large and small as well as both integrated and nonintegrated firms referred to effects on activity in the Gulf. There were no differences by type of company in the text of the responses.

**Differences in the Effects of Regulations by Type of Company.** There were some differences by type of company in the comments concerning the effects of OPA '90 on operations in the Gulf. First, only representatives of major and large integrated corporations mentioned administrative impacts. Second, only executives from major corporations presented the adverse effects on contractors, service companies, and partnering as impacts of this regulation. Third, only officials from integrated companies stated that their firm could continue operating in the Gulf because they could self-insure. Fourth, only people from nonintegrated businesses declared that their firm would be out-of-business due to the financial responsibility provision of \$150 million.

There were few obvious differences by type of company in response to the possibility of needing to reinject produced water, which was a potential implication of the Clean Water Act in the fall of 1994. The two disparities were: 1) influences on operations were primarily mentioned by representatives of major corporations and 2) only executives from small and nonintegrated firms felt that their companies would not be affected or were unsure what the consequences would be.

As occurred in the responses to the Clean Water Act, there were very few divergences by type of company in the comments concerning the Clean Air Act. First, the discussion of influences on operations was almost exclusively from representatives of large integrated concerns. Only officers of major corporations responded by remarking that the effects of the Clean Air Act would be less than those of the Clean Water Act. In addition, only executives from small and nonintegrated types of businesses declared that they had not been affected.

## SUMMARY

In summary, the results concerning the similarities and differences by type of company in business characteristics showed that there were three similarities and seven differences. The similarities were: 1) almost all of the enterprises extracted both oil and gas, 2) the vast majority of the concerns obtained more gas in 1993 than in 1986 and 3) the largest categories of employment were production/platform maintenance and operation, exploration, and



administration. Four of the differences in business characteristics varied by integration. Most of the nonintegrated businesses obtained more oil in 1993 than in 1986 while the majority of the integrated enterprises extracted less oil. The majority of the other offices established by the integrated companies were outside of the Gulf zone while the majority of the other offices of the nonintegrated firms were in this area. The integrated businesses tended to close offices in the Gulf region, but the nonintegrated enterprises increased their numbers of other offices in this area. The integrated companies had more employees than did the nonintegrated firms, especially the majors, and the integrated businesses decreased their workforces between 1986 and 1994 whereas the nonintegrated endeavors increased the size of their staffs. One variation by type of company demonstrated a difference between major and independent firms. Most of the major corporations' headquarters were outside the Gulf of Mexico region whereas the bulk of the independent endeavors had headquarters in the Gulf area. Two differences by type of company could not be explained by any of the three dimensions that distinguish the five types of companies. First, the quantities of oil and gas extracted in 1993 varied by type of company. Second, the nonintegrated firms and the large integrated concerns were more involved in exploring in 1994 than in 1986 while the major corporations and small integrated businesses were not.

The results concerning the business environment can be summarized as follows. There were five similarities across the five types of companies. The executives overwhelmingly chose the Minerals Management Service as the agency with the greatest influence on their activities and they tended to mention the Department of Transportation as the agency with the fourth largest impact. Second, almost all of the companies used 3D seismic data. Third, almost all of businesses participated in joint ventures in the last year. Fourth, almost all of the companies contracted out some activities in 1994, almost all of them increased their use of service companies between 1986 and 1994, they contracted out the same types of activities, and the ranges of the percentages of their Gulf of Mexico budgets expended on service companies were similar across the five categories of firms.

The differences by the type of company were more numerous than the similarities. Some of these variations were due to integration. First, representatives of integrated firms ranked the Environmental Protection Agency as the agency with the second largest impact on their operations while those from nonintegrated businesses selected the Coast Guard. Second, integrated firms ranked the Clean Water Act as the one with the greatest potential impact on their operations and the Clean Air Act as second while nonintegrated firms ranked the financial responsibility provisions of OPA '90 as the most influential regulation. Third, the majority of nonintegrated firms participated in more joint ventures in 1994 than in 1986 while integrated firms did not and nonintegrated businesses partnered with large and small companies while integrated enterprises overwhelmingly partnered with large companies. Fourth, officers from nonintegrated concerns reported spending a greater percentage of their Gulf operating budgets contracting out activities than did integrated firms. Fifth, representatives of integrated concerns were less optimistic about the size of the workforce in the Gulf in 1998 than were those of nonintegrated businesses.

Two variations seemed to be related to both integration and size. Major and large integrated corporations (two largest types of firms and both are integrated) ranked the financial responsibility provisions of OPA '90 as third. Approximately half of the integrated firms were engaged in deep water projects while almost all of the small nonintegrated businesses and almost none of the large nonintegrated concerns were currently involved in or currently planning to do deep water exploration. One variation depended on size - large companies ranked the increase in lease bonding to cover plug-and-abandon costs as fourth. One difference varied along the typical dimension used to examine oil and gas companies - major corporations vs independent firms. Major corporations were more likely to be engaged in subsalt exploration than were independent businesses. Three other differences cannot be explained by size, integration or the difference between major and independent corporations. These are: 1) major corporations and nonintegrated businesses were the most likely to use horizontal drilling, 2) major corporations were the most involved in joint ventures followed in descending order by the nonintegrated firms and then the integrated independent businesses, and 3) the majority of executives from large integrated and small nonintegrated businesses reported spending a greater percentage of their Gulf operating budgets on service companies in 1994 than in 1986 while the majority of the other three types of firms did not.

When business practices were examined, it was found that each of the similarities concerned the effect of the environment on operations. The texts of the respondents' answers concerning how the current prices of oil and gas reduced activity in the Gulf were comparable, regardless of the type of company, as were the texts of the replies about the effects of future prices on activity. Moreover, the majority of the executives were in favor of areawide leasing and the reduction of the minimum bid. In addition, most of the officers talked favorably about the impacts of 3D seismic data and horizontal drilling on the operations in the Gulf. Further, all of the representatives were against each of the four regulations studied.

The differences largely concerned the effect of business characteristics on practices, although there were some minor variations in the responses about the impacts of the environment. Some of the dissimilarities occurred along the dimension distinguishing the major corporations from the independent firms. First, the major corporations extracted more oil and gas in 1994 than did the independent businesses. Second, the majority of the independent companies were more involved in exploring in 1994 than in 1986 while most of the major corporations were not. Third, the bulk of the major corporations did not have their headquarters in the Gulf region while the headquarters of the independent enterprises were in this area. Fourth, in response to the question concerning how current prices affect operations, representatives of major businesses tended to mention cost cutting and the trade off between oil and gas while those from independent firms did not. Fifth, when discussing the effect of future prices on activities, executives from major corporations mentioned cost cutting while those from independent businesses did not. Sixth, people from major firms responded favorably to the question concerning how subsalt technology had influenced their operations while those from independent companies responded that they were waiting to see how subsalt affected others before they would decide to become involved.

Other variations demonstrated the differences between integrated and nonintegrated companies. Most of the nonintegrated businesses extracted more oil in 1993 than in 1986 while most of the integrated firms did not. Also, the nonintegrated firms had a greater proportion of their other offices in the Gulf area and tended to establish more other offices in this region between 1986 and 1994 while integrated companies had more other offices outside the Gulf zone and tended to close offices in this region. In addition, nonintegrated enterprises increased their workforces between 1986 and 1994 while integrated endeavors did not. Moreover, the answers concerning some aspects of the business environment differed along this dimension. First, respondents from nonintegrated firms often stated that the reduced minimum bid allowed them to begin operations in the Gulf while those from integrated businesses tended to reply that the reduced minimum bid had no influence on their operations. Second, members of nonintegrated companies repeatedly said that they were waiting to see how other firms were affected by deep water projects while those from integrated corporations were more likely to mention actual impacts of these projects on their operations. Third, when responding to the question concerning the effect of the financial responsibility provisions of OPA '90 on activities in the Gulf, executives from nonintegrated enterprises frequently declared that this regulation would put their firms out-of-business whereas those from integrated companies asserted that they could self-insure.

One difference in business practices occurred along all three dimensions - workforce size. Major companies had the largest labor forces in the offshore Gulf followed by large integrated, small integrated, large nonintegrated and small nonintegrated firms. Thus, major corporations had larger numbers of employees than did independent enterprises, integrated businesses had more workers than did nonintegrated firms, and, within integration, larger companies had more employees than did smaller firms.

## CHAPTER 5

### THE SHIFT IN THE GULF AND POTENTIAL IMPACTS

As pointed out in chapter 2, people speak of a shift in activity in the Gulf of Mexico in which major corporations are becoming less active, particularly in exploration, while independent firms are becoming more active. In addition, operations that used to be conducted in-house by major corporations are now being contracted out and some companies are being created to do these tasks, sometimes on a specialty basis, such as the firms that do 3D seismic data and sell the information to oil and gas exploration and production firms. These new businesses to which the tasks are contracted out are very useful to large companies, like the major oil and gas firms, that are downsizing to maintain their competitive edge. This trend toward contracting out some functions is occurring in other large industries as well such as the automotive industry. The results found in this study will be examined for evidence relevant to the issue of a shift in the oil and gas extraction industry in the Gulf. Some of the findings support the notion that a shift is occurring while some evidence does not. The outcome in support of the belief in this shift will be presented first, the evidence against the idea will be presented second. The final section will be a discussion of the potential impacts of the changes in the oil and gas industry in the Gulf.

#### DECREASED ACTIVITY BY MAJOR FIRMS AND INCREASED ACTIVITY BY INDEPENDENT ONES

The results to be discussed first in this section support the idea that there has been a change in activity levels of the major and independent companies in the Gulf. These findings suggest that the major corporations are becoming less active and the independent businesses are becoming more vigorous. In addition, the outcome implies that the nonintegrated enterprises are becoming the most active players in this region.

#### Business Characteristics

Some of the changes between 1986 and 1994 in the characteristics of the five types of companies suggest that the nonintegrated firms may be the most committed to oil and gas extraction in the Gulf of Mexico. These differences include the ones concerning: the amount of oil extracted, the involvement in exploring, the location of headquarters and other offices, and the numbers of employees. First, the changes between 1986 and 1993 in the amount of oil extracted suggest that the nonintegrated enterprises are becoming more active. As reported earlier, the overwhelming majority of the large and small nonintegrated operators were extracting more oil in 1993 than in 1986 while approximately equal numbers of the major corporations and small integrated companies were obtaining more oil and less oil and the majority of the large integrated firms were deriving less oil. Second, the results concerning the difference in exploring from 1986 to 1994 imply that the nonintegrated firms are becoming more involved in offshore extraction in the Gulf. Large majorities of both the large and small nonintegrated endeavors were doing more exploring in 1994 than in 1986. In

contrast, about equal numbers of the major corporations were doing more and less exploring in 1994 while over half of the large integrated firms were doing more exploring in 1994.

Third, the location of headquarters and other offices also connotes a greater commitment to the Gulf of Mexico on the part of the independent businesses, particularly the nonintegrated ones. Most of the major corporations had their headquarters in cities outside the Gulf region while most of the independent operators had theirs in this area. In addition, the integrated companies had a large number of their other offices outside the Gulf territory, but most of the other offices of the nonintegrated firms were in the Gulf region. Further, between 1986 and 1994, the integrated companies closed some of their offices in the Gulf area while the nonintegrated businesses opened some offices in this region. Fourth, the sizes of the workforces hint that the nonintegrated endeavors are the most committed to Gulf extraction. The pattern of changes in the numbers of employees in the nonintegrated companies displayed an increase in workers, especially in the small nonintegrated firms. On the other hand, the configuration of differences in the integrated concerns showed overall decreases in the number of employees.

### **Business Environment**

Some changes in the business environment between 1986 and 1994 intimate that the independent companies are becoming more important players in Gulf extraction. These changes consist of those concerning: joint ventures, service company use and the companies' views of the future of oil and gas extraction in the Gulf. In addition, the answers to the questions concerning how the change in leasing policies affected the firms' operations suggest that a shift in the players is occurring.

First, the differences from 1986 to 1994 in participation in joint ventures intimate that the nonintegrated independent companies are doing everything they can to increase their activity in the Gulf. Majorities of the large and small nonintegrated endeavors increased their participation in joint ventures during these eight years. On the contrary, only half of the large integrated concerns took part in more joint ventures in 1994 while about equal numbers of major corporations did more and did fewer of these in 1994.

Second, the changes in the use of service companies hint that the major companies may be reducing their presence in the Gulf. Although the bulk of the major corporations (7 of 11) hired outside contractors more in 1994, four companies used service companies less in 1994. Only five of the firms examined, decreased their use of service companies between 1986 and 1994 - four major and one large integrated companies. However, the unknown issue is whether the four companies are doing more activities themselves or are less involved in the Gulf and hence have less need for outside contractors. Also, it is possible that outsourcing on the part of the seven major companies that increased their use of service companies is a way to reduce their presence in and commitment to extraction in the Gulf.

Third, the major corporations and large integrated independent firms seem less optimistic about the future of operations in the Gulf. First, major and large integrated companies were less hopeful about their businesses' involvement in exploration in 1998. Although the majority of all five types of companies reported that their firm would be more engaged in exploring, representatives of four major and four large integrated concerns disagreed with the majority. In addition, the results were similar concerning the size of the workforce in the Gulf in 1998. Again, the bulk of all five types of firms predicted that the workforce would be larger in 1998. Yet, eight officials disagreed - four from major corporations, three from large integrated businesses, and one from a small nonintegrated enterprise who was concerned about regulations. The explanations employed exclusively by officers from major corporations for their predictions that the workforce would not be larger suggest that the major firms may be planning to reduce their presence in the Gulf. These reasons included: disposition of properties, reduced exploration and production, and outsourcing. Moreover, almost all of the respondents predicted that the independent companies' share of activity in the Gulf would be larger in 1998 than in 1994. Only three officials disagreed with this expectation. The reasons given for the anticipation of a greater proportion of the operations being conducted by independent operators imply that the major corporations will have a reduced presence in the Gulf. These explanations consisted of: the general trend toward a smaller presence by the major corporations, the marginal/mature nature of the Gulf which precludes "elephant hunting", and the exit from the Gulf by the major corporations. A few people qualified their predictions by stating that the independent firms' share of activity on the shelf would be greater in 1998, but the major corporations' proportion of operations in deepwater would be greater than that of the independent businesses.

The respondents answers concerning how changes in the two leasing policies - areawide leasing and the reduced minimum bid - influenced their companies' operations in the Gulf provided the same evidence for the idea that a shift in activity is occurring. This evidence can be summarized as follows: 1) the changes allowed independent companies to begin activities in the Gulf, 2) the new policies increased competition in the Gulf, and 3) the changes in the policies increased activity by independents in the Gulf.

As demonstrated previously, three nonintegrated companies claimed that the change in one or both of these policies allowed their company to enter into Gulf extraction (two respondents said this about both and three said this about the reduction of the minimum bid). One executive from a large nonintegrated concern stated, "We have been active in the Gulf only since 1990. However, without areawide leasing, we would not have become active in the Gulf at all" and "...Without the lower minimum bid, the decision to become active in the Gulf would have been more difficult." An officer from a small nonintegrated company, in answer to both questions, said, "...it has paved the way for us to enter the Gulf of Mexico...". Other similar comments were: "Allowed us to compete, without this we couldn't exist" (large nonintegrated firm), "Enormously, this is what put us in business. This drives GOM activity" (small nonintegrated enterprise), and "Company began..." (small nonintegrated firm).

In addition, several statements made by the respondents demonstrate that the changes in the leasing policies increased competition in the Gulf. At least six people stated either that these policies increase overall competition in the Gulf or that their independent firm was more able to compete as a result of these policies. For example, two representatives of major corporations responded that, "More companies are competing for properties. ..." and "...allowed more independents, thus more competition". Executives of independent businesses made the following statements: "Allowed us to compete on more prospects - more competitive" (large integrated firm), "... More competitive. ..." (large nonintegrated business) and "Allowed us to compete, without this we couldn't exist" (large nonintegrated).

Moreover, these policies were credited by representatives of many independent companies with increasing their firms' activity in the Gulf. As shown earlier in the table about areawide leasing, four people from large integrated businesses stated that areawide leasing increased their activity, four respondents from large independent firms responded that areawide leasing increased their potential for finding oil and gas, and seven executives from independent concerns claimed that areawide leasing enabled them to get more leases. Also, as demonstrated above, three people from nonintegrated enterprises asserted that the reduced minimum bid increased their activity and eleven officials from independent endeavors declared that the reduced minimum bid increased their ability to make bids, get leases, and obtain more acreage. A member of a small nonintegrated firm stated that areawide leasing, "Caused significant growth for us". Another executive declared that the reduced minimum bid, "Increased the number of bids by smaller independent companies" (large integrated firm). Yet another official from a large nonintegrated business asserted that the reduced minimum bid, "It began more activity, decreased farmouts and increased our activity". As further support that the changes in the leasing policies assisted independent companies in the Gulf, an official from a small integrated concern, in response to both policies said, "Helped independents".

Additional evidence for a shift from integrated corporations to nonintegrated companies comes from the cumulative weight of some of the comments. For example, one large integrated company is no longer involved in oil or gas exploration and production in the Gulf. Also, a representative of a small integrated business was interviewed, but did not answer the questions on the interview instrument. The reason for this was that the company no longer was involved in exploration or production in the Gulf, it was only engaged in marketing. Thus, the fact that some of the integrated businesses are only doing marketing and have foregone exploration and production further supports the idea that there is a shift in exploration and production activity away from the integrated firms (including major corporations) and toward the nonintegrated businesses.

### **MAJOR FIRMS' COMMITMENT TO THE GULF**

Some of the results suggest that the major corporations are firmly committed to extraction in the Gulf. Part of this evidence concerns business characteristics and a portion pertains to the business environment.

## **Business Characteristics**

One factor discussed earlier in the section about business characteristics implies that the major corporations are currently committed to resource extraction in the Gulf, particularly gas. This finding is the following. Almost all of the major corporations, as well as the nonintegrated companies, obtained more gas from the Gulf in 1993 than in 1986. The majority of the large integrated firms derived more gas in 1993, but a third of this group of businesses extracted less gas in 1993.

## **Business Environment**

Two issues presented in the section on the business environment hint that the major corporations examined in this study plan to stay in the Gulf in the near future: their use of new technology and their participation in joint ventures. First, regardless of the type of technology (3D seismic, deepwater projects, subsalt exploration, horizontal drilling), the majority of the major corporations either were already involved or currently planned to become involved with it. This statement could not be made for any of the four types of independent companies. The fact that nine of the eleven major companies either engaged in or planned to engage in subsalt exploration intimates that at least these nine companies will be in the Gulf in the near future. In addition, six of the eleven corporations were either involved in or were currently planning deepwater projects. Deepwater projects are a significant investment in the Gulf of both time and money and hence implies that these corporations have no plans to abandon the Gulf soon. In contrast, the majority of all four types of independent companies were not engaged in subsalt exploration, the bulk of the large and small integrated and small nonintegrated firms did not do horizontal drilling, and the largest number of the large nonintegrated businesses were not involved in or planning deepwater projects.

Second, the major companies were the most involved in joint ventures in terms of both the number of these operations and the fact that all of the major corporations were participating in these projects. However, this participation in joint ventures might be a way for the major corporations to continue operating in the Gulf and reduce their commitment to extraction from the Gulf or it might be a way to increase operations in the Gulf. No questions were asked to ascertain why the companies took part in joint ventures; thus the meaning of this participation is unknown.

## **EVIDENCE THAT NEITHER SUPPORTS NOR IS AGAINST THE SHIFT**

It is impossible from the respondents' comments to predict how the four regulations would influence a shift in the players in the Gulf. Although the major corporations and integrated companies could continue operating in the Gulf if the financial responsibility provisions of OPA '90 were enforced as currently stated and if the increase in lease bonding to cover plug-and-abandon liabilities was in effect, these regulations could put some of the nonintegrated firms out-of-business. As was discussed earlier, the evidence from this study suggests that



the shift has been not just from the major corporations to the independent enterprises, but from the major and integrated companies to the nonintegrated operators. Thus, these two regulations could prevent the shift from continuing or slow its pace. However, these two regulations do nothing to keep the major and integrated companies in the Gulf so, instead of influencing the shift, the two regulations could result in earlier abandonment of the Gulf on the part of all five types of companies.

In addition, the Clean Water and Air Acts were of greatest concern for the major corporations and the large integrated companies. These two acts make the Gulf unattractive for all types of companies, but particularly these two. These two kinds of operators are those most capable of leaving the Gulf and the effect of these two acts may drive them to abandon the Gulf given the number of times that representatives of major and large integrated corporations stated that premature abandonment was a possible response to these acts. Thus, if all four acts are enforced together, who is left in the Gulf? That is the question implied by the overall reaction to these four acts. Therefore, it is impossible to predict, at this time, the effect of these four regulations on the shift in the Gulf.

### **POTENTIAL IMPACTS OF THE SHIFT IN THE GULF**

The potential impacts to be discussed are due not only to the shift in the operators in the Gulf, but also to changes in the prices of oil and gas, the degradation of the pipelines and other aspects of the infrastructure, the increases in the costs of drilling, and various other factors. Three categories of potential impacts will be presented: 1) working conditions and employment, 2) operations and 3) government revenues.

#### **Working Conditions and Employment**

Changes in the numbers of injuries and fatalities are possible impacts of the shift in the Gulf. In chapter 2, table 2.5 demonstrated that, between 1986 and 1990, the independent firms reported twice as many fatalities and injuries as the major corporations, although the independent companies reported about half as many mishaps as the major corporations. In addition, table 2.3 showed that the number of operators in the Gulf has been increasing since 1983. The present study found that 10 of the 12 companies that are probably new operators in the offshore Gulf were nonintegrated independent firms and one was an integrated independent business. Thus, as most of these new operators in the offshore Gulf are independent businesses, not major corporations, it is logical to expect that the number of injuries and fatalities, particularly injuries, will increase as the major corporations become less active in the Gulf and the independent enterprises become more active. However, to more accurately predict accidents, injuries and fatalities, it would be necessary to account for other factors such as the age of the equipment, the educational requirements of workers, and the amount of activity of the businesses. Independent firms often get properties started years ago by major corporations and thus they inherit older rigs and equipment which is more prone to accidents, injuries and fatalities than the new equipment being created in new properties of the major businesses, such as the new deepwater rigs. In addition, major firms

have higher educational requirements - i.e., requiring a high school degree (Seydlitz et al. 1995). Collecting data on these factors to calculate projections of accidents, injuries and fatalities was beyond the scope of this study.

Employment may also be influenced by the shift in the operators in the Gulf. Small percentage decreases in the numbers of employees by the major firms may not be offset by large percentage increases by the independent businesses, especially the nonintegrated companies which have the smallest numbers of employees. (Note, the present study found that integrated firms, not just major corporations, were becoming less committed to oil and gas exploration and production in the Gulf. The shift in activity was from integrated firms to nonintegrated ones.) A comparison of the statistics concerning the total numbers of employees in each of the five types of enterprises demonstrates this point. The mean number of workers employed by major operators was almost three times larger than that for the largest mean of the independent firms - the large integrated ones. This mean also was 14.5 times that of the large nonintegrated companies and was 27 times larger than the mean for the smallest employers - the small nonintegrated ones (see table 4.11). The largest major corporation employed almost four times more people than did the largest independent firm, 23.6 times more workers than the largest nonintegrated independent, and 32 times more workers than did the largest small nonintegrated company. In addition, the smallest major firm had almost as many people as did the largest small nonintegrated business. Thus, the increase in number of operators does not mean that there will be an increase in employees in the offshore Gulf. Moreover, the jobs themselves may vary in their benefits such as retirement, their working conditions, their salaries and educational requirements. Thus, reductions in the number of employees in major corporations could mean the loss of better positions for more qualified workers; therefore, such reductions cannot be offset by an increase in hiring by independent firms.

It is also possible that, although there is a change in the companies operating in the Gulf, there may be less of a change in the actual people working in exploration and production in the offshore Gulf. It is feasible that people who were laid off by major corporations have started their own exploration and production firms or service businesses or have obtained employment in independent exploration and production companies and existing service firms.

### **Operations**

Operations in the Gulf might also be influenced by the shift in the companies involved in offshore extraction. Although the major corporations' share of production in the Gulf did not decline much between 1987 and 1991 (Dodson and LeBlanc 1993), there is no guarantee that there will not be a decline in overall production in the future. Major corporations have become less involved in exploration and development as compared to independent firms as shown by the decrease in their portion of the exploratory wells (40 percent in 1987 to 21 percent in 1991) and the developmental wells (63 percent in 1987 to 49 percent in 1991). As occurred with employment, a small percentage decrease in production by major corporations might not be offset by a large percentage increase by independent firms, especially not

nonintegrated ones which are the group of firms that the current study found to be more aggressively involved in the Gulf. The results of the present study showed that the major company that extracted the most oil extracted 277 times more oil than did the independent business that got the most oil in 1993 and 318 times more than the nonintegrated independent enterprise that derived the most oil. In addition, the major corporation that extracted the most gas obtained 5.5 times more gas than did the independent firm that extracted the most gas, 6.5 times more gas than the nonintegrated independent company that collected the most gas, and 18.2 times more gas than the small nonintegrated business that derived the most gas. Further, the major business that obtained the least gas still extracted 1.11 times more gas than did the small nonintegrated firm that obtained the most gas. Therefore, a small percentage decrease in production by the major corporations may not be offset by a large percentage increase in production by independent companies, especially not nonintegrated ones. The decrease in the major corporations' share of the exploratory and developmental wells presented above may begin to be evident in an overall reduction in production from the Gulf, especially since the number of executives from major corporations interviewed in the present study that stated that their companies had decreased exploration activities was equal to those that declared that their firms had increased these activities.

If major corporations are at least the catalysts, if not the developers, of new technology in the Gulf, then a decline in interest in the Gulf by major companies could result in a decrease in new technology or an elongation in the time between technological developments. A comparison of the number of people involved in research and development in the Gulf demonstrates this point. In 1994, only major corporations and large integrated independents had any employees assigned to research and development in the offshore Gulf of Mexico. Moreover, five representatives from major corporations reported that the number of employees in research and development in the Gulf had decreased since 1986 and five stated that the number had remained the same. In addition, most of the firms in each of the four categories of independent companies had no research and development funds for the Gulf in 1993 whereas most of the major businesses did have some money in these funds. The medians of research and development dollars for each of the four types of independent enterprises were 0 while the median for the major corporations was \$237,500. The major corporation with the largest research and development fund had a fund that was over two times larger than that of the independent firm with the largest such fund - a large nonintegrated business. None of the small nonintegrated companies had any dollars assigned for research and development in the Gulf. Therefore, the impact on resources for research and development in the Gulf due to reduced interest in the Gulf on the part of the major businesses cannot be offset by an increase in involvement by independent businesses.

### **Government Revenues**

If there is an overall decline in exploration and production in the offshore Gulf, despite an increase in such operations by nonintegrated firms, then government revenues might also decline. The Gulf of Mexico is the main site of OCS extraction of oil in the United States and the world. More than 90 percent of the petroleum extracted from the OCS comes from

the Gulf of Mexico (Brewer et al. 1992). A proportionally small reduction in activity in the Gulf may not be offset by a proportionally large increase in activity elsewhere on the OCS of the United States and this could have a significant impact on government revenues because, between 1979 and 1984, the money collected through the Minerals Management Service from the offshore petroleum and gas industry was second only to the Internal Revenue Service as an official source of revenue for the federal government (Louisiana Department of Natural Resources 1991; Simmons 1993).

## GLOSSARY

This set of definitions contains at least two distinct subsets: strict or legal and operational or functional. The source for the former includes various legislative acts, court cases, and/or administrative regulations. The source for the latter includes practice and is derived in part from Williams and Meyers (1991). However, there will be times when a term is either ambiguous or its meaning is still evolving. In such a case it will be necessary to include definitions from many sources. The purpose of these definitions is provide a basic set of commonly used terms that will be necessary to understand the various writings, whether that be legal and trade journals or Congressional Acts, associated with the oil and gas industry.

Act of God means an "unanticipated grave natural disaster or other natural phenomenon of exceptional, inevitable, and irresistible character the effects of which could not have been prevented or avoided by the exercise of due care or foresight" (33 United States Code Annotated 2701.1).

Barrel means "42 United States gallons at 60 degrees fahrenheit" (33 United States Code Annotated 2701.2).

Blow out means "a sudden, violent expulsion of oil, gas and mud (and sometimes water) from a drilling well, followed by an uncontrolled flow from the well" (Williams and Meyers 1991, p.111).

Bonus refers to the cash consideration paid by the lessee for the execution of an oil and gas lease by a landowner, in this case the United States administered by Minerals Management Service, and is usually figured on a per acre basis. "Lease bonuses are rights to payment unrelated to production or the extraction of oil; they do not qualify for depletions; they are not an economic interest in property for purposes of federal income tax law" (723 F. Supp at 375).

Deepwater activity is a relative term that may refer to drilling that takes place in water greater than 600 feet. According to Times-Picayune Energy Editor Mary Judice (1994a) it is drilling that occurs in water deeper than 1000 feet.

Discharge means "any emission (other than natural seepage), intentional or unintentional, and includes, but is not limited to, spilling, leaking, pumping, pouring, emitting, emptying, or dumping" (33 United States Code Annotated 2701.7).

Facility means "any structure, group of structures, equipment, or device (other than a vessel) which is used for one or more of the following purposes: exploring for, drilling for, producing, storing, handling, transferring, processing, or transporting oil." This term includes any motor vehicle, rolling stock, or pipeline used for one or more of these purposes (33 United States Code Annotated 2701.9).

Horizontal drilling means any "experimental natural gas production process whereby a well is drilled horizontally, rather than vertically, to penetrate a gas bearing formation" (Williams and Meyers 1991, p.567). A topical report by the Gas Research Institute goes into much depth about horizontal drilling.

Independent oil companies may be easy to identify by simply juxtaposing them with the majors. Or, an independent can be seen as "a company that is relatively small and unintegrated" (Williams and Meyers 1991, p. 589). But, such a distinction does not give the precision needed to better analyze those operators in the Gulf of Mexico (GOM).

Joint adventure (or venture) means "an association of persons for the prosecution of a single venture" (Williams and Meyers 1991, p.619).

Major oil company is that type of company integrated to a substantial degree. For a company to be integrated, it must be engaged in all phases of the oil industry. In *Saturn Oil & Gas Co. v. Federal Power Comm'n*, 250 F.2d 61, those phases were outlined as "exploration, production, transportation, manufacturing and refining, and retailing." Many of the journalistic expose works generally limit the number of majors to the following: Exxon, Shell, BP, Gulf, Texaco, Mobil, and Chevron (Yergin 1991). However, a recent survey and analysis of the industry by Salomon Brothers put the number closer to twenty than seven. This was based on level of exploration and production expenditures, number of employees, and the amount of reserves and assets.

Mobile offshore drilling unit means "a vessel (other than a self-elevating lift vessel) capable of use as an offshore facility" (33 United States Code Annotated 2701.18).

National Contingency Plan means "the [Plan] prepared and published and as amended by [the Oil Pollution Act of 1990], or revised under section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act, also known as 'Superfund'" (42 U.S.C. 9605).

Natural gas means "hydrocarbons which at atmospheric conditions of temperature and pressure are in a gaseous phase" (Williams and Meyers 1991, p.745).

Natural resources includes "land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the exclusive economic zone), any State or local government or Indian tribe, or any foreign government" (33 United States Code Annotated 2701.20).

Navigable waters means "the waters of the United States, including the territorial sea" (33 United States Code Annotated 2701.21).

Offshore facility means "any facility of any kind in, in, on, or under any of the navigable waters of the United States, and any facility of any kind which is subject to the jurisdiction of the United States and is located in, on, or under any other waters, other than a vessel or a public vessel" (33 United States Code Annotated 2701.22).

Oil means "oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil" (33 United States Code Annotated 2701.23). For tax purposes, oil may sometimes include natural gas as established by the Oil Taxation Act 1975. Oil does not include "petroleum, including crude oil or fraction thereof, which is specifically listed or designed as a hazardous substance under subparagraphs (A) through (F) of section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act" (42 United States Code Annotated 9601 et seq.).

Operation means "the activity leading to the production of oil and gas" (Williams and Meyers 1991, p.841). In *Amoco Production Co. v. Sea Robin Pipeline Co.* the court concluded that "operation," as used in the Outer Continental Shelf Lands Act, refers to the doing of some physical act (844 F.2d 1202 at 1207).

Outer Continental Shelf facility means "an offshore facility which is located, in whole or in part, on the Outer Continental Shelf (OCS) and is or was used for one or more of the following purposes: exploring for, drilling for, producing, storing, handling, transferring, processing, or transporting oil produced from the OCS" (33 United States Code Annotated 2701.25).

Owner or operator means "(a) in the case of a vessel, any person owning, operating, or chartering by demise, the vessel, and (b) in the case of an offshore facility, any person owning or operating such a facility, and (c) in the case of any abandoned offshore facility, the person who owned or operated such facility immediately prior to such abandonment" (33 United States Code Annotated 2701.26).

Person means "any individual, corporation, partnership, association, State, municipality, commission, or political subdivision of a State, or any interstate body" (33 United States Code Annotated 2701.27).

Plug and abandon (or P & A) is the "placing of a plug in a dry hole, then abandoning the well" (Williams and Meyers 1991, p.871). Plugging was defined in a jury instruction in *Salmon Corp. v. Forest Oil Corp.* as "closing a wellbore in such a manner as to prevent the migration of oil, gas, salt water, or other substance, from one stratum to another" (536 P.2d 909 at 911). Mary Judice (1994c) Energy Editor for the Times-Picayune discusses the growing business of removing platforms and other P & A costs.

Removal costs means "the costs of removal that are incurred after a discharge of oil has occurred or, in any case in which there is a substantial threat of a discharge of oil, the costs

to prevent, minimize, or mitigate oil pollution from such an incident" (33 United States Code Annotated 2701.31).

Rent is "the yearly amount paid to hold a lease when no production has occurred" (Simmons 1993, p.4).

Royalty means "the landowner's share of production, free of expenses of production, although it is subject to costs incurred after production, such as transportation costs" (Williams and Meyers 1991, pp.1087-8). The federal courts in U.S. v. 525 Co. said that "royalty" does not include oil payments (342 F.2d 759). The royalties, rents, and bonuses are the three types of OCS revenues collected by MMS and during the high production years (1979-1984) were the second largest source, after Federal taxes, of income to the Federal government (Simmons 1993, p.4).

Subsalt refers to a relatively new play on the OCS where oil is trapped between a rock and salt formation. Through the use of high powered computers and 3-D seismic technology, which collects a series of sound waves, sub-salt has become the focus of much attention in the GOM as reported by Times-Picayune Energy Editor Mary Judice (1993). For a more detailed analysis of sub-salt plays, 3-D, and leasing trends on the GOM see Tipple and Koen (1994).



**LITERATURE CITED**

- Armstrong, B. 1993. Testimony of Bob Armstrong, Assistant Secretary, Land and Minerals Management, Department of Interior. Before the U.S. Senate Energy and Natural Resources Committee. Washington, D.C., September 14. (Mimeographed.)
- A.T. Kearney, Inc. 1991. Estimating the environmental costs of OCS oil and gas development and marine oil spills: A general purpose model. New Orleans: MMS.
- Brantley, J.E. 1971. History of oil well drilling. Houston: Gulf Publishing Company.
- Brewer, G.D., C. Auger, G. Brown, B. Cicin-Sain, R. Faust, R.B. Grambling, R.W. Johnson, J. Opaluch, R.A. Rappaport and C.P. Wolf. 1992. Assessment of the U.S. outer continental shelf environmental studies program:III. social and economic studies. Socioeconomics panel, National Research Council. Washington D.C.: National Academy Press.
- Committee to Review the OCS Environmental Studies Program. 1989. The adequacy of environmental information for outer continental shelf oil and gas decisions: Florida and California. (Prepublication copy).
- CQ Almanac Staff. 1990. Oil spill liability, prevention bill enacted. CQ Almanac:283-287.
- Crandell, J.D., C.Y. Lau, J.R. Wilson, G.B. Kieburz, V.L. Hallstrom, G.A. Howald. 1993. Survey and analysis of the 1993 worldwide oil and gas exploration and production expenditures: Midyear update. New York: Salomon Brothers.
- Dewar, H. 1995. Vote dilutes clean water act. The Times Picayune (April 1995):A-16.
- Dodson, J.K. and L. LeBlanc. 1993. U.S. Gulf activity reviving, but drilling insufficient to halt declining reserves. Offshore/Oilman (January):23-25.
- Earney, C.F.F. 1980. Petroleum and hard minerals from the sea. New York: V. H. Winston and Sons.
- Environmental Protection Agency. 1994. EPA strategic plan summary. Washington, D.C.: EPA Public Information Center.
- Feagin, J. 1990. Extractive regions in developed countries: A comparative analysis of the oil capitals, Houston and Aberdeen. Urban Affairs Quarterly 25:591-619.
- Freudenburg, W.R. and R. Grambling. 1994. Oil in troubled waters. Albany, N.Y.: State University of New York Press.

- Groten, B. 1991. A review of horizontal drilling, logging, and completion practices: defining fundamental research opportunities for the gas industry. Chicago: Gas Research Institute.
- Hall, J. 1992. N.O. still struggling in wake of oil bust. *The Times-Picayune* (July 22):D-10.
- Hayes, T.C. 1991. Oil and gas exploration will increase. *The New York Times* (January 3):D-3.
- Judice, M. 1991. Gas glut is taking its toll. *The Times-Picayune* (September 1):F1.
- Judice, M. 1993. Unlocking secrets of the Gulf. *The Times-Picayune* (November 14):F1-2.
- Judice, M. 1994a. Shift from oil to gas drilling is making waves in the gulf. *The Times-Picayune* (March 23):C-1.
- Judice, M. 1994b. Fishing for deep oil. *The Times-Picayune* (March 13):F-1.
- Judice, M. 1994c. Taylor questions oil bond. *The Times-Picayune* (April 26):C1-2.
- Judice, M. 1994d. Dismantling platforms is big business. *The Times-Picayune* (August 16):C1-2.
- Judice, M. 1994e. Redrilling cuts cost of oil, gas. *The Times-Picayune* (November 11):C-2.
- Judice, M. 1994f. Energy firms will spend more in 1995. *The Times-Picayune* (December 14):C-1.
- Judice, M. 1994g. At your service. *The Times-Picayune* (October 2):F-1.
- Judice, M. 1995a. Oil giants to take deepwater plunge. *The Times-Picayune* (January 25):D-3.
- Judice, M. 1995b. Oil execs slam clean-air rules. *The Times-Picayune* (January 14):C-1.
- Judice, M. 1995c. Energy companies cope with prices by drilling less. *The Times-Picayune* (April 4):C-10.
- Kaplan, B. 1994. Offshore potential brings Miami firm to New Orleans. *New Orleans City Business* (January 17-23):12.
- Koen, A.D. 1993a. Higher gas prices fuel OCS sale 142 bidding. *Oil and Gas Journal* (March 29):27.

- Koen, A.D. 1993b. Independents spark behind Gulf of Mexico resurgence. *Oil and Gas Journal* (September 27):20-26.
- Laska, S., V.K. Baxter, R. Seydlitz, R.E. Thayer, S. Brabant, and C. Forsyth. 1993. Impact of offshore petroleum exploration and production on the social institutions of coastal Louisiana. OCS Study MMS 93-0007. U.S. Dept. of the Interior, Minerals Mgmt. Service, Gulf of Mexico OCS Region, New Orleans, LA. 246 pp.
- LeBlanc, L. 1993. Independent sees niche developing in deepwater Gulf of Mexico. *Offshore* (July):27.
- LeBlanc, L. 1994. Industry marches into deepwater: The offshore years (1954-1994). *Offshore* (April 1994):36-56.
- Lee, M.R. 1993. Summaries of environmental laws administered by the environmental protection agency. Washington, D.C.: CRS Report for Congress, January 14.
- Lore, G. 1992. Exploration and discoveries, 1947-1989: An historical perspective, Gulf of Mexico OCS. OCS Report MMS 91-0078. U.S. Dept. of the Interior, Minerals Mgmt. Service, Gulf of Mexico OCS Region, New Orleans, LA. 87pp.
- Louisiana Department of Natural Resources. 1991. Outer continental shelf lease sales. *Louisiana Coast Lines* (Supplement, December):1-6.
- McLin, J. 1988. The petroleum price rollercoaster: Some social and economic effects in producing countries. *International Labor Review* 127:409-428.
- Moore, J. 1993. 1993 USA Gulf Coast Oil and Gas Directory, 2nd Edition. Tulsa, OK: Pennwell Publishing Company.
- Seydlitz, R., P. Jenkins and S.A. Hampton. 1995. The impact of energy development on education. *Impact assessment* 13(1):31-46.
- Simmons, M.M. 1993. Outer continental shelf leasing and development: Issues for the 103rd Congress. Washington, D.C.: CRS Issue Brief, August 16.
- Simmons, M.R. 1993. U.S. drilling contractors could face stiff challenges. *Oil and Gas Journal* (September 13):45-48.
- Southerland, D. 1995. Oil firms look to deep water. *The Washington Post* (April 10):A-1.
- Staff. 1991. API: Policies are driving oil industry from the U.S. *Oil and Gas Journal* (November 25):21-24.

- Staff. 1992a. In the oil drums. *Economist* (April 28):75.
- Staff. 1992b. EPA issues offshore air pollution regulations. *Oil and Gas Journal* (August 31):26.
- Staff. 1992c. Independent Petroleum Association of America supply and demand committee long-run forecast: 1992-2000. Washington, D.C.: IPAA.
- Staff. 1993. OGI300. *Oil and Gas Journal* (September 20):58-71.
- Staff. 1995. Shell poised for gulf deepwater installation. *Oil and Gas Journal* (April 10):26-28.
- Tipple, B. and A.D. Koen. 1994. Understanding salt movement key to hot Gulf of Mexico play. *Oil and Gas Journal* (May 2):33-42.
- Uda, M.J. 1991. The oil pollution act of 1990: Is there a bright future beyond Valdez? *Virginia Environmental Law Journal* 10:403-433.
- U.S. Bureau of the Census. 1956-1993. Statistical abstracts of the United States: 1956-1991. Washington, D.C.: U.S. Government Printing Office.
- U.S. Congress. 1990. Oil pollution liability and compensation. One-hundred first Congress, Report 101-241. Washington, D.C.: U.S. Government Printing Office.
- U.S. Congress, Senate. 1993. Outer continental shelf deep water royalty relief act. One-hundred third Congress. Washington, D.C.: U.S. Government Printing Office.
- U.S. Department of the Interior, Minerals Management Service. 1992a. Oil spills 1971-90 statistical report. Herndon, VA: MMS.
- U.S. Department of the Interior, Minerals Management Service. 1992b. Oil & gas leasing/production program: Annual report/FY 1991. Herndon, VA: MMS.
- U.S. Department of the Interior, Minerals Management Service. 1992c. Accidents associated with oil and gas operations, Outer Continental Shelf 1956-1990. Herndon, VA: MMS. 324pp.
- U.S. Department of the Interior, Minerals Management Service. 1994a. Offshore oil stats, 2nd quarter. Herndon, VA: MMS.
- U.S. Department of the Interior, Minerals Management Service. 1994b. Oil and gas leasing procedures guidelines. (Draft Copy). New Orleans: MMS.

- U.S. Department of the Interior, Minerals Management Service. 1994c. Federal offshore statistics: 1993. Herndon, VA: MMS.
- Wallop, M. 1993. Statement of Malcom Wallop, U.S. Senator, Regarding U.S. policy on oil and gas development on the outer continental shelf. Washington, D.C., September 14. (Mimeographed.)
- White, W.H. 1993. Testimony of William H. White, Deputy Secretary, Department of Energy. Before the U.S. Senate Energy and Natural Resources Committee. Washington, D.C., September 14 (Mimeographed).
- Williams, H.R. and C.J. Meyers. 1991. Manual of oil and gas terms 8th ed. New York: Matthew Bender and Co.
- Yergin, D. 1991. The prize: The epic quest for oil, money, and power. New York: Simon and Schuster.

## APPENDIX A

### SUMMARY OF FINDINGS FROM EXPLORATORY INTERVIEWS

Bergman & Hammer, Ltd., April 5, 1994

Bergman & Hammer conducted eighteen interviews with industry participants in Houston, New Orleans, Lafayette and Washington. The persons contacted were representatives of major oil companies, independent companies, oil service companies and industry associations. The interviews were open-ended in nature and were not designed to provide a scientific sample of opinions and company characteristics.

#### NATURE OF THE INDUSTRY

The overall history of the Gulf OCS oil and gas industry is widely familiar. Exploration and production (E&P) activity in the Gulf was traditionally dominated by major oil companies. Independent companies gained a foothold during the boom of the 1970s and then began to displace the majors during the 1980s. The net shift of activity from majors to independents accelerated after the price collapse of 1986, which initiated a general decline in exploration effort and total employment (while production held fairly constant). By the early 1990s, independent companies were dominating offshore exploration and threatening to take the lead in production. Ongoing sales of assets by the majors suggested that they were pulling out of the Gulf, presumably because of better opportunities in other parts of the world.

These events can be misinterpreted without a recognition that the restructuring of the Gulf oil and gas industry involved much more than transfers of activity between majors and independents. The entire industry was forcibly streamlined to survive an era of low oil and gas prices. For the majors, the adjustment involved asset rationalization and internal reorganization; for the independents it involved a selection process based on financial strength, technical competence and entrepreneurial skill. The outcome was a much more efficient industry with many different kinds of companies occupying many different niches. The majors emerged with a reduced presence but a firm hold on their core areas of activity. Their share of the offshore industry may decline further if price rises are insufficient to support large-scale replacement of reserves, but the majors as a group remain committed to the Gulf.

The distinction between major and independent companies fails to capture many aspects of the present industry structure. A further categorization is probably needed (although none is offered here). The primary gainers in the offshore industry have been companies that one observer describes as "a whole new breed of big independents." These companies resemble majors in terms of capability but independents in terms of organization and staffing. Their existence illustrates the need for a multidimensional industry categorization. The important variables include not only production, reserves and downstream integration but also in-house staff capabilities, E&P strategies, sources of capital and operating versus nonoperating status.

The present mix of independent companies in the Gulf OCS can be viewed from two perspectives. On one hand, the great bulk of E&P activity involves companies of substantial size, i.e., organizations that invest tens or hundreds of millions of dollars per year. On the other hand, even the smallest companies play an essential role because they establish and recover reserves that otherwise might not contribute to the nation's energy supply.

Many of the most important trends in the Gulf OCS have involved oil service companies. (Here "service companies" include contractors of all kinds plus suppliers of oilfield equipment and materials.) The emergence of independent oil producers in the Gulf was generally positive for the oil service sector because independents were more likely than majors to rely on contract services. By the mid-1980s, the oil service sector accounted for about two-thirds of all direct offshore employment, or roughly 100,000 jobs. The largest categories were contract labor, field services, air and water transportation, development drilling, exploratory drilling and platform fabrication. There were diverse and often highly specialized companies in geological, geophysical and engineering fields; in the supply of equipment and materials like drilling muds and bits; in construction-related areas such as diving and pipeline installation; and in oilfield specialties like well logging, completion and workover.

The oil price collapse of 1986 created a wrenching period of transition and consolidation in the service sector. The employment losses, bankruptcies and financial repercussions of the price decline involved service companies to a greater extent than exploration and production companies. The present service sector is more efficient than its predecessor and better able to supply services on a coordinated basis, but may be less than optimally competitive due to over-concentration in some areas.

## **REPOSITIONING OF MAJOR OIL COMPANIES**

All of the major oil company representatives contacted for this review emphasized that the Gulf of Mexico OCS was still strategic for their companies. Pulling entirely out of the Gulf was not an option for most majors (although Tenneco did so). Instead, the majors have tried to increase their return on investment in the Gulf through three general types of adjustment: 1) asset rationalization; 2) corporate restructuring; and 3) streamlining and destaffing of operations. Many of their efforts resemble cost-cutting programs in other sectors of the U.S. economy.

### **Asset Rationalization**

Major oil companies in the Gulf have sought to reposition themselves by divesting nonstrategic properties and focusing upon core areas of activity. This process is called asset rationalization or portfolio management. Divestments tend to involve properties at both ends of the production life cycle, i.e., undeveloped properties that are unpromising or more valuable to somebody else, and producing properties that are declining or in need of workover. Emphasis is often placed on clustering properties geographically to attain an

efficient scale of operation. Infrastructure is sometimes a key factor in determining which properties are strategic. Asset rationalization includes acquisition as well as divestment of properties, although the latter effect has tended to predominate. Most of the properties acquired are undeveloped tracts. Some acquisitions have been achieved by exchanges of interest between companies. While asset rationalization has generally worked to reduce the presence of the majors in the Gulf, the overall effect of this process may be stimulative. For example, one major company has divested half of its Gulf OCS properties since 1991, yet has maintained 98 percent of its Gulf production. In all likelihood, the divestment has shifted properties to companies with more interest in developing them quickly.

### **Corporate Restructuring**

Major oil companies have attempted to improve efficiency and accountability by changes in management structure, reporting relationships and geographic positioning. The corporate divisions responsible for E&P in specific basins such as the Gulf of Mexico OCS have always had considerable autonomy. Recent changes have tended to increase divisional autonomy through mechanisms such as the creation of profit centers. In at least one case, regional entities have been spun off as separate corporations. Meanwhile there have been efforts to consolidate management and technical functions within divisions (as discussed later). The objective is often to arrive at fewer divisions with greater centralization of personnel and more power to make and implement decisions.

### **Streamlining and Destaffing of Operations**

Observers of the Gulf offshore industry tend to describe the major oil companies collectively as high-cost producers with excess staff. This condition developed through corporate inertia and the up-and-down history of petroleum prices. In the words of one company representative, "the industry got staffed for \$75 oil, then \$25 oil, then \$18 oil - but now we're selling it at \$14." Boosting productivity and reducing staff have thus become ongoing priorities. Many companies have initiated formal programs that involve review of all activities and adoption of management approaches from other industries (e.g., synchronous production and Deming methods). Some majors are even benchmarking their operations against independent companies. Streamlining programs are barely underway in some companies and more or less completed in others.

The major oil companies have traditionally been called "elephant hunters." That is, they sought to discover and develop large fields and were uninterested in small finds. (One of the majors reportedly had a threshold of 50 million BOE and would divest fields with reserves below this level.) Some of the recent restructuring and streamlining efforts have been intended to reduce the size of reservoirs that companies can recover economically. The ability of at least some majors to address small fields has been increased through general cost-cutting measures, technical innovations and improved project planning. For example, companies now utilize advances in drilling, well completion and platform operation to combine reserves and spread the cost of facilities. One major claims to have eliminated any



lower limit on reservoir size. Still, the majors clearly have a stronger overall orientation than the independents toward large fields and high-volume production.

A significant question involving corporate structure is the linkage between operations in the Gulf of Mexico and operations overseas. A common perception is that the majors reduced their presence in the Gulf after 1986 because better opportunities emerged in other parts of the world. This would imply that oil companies allocate investment funds in a competitive, either/or fashion. It is true that the operating divisions of most companies must vie with one another for capital even when they have great autonomy in other respects. However, the competition is not zero-sum, so the trade-offs should not be exaggerated. The majors retrenched in the Gulf primarily because their returns on investment there were low. The costs and uncertainties of environmental regulation were negative for the Gulf, but other circumstances were negative elsewhere (such as the fact that payments to foreign governments could take away much of a project's upside). Decisions probably turned less upon comparisons of such factors than upon absolute levels of profitability. Thus, a return to positive expectations in the Gulf would probably stimulate activity there regardless of opportunities in the rest of the world.

### **CHARACTERISTICS OF INDEPENDENTS**

As a group, the independent oil and gas companies operating in the Gulf of Mexico OCS are lean, efficient and opportunistic. Their investments in offshore projects can well exceed \$1 million per year per employee. One company that ranks among the top 25 gas producers in the Gulf employs only 35 people. The independents maintain technical staffs to support decision-making, but tend to contract out activities that require large numbers of people. Their employment depends upon the relative use of in-house personnel for data interpretation, geological/geophysical work, process supervision and facility design. Some of the larger companies manage all processes internally and feel they have all the capabilities the majors do.

The independents vary greatly in scale and orientation. The largest are capable of handling all but the biggest projects (such as billion-dollar deepwater ventures), while the smallest operate in very limited arenas. Specialization of activity is encouraged by the nature of the E&P life cycle and the variation in environments and resources confronted. Many independents concentrate on acquiring, rehabilitating and operating mature properties. Others emphasize the front end of the E&P process, and a few try to establish and sell reserves without involvement in production. (The last option is currently minor but may increase in response to environmental regulations.) There are also plug-and-abandon companies that gain access to reserves by taking on responsibility for well abandonment. A company's orientation is likely to be shaped by size, capabilities, experience and other factors like capital access. For example, access to trust fund and pension fund capital may encourage an emphasis on farm-outs because institutional investors favor producing properties.

The future prospects of the Gulf offshore industry cannot be assessed without an understanding of how and why the independent companies came to assume such an important role. A common view is simply that the majors shifted their attention elsewhere and the independents moved in to fill the resulting vacuum. As already suggested, this view is somewhat misleading because the majors were driven as much by low profitability in the Gulf as by new opportunities in other countries. Also, the majors would not have divested Gulf assets so readily if the independents had not wanted to buy them. A key part of the explanation is that conditions emerged in which the majors could not operate as profitably as other types of companies.

The normal pattern for a hydrocarbon-producing basin is a progressive decline in the size of fields discovered. The Gulf of Mexico OCS has generally followed this pattern. The fields discovered in 1980 through 1989 had average reserves only about one-tenth as great as the average for fields discovered before 1960 (although the number of new fields increased substantially). The relatively short lives of offshore wells meant that the production rates of many wells were declining as the Gulf basin entered maturity. The major oil companies were organized and staffed for large finds and high-volume production. Hence there was room for companies that could address small reserves economically. After the independents became established, some expanded their capabilities and became competitive with the majors across a wide range of activity.

Three factors abetted the entry of independent companies into the offshore industry. First, the independents gained increasing access to first-line technology, which had been largely monopolized by the majors prior to 1980. The spread of technology was linked in part to the evolution of the contracting sector and its recruitment of experts from major companies. Second, the independents benefitted from the progressive development of offshore infrastructure (e.g., the pipeline network), which reduced the cost of establishing production facilities. And third, exploration activity by the independents was greatly encouraged by changes in MMS leasing policies, namely the shift from nominated leasing to areawide leasing in 1983 and the reduction of the minimum bid to \$25 per acre in 1987. These changes allowed companies to pursue opportunities with a reasonable assurance that tracts of interest could be secured at a moderate cost.

The trend toward smaller finds and declining production from existing wells may continue to promote transfers of Gulf activity from majors to independents. This outcome is uncertain because the majors may be able to develop large fields in frontier areas. As discussed below, technical advances can modify the trend of discoveries in the Gulf if product prices are high enough to support expensive, high-risk exploration and development. In any case, it seems unlikely that assets and activity will shift from majors to independents as rapidly in the future as in the recent past. The pattern over the past ten years was shaped by factors that were essentially one-time events, namely the repositioning of majors and the removal of limitations on the role of independents. Future changes are likely to be evolutionary rather than revolutionary in the absence of new destabilizing forces.

A net shift of activity away from independent companies is possible. This outcome could be produced by either of two circumstances: a return to nominated leasing in the Gulf, which would reduce offshore exploration by independents; and an unmodified application of the OPA 90 financial responsibility provisions, which would prevent many independents from operating offshore facilities. The result in either case would be an overall contraction of the industry rather than a displacement of independents by majors.

### **PRESENT AND FUTURE DIFFERENCES BETWEEN MAJORS AND INDEPENDENTS**

Reports of restructuring and cost-cutting by the majors would suggest that the majors and independents are becoming more alike. The following comments address the present degree of similarity and the prospects for an eventual convergence of characteristics.

With regard to cost, representatives of independent companies feel that "there's still a big difference" between majors and independents. One of the persons interviewed gave some evidence from his company's experience as both an operating and nonoperating gas producer. The average lift cost for the company's operating properties was 20 cents per tcf. The average for properties operated by others - primarily majors - was 40 cents per tcf. A representative of another independent cited a benchmarking study by an accounting firm. His company was judged to be compatible in terms of operating cost with one of the smaller majors, yet the major had about fifty people performing functions that his company accomplished with fifteen. These comparisons may overstate the general level of variation (since they involve two of the most efficient independents), but are nevertheless striking. Representatives of independent companies tend to feel that the overall cost difference involves contracting as well as internal staffing. The majors are still considered less cost-conscious than independents in the design and execution of drilling programs and the procurement of supplies.

The majors may or may not be moving toward the independents in the use of contractors. Both groups of companies have been exploring new types of contractor relationships - such as turnkey arrangements, business alliances and lead contractors - to gain efficiency and control. Possibly the majors are increasing their overall reliance on contractors somewhat. However, the interview responses did not stress this trend or reveal instances in which major companies had outsourced whole functions (as done by many big firms in other industries). One major was reportedly pulling more activities in-house rather than the reverse. Thus, the majors' tendency to rely less on contracting than independents seems to be a persistent difference.

The independents feel that they are more nimble and flexible than the majors in making decisions and implementing projects. All accounts suggest that this difference remains significant, although its magnitude may be exaggerated. Part of the explanation is simply corporate size. One observer at an independent company compared the majors' decision-making with "turning a battleship," because so many people and procedures were involved.

He cited a case in which a major required fifteen months to lay off workers in response to low gas prices, by which time prices had doubled. Another independent company executive linked the majors' inflexibility to corporate pride, which retarded various kinds of adjustments (for example, causing the majors to "stick with in-house models for too long"). The managers of independent companies must be considered credible observers because many of them once worked for the majors. On the other hand, some of their observations may be losing relevance as the majors move forward with restructuring programs.

The majors and independents seem to be converging in some aspects of asset management and resource orientation. Attempts by majors to rationalize their holdings may have raised their interest in acquiring producing properties (although the majors remain less likely than independents to carry properties through the late stages of production). As noted above, some majors are becoming more willing to develop relatively small fields. Meanwhile, the larger independents are gradually approaching the majors in ability to undertake high cost, high-risk projects. In the past the majors were responsible for nearly all E&P in water depths exceeding 1,200 feet, but some independents are now entering deepwater ventures. One of these companies expects deepwater E&P to account for 25 percent of its future offshore spending. Independents have also become involved in subsalt exploration. Typically, independents undertake new types of E&P in partnership with majors, then gain more and more ability to pursue ventures on their own.

The majors have some persistent financial advantages over the independents that offset at least part of the variation in operating cost. Downstream integration is a stabilizing factor because the profitability of oil and gas refining bears an inverse relationship with returns from E&P. (Low petroleum prices reduce the cost of refinery feedstock more than the market value of refinery products.) This still gives the majors an advantage over nonintegrated independents despite losses of refining capacity due to obsolescence and environmental regulations. The majors also retain an edge in access to capital. The stronger independents can fund most types of E&P projects but lack the majors' financial capability for long-term investments and massive ventures.

The interviews for this survey have failed to support the hypothesis that shifts of Gulf offshore activity from majors to independents have been linked to different attitudes toward risk. The hypothesis is that mergers and rising indebtedness during the 1980s made the major oil companies risk-averse and short-term in orientation (characteristics that have been attributed to U.S. corporations generally). While far from conclusive, the interview findings suggest that risk-taking behavior does not vary systematically between majors and independents, or between the majors now and the majors of old. The oil and gas business is a game of chance, and its players at all levels routinely address risks that would create general panic in other industries.

A reasonable hypothesis for the future is that the majors and independents in the Gulf OCS will continue to draw closer in operating characteristics, but will stay significantly different. Most of the majors will remain elephant-hunters by virtue of their scale and operating style.

They are not likely to change in ways that could undermine this role. Although their ability to pursue a variety of targets will become increasingly important, the critical issues for the majors will remain the supply of large fields and the returns obtainable from developing them.

## CAUSES OF EMPLOYMENT DECLINES

Net employment losses occurred throughout the U.S. petroleum industry after the oil price collapse of 1986. The decline from the mid-1980s to 1994 was nearly half a million jobs. The Gulf of Mexico OCS participated in this trend, although to a lesser extent than many onshore regions.

A distinction should be drawn between job losses due to decreases in E&P activity and job losses due to gains in operating efficiency. In the Gulf OCS, efficiency gains may have been as important as activity reductions to the overall employment decline. Reductions in exploration and development activity were clearly the dominant influence in the immediate aftermath of the 1986 price drop, but became less important in later years. Meanwhile the offshore industry was achieving dramatic gains in efficiency. These gains resulted partly from technological changes and partly from corporate adjustments to low oil and gas prices. Based on the industry interviews, the following factors have been the primary negative influences on offshore-related employment over the past five years.

1) Downsizing and restructuring efforts by major oil companies. As already noted, the cost differences between majors and independents largely involve staffing. Recent cost-cutting efforts by the majors have yielded employment reductions on the Gulf coast through buyouts, layoffs and redeployments of personnel. Some of these efforts are far advanced and some are relatively new, with the majors generally lagging behind other industry participants in this regard. ("They're facing now what we went through eight years ago," said one oil service company representative.) Streamlining efforts by the majors may currently be the largest single negative influence on OCS employment.

2) Shifts of activity from majors to independents. Greater use of contracting accounts for only part of the overall difference between majors and independents in staffing relative to production. Consequently, shifts of productive assets from majors to independents tend to reduce industry employment even if activity levels are unchanged. This factor is still contributing to Gulf coast trends, but may not be as important numerically as it was several years ago.

3) Restructuring of the oil service sector. A majority of the upstream workers who lost their jobs after the price crash were employees of oil service companies (including oilfield supply). Many of the smaller service companies and most of the "Mom and Pop" operations went out of business. Other companies went through mergers, acquisitions, selloffs and other convolutions. The result was an extremely rapid and pronounced industry consolidation, continuing well into the 1990s. The oil service sector is now dominated by broad-spectrum

drilling, construction and equipment companies that are undoubtedly more efficient and less labor-intensive than their predecessors.

4) Technological change in exploration and development. The expected pattern in a mature hydrocarbon-producing region is a progressive increase in the exploration effort required for each incremental reserve addition. Some data sources show such a pattern for the Gulf of Mexico.<sup>1</sup> Other sources suggest, however, that this pattern has been offset by technological advances. An API study claims that the cost of offshore drilling in dollars per BOE decreased by 12% per year during 1985-90 (for exploratory plus development drilling), due largely to sharp increases in the average reserve addition per foot of successful drilling.<sup>2</sup> This cost decline would largely predate the positive influence of 3D seismic evaluation on success and recovery rates. Whatever the absolute magnitudes, technological change has clearly reduced drilling employment relative to what would otherwise be required for any given reserve additions.

5) Technological change in production. Innovations in platform operation and other aspects of OCS production have had large negative effects on employment. As an example, remote operation of platforms has progressed to the point at which some companies maintain personnel on a minority - as few as 10 percent - of the platforms that they operate.

These influences on offshore-related employment are expected to continue rather than reverse. Some observers have described the offshore industry prior to 1986 as "fat." There is no reason to expect a return to this condition unless oil and gas prices escalate very rapidly. The general level of competition among oil and gas companies is probably increasing due to the rising presence and capability of the larger independents. Pressures to increase efficiency will therefore continue. Over-concentration may inhibit competition in some areas of the oil service sector, but this should not have a major bearing on employment. Thus, future changes in OCS-related employment should generally track changes in activity levels, except that there will be ongoing deductions due to productivity gains and perhaps further transfers of activity to independents.

## **GEOGRAPHIC SHIFTS IN OFFSHORE-RELATED EMPLOYMENT**

The contraction in the Gulf oil and gas industry since 1986 has involved a net shift of OCS-related activity from coastal areas to Houston. The smaller oil-dependent communities along the Gulf coast have been hardest hit, but the shift has also affected metropolitan areas like

---

<sup>1</sup> Lore, G. 1992. Exploration and discoveries, 1947-1989: An historical perspective, Gulf of Mexico OCS. OCS Report MMS 91-0078. U.S. Dept. of the Interior, Minerals Mgmt. Service, Gulf of Mexico OCS Region, New Orleans, LA. 87pp.

<sup>2</sup> Porter, E.D. 1992. U.S. Petroleum Supply: History, Prospects and Policy Implications. American Petroleum Institute (Research Study #064), August.

New Orleans and Lafayette. A significant question is whether a rebound of Gulf E&P activity or some other set of circumstances might create a net transfer of jobs back toward the coast. The following paragraphs address this question by describing the factors responsible for the past geographic trend, based on the interviews with industry participants. The subject is the geographic realignment occurring over and above the general contraction in OCS-related employment.

During the past ten years there has been a general trend toward centralization of oil company operations. This trend has strongly favored Houston because it is the focus of the world oil and gas industry and the predominant location of industry support services. Centralization has been encouraged by improvements in communication that allow oilfields to be operated from greater distances. Another factor is the escalating complexity of E&P technology, which has increased the advantages of pooling specialized talent at central locations. Shifts of personnel have often been accompanied by new working arrangements such as more horizontal management structure and greater reliance on team problem-solving approaches.

The centralization trend has been moderated for major oil companies by the fact that their scale can support the continued operation of regional offices. This means that consolidation and downsizing of functions can often be achieved without leaving the Gulf coast. (For example, one major recently combined three coastal offices into one without reducing total employment substantially.) The oil and gas companies most likely to shift OCS-related employment to Houston have been the larger independents that operate in onshore areas and/or foreign countries. For such companies, Houston tends strongly to be the most logical point for consolidating technical and management functions.

Oil company consolidation has been almost uniformly negative for communities smaller than metropolitan areas. For New Orleans and perhaps a few other sizeable communities, there have been offsets in that some locally based independents have brought functions from elsewhere due to acquisition and reorganization programs. This was the case for a majority of the larger independents interviewed in New Orleans. (Oil and gas companies have reduced their overall technical and administrative presence in New Orleans, but this trend has primarily involved onshore rather than offshore E&P. Observers report that New Orleans now serves just as an offshore base rather than a center for both onshore and offshore activity. Efficiency considerations and the rapid decline in nearby onshore reserves have caused several majors and perhaps some independents to shift onshore-related staff to Houston.)

Consolidation within the oil service sector has also had strong geographic implications. The relatively large companies that now dominate the sector tend to be engaged in many kinds of activity at many U.S. or worldwide locations. A Houston base is much more important for such companies than for the smaller firms which they supplanted. Many of the coastal firms that went out of existence were acquired - or their assets acquired - by companies already headquartered in Houston. (A good example was the recent sale and breakup of ODECO. This was a New Orleans-based drilling company that got into E&P in the 1970s. Murphy

Oil, a part owner and close working partner of ODECO, took over the company in order to acquire its reserves and E&P capability. The ODECO drilling operations were sold to Diamond M Offshore in Houston. Diamond M absorbed the management and technical functions in Houston and consolidated all yard operations at New Iberia. The outcome was a vacant yard at Morgan City and a vacant 15-story office building on Canal Street.)

Technological change has also encouraged the concentration of oil services in Houston. The increasing complexity of oil and gas exploration has led to the emergence of highly specialized companies, such as firms specializing in analysis of 3D seismic data. These firms need to locate at the industry center in order to attract and serve a broad clientele. By substituting for functions that oil companies once provided internally at Gulf coast sites, these firms have created a net shift of jobs to Houston.

Thus the geographic redistribution has not been achieved by simple relocations of activity from hinterland areas to Houston. The process has involved transformations of activity, i.e., changes in work content, working relationships and/or management structure. Nothing is likely to undo these transformations in the future. Hence, other locations on the Gulf coast probably cannot increase their share of total offshore-related employment at Houston's expense.

There are three conceivable trends that might work against this conclusion. First, the industry might expand rapidly in response to oil and gas price increases, and Houston might come to be regarded as a high-cost area. Second, an eastward shift in offshore operations might occur due to greatly increased activity along the Norphlet Trend. (This would essentially require a change in government policies toward E&P in the Eastern Gulf.) Third, an expanding industry combined with a lack of responsiveness by existing oil service companies might create opportunities for new service firms outside Houston. All three of these outcomes have low probabilities and expected magnitudes. Hence, the best guess is that Houston will retain its present dominance of offshore-related activity.

### **FUTURE OPPORTUNITIES IN THE GULF BASIN**

The prospects for future hydrocarbon production in the Gulf of Mexico OCS depend upon a highly complex array of geological and technological factors. This review relies primarily on the opinions of industry participants rather than evidence from the technical literature (which would require a major effort to synthesize). The prevailing opinions place varying emphasis on positive and negative factors, but agree in many respects.

The Gulf offshore province is strongly gas-prone. Exploration prior to the late 1970s focused primarily on the discovery of oil fields, but significant gas reserves were developed as a byproduct. Declining oil finds and decontrol of gas prices then led to an increasing orientation toward gas. By 1991, gas accounted for over 70 percent of the energy content and over 55 percent of the wellhead value of Gulf offshore production (excluding



condensate). The gas share of value exceeded 70 percent in early 1994. Recent price trends have strengthened the alignment of both major and independent companies toward gas.

Industry observers call the Gulf OCS a mature province due to the decline in average size of fields discovered. This description is clearly accurate for the continental shelf waters of the Central and Western Gulf. (The following references to the "shelf" exclude deepwater areas, which are technically off the shelf, and subsalt deposits, which have just become a factor.) The shelf in the Central and Western Gulf is also mature in terms of production. Due to prevailing reservoir characteristics, Gulf offshore wells tend to have short lives - 10 to 15 years as compared with 25 to 30 years for onshore wells. The yields from many existing wells are declining. Some of the most prolific gas reservoirs are "reaching the critical breakover point on the decline curve," according to one observer. Thus, maintaining production on the shelf may become increasingly difficult.

Opinions about future E&P activity on the shelf are somewhat varied. Optimists point out that new oil and gas fields are still being discovered. They feel that substantial new opportunities remain for both majors and independents in water depths of 300 to 1,200 feet. (One executive of an independent company described the Gulf as a "fairly immature" province relative to nearby onshore areas.) Pessimists note the declining number of large finds and the increasing risks associated with exploration. In general, industry opinions seem to be correlated with ability to make money from small and/or declining fields. The companies that can address small reserves effectively are most apt to be optimistic about future E&P in the areas where activity is now concentrated.

The general weight of opinion suggests that oil and gas production in shelf waters of the Central and Western Gulf will soon start to decline. If so, the chances for sustaining overall Gulf E&P will depend upon three new areas of development. These are: 1) deepwater; 2) subsalt; and 3) the eastern Norphlet Trend. The following paragraphs comment on these prospects.

### **Deepwater**

Oil and gas production in Gulf waters exceeding 1,200 feet is very recent. The deepest fixed platform is a facility at about 1,350 feet. Another company has four current projects in still deeper waters. Two involve subsea gas wellheads at 1,500 and 2,000 feet, tied to platforms 10 and 25 miles away. The other two are the billion-dollar Augur and Mars projects utilizing tension-leg platforms. The Augur platform is located in 2,860 feet of water and is scheduled to start production in the spring of 1994. Total reserves are estimated at 220 million BOE for Augur and 500 to 700 million BOE for Mars. The planned production from these two facilities alone would raise the oil and gas output from the entire Gulf OCS by about 5 percent (relative to recent levels).

Some representatives are outspoken about the vast potential of deepwater E&P. They feel that recoverable deepwater reserves may be as great as 15 billion barrels, which would equal

the entire recent production of the Gulf OCS for more than a dozen years. One executive describes the deepwater potential as "between one and two Prudhoe Bays." He envisions as many as ten deepwater projects on the scale of Augur and Mars. Experience suggests that tension-leg platforms may be feasible in waters as deep as 7,000 feet.

All of the people interviewed for this survey were asked their opinions about deepwater prospects. There was general agreement that deepwater E&P could be very important, but disagreement on the likely volume of activity within the next five years. The question was whether oil and gas prices would be high enough to support the cost of deepwater ventures. Bullish and bearish views on prices (discussed later) yielded correspondingly bullish and bearish views on deepwater impacts. The Augur and Mars projects looked good when oil was \$18 and could survive with \$14 oil; but some observers expressed doubt that these projects would have proceeded if recent price trends had been known. (Augur and Mars are expected to produce more oil than gas. The overall deepwater mix may be about fifty-fifty.) Many deepwater projects could require \$25 oil. One of the independent company representatives was optimistic about deepwater activity for non-price-related reasons. He saw the possibility of smaller deepwater ventures that did not require billion-dollar investments, and felt that independent companies could find niches in deepwater E&P.

### **Subsalt**

Many areas of the Gulf of Mexico are underlain by huge salt deposits. Oil and gas have long been extracted from strata above the salt, but little attention was paid to the possibility of further reserves underneath. This possibility emerged very recently due to improved collection, processing and interpretation of 3D seismic data. Subsalt hydrocarbon reservoirs are now known to exist. Their number may or may not be large, and their pursuit may or may not be economically justified at current product prices. Nobody is sure yet.

As of February, 1994, the record of Gulf subsalt exploration included one successful well and five unsuccessful wells. The successful one required three months to drill. Subsalt exploration was both expensive (over \$10 million per well) and risky. Subsalt prospects were nevertheless receiving a great deal of attention. Lease transactions were reportedly slow because the majors were holding properties for reevaluation. One observer said that the upcoming MMS lease sale would reveal a heightened level of interest in pursuing subsalt reserves.

When pressed for opinions about the importance of subsalt activity, most of the industry participants were agnostic. One felt that subsalt prospects were "getting overblown." Some others were skeptical, and some declined to comment. However, four representatives of independent companies felt that subsalt E&P would probably be important. One person expected the discovery of large subsalt structures in the 100 million BOE range, but would not speculate about their numbers. He pointed out that the cost and risk of subsalt exploration were offset by the location of subsalt reservoirs on the shelf in shallow water, often near existing infrastructure. Another felt that subsalt potentials would do more than

deepwater exploration to keep the majors in the Gulf. Still another said that there was "a lot hanging on subsalt" and could see reserve additions of around 2 billion BOE from this source, primarily involving fields of 15 to 50 million BOE. The last said it was "probable that subsalt is going to be a really big play."

### **Eastern Norphlet Trend**

The geologic formation known as the Norphlet Trend is located fairly close to the Gulf shoreline from Mississippi to the Florida panhandle. The western portion of the Norphlet Trend became a target of exploration during the 1980s. The question mark for the future is the development of the eastern portion, which occupies the Eastern Gulf region. The eastern portion plays a prominent role in plans by one major company and one of the independents contacted for this review. A company has drilled two exploratory wells in the waters south of Pensacola and has obtained permits for a third. Their holdings could yield three trillion cubic feet of natural gas (about 500 million BOE) from dry gas wells. Production facilities in this area could utilize onshore infrastructure in Alabama or Mississippi. E&P activity off the Florida panhandle is theoretically possible under existing federal policies, but there are serious regulatory barriers. The acquisition of all necessary approvals for one exploratory well took three years. The question is whether opposition to E&P activity in the Eastern Gulf will nullify the eastern Norphlet Trend as a source of new reserves.

## **TECHNOLOGY AND INNOVATION**

The development of the Gulf OCS oil and gas industry has been strongly shaped by technological advances. Ongoing technical change may be critical to the viability of the industry given the rising difficulty of establishing new reserves. The major oil companies were the primary source of innovations in the past since they conducted most R&D spending and were better equipped than the independents to test new procedures. Thus, a relevant question is whether shifts of activity from majors to independents can hurt the industry by slowing its technological progress.

The persons interviewed were unanimous in citing the influence of technology on recent industry trends. Primary emphasis was placed on the use of 3D seismic data, which has yielded a quantum improvement in ability to locate and understand oil and gas reservoirs. The complexity and massive computational requirements of 3D data interpretation have caused a restructuring of G&G activity by forcing greater use of outside contractors. There may also be greater reliance on outside companies for collection of seismic data (which some vendors now collect and market on a speculative basis). Property transactions have reportedly been affected because the major companies are holding onto tracts that in earlier years might have been sold.

Some respondents mentioned the importance of horizontal drilling (or more generally, directional drilling). So far, horizontal drilling has apparently had less impact in the Gulf OCS than in many onshore oilfields, but its acceptance and use in the Gulf have steadily

increased. Observers also cite technological changes in connection with enhanced recovery, automated production systems and environmental protection.

The lean operating characteristics of most independent oil companies have traditionally ruled out much spending on R&D. However, the involvement of independents may be increasing due to changes in the overall pattern of R&D activity. As described by the literature, R&D is becoming more applications-oriented, with greater emphasis on short-term economic returns.<sup>3</sup> This shift is accompanied by greater reliance upon out-of-house capabilities and joint funding arrangements. Opportunities are thus created for independent companies to participate in collaborative ventures of immediate benefit. Some of the ventures involve universities and national laboratories. Two of the persons interviewed in the present survey - representing an independent oil company and a marine construction firm - said that their companies were involved in collaborative R&D efforts.

None of the persons interviewed felt that the Gulf offshore industry was threatened by a slowdown in the advance of technology. A possible reason was that they expected most innovations in the next few years to come from technology dissemination and refinement, i.e., the process of building upon breakthroughs that have already occurred. This process will involve many different actors and thus may not be critically dependent upon the major oil companies. Another factor may be a conviction that the majors will continue to conduct R&D regardless of their presence in the Gulf of Mexico. New technology has always flowed from the Gulf to the rest of the world, and reverse flows should occur when and if the focus of activity shifts elsewhere.

### CAPITAL ACCESS AND TAXATION

The interviews dealt briefly with capital availability and tax treatment as possible influences on the behavior of major and independent oil companies. The findings were only suggestive.

Over and above the scale-related advantages possessed by the majors, capital availability did not emerge as a key point of difference between the majors and the larger independents. Both types of companies financed investments largely or entirely out of cash flow. Both had access to equity markets, but used new stock issues sparingly if at all. In contrast, the smaller independent companies were likely to obtain capital through investment partnerships and loans. A significant difference among the smaller independents was whether or not they

---

<sup>3</sup> Oil and Gas Journal; July 5, 1993; page 14. The above article provided data on R&D expenditures by 17 oil companies for the years 1981 through 1992. The total ranged between \$1.9 billion and \$2.43 billion for all years after 1982. In real terms, there was a decline of about 25% from 1984 to 1992. Expenditures were generally correlated with oil prices, suggesting that a rebound may occur if prices improve. A worldwide diminution in offshore activity is not expected; hence future R&D should remain relevant to the Gulf of Mexico.

had access to institutional sources such as pension funds and trust funds. (A representative of one company with institutional connections said that there was "more money than deals" in early 1994, while other companies were apparently facing a scarcity of funds.) The extent to which a company relied on internal capital versus other funding sources might have important implications for E&P activity, but no such relationships were established by the interviews.

The tax question was whether the preferential treatment of independent companies gave them significant advantages relative to the majors. The relevant features of the tax code were: Section 29 tax credits for special fuels; the Alternative Minimum Tax; the oil depletion allowance; and the treatment of intangible drilling costs. The interviews indicated that the first two items were unimportant for the Gulf OCS. No products from the offshore Gulf were eligible for Section 29 credits, and the Alternative Minimum Tax mainly affected the ability of major companies to benefit from Section 29.

The oil depletion allowance was eliminated for major oil companies in the mid-1970s. (It was so important prior to that time that it sometimes accounted for a company's entire profitability.) The depletion allowance still exists for small volumes of oil produced by independent companies. The maximum allowance is 15 percent of revenue for 1000 barrels per day. At early 1994 prices, the maximum works out to roughly \$750,000 per year (on annual revenues of about \$5 million). This can be an important factor for small companies, but is minor for the larger firms that supply the bulk of independent production.

Intangible drilling costs (IDCs) include chemicals, rig leases, contractor payments and practically all other drilling expenses besides well casings. Independent oil companies can expense 100 percent of IDCs for tax purposes, but major companies can only expense 70 percent (while capitalizing the rest). This difference is clearly an advantage for the independents. However, observers express few opinions about the importance of this factor and the depletion allowance to recent industry trends. A reasonable guess is that taxation has played at most a minor role in shifting Gulf OCS activity from majors to independents.

### **CONDITION AND PROSPECTS OF THE OIL SERVICE SECTOR**

The shift of E&P activity from majors to independents has yielded a general increase in the role of the oil service sector (still referring to supply companies as well as contractors). Both the majors and independents have attempted to improve their usage of contractors through such measures as:

- \* planning contractor activities in greater detail;
- \* involving contractors up-front in the design of projects (as opposed to soliciting bids for jobs already defined);
- \* improving the coordination of contractors through "supply chain management" and/or designation of a lead contractor;
- \* improving efficiency by pooling staff capabilities;

- \* forming long-term "strategic alliances" or "aligned interest" relationships with contractors; and
- \* utilizing turnkey contracts or other arrangements that involve a sharing of risk.

The business environment remains relatively harsh for most service companies. The independent oil companies have long been aggressive in attempting to beat down service company prices, and the majors are much more cost-conscious than formerly. In some areas there are still relatively few jobs to bid into, yielding "excessive competition" in the words of one observer. Long-term relationships with oil companies often require substantial discounts. Risk-sharing arrangements are problematic for many service companies.

The oil service sector is both stronger and weaker than it was ten years ago. One improvement is that service companies have obtained greater access to first-line technology, as already mentioned. Another is that the consolidation process has yielded financially sounder companies with stronger asset bases. A third is the ability of integrated service companies to provide "one-stop shopping" (for example, G&G services through all aspects of reservoir modeling to the point of drilling). Many observers feel that service companies have become generally better able to meet their clients' needs.

The weaknesses of the oil service sector involve its ability to support an expansion of the offshore industry - or even a continuation of present activity levels -- in the future. The three main problems are overconcentration, losses of personnel and equipment shortages.

While many oil service markets remain intensely competitive, there has been so much concentration in others that one or two companies are now dominant. Several of the interview respondents felt that this situation was potentially serious. One said that a problem already existed for certain kinds of oilfield supplies. A single company had almost cornered the market and was "getting top dollar." Another executive said that the concentration of some technical services was a growing concern and would become serious if it proceeded any further. He could envision future situations in which a firm might buy up rival software simply to make it unavailable.

The past restructuring of oil services involved tremendous losses of personnel. Large numbers of salaried professionals and skilled field workers left the oil industry permanently. As a result, some components of oil services were left with very little excess capacity. As described by one observer, the capacity of the downsized service sector was first tested in the second half of 1993 when higher gas prices created some increases in demand. Signs such as green rig crews suggested that the industry was soon "near the limits of the workforce."

Shortages of trained personnel could become serious in the future for both service firms and oil and gas companies. Employees will continue to be lost through attrition, and as one observer has noted, there may be "nobody in the pipeline" to replace them. Universities are now turning out relatively few petroleum engineers, geological engineers and geophysical experts. An equivalent situation may hold for skilled field workers. Long lead times are

always required to recruit people for knowledge-intensive jobs, and the time lags may be particularly long for the petroleum industry due to widespread skepticism about job security.

Equipment shortages were mentioned in a number of interviews as a problem for the oil service sector. One observer cited a recent shortage of specialty tools; another noted that boats had become scarce. The primary focus of concern, however, was the prospective shortage of drilling rigs. Some limits on rig availability were occurring by early 1994, and industry participants feared that serious shortages would develop if there were any further increases in demand. A drilling company representative gave the following reasons for this trend.

A wide disparity has emerged between the lease rates obtainable for rigs and the revenues needed to justify their replacement. As part of the industry restructuring, drilling companies have improved their debt positions and written down the value of their equipment. "Nobody is carrying rigs on their books at replacement value," according to the drilling company executive. Consequently, there is no provision for rig replacement. The economics of the industry now dictate that: "you can work your rigs until you wear them out; then you're out of business." This is not a remote prospect for some companies, given the age of their equipment. The executive described his own company's rigs as "relatively new" because most dated back only 12 to 15 years.

A specific rig was cited as an example. It was built about 15 years ago at a cost of \$26 to \$28 million. In 1980 it leased for \$46,000 per day (with a crew of 50-plus people). Its lease rates during the recent slump dropped as low as \$8,000 per day, barely enough to keep the crew together. Now it is working in Venezuela at \$26,000 per day, roughly the same as what it would earn in the Gulf of Mexico. (Present Gulf rates for such rigs are in the "mid to upper twenties.") Drilling companies use a rule of thumb that each \$1,000 per day in lease revenue justifies an expenditure of \$1 million for rig replacement. The rig in question would now cost at least \$50 million to reproduce. Thus, lease rates will have to double before its replacement becomes economically rational.

Given these circumstances, the only long-term solution is an escalation of lease rates to levels that allow reinvestment in capital stock. The problem is reportedly worldwide, hence cannot be solved in the Gulf of Mexico by importing rigs from elsewhere. A worldwide escalation in drilling costs should ultimately be reflected in oil prices, which would lessen the net impact on producers; but the adjustment would still work to the disadvantage of exploration-intensive basins such as the Gulf. Drilling economics may thus cast a shadow - if only a long-term shadow - on the Gulf offshore industry.

## **ENVIRONMENTAL REGULATIONS**

Most of the persons interviewed were vocal about environmental regulations. There was a strong feeling that existing regulations were burdensome and that prospective regulations could have profound impacts on the offshore industry. In general, the persons at independent

companies were more concerned than representatives of the majors. The milder views of the latter might be explained by the greater ability of the majors to absorb environmental costs (due to their greater operating margins) and the majors' lack of exposure to lease bonding and financial responsibility requirements.

The impacts of environmental regulations on the offshore industry can be divided conceptually into cumulative effects and threshold effects. Cumulative effects were summarized by one observer as follows. "Oil people are resourceful. Usually they won't say that a new regulation will kill them. But cumulatively, environmental regulations can make resources uneconomic." Most representatives of independent companies felt that regulations were already having cumulative effects on Gulf E&P and were threatening to exert more serious impacts in the future.

Cumulative effects are difficult to discuss in general terms. For this reason, the interview questions focused primarily on threshold effects - namely, cases in which specific environmental regulations could yield direct consequences such as abandonment of projects. The subjects were the following areas of regulation: 1) the financial responsibility provisions of OPA 90; 2) the increases in lease bonding to cover plug-and-abandon liabilities; 3) the possibility of water quality standards that require reinjection of produced water; and 4) air emission controls resulting from a possible extension of onshore standards to the offshore Gulf. These are discussed below in descending order of expected impact.

### **Financial Responsibility Under OPA 90**

The requirement that all operators of offshore facilities must demonstrate financial responsibility of \$150 million was described as a "killer" by representatives of independent companies. One person estimated that this provision would shut down 100 of the 139 companies operating in the Gulf OCS. Another said that only 12 or 15 firms would remain. Still another felt that independent companies of medium size and up could possibly pay for the requisite amounts of liability insurance, but no insurance products were available. The chief barriers for insurers were the unlimited liability for removal costs and the right of direct action by any claimant against guarantors. One person produced a letter from associates of one prestigious law firm saying that they definitely would not insure risks under OPA 90. (Even before the full implementation of the Act, underwriters were including clauses saying that their policies did not constitute evidence of financial responsibility under OPA 90.) The interview respondents asserted that the withdrawal and bankruptcy of companies due to OPA 90 would produce a legal and financial nightmare; that the oil produced by these companies was unlikely to be recovered by others; and that the resulting rise in oil importation would increase tanker shipments and the overall likelihood of oil spills. The comments revealed a general assumption that OPA 90 would affect Gulf oil and gas producers regardless of their relative orientation toward gas. (An exemption is expected for natural gas if its production yields minimal amounts of condensate; but Gulf offshore wells tend to produce condensate, and there would be no advance guarantee that any given well would be exempt.)



### **Water Quality Standards**

The interview respondents were asked what would happen if standards for salinity or oil & grease were tightened to the point at which produced water had to be reinjected. (Reinjection is already common in state waters.) There were a number of strong opinions. One person said that a reinjection requirement would instantly shut down 15 percent of his company's production and ultimately sink half of its projects. Another said that "a good part of his production would be lost." A third agreed that reinjection would "put a lot of projects under." A fourth pointed out that water determined the economic limit of offshore wells, so tougher disposal policies would tend to shorten well lives across the board. Some other observers felt that reinjection costs would vary greatly with site and facility characteristics. A few persons were not highly concerned about the possibility of reinjection. Over and above financial impact, there was a general feeling that water quality regulations were unnecessarily stringent. One respondent said that there had never been a demonstrated problem with disposal of produced water; another asserted that regulations (existing or proposed) would prevent the disposal of New Orleans tapwater.

### **Bonding of Leases**

Lease bonding requirements are currently being increased tenfold, from \$300,000 to \$3 million for an areawide bond on producing properties. There was agreement among the persons interviewed that this change would primarily affect the smaller independent companies. Two representatives of medium-sized independents said that some increase in bonding requirements was needed (although one added that the change should be reasonable). Another emphasized that the small independents could find cover by forming joint arrangements with larger companies. In contrast, three executives at small companies felt that the new bonding requirements were burdensome and wasteful. They said companies would have no way to buy a \$3 million bond without putting up the entire \$3 million from their own sources. Reportedly, the reluctance of insurers to post bonds and charge premiums in a conventional fashion was due to the perpetual nature of bonding, i.e., the fact that the MMS was reluctant ever to release bonds once posted. The bonding requirement thus tied up large amounts of capital that could otherwise be used for constructive purposes. One respondent said that the program should be changed to give companies credit for reserves and future income streams (for example, by letting companies build up bond amounts through production, in a fashion resembling some of the existing agreements between companies involved in lease assignments). Another person suggested making the bonds annual or subject to some other fixed term, which would allow normal underwriting of risk. Companies would only have to put up cash if unable to renew their bonding in the market.

### **Air Emission Controls**

The interviews addressed the possibility that onshore standards for air quality and air emissions would be extended to the Gulf OCS (like other offshore areas). The responses reflected uncertainty about what this would mean in terms of regulation. Three of the milder

opinions were: that prospective air regulations would be "just a nuisance, not devastating;" that they would be "not so much a problem" as water regulations; and that they would "not be intolerable" unless they yielded a California-type situation in which producers had to buy pollution allowances from other companies. There were remarks about the potentially high cost of air-related retrofits to platforms, which "could affect some investment decisions." The strongest opinion (which may have applied to onshore as well as offshore regulation) was that air quality controls were a major factor driving activity overseas, and that the U.S. was "out of line with the rest of the world" on this issue.

The interviews fished for remarks on other environmental issues with few notable results. Requirements for disposal of NORM (naturally occurring radioactive material) were generally considered silly and wasteful. The most significant outcome according to one observer was that pipes would not be extracted from wells before plugging, which would create an economic loss and rule out the reuse of old wells. There were no spontaneous comments from respondents about conflicts involving oyster leases. Environmental regulations were not considered a threat to the pipeline system, although producers had worried about a pipeline safety bill in the early 1990s that would have required digging up abandoned pipelines.

A general question of concern was whether the shift from major to independent companies could have adverse environmental or safety consequences (i.e., whether the independents were less able to manage the industry). The interviews yielded little direct evidence on this question, but suggested that the issue was not critical for the following reasons.

The small independents occupy niches in the industry that would be available regardless of the presence of the majors. The shifts of E&P activity between majors and independents primarily involve the large independents. Most of the interview findings indicate that the majors and large independents comply similarly with environmental and safety regulations and experience similar regulatory impacts. Thus, the industry transition - if it continues - should not change the effects of offshore oil and gas production on the surrounding physical environment.

Three isolated comments in the interviews might suggest a need to modify this conclusion. Two were remarks by representatives of major companies, and the third came from an independent. The first was that independent companies have greater difficulty with environmental regulations than majors and often spend less for compliance because of their thinner operating margins. (This pattern would presumably apply to both large and small independents. It would arise from the types of reserves targeted, hence would be attributable to the maturing of the Gulf basin rather than the shift of participants *per se*.) The second comment was that independents might have less ability to deal with infrequent crisis situations than majors because of their shorter experience in the Gulf. The third comment was that some independent companies were lax in reporting problems to the responsible federal agencies. As many as half of all oil spills (usually very small spills) were said to go

unreported. The commenter attributed this to deficient practices on the part of a minority of independents.

Returning to the subject of OPA 90, there is good reason to doubt that Congress intended the more perverse consequences of the Act or that all of its provisions will be implemented in their present form. The question is how to change the Act while preserving its objectives and saving various legislative faces. A possible course of action has been proposed by one executive. The following paragraphs outline the approach as a way of indicating the problems with OPA 90 as well as their possible solution.

A technical corrections bill - a device used by Congress to correct unintended results of legislation - should be passed rather than a direct overhaul of OPA 90. The technical corrections bill would make three changes. The first would be a redefinition of "offshore facility." OPA 90 uses this term to cover "any facility of any kind located in, on or under any of the navigable waters of the United States." The reference to "navigable waters" extends the definition to all facilities on inland waters, even small marinas and pipeline crossings. The proposed approach would not attempt to change this reference, but would simply restrict "facilities" to those located offshore of the U.S. coastline.

The second change would limit legal liability in some fashion to make offshore facilities insurable (and would override state laws that impose unlimited liability). It would also create a sliding scale to establish levels of financial responsibility. OPA 90 now requires the same \$150 million responsibility for an offshore facility whether its spill potential is three barrels or three million barrels. The proposed approach looks to the scale established by OPA 90 for oil tankers. The liability of tank vessel operators for oil removal is limited to \$1,200 per gross ton of capacity, with minimums of \$2 million for vessels under 3,000 tons and \$10 million for larger vessels. The \$1,200 per ton works out to \$67.50 per barrel of oil. At this valuation, the typical oil platform operated by an independent company would have to release its full output to the Gulf for many weeks just to reach the \$2 million minimum for vessels. An important consideration is that oil platforms include very little storage. (The maximum for a Gulf offshore platform is around 5,000 barrels, a \$337,500 liability according to the above valuation.) Congress should instruct the MMS to create a liability scale for offshore facilities bearing some equivalence to the tanker scale. This would require judgments about: 1) the time period over which an oil platform's uncontrolled output should be summed when equating it to a tanker's cargo (acknowledging that tankers are compartmentalized and may release only part of their oil in a spill); 2) the relative probabilities of tanker spills versus platform spills; and 3) the possible influence of spill locations, cleanup difficulties and so forth. The proposed plan would leave the details to MMS, in the knowledge that any approach to parity with the tanker scale - even an approach within an order of magnitude - would yield responsibility levels vastly lower than \$150 million for most platforms operated by independents.

The third change would require all operators of offshore facilities to purchase insurance covering their maximum liabilities. Companies would no longer be allowed to establish

responsibility on the basis of net financial worth. The arguments for this change are that audited net worth may not convey an oil company's true value, and that requiring universal insurance coverage would provide added protection to taxpayers.

### PRICE EXPECTATIONS

The final sections of this text give some additional perspectives on the future of the offshore industry. To a large extent, future trends in Gulf E&P activity will be driven by oil and gas prices. Opinions about the industry's growth or decline are therefore linked strongly to expectations about prices. These expectations disagree substantially, which is understandable given the political influences on oil prices and the complex forces that determine gas prices.

The views of industry participants are colored by recent events. Wellhead prices for oil fluctuated between \$16 and \$19 per barrel from mid-1991 through mid-1993, then declined to the \$12-\$14 range by early 1994. Natural gas prices were depressed by the gas supply "bubble" during 1986-91 and went below \$1.00 per thousand cubic feet in early 1992. Then gas rebounded to prices as high as \$2.60 per thousand cubic feet in the winter of 1994. These trends have left industry participants "excited about gas, scared about oil," in the words of one observer. This phrase probably summarizes prevailing views toward the short term.

For the longer term, industry participants agree only that the gas "bubble" is gone and that the new supply-demand balance for gas will exert upward pressure on prices, all else being equal. Some observers place significance on the fact that gas is now traded as a commodity. (One observer pointed to the gas scarcity after Hurricane Andrew - when prices briefly went up to \$3 per tcf - as an indicator that a new era had arrived.) Opinions diverge on the future trend in worldwide oil prices and the extent to which gas prices will be limited by fuel-switching between gas and oil.

The interviews suggested that opinions about price levels over the next several years could be divided into four categories, as follows: 1) an expectation of moderate price gains for both oil and gas; 2) a generally bearish view; 3) a generally bullish view; and 4) a bullish view of gas and a bearish view of oil. About half the industry representatives held opinions in the first category, with the remainder divided equally between more positive and more negative views. There was some reluctance to quantify "moderate" price increases, but the predominant expectation seemed to be roughly as follows. Oil might return to \$15 or \$16 per barrel within a year, then increase by 4 to 8 percent annually. Natural gas might decline by 10 or 20 percent from the seasonal and weather-related highs of early 1994, then advance at the same rate as oil or slightly faster.

The bearish view rests on a premise that worldwide oil production will rise at least as fast as demand. This premise is supported by such factors as the increasing E&P activity in the Pacific Rim, the prospective return of Iraqi oil, the opportunities available in the former Soviet Union, and the access of Western oil companies to other areas where they formerly

were not welcome. The outcome according to one observer is that \$13 to \$16 oil is "the best we can hope for" over the next several years. Gas prices are coupled with oil prices because many utility and industrial users can switch fuels. For this reason, the bearish view holds that gas prices have little upside so long as oil prices remain flat. The early-1994 price relationship - with oil per barrel only five times as high as gas per tcf - is viewed as a temporary anomaly. Fuel-switching will occur if this relationship persists, with the result that average gas prices will stay in the \$2.00-\$2.30 range for some time.

The bullish view expects worldwide oil production to lag demand for several years. While acknowledging recent gains in estimated global petroleum resources, this view focuses on the drawdown of reserves in existing production areas (outside the Middle East). "Everybody has been producing flat-out" in these areas and their production rates have been declining, while low prices have discouraged new oilfield development. The world market will be affected by political pressures because several oil-producing countries face economic crises at current price levels. The bulls also note the cyclical nature of oil prices. Some discern a Biblical cycle of seven fat years (when prices rise) followed by seven lean years. Technological change may now have shortened the cycle, but in any case gas has entered the rising phase and oil is expected to be next. This view considers \$20 oil a likelihood within two or three years.

The bullish/bearish position was expressed by only one industry representative, but was based on a detailed analysis and therefore deserves mention. The premise in this case is that gas prices will become decoupled from oil prices due to limits on fuel-switching. According to the analysis, no more than 10% of natural gas users have the ability to switch fuels. Many of these cannot switch to oil because of air quality regulations. The changeover requires time and expense, and there are disadvantages involving taxation and transportation of oil. The expectation is that nearly all opportunities for fuel-switching will be exhausted within a year. A pause in gas prices may occur during this period, but then there is potential for strong gains in gas prices even if oil prices remain stagnant.

The industry sources generally viewed gas as the "fuel of the future" and were aware of downstream investment trends that would increase the nation's commitment to gas. However, only one emphasized the possibility of support from government policies favoring gas dependence. Others tended to view the federal role as negative based on the government's restriction of E&P activity in Eastern Gulf and Atlantic coastal waters. The respondents also failed to emphasize gas importation from Canada as a market factor. The general feeling was that Canada (and ultimately Mexico) would fulfill U.S. demands to the extent that the domestic industry was prevented from doing so.

## FUTURE SCENARIOS

The persons interviewed were asked about probable trends in E&P activity for their own companies and for the Gulf offshore industry as a whole. Nearly all the responses came from representatives of independent companies. The answers did not cover the possible effects of financial responsibility requirements under OPA 90 - either because the respondents believed the Act would be changed or because they found its consequences unthinkable.

Two of the independent companies were expected to increase their presence in the Gulf OCS over the next several years. The spokesmen for a third company said it would expand but possibly not in the OCS. The other representatives of independents either said or implied that their companies' E&P activities would probably remain stable. Views on the Gulf offshore industry as whole were somewhat less optimistic because of doubts about reserve replacement by the majors. Opinions were divided about equally between three propositions: that total E&P activity in the OCS would expand; that it would stay roughly the same; and that it would contract. The overall balance of opinion was slightly on the negative side.

The independent companies in an expansion mode were reportedly willing to add employees. Personnel reductions were not mentioned as a possibility by any of the independent company representatives. However, many felt that employment declines would occur at the majors due to further corporate streamlining. Productivity gains would also have a downward influence on employment throughout the industry. Significantly, a spokesman for one of the majors said his company would expand its E&P activity in the Gulf OCS if conditions were favorable, but probably would not staff up unless oil reached \$25 per barrel.

(One independent company executive felt that the majors were actually understaffed in key areas, which could limit their responses if conditions turned favorable. Early retirement programs and other downsizing measures had yielded a "purging of the mentors" in exploration groups.)

Table A-1 presents three alternative future scenarios for the Gulf OCS oil and gas industry. These scenarios provide a rough, tentative description of future prospects based on the interview findings to date. The three scenarios pertain to calendar year 1998 and reflect the pessimistic, intermediate and optimistic viewpoints observed in the industry. Each is associated with specific oil and gas prices. The descriptions of activity and employment consist of verbal comparisons between 1998 levels and early 1994 levels.

The scenarios suggest that there are only modest prospects for an upturn in offshore-related employment. In the intermediate scenario, the total volume of E&P activity would remain close to the early 1994 level, but productivity gains and shifts of activity toward independents would yield slightly fewer total jobs in 1998 than at present. The opinions of industry observers suggest that \$20 oil will be required to yield a significant gain in overall

employment. As noted earlier, future job changes are likely to be distributed more or less proportionally around the Gulf coast, without any major geographic realignment.

Table A-1

## Alternative Scenarios for Calendar Year 1998

	Pessimistic	Intermediate	Optimistic
Annual Average Wellhead Price			
Oil (/bbl)	15.00	18.50	22.00
Natural Gas (/tcf)	2.20	2.60	3.00
E&P Relative to 1994			
Exploration	Lower	Slightly higher	Higher
Production	Lower	Slightly higher	Higher
Independents' Share of Activity	Higher	Slightly higher	Same as '94
Employment Relative to 1994			
Majors	Much lower	Lower	Same
Independents	Slightly lower	Same	Higher
Oil Service/Supply Co.	Lower	Same or Slightly lower	Higher
Total	Lower	Slightly lower	Somewhat higher

**POSTSCRIPT**

This document is many ways an outside view of the Gulf offshore industry, even though it is based upon the opinions of industry representatives. At one point during the field work, the interviewer made a casual reference to the industry as "healthy." The person being interviewed - a senior vice president of a leading independent - asked sharply how an industry that had lost 450,000 jobs could be called healthy. Perhaps the word was poorly chosen, but the sentiment still stands. The oil and gas industry in the Gulf OCS has shown a remarkable capacity to adjust. Most of its participants have achieved major gains in efficiency and productivity. There is now a diverse array of companies addressing every resource niche and technical specialty. The industry makes investment decisions effectively under conditions of extreme risk. Its competitive atmosphere generally produces constructive responses that benefit the consumer. No industry in the U.S. has moved faster to eliminate waste, and no industry has shown greater readiness to accept and implement new technologies. The offshore industry has been sorely tested, but it is healthy in the same way that Job in the Old Testament must have been healthy; otherwise it would not have survived. Many of the issues now facing the industry and its government overseers do not have easy answers, but there should be no doubt that this is an industry worth saving.



### **The Department of the Interior Mission**

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



### **The Minerals Management Service Mission**

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The **MMS Royalty Management Program** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.