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BY THE COMPTROLLER GENERAL

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# Report To The Congress

OF THE UNITED STATES

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## Critical Factors Affecting Saudi Arabia's Oil Decisions

A key factor in meeting future petroleum demand by industrialized countries, including the United States, will be the willingness of Saudi Arabia to expand productive capacity and to supply increasing amounts of oil. But this report discloses that continued increases in Saudi Arabia oil production cannot be taken for granted. Its capability and willingness to increase production is dependent on many complex and interrelated technical, political, security, and economic factors.



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COMPTROLLER GENERAL OF THE UNITED STATES

WASHINGTON, D.C. 20548

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To the President of the Senate and the  
Speaker of the House of Representatives

This report focuses on the essential role of Saudi Arabia as the world's largest oil exporter and that country's importance to the United States and its allies as a key source of needed petroleum imports. This report identifies and discusses the critical technical, political, security, and economic factors which influence Saudi Arabian petroleum decisions.

Our review was a self-initiated study made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Secretaries of State, Energy, Defense, Commerce, and Treasury; and to the Director, Office of Management and Budget.

A handwritten signature in black ink, reading "Thomas B. Stuchlik", is written over the printed name.

Comptroller General  
of the United States

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COMPTROLLER GENERAL'S  
REPORT TO THE CONGRESS

CRITICAL FACTORS AFFECTING  
SAUDI ARABIA'S OIL  
DECISIONS

D I G E S T

The United States for some years to come will have to cope with a critical dependence on foreign oil imports to sustain its economy. Some consequences of this growing oil import dependence are impairment of foreign policy options (particularly in the Middle East), reduced security of oil supplies, and greater balance-of-payment deficits which erode the dollar's value.

Saudi Arabia has a vital role in meeting world energy needs because it has over 25 percent of the free world's known oil reserves and the ability to increase or decrease oil production. What is Saudi Arabia's capability to expand oil production? What factors influence Saudi Arabia's oil decisions? What do Saudi officials expect in return for producing and supplying increasing amounts of petroleum to the United States, Europe and Japan? The U.S. General Accounting Office (GAO) sought answers to these questions.

Although much has been written on the important Saudi oil role, GAO believes there is a need to provide the Congress with a perspective that emphasizes the unique position occupied by Saudi Arabia and the factors affecting its oil decisions. GAO examined technical factors affecting Saudi Arabia's ability to expand oil productive capacity and obtained views on issues affecting Saudi willingness to increase production. In presenting the Saudi views, GAO does not necessarily endorse the validity of the Saudi Government's positions or requests.

CONCLUSIONS AND OBSERVATIONS

Saudi Arabia's dominance among oil exporters is expected to increase in the years to come. Various studies on the world energy outlook

prepared by recognized authorities conclude that without substantially increased Saudi oil production and exports, at some point before the end of this century, world oil supplies will be insufficient to meet demand under an orderly marketing system. However, continued increases in Saudi Arabia's oil production cannot be taken for granted by the United States. Its capability and willingness to increase production is dependent on many complex and interrelated technical, political, security, and economic factors.

#### Productive capacity expansion

Although there are no insurmountable technical problems to prevent large increases in productive capacity if the necessary funds are spent and technical performance standards maintained, Saudi Government decisions and implementing actions will have a significant impact on the rate of expansion. With the necessary commitment by the Saudi Arabian Government, and with increased development drilling, well workovers, and the installation of additional equipment, the authorized plan to increase sustainable oil production capacity from the estimated 10.5 million barrels a day to the established goal of 13.5 million barrels daily by the early 1980s is feasible. Nevertheless, many technical problems will develop in the coming years that are normal to maturing and depleting reservoirs. (See pp. 11 to 19.)

Other operating and management considerations affecting petroleum operations include

- future role of the Arabian-American Oil Company,
- security of oil operations,
- greatly increased management burden stemming from the sheer size of expansion plans,

- desire to use more of the associated gas now flared (burned off),
- logistical, administrative, and social problems associated with a surge in the number of foreign employees to carry out expansion plans,
- unforeseen emergencies impairing the petroleum system, including pipelines, pumping stations, ports, shipping lanes, and adverse weather conditions, and
- desire to develop a broader domestic industrial base by expanding refinery capacities to increase products and decrease crude oil exports. (See pp. 19 to 26.)

Regardless of installed productive capacity, a more critical factor is authorized production. The Saudi Government has imposed a production ceiling of 8.5 million barrels a day and has indicated this ceiling will be retained at least until the end of 1979. Future Saudi production decisions will likely reflect its political, security, and economic objectives.

#### Political and security factors

Saudi political and security objectives revolve around security of the country and peace in the Middle East. The Soviet Union and radical groups whose philosophies threaten the Monarchy and Islamic values pose the greatest concern. Saudi Arabia has turned to the United States for assistance in achieving its goals and, although generally satisfied with U.S. support, its officials are especially concerned about U.S. willingness to

- use its influence with Israel to bring about lasting peace in the Middle East (see pp. 27 to 29) and
- approve the Saudi request to purchase 60 F-15 aircraft (see pp. 32 to 36.)

Saudi Arabia officials said that a Middle East war could seriously disrupt the flow of oil even without an oil embargo because of shipping restrictions and possible damage to Saudi oilfields or destruction of the facilities. The Saudi Government wants the United States to exert greater leverage to gain Israeli concessions and thereby accelerate the negotiations. The Saudi Government has also placed great importance on the F-15 request as a test of overall U.S. friendship and commitment to Saudi self-defense aspirations. Future Saudi oil decisions could be affected by U.S. actions on these two issues.

#### Economic factors

Saudi Arabia's ability to use effectively its mounting oil revenues could be another important factor in future oil decisions. Last year alone, the Government's revenues exceeded expenditures by \$17 billion. Some influential officials want to slow down capacity expansion and restrict future production to levels more in line with the economic needs of the country. The projected growth in oil revenues will add to the dilemma and increase the pressure on Saudi decisionmakers to limit oil production. (See pp. 39 to 41.)

The Saudi Government has stated that its willingness to produce oil at levels substantially beyond its own internal revenue needs depends on the industrialized countries' willingness to provide (1) real value guarantees for the resulting surplus revenues and (2) advanced technology and assistance in carrying out domestic industrialization and development programs. (See pp. 39, 44, and 45.)

The United States does not provide any form of special treatment for surplus funds generated by production in excess of Saudi needs. The move to limit future production could gain momentum if Saudi economic concerns are not resolved.



Saudi Arabia's ambitious \$142 billion 5-year internal development program provides an unusual opportunity for U.S. businesses to reduce the growing U.S. trade imbalance while at the same time helping Saudi Arabia with its internal development. However, U.S. Government actions may impede these objectives. Two special problems have been the

- changes in the tax laws for overseas employees (see pp. 46 and 47) and
- antiboycott legislation (see pp. 47 to 51).

#### Other considerations

The United States has enjoyed a special relationship with Saudi Arabia, nurtured over the years by the key role of four major U.S. oil companies in developing Saudi oil resources and more recently by U.S. Government assistance and cooperation. It appears that preserving and enhancing this relationship could provide a foundation for resolving the political, security, economic, and energy issues facing both nations. It would also provide the United States with greater influence in Saudi petroleum decisions.

While this report focuses on the important role of Saudi Arabia, it is obvious that U.S. energy policy must emphasize reducing U.S. dependence on foreign oil. Therefore, U.S. energy strategy should include actions to

- achieve energy conservation,
- seek new sources of oil and gas,
- accelerate the development of alternative energy sources, including renewable energy forms,
- cooperate in the search for energy solutions among industrialized nations.

- seek cooperation of producer nations but consider using leverage at U.S. disposal while avoiding unwarranted confrontations, and
- help strengthen the weakening dollar by aggressively seeking export opportunities for U.S. businesses. (See pp. 57 and 58.)

Although Saudi Arabia's internal development plans offer tremendous export opportunities, there is no clear U.S. position on the extent to which the U.S. Government should assist in Saudi Arabia's internal development. GAO believes that the U.S.-Saudi Arabia Joint Economic Commission may provide an excellent opportunity for the United States to develop imaginative and innovative proposals for increasing U.S. exports of goods and services if consistent with U.S. foreign policy and economic goals. GAO plans to review operations of the Joint Economic Commission. The huge petrodollar accumulations of Saudi Arabia, its ambitious internal development programs and desire for U.S. assistance, and the need to improve the U.S. trade balance are reasons for greater U.S. export efforts in Saudi Arabia. (See pp. 51 to 54 and 58.)

#### AGENCY COMMENTS

Executive agency officials who reviewed the draft report generally agreed with the reporting thrust. Their comments have been added to the report where appropriate. (See pp. 58 and 59.)

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## ABBREVIATIONS

Aramco	Arabian American Oil Company
b/d	barrels a day (of oil)
FMS	Foreign Military Sales
GAO	General Accounting Office
NGL	natural gas liquids
OPEC	Organization of Petroleum Exporting Countries
SAG	Saudi Arabian Government
SDR	special drawing rights

## CHAPTER 1

### INTRODUCTION

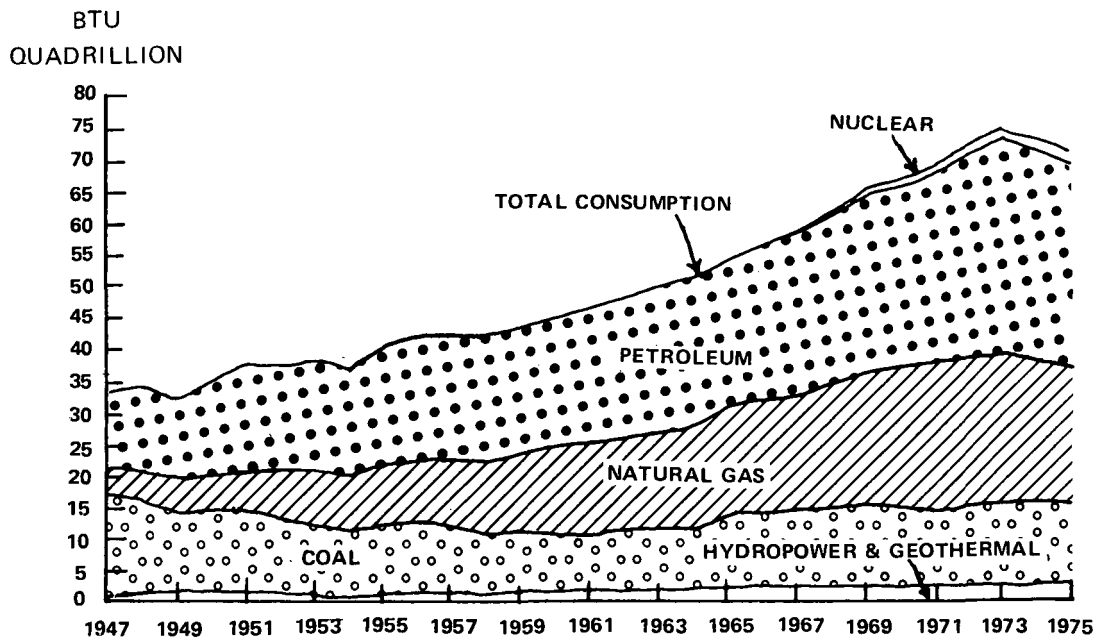
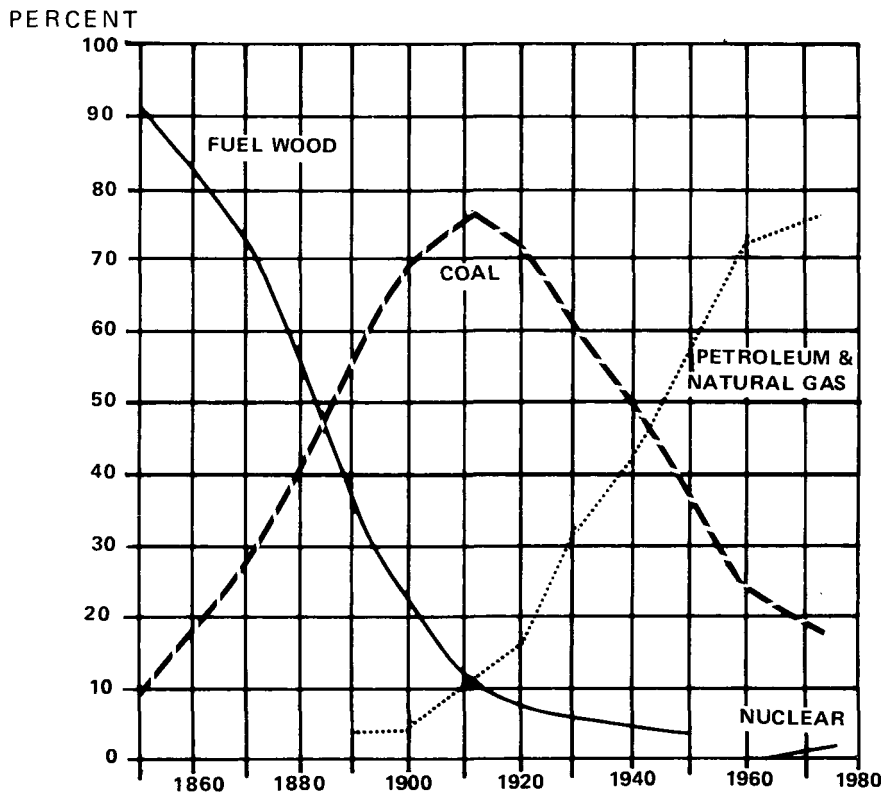
Since the end of World War II, most of the advanced and developing nations have come to rely on petroleum as their primary source of energy. The increasing U.S. dependence on oil is reflected in the graph on page 2. Oil comprises nearly half of U.S. energy consumption. Without major changes in U.S. energy policy, oil will continue to be our largest energy source during this century. The alarming and costly increase in U.S. dependence on oil imports is illustrated by the fact that even during the 1973-74 Arab oil embargo, the United States was importing 35 percent of its oil requirements at an annual cost of about \$7 billion. In 1977 U.S. oil imports had increased to 48 percent and cost nearly \$42 billion.

As a result of the embargo, subsequent large price increases, and increased reliance on imports, the United States and other major free world petroleum consuming nations have become aware that relatively cheap, inexhaustible, and secure energy supplies to fuel economic growth no longer exist. Consequently, they have been forced to more carefully assess the energy outlook and to appraise future prospects of obtaining adequate and secure imports at reasonable prices. Perhaps more important, they have come to realize the great degree to which all nations are economically interdependent.

Increasing energy requirements, coupled with increasing dependence on oil imports, make access to foreign supplies a vital national and international concern. Many energy experts believe that the world could face significant oil shortages before the end of the next decade. At the present time and for the foreseeable future, the member nations of the Organization of Petroleum Exporting Countries (OPEC) are the largest sources of petroleum. Within OPEC, Saudi Arabia has the largest petroleum reserves, amounting to 27 percent of the free world total. (See app. I.) It produced over 9 million barrels a day in 1977, ranking third behind only the Soviet Union and the United States. Furthermore, it claims to have a surplus capacity of an additional 3 million barrels a day and the potential for further increasing its oil production capacity.

As the world's largest oil exporting nation, Saudi Arabia is looked upon by many energy experts as the "swing producer" needed to satisfy incremental world demand. Consequently, the United States and other oil importing nations

# U.S. ENERGY CONSUMPTION PATTERNS BY MAJOR ENERGY SOURCE



of the free world will be vulnerable to Saudi oil pricing, production, and capacity expansion decisions during the 1980s. Saudi Arabia provided 16 percent of the U.S. oil imports in 1977, and U.S. allies in Western Europe and Japan are much more dependent on Saudi oil. Besides its vital role in meeting oil demand, Saudi Arabia also is a large market for U.S. exports and an important source of funds for U.S. financing needs.

Saudi Arabia is a country in rapid transition. In less than a decade, this conservative Moslem Monarchy has assumed an increasingly influential role in global energy and financial affairs due to its oil and financial wealth. Changes and stresses within the country have been dramatic, and throughout it has relied heavily upon close and friendly relations with the United States to achieve many of its major policy objectives. Continuation of the "special relationship" has become especially important to the United States so that it can influence Saudi oil and financial decisions in a manner to serve both U.S. and Saudi interests.

#### SCOPE OF REVIEW

The primary purpose of our review was to examine important factors affecting the ability and willingness of Saudi Arabia to expand future petroleum production to meet incremental world demand. We developed and analyzed information on the world energy outlook; technical, operating, and management considerations affecting Saudi oil production and expansion capabilities; political, security, and economic issues influencing Saudi oil decisions; and U.S. trade opportunities resulting from escalating Saudi oil revenues and internal development projects. We obtained views and information from more than 120 U.S. and Saudi officials representing 35 public and private agencies, ministries, departments, and organizations, both in the United States and Saudi Arabia. (See app. II.) We inspected key oil installations and operations in Saudi Arabia during October and November 1977 and held numerous discussions with U.S. and Saudi petroleum officials.

Although much has been written on various aspects of the international oil situation, including the important Saudi role, this report is intended to provide the Congress with a perspective that emphasizes the unique position occupied by Saudi Arabia and the factors affecting its oil decisions. In presenting Saudi Arabian Government views on actions needed to ensure its willingness to meet future petroleum needs, we do not necessarily endorse the validity of



the Saudi positions or requests. Moreover, its positions are not considered inflexible; they could be modified by future events.

We did not request formal agency comments on this report; however, copies of our draft report were provided to the Departments of State, Energy, Defense, the Treasury, Commerce, and the Central Intelligence Agency for review. Informal comments were obtained from each of these agencies and their views have been considered in the report where appropriate.

CHAPTER 2  
WORLD ENERGY OUTLOOK AND  
SAUDI ARABIA'S ESSENTIAL ROLE

The energy outlook for the United States, and the world, has been the subject of increasing concern since the Arab oil embargo. Because of energy's critical role in continued world economic development, numerous recent studies have been made of this important and complex subject. We have identified and examined 17 studies prepared by authoritative organizations and individuals that project the future energy outlook. (See app. III.) Some of these studies are highly detailed, and extensive research went into their preparation. We also talked with officials responsible for preparing several of the more comprehensive studies. Many problems are involved in predicting the future energy supply and demand situation, and these studies revealed numerous uncertainties.

STUDY RESULTS ARE NOT CONCLUSIVE

Conclusions on the U.S. and world energy outlook in the studies we reviewed ranged from highly pessimistic to relatively optimistic; however, most were pessimistic about the outlook during the 1980s. The studies differed on the categories of variables considered, their relative importance, and their effects. The forecasts also differed widely on the basic assumptions, methodology, and format used, thus making comparisons difficult. Nevertheless, there were several areas of general consensus. Two recurring findings were (1) oil will continue to be the largest single energy source through the end of this century, and total oil demand will continue increasing at least through 1985 and (2) industrialized oil importing countries will need increasing amounts of oil from OPEC sources, and Saudi Arabia will be the single most important producer in meeting additional demand.

PETROLEUM OUTLOOK UNCERTAIN

Petroleum is generally considered the incremental fuel--the energy source that will meet demand not met by other energy forms. Forecasts on the future availability of needed petroleum varied, but most studies predicted petroleum shortages before the end of this century unless extensive actions are taken by the major industrialized countries to reduce oil consumption.

In the last 18 months, there have been several major developments in the world affecting short-term oil supplies. During this period, oil from Alaska's North Slope and the North Sea have begun to flow, and there is speculation that additional reserves will be discovered and developed. Results of exploration in Mexico are encouraging, although development of these reserves will require many years. The infusion of additional supplies from the North Slope and North Sea, coupled with the slow recovery of the world economy, has resulted in a temporary surplus of oil on world markets, thereby dampening upward price pressures. Support for a price increase was offset at the December 1977 meeting of OPEC by recognition of the present surplus situation and the state of the world economy; consequently, prices remained frozen.

Despite the current oil surplus, the preponderance of world energy forecasts that we reviewed considered it as only temporary and anticipated future petroleum shortages.

#### U.S. petroleum needs are increasing

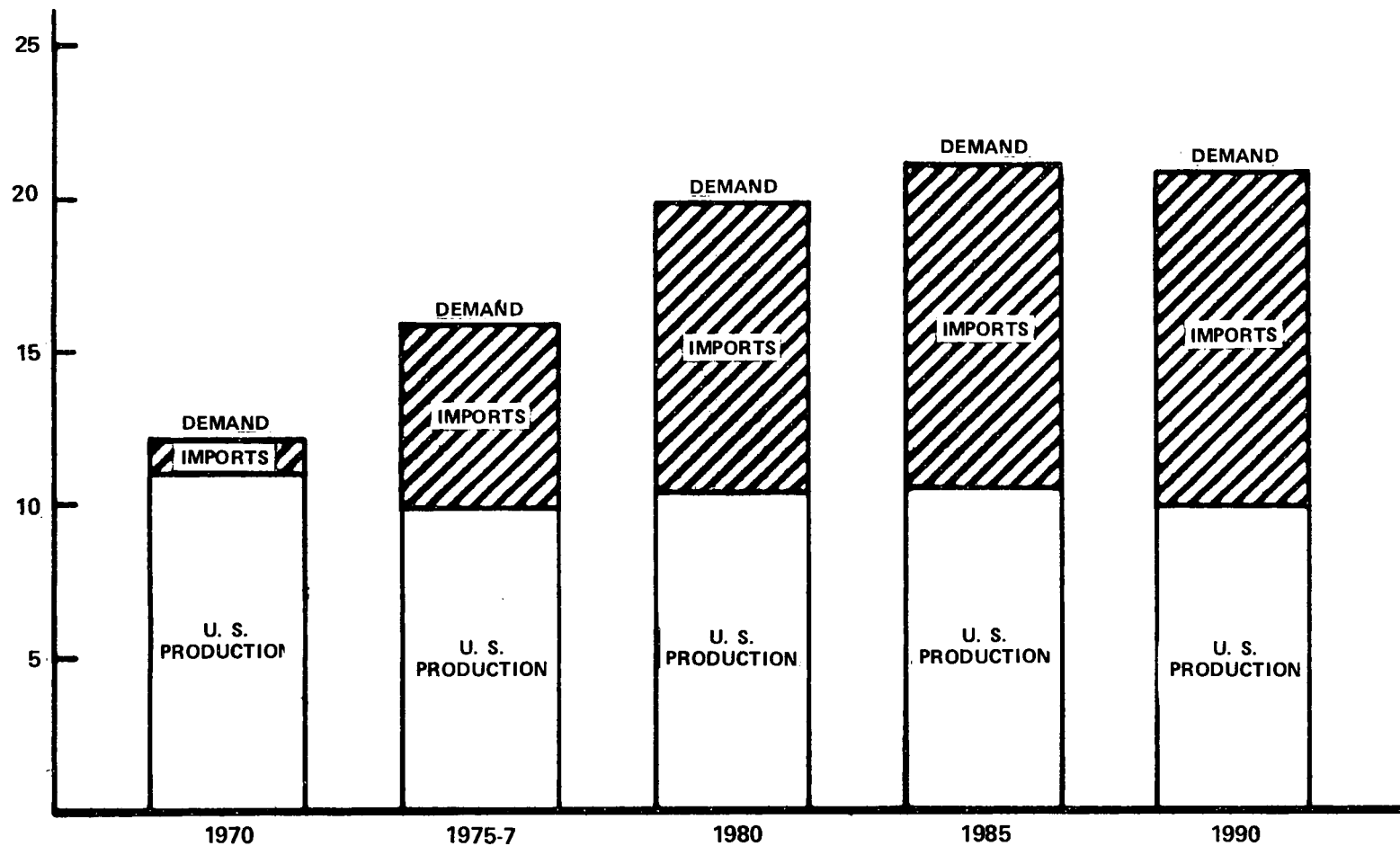
There is consensus in the studies about the continued U.S. reliance on huge quantities of oil imports but disagreement about the amounts that will be needed. However, the studies were in agreement that U.S. oil imports in 1985 will exceed the administration's goal of 6 million barrels a day. We previously reviewed the administration's proposed national energy plan and in an October 1977 report (EMD-78-5) concluded that U.S. oil imports are likely to range from 12 to 13 million barrels a day by 1985. Estimated U.S. petroleum requirements through 1990, based on a composite average developed from the studies we examined that contained projections, are shown on page 7.

The studies place different emphases and interpretations on the numerous variables that affect the petroleum outlook. It is evident that U.S. petroleum import requirements and vulnerability to foreign oil producers will be influenced by such factors as the

- effectiveness of conservation efforts, legislation, and other Government programs to alleviate the energy problem,
- ability and time required to develop alternative energy sources at economically acceptable prices,
- world economic situation, particularly the rate of economic growth,

## U. S. PETROLEUM OUTLOOK : 1970-1990

Petroleum  
Requirements  
(Million B/D)



- petroleum production and pricing policies adopted by OPEC, especially Saudi Arabia,
- U.S. foreign policy toward the major petroleum producing countries and the political and economic stability in these countries,
- ability to find, develop, and produce new sources of nonrenewable energy (oil, gas, coal, etc.), especially the success in exploration and development outside the OPEC countries,
- ability to solve environmental, regulatory, and other problems to enable increased use of the large U.S. coal deposits and development of the nuclear potential,
- energy supply and demand situation in the Communist bloc countries, particularly the Soviet Union, and
- absence of embargoes, wars, and other military actions constraining movement of supplies.

The energy projections on page 7 indicate the United States will have to continue to cope with the problems associated with the critical dependence on foreign oil imports to sustain the U.S. economy. Some consequences of this growing oil import dependence are impairment of foreign policy options (particularly in the Middle East), reduced security of oil supplies, and increased balance-of-payment deficits which erode the dollar's value.

#### SAUDI ARABIA'S ROLE

A recurring observation or conclusion in many of the studies was the vital role of Saudi Arabia in meeting future petroleum demand. Several of the studies and officials we met with rely on Saudi Arabia to supply the difference between world demand for oil and the volume other oil producers are able to produce. Saudi Arabia is perceived by many to have sufficient reserves and potential for expanded production to meet this incremental world demand. This presupposes a capability and willingness by Saudi Arabia to develop additional productive capacity and to produce needed amounts of oil.

The large increases expected in Saudi oil production are illustrated by data taken from the following studies which developed supply and demand projections.

<u>Study by</u> (note a)	<u>Projected demand for Saudi oil</u>		
	<u>1980</u>	<u>1985</u>	<u>1990</u>
	(million barrels a day)		
Congressional Research Service	11.8	16.6	20.6
Central Intelligence Agency	7.0	19 to 23	(b)
Workshop on Alternative Energy Strategies at the Massachu- setts Institute of Technology	(b)	(b)	20

a/See appendix III for title and date.

b/No estimate made.

In 1977 Saudi Arabia produced about 9 million barrels of oil a day (b/d).

A comprehensive Exxon study estimates that oil production needed from the Arabian Peninsula, of which Saudi Arabia is the largest producer, will grow from 13 million b/d in 1976 to about 23 million b/d in 1990, a 77-percent increase.

The studies also point out that Saudi Arabia's ability to retain an excess producing capacity could be an important factor in future oil prices. Its current excess capacity gives Saudi Arabia considerable influence in OPEC pricing decisions.

### CONCLUSIONS

In analyzing the various conclusions in the studies examined, we found that the more optimistic forecasts were predicated upon a number of speculative and conditional assumptions--such as the effectiveness and presumed large impact of conservation efforts, substantial contributions from alternate energy sources, and timely discovery and development of additional reserves. Although we did not attempt to determine the most accurate of the forecast projections and conclusions, the preponderance of evidence suggests serious economic risks in being overly optimistic. We therefore believe the prudent approach to energy planning would be to ensure availability of oil supplies from the major OPEC countries while at the same time promoting conservation and rapid development of conventional and new forms of energy supplies

to reduce U.S. reliance on imported oil. Moreover, since Saudi Arabia is the most important oil producer, factors affecting its ability and willingness to produce increasing quantities of oil should be considered by U.S. policymakers.

### CHAPTER 3

#### TECHNICAL, OPERATING, AND MANAGEMENT

##### CONSIDERATIONS AFFECTING PETROLEUM PRODUCTION

Saudi Arabia's ability to expand oil production to meet incremental world demand during the 1980 has recently become a matter of increasing concern to U.S. policymakers. During a 5-week visit to Saudi Arabia in October and November 1977, we inspected the major oil installations, held numerous discussions with key U.S. and Saudi petroleum officials, and reviewed important technical, operating, and management considerations affecting oil production and expansion capabilities. Although we were not allowed full access to proprietary records and other data that would be required to perform a complete and comprehensive technical assessment, we did develop sufficient information to evaluate many aspects of Saudi Arabia's petroleum operations.

Our main conclusion is that with the necessary commitment made by the Saudi Arabian Government (SAG) and with increased development drilling, well workovers, and the installation of additional equipment, there are no insurmountable technical problems to prevent increasing sustainable oil production capacity from the estimated 10.5 million b/d to the established goal authorized by SAG of 13.5 million b/d by the early 1980s. Nevertheless, many technical problems will develop in the coming years that are normal to maturing and depleting reservoirs. These expected problems include maintaining reservoir pressure and installing facilities necessary to shift from natural to artificial reservoir energy methods. Successful resolution of these problems will require innovative techniques. This includes the need to inject even larger volumes of water and gas, the workover of many shut-in wells, and the handling of increased quantities of water with the oil produced. Eventually, other oil recovery methods may be needed.

The anticipated technical problems will require large capital investments for projects, such as water and gas injection facilities; desalting equipment; gas-oil separator plants; offshore production platforms; additional pipelines and terminal facilities; as well as power generation plants, communication networks, and other support facilities. Large increases in manpower will be required to implement the expansion. Management decisions on oil related operations, such as gas gathering and oil refining, will also affect future oil productive capacity and availability.



In understanding the Saudi Arabia oil situation, the key role of the Arabian-American Oil Company, better known as Aramco, is an important factor.

#### ROLE OF ARAMCO

Aramco, the largest crude oil producing company in the world, is a corporation of four American oil company shareholders (Exxon, Standard Oil of California, Texaco, and Mobil) and the Saudi Arabian Government. Since the early 1970s, SAG has greatly expanded its role and influence over oil operations and Aramco's role has evolved from sole owner to minority partner. In 1974 SAG increased its ownership interest in Aramco's crude oil production and related facilities from 25 to 60 percent, with the understanding of an eventual complete takeover by SAG.

Saudi Arabia and the Aramco oil company shareholders are near final agreement on terms which will transfer the remaining 40 percent equity ownership and substantially all of Aramco's assets to SAG. Because the agreement has not been signed, the specific terms are closely held and could not be obtained by GAO. However, Aramco told us the contract terms will be retroactive to January 1, 1976. Aramco will continue to operate the oil installations, explore for and produce Saudi oil, and expand capacity in return for established fees. Oil lifting rights by the shareholder oil companies will be related to performance. Even though the total takeover has not yet occurred, decisions on oil production levels, exports, pricing, and future development of reserves are now made and controlled by SAG.

Under the 1974 agreement, SAG can sell or withhold any part of its 60-percent share of production. In 1977 the oil company shareholders were allowed to take about 94 percent of production. According to Petroleum Intelligence Weekly, the four American oil companies reported \$810 million in aggregate profits for 1977 from their interest in Aramco. This averages about \$0.27 a barrel on their share of the Saudi oil production. Petromin, the SAG state oil company, marketed the remaining 6 percent and will likely handle an increasing share following the takeover of Aramco, although Petromin's future role has not been announced.

In addition to numerous projects to expand oil production capability, Aramco has been directed by SAG to carry out a \$16 billion gas gathering project and a major electrification project for the Eastern province. These projects entail huge costs and substantial management and manpower requirements. According to its officials, Aramco's capital

expenditures were \$5.5 billion in 1977, are estimated at \$7.7 billion for 1978, and would exceed \$30 billion during the next 5 years under plans as of November 1977. They also told us that the funds must be generated from internal cash flow and this could become an important future consideration in the rate and timing of productive capacity expansion.

Aramco increased its staffing from 10,000 employees in 1971 to 25,000 in 1977 and within 5 years expects to be employing 40,000 people. The logistics and infrastructure to support this manpower requirement will be difficult to achieve in the remote desert environment. The physical hardships of living in Saudi Arabia may make it difficult to attract the large number of additional qualified technical and management personnel needed.

#### Producing operations

Aramco produces about 97 percent of Saudi Arabia's oil. This production, which came from less than 800 producing wells in 15 oilfields, averaged 9.2 million b/d in 1977. By contrast, the United States required about 500,000 wells in thousands of oilfields to produce about 9.9 million b/d in 1977. A single Aramco field, Ghawar, has proven recoverable crude reserves over 1-1/2 times those of the entire United States.

Over 90 percent of Aramco's oil production is obtained from four fields. Pertinent data on these fields is shown below.

<u>Field</u>	<u>Discovery date</u>	<u>1976 oil production</u>	<u>Percent of total production</u>	<u>Cumulative production</u>	<u>Estimated reserves remaining</u>
		(thousand b/d)		(billion barrels)	
Ghawar	1948	5,353	64	15.5	46
Safaniya	1951	1,436	10	4.0	14
Abqaiq	1940	831	10	5.5	4
Berri	1964	<u>766</u>	<u>9</u>	<u>1.3</u>	<u>6</u>
Total		<u>8,386</u>	<u>93</u>	<u>26.3</u>	<u>70</u>

All except one of the 15 fields now in production were discovered before 1968. Another 23 oilfields have been discovered but not yet placed in production. (See app. IV for trends in Saudi oil production.)

#### PRODUCTIVE CAPACITY EXPANSION PLANS

Productive oil capacity is defined as the maximum output of crude oil attainable from existing wells, well equipment, and surface facilities within 90 days and sustainable for 6 months without impairing the maximum efficient rate of production or adversely affecting ultimate recovery. In determining sustainable productive capacity, several negative factors must be considered, including

- equipment breakdown or accidental failure, including possibility of fire,
- unscheduled slowdown or shutdown for maintenance,
- human error or personnel limitations,
- bad weather which can adversely affect maintenance and terminal loading,
- limited overall storage capacity at gathering points and point of export (the export complex has storage tanks for only about 4 days production), and
- disasters.

The cumulative probable effect of these factors on productive capacity is estimated at 10 to 15 percent.

Saudi Arabia's installed sustainable productive capacity in January 1978 was estimated at about 10.5 million b/d--about 365,000 b/d in the Saudi portion of the Neutral Zone shared with Kuwait and the balance in the Aramco operating area. As of October 1977, SAG had authorized Aramco to increase productive capacity to 14 million b/d by 1982. Aramco officials in Saudi Arabia told us their long-range plans are to expand productive capacity to 16 million b/d by 1985 but acknowledged that SAG has not approved these plans. In March 1978 Aramco officials informed us that SAG had revised the authorized productive capacity expansion to 13.5 million b/d by the early 1980s.

Three major factors that will affect future crude oil production capability in Saudi Arabia are

- exploration and reserve development,
- technical performance, and
- operational policy considerations.

#### EXPLORATION AND RESERVE DEVELOPMENT

Exploration for new oil reserves in Saudi Arabia is continuing and the prospects for additional discoveries are considered by Aramco to be good. Seven seismic crews are conducting geophysical surveys to delineate suitable structures for exploratory drilling. In December 1977 four land rigs and one marine unit were drilling exploratory wells. Development drilling activity is concerned largely with accurately delineating structures in existing fields, and the drilling will undoubtedly increase proven reserves in these fields. We were told that the remaining structures could contain several hundred million barrels of oil. Additional reserves are also expected to be found in the offshore areas of the Arabian Gulf. (See app. V for location of Saudi oilfields.)

Aramco's 1977 annual report released in May 1978 estimated Saudi Arabia's petroleum reserves, as of December 31, 1977, to be:

(billion barrels)

Proved reserves	110.4
Proved and probable reserves	177.6

Regardless of the figure reported, it is obvious that Saudi Arabia has huge quantities of reserves available to expand production. From our review of procedures followed in determining reserves, there is little doubt that both proven and probable reserves can ultimately be commercially recovered using existing technology if prudent production practices, such as pressure maintenance, workover operations, and constant monitoring of the reservoir behavior are followed.

With additional drilling and producing equipment, it is technically possible to increase oil production substantially in many of the producing fields. In addition, 23 proven

fields are not yet in production. Although Aramco would not provide us with reserve estimates for these fields, the aggregate undeveloped oil production potential in Saudi Arabia is enormous by world standards.

The terminal facilities, pipeline facilities, and production equipment (gas-oil separation plants, desalters, etc.) necessary to expand production to 12.5 million b/d were on hand or on order as of November 1977, but not enough wells have been drilled to sustain that level of production. We were told that at least 3 years of drilling at current levels would be required to develop sufficient wells to sustain production at 12.5 million b/d. This time could be shortened by obtaining additional drilling rigs.

#### TECHNICAL PERFORMANCE

In examining technical performance, we focused on production rates, reservoir performance, preventive maintenance, and terminal operations. We did not identify any problems that would preclude continued expansion of productive capacity if prudent operating practices are continued and sufficient funding is provided. This assumes necessary experienced management and technical personnel will be available to run the operations.

#### Production rates

If a reservoir is rate sensitive, the rate of production will affect or alter the quantity of reserves that ultimately can be recovered. Aramco officials told us that most oil-fields in Saudi Arabia are generally not rate sensitive--that is the rate of production will not reduce the ultimate oil recovery although it may affect the economics of production. Aramco's major oil reservoirs are currently producing at rates, in relation to reserves, which are far lower than those practiced in the United States and elsewhere. Aramco reservoirs have good technical characteristics, and it is probable that production rates could be increased by more than 50 percent in some of the fields without significantly affecting the ultimate volume of recoverable oil. This assumes that pressures would be maintained and that current practices to maximize benefits from water injection would be continued. Obviously, large production increases would require huge capital expenditures; additional equipment, wells, injection and production facilities; and related support facilities.

## Reservoir performance

The 4 major oilfields and most of the other producing oilfields in Saudi Arabia have been in production over 12 years and are reaching maturity. As they become more mature, reservoir pressure maintenance and control will become more important and difficult and the associated costs will increase. This life cycle of oil producing reservoirs is not unique to Saudi Arabia. What is unique is the vast size of these fields and reservoirs. Eleven of the 15 Aramco producing oilfields each have over 1 billion barrels of proven reserves remaining. This sheer size requires innovative techniques. Pressure maintenance by water and gas injection is being used extensively to augment natural water drives, maintain high well flow rates, and postpone the necessity of going to artificial lift methods. The amount of water injected is determined by the reservoir pressure desired. Because of their size and performance characteristics, huge quantities of water are injected in Saudi fields. For example, in April 1977, Aramco was injecting 9.2 million barrels of water per day in Ghawar, which was producing 5.9 million barrels of oil daily.

These proven techniques for augmenting natural reservoir energy mechanisms will require installation of more sophisticated injection systems; injection of even larger volumes of water and gas; and additional facilities to process the oil, water, and gas produced. Eventually other oil recovery methods may be necessary. The expected problems will require new programs, imaginative engineering and management, and large capital investments.

Aramco is exerting considerable effort to maintain optimal reservoir pressure by means of water (supplemented in part by gas) injection. It monitors reservoir performance every 3 months, which is twice as frequent as the average operating company, to identify any reservoir performance abnormalities. Our visits to Arabian oilfields disclosed (1) no evidence of any excessive pressure declines, and in some segments of Ghawar we observed a slight pressure rise, (2) no unusual water intrusion, and (3) no uncontrolled gas cap expansion. We found reservoir pressures were generally holding steady as water injection becomes effective and therefore should not prevent future capacity expansion. However, our review was limited and there could be areas in the oilfields where problems exist.

## Maintenance operations

During field inspections we found that Aramco maintenance and safety procedures are given high priority in recognition of their vital importance. However, maturing oilfields and expanded operations will necessitate even greater maintenance efforts in the coming years.

Aramco plans to double its maintenance staff in the next 5 years because of the many large construction programs now underway. Its maintenance covers all phases of petroleum operations, such as drilling, production, refining, pipeline transportation, and support work in the desert and offshore. We discussed maintenance at length with Aramco engineers while visiting the Abqaiq oil processing facilities and were shown various examples of innovative repair techniques. We also observed various backup systems--if one operational system fails or is disrupted for any reason, a second, and frequently a third, support system is available.

Aramco's corrosion monitoring and preventive maintenance procedures appeared to meet accepted oil industry practices. Aramco officials told us that internal corrosion was not an abnormal problem although extensive preventive measures are required. The Saudi oil reservoirs contain extremely saline formation waters (six times as saline as normal sea water) and, when combined with the high sulphur content of the oil, pose potentially serious corrosion problems. The presence of salt in the oil produced is an early warning of pending water intrusion; consequently, any well in Saudi Arabia that produces more than 10 pounds of salt per 1,000 barrels of oil is shut in because of the salt's corrosive effects. Over 210 wells were shut in temporarily for this reason in November 1977. Aramco plans to spend over \$1.5 billion during the next several years for desalting equipment which will be capable of handling 14 million b/d of oil production by the early 1980s.

We visited the site of the serious fires that occurred in May and June 1977 at the Abqaiq producing facility, the only major known mishaps at Aramco facilities in recent years. The May fire was due to external corrosion of a pipeline. We were told that the cathodic protection system designed to prevent such corrosion failures had not functioned because some nearby pipe caused undetectable deflections of the electrical current. The June fire was due to an unexpected pressure surge in the lines. Although full production was restored within 6 weeks, the damage caused by these fires was extensive and repairs cost over \$100 million.

As a result of the fires, extensive new preventive maintenance and safety measures are being implemented. These measures include new earth dikes being erected around the tank farms; pits for possible escaping liquids; additional corrosion monitoring units; new and additional gate valves to shut off or control pipeline flows; and rerouting large sections of the lines serving various processing units. Many underground pipeline units have been or are scheduled to be elevated above the surface, including several high-pressure lines.

We also reviewed the preventive maintenance and safety program at the Ras Tanura-Ju'aymah refinery and terminal complex. Officials stated that over 60 percent of the operating personnel's time at this complex is devoted to preventive maintenance and safety procedures.

### Terminal operations

Over 90 percent of Aramco's crude oil and all of its refined products and natural gas liquids for export are loaded aboard tankers at the Ras Tanura-Ju'aymah complex. This complex is designed to handle up to 12 million b/d. During 1976 over 4,000 tankers were loaded with 2.8 billion barrels of crude oil (an average of 7.7 million b/d) and 202.3 million barrels of refined products. The complex has storage capacity for about 35 million barrels of oil and natural gas liquids and storage capacity for an additional 5 to 6 million barrels is under construction.

These export facilities have never had to operate at their rated capacities. Due to the rapid expansion and increased activity at the Ras Tanura-Ju'aymah complex, there had been some equipment failures and human errors caused by inexperienced personnel which combined to reduce loading efficiency below rated capacity. Also, adverse weather conditions sometimes reduce operations or temporarily close the terminal complex. High winds on the Arabian (Persian) Gulf which cause waves up to 8 feet make oil loadings hazardous and cause terminal shutdowns, especially during the winter months. While the weather is unpredictable, equipment failures and personnel deficiencies reportedly have been corrected. This export terminal complex is being expanded; the ultimate size will be determined by future needs.

A 750-mile crude oil pipeline to Yanbu on the Red Sea in western Saudi Arabia is under construction and will provide an alternate location and route for exporting crude oil



and natural gas liquids. The maximum quantities of crude that can be exported from Yanbu when this project is completed are estimated at 250,000 b/d.

#### OPERATIONAL POLICY CONSIDERATIONS

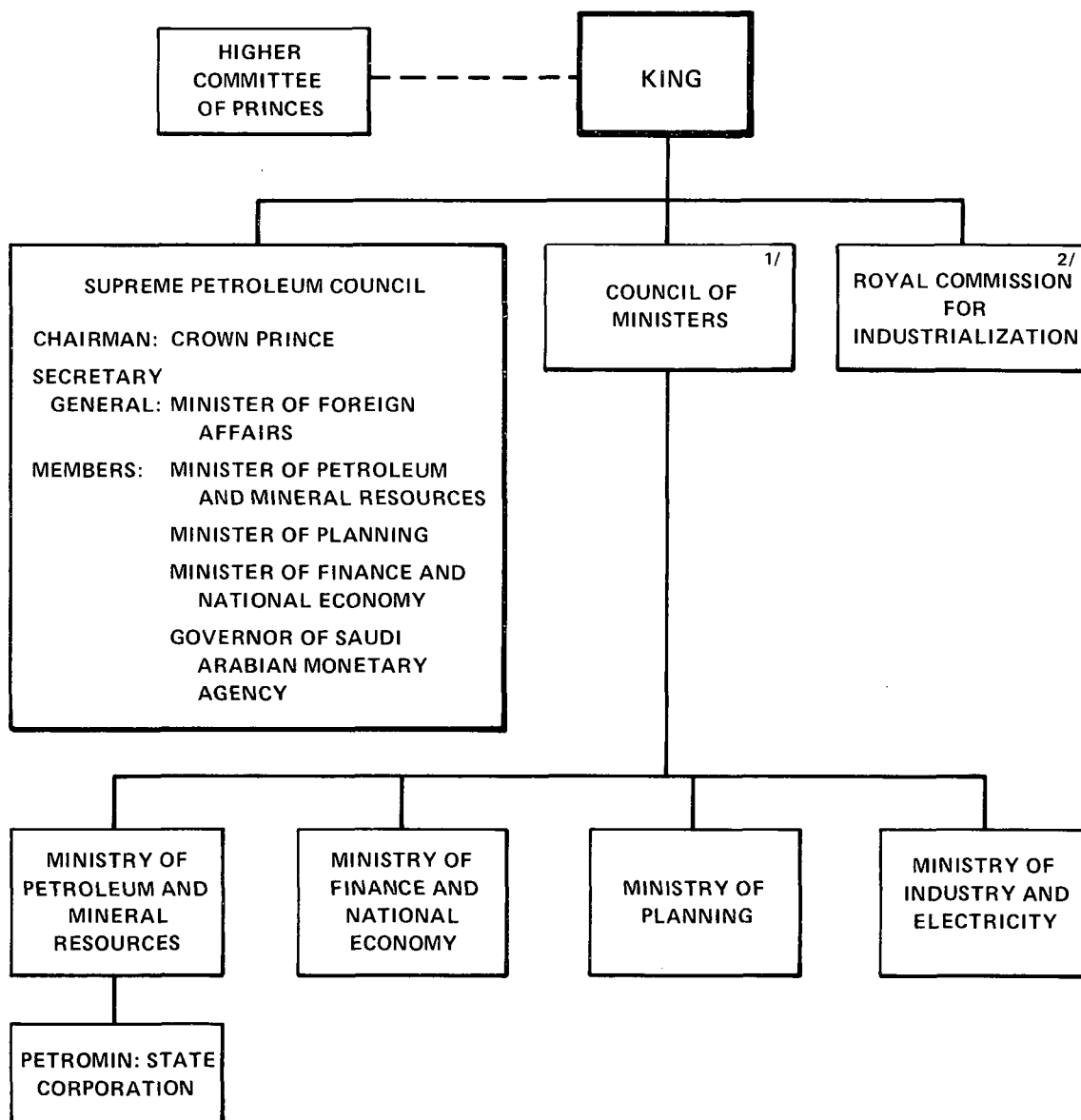
Future crude oil production capability and availability will be affected by various operational, funding, and policy decisions of SAG. It decides the policy on such matters as productive capacity expansion plans; Aramco has the primary responsibility for implementing them. The Ministry of Petroleum and Mineral Resources is responsible for managing the country's resources and has established conservative production operating guidelines.

#### Petroleum policymaking process

SAG petroleum policy emanates primarily from Crown Prince Fahd and the Supreme Petroleum Council, which he chairs. The Council was established in 1973 to make recommendations concerning oil policy and related economic matters. Its organization is shown in the chart on page 21. Among the issues taken up by the Council are future oil production levels, investments in the petroleum industry, oil pricing and other marketing questions, the Aramco takeover, participation agreements, and implementation of economic development plans. The Crown Prince formulates the major oil policy decisions, based on the discussions and recommendations of the Council, and provides guidance to the ministries for carrying out daily operations.

The Ministry of Petroleum and Mineral Resources appears to have exclusive jurisdiction in carrying out petroleum policies. The Ministry establishes production levels, sets prices, and determines how petroleum revenues should be budgeted for oil operations and capacity expansion. It reports directly to the Crown Prince and King, bypassing the ministerial structure. Although the Ministry reportedly is highly independent, any new policy action must be presented to the Supreme Petroleum Council for approval. Decisions by the Council can be overridden by the King. Petroleum Minister Yamani has been the principal spokesman for SAG on oil matters and has served as the primary negotiator with the oil companies in the takeover discussions. He has also acted as the chief Saudi representative at the OPEC meetings where he assumes a very influential role in determining oil pricing decisions.

## SAUDI GOVERNMENT PETROLEUM POLICYMAKING STRUCTURE



<sup>1/</sup> NOT CONSIDERED A SIGNIFICANT DECISIONMAKING UNIT.

<sup>2/</sup> INVOLVED WITH NEW PETROLEUM RELATED PROJECTS AS PART OF SAUDI ARABIA'S INDUSTRIALIZATION.

Based on our discussions with U.S. Mission and SAG officials, it appears that the relative influence and responsibility over petroleum decisions wielded by each group varies as a result of internal political maneuvering. Internal events, such as changes in the Monarchy and cabinet reshufflements, have previously altered the decisionmaking influence held by the various officials and groups. Because of differences within the Supreme Petroleum Council over the appropriate policy, future petroleum decisions can be significantly affected by changes in the power structure.

#### OTHER MANAGEMENT CONSIDERATIONS

Additional SAG management considerations that could affect petroleum availability include

- future role of Aramco and Petromin (or their successor companies),
- desire to utilize gas now being flared (burned off),
- continued expansion of refinery capacity, and
- security of oil operations.

#### Aramco's future role

Aramco's ultimate responsibilities under the pending SAG takeover remain uncertain, but it or a successor company will undoubtedly continue to have a key role. Based on our discussions with officials of Exxon, Mobil, Aramco, and SAG, the takeover apparently will not significantly affect day-to-day petroleum operations. Most officials believed that the revised arrangement will provide sufficient incentive for the shareholder companies to continue their exploration and development operations.

Petromin may eventually evolve into a fully integrated oil company and assume some functions now performed by Aramco, but it presently lacks many of the managerial and technical skills needed. A shortage of management and technical skills within SAG could constrain it from expeditiously implementing ambitious expansion plans unless it continues to rely heavily on outside advice and assistance. We were frequently told that although there is high-quality management at the top levels of SAG, there is insufficient management expertise below this level and also a shortage

of qualified technical personnel. To help improve its capabilities, SAG has established a University of Petroleum and Minerals at Dhahran.

#### Gas gathering operations

Saudi Arabia's estimated gas reserves are approximately 85 trillion cubic feet. Although the produced gas-to-oil ratio varies for each of the fields, there is an estimated 600 cubic feet of gas for every barrel of oil produced. About 65 percent of this gas is flared and the balance is used for (1) reinjection in the producing reservoirs, (2) domestic fuel, or (3) export as liquid petroleum gas. A key component of Saudi industrialization is a massive \$16 billion gas gathering project to use larger quantities of gas being flared. Under this program, more of the associated natural gas will be utilized and natural gas liquids (NGL) will be recovered. This program is designed to produce up to 544,000 b/d of NGL by 1985, when Saudi Arabia is expected to supply one-third of all NGL moving in international trade. The sharp crude oil price increases since 1973 have made these projects economical. The project is being built in increments, with the first increment scheduled for completion in the early 1980s. These gas utilization plans could cause Saudi decisionmakers to limit oil production to prevent excessive flaring. The enormity of this program imposes a major supervision and manpower load on Aramco.

#### Planned refinery projects

Saudi Arabia's refinery capacity could be increased from about 700,000 barrels per day to over 1.2 million barrels if a 250,000 b/d refinery planned for Jubail under a joint venture with Texaco and Standard Oil of California and a proposed 250,000 b/d refinery at Yanbu in a joint venture with Mobil are completed.

How this additional refinery capacity will affect world markets and access to crude oil supplies can only be speculated at this time. However, it will add to the excess worldwide refinery capacity that already exists. Although the apparent "economics" make it questionable for refineries to be built in the Middle East, some oil companies find it to their best interest to enter joint refinery ventures, apparently for the implied access to crude oil. The bulk of refined products in Saudi Arabia will be for export. We were told that if these projects are completed, Saudi Arabia will likely tie access to crude oil to purchases of its refined products.

## Security of oil operations

All major Saudi facilities have tight security procedures, but petroleum operations remain vulnerable to sabotage or external threats. Another concern to U.S. military officials is that nearly all exports must pass through the narrow Straits of Hormuz and this provides a serious potential chokepoint to oil shipments in event of aggression.

We found that all key installations are enclosed by high fences with elevated watchtowers strategically located and manned by Saudi Army personnel. All entrances and exits are tightly controlled; only individuals with proper passes are permitted entry. The large Ras Tanura-Ju'aymah complex has especially tight security controls because about 97 percent of Aramco crude oil is processed and exported from this location. Aramco is highly concerned with security and constantly reviews its security procedures. Nevertheless, sabotage is possible. Because of the small number of key facilities and the large volume handled by each, the impact of sabotage on production could be much more severe than in other countries.

SAG learned as a result of the May 1977 fire at Abqaiq how vulnerable its facilities are. We understand that if the fire had occurred a few meters away, the impact on production would have been devastating. In April 1978, an explosion and fire reportedly caused by leaking gas occurred at a gas-oil separator plant north of Abqaiq. The plant was almost totally destroyed and 4 employees were killed. The vulnerability of the facilities strengthens the argument of those in SAG who would like to see the rate of expansion slowed and available resources used to increase protection and maintenance.

## U.S. MISSION STAFFING LIMITS PETROLEUM REPORTING

Given Saudi Arabia's critical importance as a source of U.S. petroleum import requirements, comprehensive and timely reporting on petroleum matters would seem imperative. Our review of the U.S. Embassy petroleum reporting procedures and files revealed that little technical petroleum information was being reported and that the only in-country petroleum officer was assigned to the Embassy in Jidda, over 800 miles from Dhahran, the best location for access to oil information. Furthermore, the petroleum officer did not have a technical petroleum background and the annual petroleum report required by the Department of State had not been prepared the last 2 years.

The U.S. Government maintains a consulate in the Eastern Province (Dhahran) where the Saudi petroleum is produced. It is also the location of Aramco and a Petroleum Ministry office which oversees the technical operation of the fields. According to the consul general in Dhahran, an important emphasis of the post's work revolves around reporting on oil matters. Yet none of the officials there have a petroleum background. There had been some differences between the Embassy and the consulate over who should be responsible for preparing the annual petroleum report; however, we were told the problem had been resolved and the Embassy in Jidda would prepare it in the future.

The consul general told us that an experienced petroleum officer or petroleum attache, who is also qualified to address policy concerns, was needed in Dhahran. He pointed out that the United States has petroleum officers or attaches stationed at far less important posts. Considering Saudi Arabia's important petroleum role, it does seem logical to station an experienced petroleum officer in the area where the oil production and the key officials are located. This would enable him to establish close contacts with Aramco and SAG and to develop inside technical information on Saudi Arabia's oil operations beyond the general data now being reported.

We discussed the need for expanded petroleum reporting with U.S. Embassy officials in Saudi Arabia. Following our departure, the Ambassador established an oil committee with Embassy members from Jidda, Riyadh, and Dhahran. At periodic meetings, the committee is expected to produce coordinated reports on subjects of interest to the U.S. Government.

During April 1978 meetings with executive agency officials to discuss our draft report, Department of Energy officials agreed with the need for expanded reporting from Saudi Arabia on technical issues and questions. We were told the Department is reexamining its overseas staffing and is considering stationing a petroleum officer in Saudi Arabia. State Department officials told us that a petroleum specialist may be assigned to Saudi Arabia before the end of 1978 and that procedures are being implemented to improve reporting by the Embassy.

## CONCLUSIONS

Although there are no insurmountable technical problems to prevent large increases in productive capacity if the necessary funds are spent and technical performance standards maintained, SAG decisions and actions taken to carry

out the decisions will have a major impact on the rate of expansion. However, little information was being reported by the U.S. Embassy in Saudi Arabia on technical factors affecting the rate of expansion or other technical aspects of petroleum operations of concern to the U.S. Government. Procedures are reportedly being implemented to improve reporting.

Various operational, policy, and management considerations may affect the rate of expansion and its permissible level. For example, security of oil operations; a greatly increased management and skilled manpower requirement stemming from the sheer size of expansion plans; a desire to use more of the gas now flared; logistical, administrative, and social problems associated with a rapid buildup in the number of foreign employees; and plans to develop a broader domestic industrial base and expand refinery capacities to increase product output in lieu of some crude oil exports--all are factors that could influence expansion plans.

Even if increased productive capacity is installed, the critical factor is authorized production. SAG has imposed a production ceiling of 8.5 million b/d and has indicated the ceiling will be retained at least until the end of 1979. The possession of additional capacity may be no more than a strategic insurance policy; its installation does not necessarily insure its use. Numerous political, security, and economic issues could affect Saudi Arabia's willingness to produce at levels needed to meet incremental world demand during the coming years, and these are discussed in the following chapters.

## CHAPTER 4

### POLITICAL AND SECURITY FACTORS

#### AFFECTING SAUDI OIL DECISIONS

As U.S. reliance on imported oil has grown, Saudi Arabia's political and strategic importance to the United States has increased dramatically. The 1973 oil embargo demonstrated to Saudi leaders the potential for using their petroleum as a weapon to achieve desired goals. Therefore, political and security factors affecting Saudi oil decisions deserve careful consideration.

It is generally accepted by most U.S. officials that Saudi oil policy is affected by political and security considerations. Statements by SAG officials confirm this linkage. For example, Prince Saud, the Foreign Minister, has stated that oil issues are tied intimately to political considerations in the Middle East. Crown Prince Fahd, the SAG's key policymaker, has also confirmed that Saudi oil is a useful source of political and economic leverage in pursuing designated goals.

The primary political and security goals of SAG, some of which are interrelated, include

- peaceful resolution of the Middle East conflict,
- security of the country against external threat,
- preservation of the monarchy, and
- containment of communism and radicalism.

The Saudis claim that realization of these goals will generate an environment favorable to the production of petroleum at levels needed to meet incremental world demand.

#### IMPACT OF MIDDLE EAST CONFLICT

According to nearly every U.S. and Saudi official we met in Saudi Arabia, the Middle East conflict is the single most important political factor affecting Saudi petroleum decisions. We were constantly reminded that a permanent peaceful settlement of the Arab-Israeli dispute is the key to Middle East stability and petroleum decisions favorable to oil consumers.



In 1973 King Faisal warned the U.S. Government that Saudi Arabia was generating more oil revenues than needed to finance internal development, that surplus income could not be profitably invested, and that it clearly was in Saudi Arabia's interest to reduce oil production. Nonetheless, he stated that Saudi Arabia would continue to produce the oil needed, provided there was progress toward peace in the Middle East. When the U.S. airlift of strategic supplies to Israel commenced during the 1973 Arab-Israeli War, Saudi Arabia joined in the selective oil embargo on the United States.

In 1975 the Saudi Ministers of Petroleum and Foreign Affairs made an explicit connection between oil prices and a Middle East peace. Recent SAG actions at OPEC conferences to hold down price increases have been tied to progress in resolving the Middle East conflict and have demonstrated the importance placed on this connection. For example, at the December 1976 OPEC Conference, the Saudis (supported only by the United Arab Emirates) refused to raise oil prices to the levels approved by the majority and weakened the effectiveness of the OPEC pricing decision by raising production. Saudi Arabia was strongly denounced by other OPEC members for these actions.

Senior Saudi officials repeatedly told us that a Middle East peace agreement is absolutely essential if there is to be an adequate flow of Saudi oil to meet world needs. The Minister of Petroleum emphasized this priority by telling us that a Middle East war could seriously disrupt the flow of oil even without an oil embargo because of shipping restrictions and possible damage to Saudi oilfields or destruction of the facilities. He reminded us of the serious economic repercussions to Western consuming nations from the 1973 embargo and stated that, with the increased dependence on OPEC oil, any future supply interruption could result in severe economic consequences.

U.S. Embassy officials told us that SAG has committed itself politically and economically to a timely solution of the Middle East conflict. If SAG becomes dissatisfied with progress toward peace, it has several options available that could adversely affect U.S. interests, such as reducing oil production, canceling productive capacity expansion plans, or assuming a passive role in OPEC pricing decisions. According to several U.S. Embassy officials, if another Middle East war flares up and direct U.S. military support is provided to Israel, the SAG may be

pressured into joining an oil embargo if one is imposed by other Arab nations.

SAG is making substantial payments to other Arab nations, such as Egypt and Jordan, to assist them economically and to support their military objectives. SAG fears that failure to achieve a satisfactory resolution will lead to increased political tension throughout the Arab world, with a resulting adverse impact on Saudi security.

#### Saudi expectations of U.S. role

In view of the priority attached to a Middle East settlement, we asked Saudi leaders and U.S. Mission officials what the Saudis expected of the United States in achieving a Middle East settlement. Senior Saudi officials believe the United States must exert far greater effort to gain Israeli concessions and thereby accelerate the peace negotiations. For example, they believe the United States must slow down the multibillion-dollar arms shipments to Israel if it continues to take a "hard line" against returning occupied Arab territory. After President Carter's visit to Saudi Arabia in January 1978, the Saudi Minister of Foreign Affairs issued an official statement reiterating SAG's two conditions for establishing permanent peace in the Middle East--total Israeli withdrawal from the Arab territories occupied in 1967, including Arab Jerusalem, and granting the Palestinians the right of self-determination and return to their lands. The SAG's flexibility on these conditions is uncertain, but some compromise may be possible.

Conversations with Saudi and U.S. Government officials disclosed that the Saudis believe an expanded U.S. role in the negotiations is essential if peace is to be realized. SAG believes that U.S. administration officials have become more sympathetic to Arab needs and rights and are making a more determined effort to secure an acceptable peace. Although encouraged by U.S. initiatives, SAG officials stated that U.S. efforts to bring about peace have been inadequate. Saudi officials told us they fear that the U.S. administration will be unable or unwilling to take actions needed to bring about peace because of the strong and influential "Zionist lobby" and the "anti-Arab sentiments in the Congress."

#### SECURITY CONSIDERATIONS

Saudi Arabia has only an estimated 1.5 million men of military age and has had difficulty obtaining qualified

military personnel. Its armed forces, including the national guard, number less than 70,000 and have encountered serious problems in filling vacancies and obtaining new recruits. Each of the services are understrength and Saudi military capabilities are considerably less than most of its potential enemies.

With an area as large as the United States east of the Mississippi River, the world's richest oil reserves, and only a small military force, Saudi Arabia faces a security problem. It perceives potential future threats to its security from several countries, such as Iraq and Israel; it also worries about radical elements gaining power and influence in the Middle East and potential trouble along its border with South Yemen. To counter these potential threats, SAG has developed a military policy that emphasizes:

- Developing a highly trained, well-equipped Air Force capable of deterring potential enemies and delaying advances in event of attack.
- Developing a land and small naval force capable of conducting initial defense and delaying actions.
- Relying on the United States, and to a lesser extent Western Europe, to provide the equipment and training necessary to develop its armed forces.
- Continuing the special relationship with the United States, expecting it to take appropriate and timely actions to reinforce Saudi Arabian defense efforts should U.S. interests become threatened.

The United States and Saudi Arabia have common military interests that are of great importance to both. These include resolution of the Arab-Israeli conflict, protection of the oilfields and related facilities, containment of Soviet efforts to extend Communist influence in the region, and support of nonradical regimes in the Middle East.

Although no formal defense agreements exist between the United States and Saudi Arabia, SAG is highly dependent on the United States for security. It expects U.S. support against external aggression which seriously threatens the security of oil supplies. Security concern and dependence on the United States is an important factor in SAG's oil and financial decisions and provides the United States with potential influence in these decisions.

A United States-Saudi Arabia Joint Commission on Security Cooperation was established in 1974 but has not met since late 1974. U.S. administration officials believe that failure to use the Commission has not adversely affected military relations between the two countries because there has been frequent discussion of security assistance cooperation at high political and military levels and the current Saudi military modernization program is based largely on recommendations in a 1974 U.S. Government survey.

High-level Saudi military officials have been critical of U.S. efforts to counter Communist influence worldwide and to reach a Middle East settlement. Among their major concerns are:

- Perceived U.S. half-hearted efforts to pressure Israel toward a necessary compromise and resulting pessimism over prospects for a Middle East settlement.
- Danger of renewed war or increased Soviet influence in the Middle East if peace efforts fail.
- Fear of Israeli preemptive strikes, including possible invasion of Saudi Arabia.
- Fear of overthrow of moderate Arab leaders if real progress is not made toward peace in the near future.
- Belief that "Zionist" influence in the United States is a prime mover of U.S. foreign policy in the Middle East.

#### Foreign Military Sales to Saudi Arabia are increasing

The U.S. effort to assist in Saudi Arabia's military development is primarily through an expanding Foreign Military Sales (FMS) program. Saudi Arabia signed FMS agreements totaling over \$8 billion from 1972 to 1976; most of it has been for military construction. SAG has budgeted 16 percent of the current 5-year plan, or \$22.2 billion, for defense spending.

A major program to modernize the Saudi armed forces is headed by the U.S. Military Training Mission, with major construction projects directed by the U.S. Army Corps of Engineers. About 1,000 Defense Department and 3,000 contractor personnel on defense related projects were in Saudi

Arabia in 1977, and their number is expected to increase in the next few years. Our October 1977 report, "Perspectives on Military Sales to Saudi Arabia" (ID-77-19), analyzes U.S. arms sales and military programs.

Request for F-15 aircraft--an  
important policy consideration

In February 1977 Saudi Arabia formally requested 60 F-15 aircraft under the FMS program. In February 1978 the U.S. administration tied this sale with proposed sales of aircraft to Egypt and Israel and stated that the entire proposed package must be approved by the Congress or none of the sales will be made. The President, with Defense and State Department concurrence, supports the sale which was submitted for congressional deliberation on April 28, 1978. Instead of a "package," four separate notifications were submitted to the Congress: (1) 75 F-16 aircraft for Israel, (2) 15 F-15 aircraft for Israel, (3) 60 F-15 aircraft for Saudi Arabia, and (4) 50 F-5 aircraft for Egypt. The Secretary of State noted in a letter to Senator Church that the President reserves the right to withdraw any or all of the letters of offer. Considerable controversy surrounds the proposed sale to Saudi Arabia, and the outlook for its approval is uncertain.

Opponents of the sale argue that it may upset the power balance in the Middle East by imposing an unnecessary threat to Israel. Proponents of the sale point out that Saudi Arabia has fewer aircraft and a weaker Air Force than five of its neighbors and has a valid defense requirement for an advanced fighter aircraft. In response to a request that the administration provide an evaluation of the military balance in the Middle East and the potential effect of the proposed aircraft sales, a report representing the considered judgment of the U.S. intelligence community on "U.S. Aircraft and the Middle East Military Balance" was provided to the House International Relations Committee on April 11, 1978. Although details on the reasons for its findings are classified, it concluded that the proposed delivery of modern U.S. combat aircraft to Israel, Saudi Arabia, and Egypt will not reduce Israel's superiority over its Arab adversaries. The report noted this superiority has increased since the October 1973 war.

The Department of Defense also conducted an analysis of the Saudi Arabian request to purchase F-15 fighter aircraft. The analysis concluded:

"\* \* \* the sale of 60 F-15s to Saudi Arabia is fully consistent with US national interests. This sale should not have a significant impact on the Middle East arms balance or pose a threat to Israel, but rather it would act as a stabilizing influence by providing the Government of Saudi Arabia an improved means of defending their national resources and geographical boundaries, while allowing the US a measure of control over use of this means."

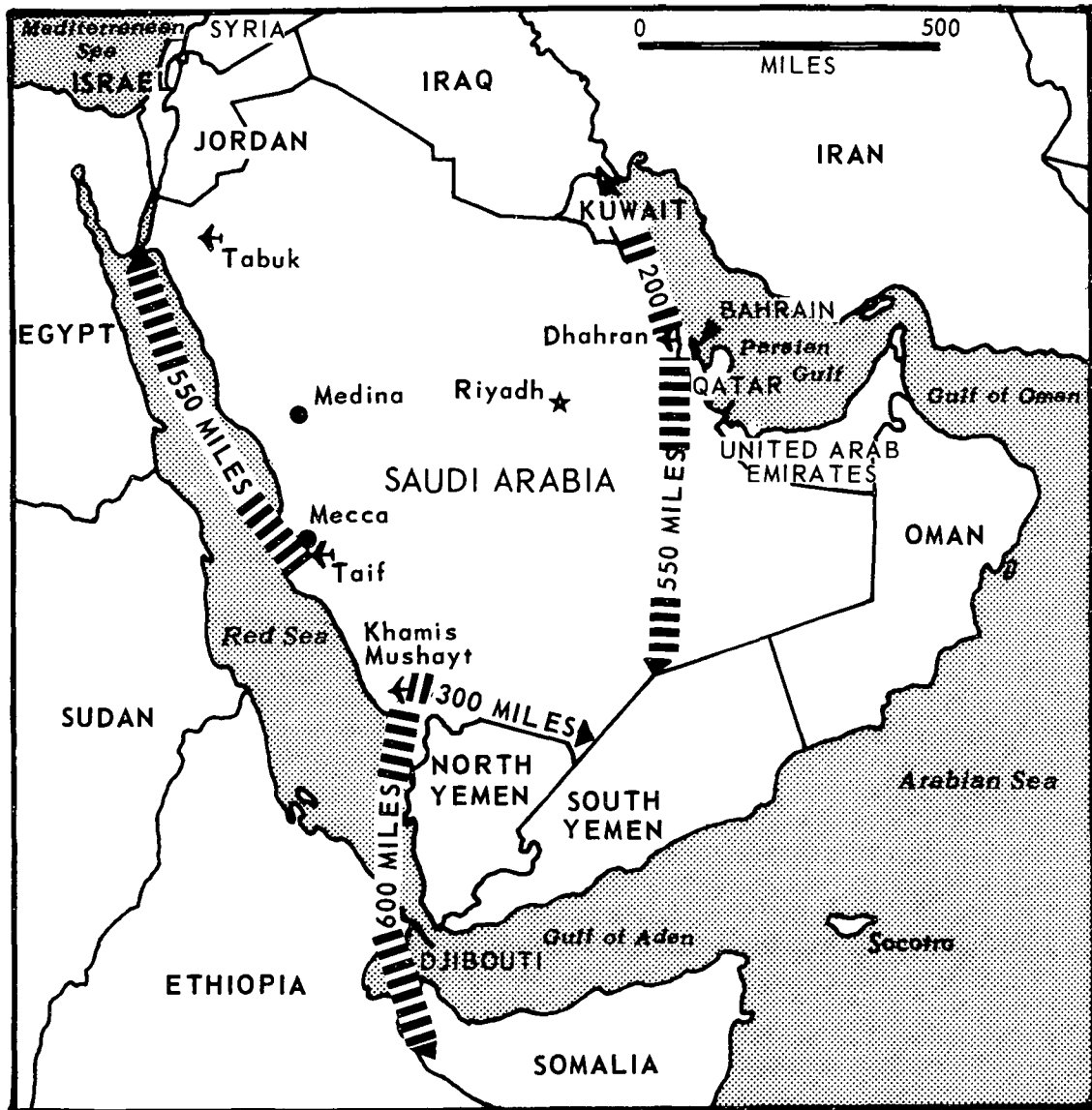
Based on information made available to us by the Departments of State and Defense, our report to the Senate Foreign Relations Committee and the House International Relations Committee 1/ concluded that apparently (1) the Saudi Arabian Government has a valid need to replace aging aircraft, (2) the F-15 is the only readily available U.S. aircraft that will meet the requirements established by the Saudi Arabian Government, and (3) the sale of F-15s as part of a package that includes new aircraft for Israel and Egypt will not have a significant impact, in terms of numbers of aircraft, on the balance of power in the Middle East.

Although Tabuk would be the most logical base from which to launch F-15 strikes against Israel, Saudi Arabia has told the United States that it will not locate the aircraft there because this would make them highly vulnerable to a preemptive Israeli strike and the threat from Israel is not their primary security concern. A senior Saudi official has stated the F-15 bases would be Taif, Khamis Mushayt, and Dhahran. (See map on the following page.)

The F-15 request has become an important symbol to the Saudis of the U.S. relationship and has political significance beyond meeting Saudi security needs. According to nearly all of the officials we contacted in Saudi Arabia, failure by the Congress to approve this sale would be a crucial blow to SAG and would severely strain relations between the two countries. Saudi officials told us that the "Zionist" lobby is the primary force working against the sale and SAG would likely interpret a refusal of their request as proof that American policy in the Middle East is not evenhanded.

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1/"Military, Economic and Political Factors Concerning the Sale of F-15s to Saudi Arabia," PSAD-78-96 and 97, May 1, 1978.



The F-15 request stems from the Department of Defense's 1974 survey of Saudi defense needs, which recommended that an advanced multipurpose fighter be obtained between 1980 and 1983 to replace the deteriorating fleet of British Lightnings. The survey did not recommend the type of aircraft needed. SAG conducted a lengthy search for the best replacement during 1975 and 1976 and assessed various alternatives before selecting the F-15.

Some officials question whether the Saudi Air Force can effectively maintain and support these aircraft. Our October 1977 report identified maintenance and support problems in the FMS program to provide F-5 aircraft to the Saudi Air Force. We were told that the substantial reliance on American advisors and technicians for maintenance limits the potential use of the weapons against U.S. wishes. Officials of the Defense and State Departments advised us that potential SAG support problems can be overcome. They also stressed that important political considerations influence the sale. Even if the sale is approved, in-country delivery of the aircraft would not start before 1982. U.S. officials pointed out that this allows several more years to achieve a peaceful solution in the Middle East before the aircraft become available.

U.S. officials contacted are certain that SAG will turn to another source for an advanced multipurpose fighter aircraft if the F-15 request is rejected by the Congress. Both the French and British have discussed potential sales with Saudi Arabia. The French are reportedly anxious to sell their most advanced fighters to Saudi Arabia. Other Gulf oil producing neighbors, such as the United Arab Emirates and Oman, have already received sophisticated European fighter aircraft.

The French Mirage F-1 followed by the more advanced Mirage 2000 or 4000 is considered the most likely replacement if the F-15 request is disapproved. Saudi Arabia has begun negotiations for possible purchase of the Mirage F-1. The Saudis apparently want to (1) assure themselves a source for an advanced aircraft, should their request from the United States be rejected, and (2) put the United States on notice that advanced aircraft are available elsewhere. Defense officials told us the French might consider a co-production arrangement to make the sale. The Tornado, a multirole combat aircraft produced by a West German, United Kingdom, Italian consortium may also become available to the Saudis.

SAG originally purchased 46 British Lightnings, 32 of which remain operational. Since the F-15 will replace the Lightnings, some thought reportedly has been given in the Congress to offering fewer than the requested 60 F-15 aircraft. We were unable to obtain Saudi views on this matter. U.S. officials generally agreed that SAG would be indignant at such a decision. These officials believed that a reduced offer would probably be rejected and that Saudi Arabia would turn to the French for the advanced fighter aircraft needed. Even though necessary replacement aircraft can be obtained



from another country, we were told U.S. rejection of the Saudi request would make it difficult for SAG to explain to its own people and the other moderate Arab countries the rationale for continuing to support U.S. efforts in the Middle East.

The Saudi officials with whom we met expressed confusion over U.S. treatment of Saudi Arabia and other moderate Arab countries vis-a-vis treatment of Israel and cited military assistance as the primary example of unequal treatment. They pointed out that Saudi oil and financial wealth makes it much more important than Israel to the strategic and economic interests of the United States and that Saudi Arabia has supported U.S. efforts in the Middle East. The sale of the F-15 aircraft has apparently been chosen as the test of U.S. friendship and overall commitment to Saudi self-defense aspirations. Our classified May 1, 1978, report discusses the F-15 request in more detail.

#### THE MONARCHY AND INTERNAL SECURITY CONSIDERATIONS

The Government of Saudi Arabia is a centralized authoritarian Monarchy dominated by the Saud royal family which has thousands of members. Although there are important intra-family rivalries for political power, any outside threat would undoubtedly be met by a strong united front.

The degree of control exercised by the Monarchy has varied depending on the wishes of the King. King Khalid limits himself primarily to ceremonial functions and serves as final arbiter on major policy decisions while Crown Prince Fahd has been delegated authority for formulating foreign and domestic policies. Saudi leaders have traditionally sought to rule by consensus and controversial decisions are often postponed when a consensus is difficult to achieve.

SAG's attempts to rapidly develop the country and to assume a greater role in world affairs has led the royal family to increasingly rely upon a group of well-educated, highly trained Saudis outside the royal family. Many received their college education in the United States, and some have been appointed to positions of power and influence.

## Threats to the Monarchy

Possibilities of an internal coup were, for the most part, strongly discounted by most U.S. officials with whom we spoke. The royal family faces no serious opposition. However, there is increasing concern within the royal family over the potential disruptive influence of foreign labor, which now comprises an estimated 40 percent of the total population.

In Saudi Arabia, we learned an increasing and influential segment of the people oppose continued expansion of petroleum operations. The opposition is headed by several influential SAG officials who favor limiting production to ensure that oil is available for future generations and who believe that expanding production increases social and economic problems.

The policy of continued expansion presently prevails, but opposition is reportedly growing. Because expanded petroleum operations are linked to other Saudi policy objectives, Saudi officials believe that assistance from the United States in realizing these objectives is needed to demonstrate to the people the wisdom of its actions. Otherwise, opposition within Saudi Arabia could increase and threaten stability or force a reevaluation of petroleum expansion plans.

## OPPOSITION TO COMMUNISM AND RADICALISM

Saudi Arabia is the keeper of two of Islam's most sacred cities, Mecca and Medina, and Saudi leaders consider themselves the protectors of the faith throughout the Muslim world. Every year during the Hajj, an estimated 1.6 million Muslims from all over the world make the annual pilgrimage to Mecca. The tenets of the Islamic faith and Saudi philosophies are diametrically opposed to Communist goals, and Saudi Arabia is considered one of the most anti-Communist countries in the world.

SAG has expressed concern over what appears to be a worldwide encroachment of communism posing a genuine threat to the Muslim people and Islamic values in the Middle East and throughout the world. They point to recent Communist successes in Western Europe, the Horn of Africa, and Asia. Furthermore, Communist support for radical leftist elements in Syria, Lebanon, Iraq, and Yemen have heightened Saudi anxiety over Middle East stability and the threat of external

aggression. The Saudis perceive the Arab-Israeli dispute and U.S. support for Israel as opening the Middle East to the spread of Soviet influence.

The Saudis believe communism succeeds most where there is political and economic instability. Consequently, since 1975 Saudi Arabia has acted with considerable restraint in petroleum pricing decisions and world financial transactions. To counter what they perceive as the political and economic slippage of Western Europe and to stem Communist gains, the Saudis have acted constructively in using their petroleum resources and financial wealth to contribute to worldwide stability and to support conservative anti-Communist governments. However, while working behind the scenes, SAG has continually called on the United States to counter Communist expansion with its political and military leverage.

Our discussions with U.S. Mission and Saudi officials indicated that SAG would like to have the United States increase its efforts to discourage Communist aggressions and encroachments, especially in the Middle East and Horn of Africa, and to ensure a balance of power vis-a-vis the Communists. SAG has been highly upset by U.S. refusal to counter Communist movements in the Horn of Africa.

In conclusion, the political and strategic importance of Saudi Arabia to the United States has increased dramatically in the last several years as U.S. dependence on imported oil has increased. At the same time, SAG views the United States as the most powerful anti-Communist country in the world and relies heavily on U.S. assistance and support in realizing its political and security objectives. This could provide a basis for mutual cooperation to achieve desired goals.

## CHAPTER 5

### ECONOMIC ISSUES AND U.S. EXPORT OPPORTUNITIES

Growing wealth from oil sales has made Saudi Arabia a world financial power. Its ability to effectively use this wealth will be an important factor in future oil production decisions. The Saudi Government has stated that its continued excessive oil production which generates large surplus revenues is dependent on the industrialized countries' willingness to provide investment opportunities guaranteed against the effects of inflation and changes in currency value. Saudi Arabia has also linked its willingness to produce at levels adequate to meet incremental world oil demand to receiving advanced technology and assistance from the developed oil importing countries in carrying out its domestic industrialization and development programs.

The SAG internal development program offers opportunities for multibillion-dollar increases in U.S. exports and additional U.S. influence, but growing competition from other countries and U.S. Government actions could impede U.S. trade opportunities. Therefore, the Saudi financial situation and resulting economic issues deserve priority attention by the U.S. Government.

#### GROWING PETRODOLLARS

SAG keeps information on its foreign asset holdings and investments confidential, and no official reports could be obtained. Nevertheless, we reviewed several reports prepared by the U.S. Government and other governments and organizations which demonstrate the impressive and growing financial wealth of Saudi Arabia.

Saudi holdings of official foreign assets are the largest of any government in the world and are increasing at a rapid pace. Since the end of 1973, SAG has amassed an estimated \$54 billion in liquid foreign assets, bringing total holdings to around \$60 billion as of October 1977. U.S. Treasury Department records show that Saudi Arabia accumulated a current account surplus of over \$70 billion during 1973-76. A 1977 study published by the First National Bank of Chicago predicted that Saudi Arabia's foreign assets could approach \$133 billion in 1981. It reported that income generated from Saudi foreign investments was \$3.8 billion in 1976 and estimated the income would climb to \$4.6 billion in 1977 and \$10.1 billion in

1981. SAG revenues exceeded expenditures by an estimated \$17 billion during 1977.

One key economic factor influencing future Saudi oil production decisions will be the ability to absorb the revenues generated. At present, Saudi Arabia simply cannot spend the large revenues despite its most ambitious development plans. The small population, unsophisticated economic structure, and acute shortage of skilled manpower are key constraints on spending.

#### INTERNAL DEVELOPMENT PLANS

Under Saudi Arabia's current 5-year development program (now in its 3d year), over \$142 billion is budgeted for a massive program of modernization and industrialization. This development program is one of the most ambitious and challenging ever undertaken. Its principal objectives are to (1) diversify the economy and reduce its overwhelming reliance on oil income, now over 90 percent of SAG revenues, (2) expand petroleum and gas operations, (3) improve the standard of living for the entire population, and (4) increase military capabilities. Among the major projects programmed are:

- Two major industrial areas each costing over \$40 billion.
- A massive \$16 billion gas gathering system to use natural gas now being flared.
- Water desalination plants costing an estimated \$18 billion.
- Construction of 300,000 new dwellings, 50 modern hospitals and health care centers, and new universities and schools.
- Major new airports at Jidda and Riyadh.

#### Revenues exceed development needs

Despite the plan's immense cost, the SAG petrodollar surplus will continue to grow. The Ministry of Planning estimated in May 1977 that all revenue needs could be met with production of about 5 million b/d in 1977, gradually rising to 8 million b/d by 1980, and that continued production at current levels of 9 million b/d cannot be

rationalized on economic grounds. Other Saudi and U.S. Government officials expressed similar views.

A Ministry of Planning official pointed out that the economic situation could force a reevaluation of Saudi Arabian petroleum production decisions. SAG's inability to effectively use oil revenues, and the resulting economic problems, has caused an increasing number of influential Saudis to oppose increased oil production. Some Saudis also believe the internal development programs are excessive and harmful to traditional Islamic values.

Because of various infrastructure and manpower problems, the development program is behind schedule and a large portion of the money appropriated for previous years' programs has not been spent. In 1976, \$32 billion was budgeted for internal development but expenditures totaled only about \$22 billion. This spending shortfall has further added to petrodollar accumulations which SAG is finding increasingly difficult to channel into prudent investments.

#### SAUDI INVESTMENT POLICIES

Saudi investment policies are playing an increasingly important role in world economic health. Financial experts believe the SAG financial reserves have been used constructively in international finance. These reserves constitute a major source for meeting long-term global capital needs, and many U.S. officials believe the funds will continue to be used constructively. However, these funds are a potential source of international financial instability and also provide financial leverage that could be used against the United States. Examples of investment policies that could be harmful to the United States include:

- reduction in U.S. dollar holdings;
- withdrawal of deposits from U.S. banks;
- sudden sale of large quantities of U.S. Government paper;
- discontinuance of purchases of additional U.S. Government securities; and
- closure of U.S. portfolio accounts in fixed income and equity securities.

Saudi Arabia would not be insulated from the adverse effects of such actions, and further, they could be the target of retaliatory U.S. actions. It seems desirable, therefore, for both nations to seek cooperative investment policies and programs aimed at achieving mutually beneficial objectives.

SAG's investment policies are carried out by the Saudi Arabia Monetary Agency, a semi-autonomous agency which also serves as the central bank. In the early 1970s, it followed ultraconservative policies and placed funds primarily in short-term U.S. and European bank deposits and government securities. The investment policy has gradually changed by

- shifting funds out of short-term assets into longer term investments offering higher yields,
- increasing investments in the private sector, including purchases of corporate bonds and equities, and
- increasing direct placement lending, primarily with "blue chip" corporations.

Despite these changes, SAG's investment policy remains conservative. The Saudis rely heavily on Western financial institutions for investment guidance and administrative assistance. They mainly buy dollar-denominated assets with their surplus revenues--both in the United States and Europe. Such holdings reportedly accounted for more than 80 percent of their portfolio of official foreign assets in 1977. Over 25 percent of these assets were believed to be invested in the United States.

Weakness of dollar may  
influence Saudi pricing policy

Saudi Arabia has been the principal proponent of price moderation in OPEC since the massive price hikes of 1974, using its influence to hold down price increases. However, since OPEC oil transactions are priced in dollars, the dollar's continued weakness has substantially increased the cost of Saudi imports from Japan, Germany, and other countries with strong currencies and has become a matter of increasing concern to OPEC because of the loss in real income.

Movement by SAG away from dollar holdings or its position to continue pricing oil in dollars could place increased

pressure on the dollar. In March 1978, the SAG reaffirmed its willingness to support the dollar and to continue pricing oil in dollars but called on the United States for greater effort to halt the dollar's decline. The possible consequences of pricing oil in special drawing rights rather than dollars is discussed in appendix VI. SAG subsequently indicated that oil prices may have to be raised if the U.S. dollar continues to decline. They also indicated that Saudi Arabia has resisted several efforts within OPEC to raise prices but the United States could no longer be sure that the Saudi view would prevail if the dollar deteriorated further.

We were told by Saudi officials that U.S. action to institute a strong energy program is considered extremely important. This would demonstrate U.S. determination to reduce its reliance on oil imports and thus strengthen the dollar.

#### Attitudes toward Arab investments in the United States

The general animosity which, in the Saudis views, has greeted Arab equity investments in the United States is also a Saudi concern. There have been discussions about requiring banks to disclose foreign investments, and Saudi Arabia has threatened to remove deposits from U.S. banks if this policy is adopted. Such countries as Germany and Japan offer alternative secure investment markets if a decision is made to reduce U.S. investments. We were told that Saudi Arabia Monetary Agency advisors have recommended shifting a larger portion of Saudi funds into European and Japanese markets and into gold. SAG receptivity to these recommendations will be influenced by U.S. responsiveness to Saudi investment concerns.

Some financial experts believe that a reassessment of U.S. attitudes toward foreign investment in the United States is needed. They point out that Saudi investments in the industrialized countries should be encouraged as a means of giving the Saudis a larger stake in the health and well-being of the industrialized economies and to provide sufficient incentives for continued oil production beyond levels necessary for internal needs.



### Desire for preferential treatment

During the Conference on International Economic Cooperation, the Saudi delegation tied their country's willingness to continue oil production at levels higher than needed for internal development to a demand for protection against investment losses. They contended that the industrialized countries, especially the United States, must ensure that Saudi Arabia's surplus investments will be safeguarded against inflation and confiscation. A definite link was made between special treatment of the SAG surplus financial assets and its willingness to continue production at levels to meet incremental world demand.

Although recognizing that the Saudi financial surplus results from an oil production rate higher than warranted by immediate needs, the United States has rejected responsibility for providing political or real value guarantees for Saudi assets. This subject has not been discussed in bilateral meetings according to State Department officials.

We discussed this matter with the SAG Ministry of Finance officials who emphasized its importance and indicated it may be raised in future U.S./Saudi discussions. Among the points made by these officials were:

- Saudi willingness to produce at high levels is a sacrifice because oil in the ground will appreciate faster in value than revenues from production.
- The petrodollar surplus arises from Saudi production to meet incremental world demand which is supportive of U.S. interests.
- The United States has a moral responsibility to reciprocate by providing special treatment for the resulting surplus financial reserves.
- Failure of the United States to address this problem will increase pressure within Saudi Arabia to reduce production.
- They do not seek special treatment for stockmarket or other private investments but expect the same opportunities afforded other investors.
- Saudi investments in U.S. Government securities should receive some form of protection, such as a

specially designed compensation account to protect against inflation or dollar devaluation or specially indexed bonds to achieve this objective.

Saudi officials were extremely disappointed by failure to gain acceptance of its proposals submitted during the Conference on International Economic Cooperation. They said the United States should recognize the importance attached to a satisfactory resolution and that it will likely be raised again at future bilateral or multilateral discussions.

Growing petrodollars and continued weakness of the U.S. dollar increases the possibility of SAG renewing its request for a satisfactory resolution. Therefore, Saudi demands for an improved investment environment outside its borders will likely require future consideration by the United States.

#### U.S. EXPORT OPPORTUNITIES

SAG's \$142 billion internal development program offers tremendous export opportunities for the United States, especially in light of the traditional Saudi preference for U.S. products and technology. An estimated 300 U.S. companies and about 30,000 Americans are in Saudi Arabia. The growing expenditures for the internal development plan will further enhance U.S. export opportunities.

Expanded exports could strengthen the dollar and reduce the negative balance of trade with Saudi Arabia which is reflected by the following Department of Commerce data.

<u>Year</u>	<u>U.S. exports</u>	<u>U.S. imports</u>	Trade balance positive or (negative)
(000,000 omitted)			
1971	\$ 164	\$ 99	\$ 65
1972	314	194	120
1973	442	515	(73)
1974	835	1,670	(835)
1975	1,502	2,625	(1,123)
1976	2,774	5,213	(2,439)
1977	3,575	6,359	(2,784)

The U.S. share of Saudi imports is larger than any other country. U.S. and Saudi officials told us that this was due largely to Saudi preference for dealing with

Americans. However, this favored position depends upon continued U.S. responsiveness to SAG needs because there are few areas in which alternatives to U.S. products are not readily available. Companies from England, France, Germany, Italy, Japan, and Korea are, with their governments' support, aggressively competing with U.S. companies for this lucrative market and have been making inroads into many areas previously dominated by American companies. Consequently, the U.S. share of the Saudi import market has declined. The U.S. share was 31 percent in 1974 compared with 22 percent in 1976, the latest year for which Commerce Department data is available.

#### POTENTIAL TRADE CONSTRAINTS

In our discussions with Saudi officials, they generally credit U.S. businesses with establishing and fostering, to a great extent, the goodwill that fuels the "special relationship" between the U.S. and Saudi Arabia today. The Saudis consider a continued large U.S. business presence to assist in Saudi Arabia's development as an important element in maintaining good relations. We were told that certain U.S. Government actions and policies are threatening to diminish the presence and competitive position of U.S. business firms in Saudi Arabia. Two especially serious issues mentioned were changes to the U.S. tax law, which reduced certain tax incentives, and the antiboycott legislation. Although neither of these actions is aimed directly at Saudi Arabia, they have had an impact on trade and economic relations.

#### Tax changes increase U.S. business costs

In 1976 the Congress and the tax court substantially reduced longstanding tax incentives for citizens employed abroad. Originally, the tax incentives excluded portions of employees' salaries and certain allowances from U.S. taxes to promote U.S. business abroad. The tax changes which increase taxable income on salaries and allowances affect not only U.S. workers abroad but also their employers. The changes will have a disproportionate impact on U.S. firms and employees in Saudi Arabia because of the unusually large allowances necessitated by the high living costs and the higher salaries required to attract qualified employees to the harsh environment of this remote desert country. For example, a typical employee with a wife and two school-aged children earning \$40,000 could be taxed on the basis of \$109,000 gross income because of housing, education, and other allowances needed in Saudi Arabia. We were told that

many U.S. employees are expected to leave Saudi Arabia because they cannot afford the high taxes or because their employers, for cost considerations, are replacing them with foreign personnel.

A company that reimburses its American employees for higher taxes must either absorb the increased costs or pass them on to the Saudis, thus becoming less competitive vis-a-vis other countries' firms because their employees are not taxed on overseas earnings. Losing a contract to a foreign competitor may cause a ripple effect, since other U.S. companies that might have provided services or material on the lost contract would also suffer.

As expected, U.S. business officials were overwhelmingly opposed to the elimination of the tax incentives. They believe the American business presence in Saudi Arabia is supportive of U.S. interests and provides benefits in maintaining continued good relations with Saudi Arabia. The increased cost of business and the strong competition from other industrialized countries may force U.S. firms to replace high-cost Americans with foreign nationals. U.S. businessmen believed that such a trend over the next several years could substantially alter the American image and diminish U.S. sales and the goodwill created by the American assistance. They further point out that many European and Japanese products now compare favorably with American products and that those governments provide a range of incentives including subsidies, loans, favorable tax treatment, and other forms of assistance.

We have reported separately on the issues and options relating to taxation of U.S. citizens employed abroad: "Impact On Trade Of Changes In Taxation Of U.S. Citizens Employed Overseas" (ID-78-13, February 21, 1978).

#### Antiboycott Legislation hinders U.S. companies

Since 1946 the Arab nations have imposed a boycott against Israel as an economic weapon in their continuing adversary relationship with that country. The boycott has taken various forms, including Arab refusal to do business with some companies that trade with Israel or that are operated by Jewish people. To facilitate imposing the boycott, a "blacklist" of boycotted companies and parties has been assembled by the Central Boycott Committee of the Arab nations. Two major implications of this boycott for U.S.

companies wanting to do business with Saudi Arabia are requirements in some instances

- that U.S. firms refuse to do business with black-listed firms (whether American or other) and with Israel and

- for U.S. firms to provide Saudi Arabia with information about their business dealings with black-listed firms or with Israel for use in enforcing the boycott or possibly providing a basis for refusing to do business with the company.

The U.S. Government opposes boycotts enforced by foreign nations against countries friendly to the United States and restricts compliance by American firms. Obviously the United States is concerned about the Arab boycott's effect and would like to see the boycott eliminated because it discriminates against some U.S. citizens and companies and can hinder U.S. companies operating in the Middle East. However, its elimination is unlikely until the Middle East conflict is satisfactorily resolved.

The boycott's impact on American companies has assumed greater significance since the 1974 oil price increases because the growing revenues of Arab oil producers present tremendous opportunities for U.S. exports. Oil producers, such as Saudi Arabia, are a lucrative market and U.S. companies are eager to do business with them. The Department of Commerce estimates the dollar value of goods involved in boycott-affected transactions increased from about \$10 million in 1974 to approximately \$4.4 billion for the 12 months ending March 1977 (latest period for which data was available), or more than 400 times the amount for 1974. Moreover, many affected transactions probably were not reported.

Legislation restricting U.S. companies from cooperating in the Arab nations' boycott demands was enacted by the Congress in June 1977 (title II of Export Administration Amendments of 1977, Public Law 95-52). The law is designed to protect the freedom and independence of U.S. commerce and the civil rights of all its citizens but has also had the effect of hindering U.S. companies' ability to compete for the Arab petrodollar market. While not specifically directed at the Arab boycott, the legislation has become known as the "Arab Antiboycott Legislation."

U.S. legislation in opposition to foreign boycotts already existed but was considered ineffective, and it did not have the impact of the current legislation. The new legislation contains six basic prohibitions. The four most important general prohibitions on U.S. companies, if there is an intent to comply with a foreign boycott, are:

- Refusing to do business with anyone because of a boycott demand.
- Discriminating against any U.S. citizen on the basis of race, religion, sex, or national origin.
- Furnishing information about past, present, or future blacklisted persons.
- Implementing a letter of credit which contains any illegal boycott condition or certification.

Intentional violation of the regulations is subject to a fine up to \$25,000 or imprisonment up to 1 year, or both. Subsequent violations are subject to a fine up to three times the value of the exports involved or \$50,000 (whichever is greater) or imprisonment up to 5 years, or both. Any violation is subject to a \$10,000 civil penalty and possible elimination of export rights.

At the time of our fieldwork (before completion of the implementing regulations), representatives of several U.S. businesses were quite concerned because the new law appeared to be replete with legal nuances and ambiguities. They said that, to ensure their firms compliance with all the provisions, their lawyers must spend large amounts of time analyzing and making official inquiries concerning the act's provisions.

The implementing regulations for the Antiboycott Legislation were issued by the Commerce Department on January 18, 1978, and apply to all U.S. citizens (including corporations, controlled foreign subsidiaries, and affiliates of U.S. concerns) whose activities include interstate or foreign commerce. The law and implementing regulations contain various exceptions to the prohibitions.

Spokesmen for the Commerce Department told us in April 1978 that they believe the language in the implementing regulations, which contains numerous clarifying examples, reduces the uncertainties associated with the

legislation. However, in our subsequent contacts with a number of U.S. businesses, they stated that although the implementing regulations are helpful, the language and standards for compliance are still not entirely clear and require substantial legal interpretation. According to Commerce Department officials, they had received several thousand inquiries from U.S. business firms and organizations seeking clarifications, explanations, and preliminary rulings on the regulation, thus confirming the uncertainty. Because of the volume of work involved, Commerce has had to request a supplemental appropriation for 33 full-time positions to staff an office to respond to antiboycott inquiries, provide guidance, and monitor compliance. For fiscal year 1979, Commerce plans to request 65 positions at a cost of over \$1 million.

#### Impact on U.S. competitive position

The Congress was aware that enactment of this law could cause minor disruption to American business dealings with Arab countries and expressed concern over the possible loss of some trade and jobs. However, the Congress indicated that some loss of trade, if there was to be any, would be preferable to the disruption of the domestic and international trade of the United States and the violation of our basic principles of nondiscrimination.

To determine the legislation's impact, we contacted 11 U.S. companies doing business in Saudi Arabia. The general consensus was that the Antiboycott Legislation puts U.S. firms at a distinct competitive disadvantage with other foreign firms that are not under similar constraints. However, it is too soon to attempt to measure the possible loss of exports or jobs. We were told by several U.S. businesses and government officials that companies from other countries use the legislation as a tool to influence the Arabs to do business with them rather than with Americans. Officials of two large U.S. corporations told us that compliance is burdensome and costly but it has not stopped them from doing business in Saudi Arabia. However, it does add an additional element of business uncertainty and they doubted whether small firms wanting to enter the Saudi market would be willing or able to do so. Specific problems cited as directly attributable to the Antiboycott Legislation included

- loss of contracts in instances when a U.S. firm was the lowest qualified bidder, because of inability to comply with a boycott demand,
- uncertainty over how stringently the Department of Commerce will interpret the regulations and enforce the legislation, and fear of possible prosecution,
- added costs associated with interpreting provisions, communicating prohibitions to field personnel, and reporting compliance to the Department of Commerce,
- inability to respond quickly to bid proposals,
- difficulty experienced by firms wanting to participate in the Saudi market for the first time, and
- difficulty for U.S. firms acting as procuring agent.

Various Saudi officials and Arab organizations believed the Antiboycott Legislation will harm the United States more than Saudi Arabia. They said that other countries' products and technicians can satisfy Saudi needs if the implementing regulations make it difficult for U.S. firms to do business in Saudi Arabia. What confused them is the rationale for passing a law that hurts U.S. economic interests at a time when the United States is faced with huge balance-of-payments deficits and a weakened dollar. They said that the legislation may have unfavorable repercussions on the "special relationship" built up over the years and could negatively affect the views and perceptions of Saudi decisionmakers toward the United States.

In April 1978 Commerce Department officials stated that so far Saudi Arabia had taken a cooperative attitude toward the legislation and had not made it especially difficult for U.S. firms to comply with its provisions. However, they indicated the Saudi attitude could change if the Saudis became dissatisfied with U.S. actions on other issues.

#### ROLE OF THE JOINT ECONOMIC COMMISSION

In June 1974 a United States-Saudi Arabia Joint Commission on Economic Cooperation was established to provide a formal government-to-government mechanism to



assist in the internal development of Saudi Arabia. This Commission has become a symbol of the desire for economic cooperation between the two countries.

The Joint Commission is headed by the U.S. Department of the Treasury and the Saudi Ministry of Finance and National Economy. To support and coordinate the Commission's work, the Treasury Department has established an Office of Saudi Arabian Affairs in Washington and a U.S. Joint Commission Office in Saudi Arabia. All U.S. technical assistance and development projects under the Commission are fully reimbursed by the Saudi Government.

As of April 1978, contracts for over \$70 million in exports and \$100 million in services had been handled through the Commission. These projects provide assistance in such areas as statistics and data processing, electrical equipment procurement, agriculture and water resource planning, national electrification planning, scientific research, vocational training, and financial information services. Over 100 U.S. personnel from both the public and private sectors were working in Saudi Arabia under Joint Commission auspices as of November 1977.

The Commission is considered an important mechanism for furthering the U.S.-Saudi economic relationship and has important benefits for both countries. For the United States, it represents an opportunity to increase exports to Saudi Arabia and reduce the negative U.S. trade balance caused largely by oil imports. Also, direct U.S. Government involvement in development projects can lead to closer relations with Saudi decisionmakers. To the extent the projects are successful, a climate of goodwill is created. For Saudi Arabia, the Commission represents an effective method of obtaining needed assistance and technology for internal development.

We discussed the performance of the Joint Commission with various U.S. and Saudi officials. A recurring comment was that the Commission was initially a disappointment to many SAG officials because it did not live up to expectations and had not been able to provide the types of large development projects and technology transfers hoped for. Saudi expectations have reportedly been lowered and they no longer expect the types of technology originally desired through the Commission, though they would still welcome it. However, some officials continued to hold strong views that more should be done.

We found general disappointment with the management and passive approach of the Joint Commission Office in Saudi Arabia. The problem cited was the lack of leadership and creative ideas by the Joint Commission staff there. Saudi Arabia would like to buy solutions and looks to the Commission for advice and assistance in carrying out its internal development needs. The types of advice desired reportedly have not always been forthcoming. A senior Saudi official told us that there had been little technology transfer, which was another major disappointment. According to this official, the United States should take the initiative by arranging seminars which bring together U.S. Government and business leaders with a view to developing project concepts and proposals for consideration by Saudi Arabia. Several officials told us that a successful, high visibility project is needed which the Saudis can point to as a sign of the U.S. commitment; this would increase Saudi faith and confidence in the Commission. They believed the Commission had missed numerous opportunities to establish major projects and to promote U.S. interests.

A Treasury Department spokesman for the Joint Commission considered criticism of its efforts unjustified. He pointed out that the Commission is relatively new and has established many worthwhile projects and that official reaction has been favorable. Also, to establish and carry out the various projects, the Commission must deal with numerous ministries within SAG and many of the limitations are due in large part to Saudi personnel constraints. The official said that an elaborate information center for the Ministry of Finance is being constructed and will be a highly visible project that can be shown as an example of the Commissions' success. Treasury Department officials also stated that the Commission is not intended nor designed to promote U.S. exports and it should not be considered a Commerce Department type of operation. They explained that the Commission's primary role is to respond to Saudi requests.

A question that remains unanswered is the extent to which the U.S. Government should be involved in Saudi Arabia's internal development. We were told that disagreement exists within the U.S. Government over the appropriate role of the Commission and whether it should actively promote U.S. exports. A State Department official pointed out that, if projects are perceived as failures by SAG, it might blame the U.S. Government and this could strain relations. On the other hand, a more active role by the Commission could lead to increased U.S. exports to Saudi Arabia and could increase U.S. influence.

In response to a March 31, 1978, request from the House International Relations Committee's Subcommittee on Europe and the Middle East, we have agreed to examine Joint Commission operations and to determine whether there are ways to improve its performance.

## CHAPTER 6

### CONCLUSIONS AND OBSERVATIONS

Saudi Arabia has a vital role in meeting world petroleum needs because of its huge oil reserves and productive capacity and the flexibility to increase or decrease oil production. Its decisions on oil production and prices will be important factors in maintaining an orderly marketing of world oil supplies. In addition, Saudi Arabia's large and growing accumulation of petrodollars provides supplemental leverage in pursuing its domestic and international objectives.

In view of Saudi Arabia's vital role, we examined important issues and factors influencing its oil decisions. We obtained the views of senior Saudi Government officials on what they expect in return for oil production consistent with U.S. and world interests. In discussing the Saudi views, we do not necessarily endorse the validity of their positions or requests.

Saudi Arabia's dominant oil production role is expected to increase in the years to come. Various studies on the world energy outlook prepared by recognized authorities conclude that, at some point before the end of this century, world oil supplies will be insufficient to meet demand under an orderly marketing system. They further conclude that a key factor in meeting increased future petroleum demand will be the willingness of Saudi Arabia to significantly expand productive capacity and to supply increasing amounts of oil.

An inescapable conclusion of our review is that continued increases in Saudi Arabian oil production to meet incremental world demand cannot be taken for granted. Saudi Arabia's capability and willingness to increase its petroleum production in the coming years is dependent on many interrelated technical, operational, political, security, and economic factors.

Although there are no insurmountable technical problems to prevent large increases in productive capacity if the necessary funds are spent and technical performance standards maintained, Saudi Government decisions and implementing actions will have a significant impact on the rate of expansion. With the necessary commitment by SAG, and with increased development drilling, well workovers, and the installation of additional equipment, the authorized plan to

increase sustainable oil production capacity from the estimated 10.5 million b/d to the established goal of 13.5 million b/d by the early 1980s is feasible. Nevertheless, many technical problems that are normal to maturing and depleting reservoirs will develop in the coming years.

A more critical factor than productive capacity is authorized production. SAG has imposed a production ceiling of 8.5 million b/d and has indicated this ceiling will be retained at least until the end of 1979. Future Saudi production decisions will reflect its political, security, and economic interests and goals.

Saudi political objectives revolve around security of the country and peace in the Middle East. The Soviet Union and radical groups whose philosophies threaten the Monarchy and Islamic values pose the greatest concern. Saudi Arabia has turned to the United States for assistance in achieving its goals and, although generally satisfied with U.S. support, is especially concerned about U.S. willingness to (1) use its influence with Israel to bring about lasting peace in the Middle East and (2) approve the Saudi request to purchase 60 F-15 aircraft.

Saudi Arabia officials said that a Middle East war could seriously disrupt the flow of oil even without an oil embargo because of shipping restrictions and possible damage to Saudi oilfields or destruction of the facilities. SAG wants the United States to exert greater leverage to gain Israeli concessions and thereby accelerate the negotiations. It has also placed great importance on the F-15 request as a test of overall U.S. friendship and commitment to Saudi self-defense aspirations. Future Saudi oil decisions could be affected by U.S. actions on these two issues.

Saudi Arabia's ability to effectively use its mounting oil revenues will be another important factor in future oil decisions. Some influential Saudi officials are leading a movement to slow down capacity expansion and restrict future production to levels more in line with the country's economic needs. The projected growth in Saudi oil revenues will add to the dilemma and increase the pressure on Saudi decisionmakers to limit oil production and the resulting accumulation of petrodollars, which are declining in value against other hard currencies.

The Saudi Government has stated that its willingness to produce oil at levels substantially beyond its own internal

revenue needs depends on the industrialized countries' willingness to provide (1) real value guarantees for the resulting surplus revenues and (2) advanced technology and assistance in carrying out Saudi Arabia's domestic industrialization and development program. The United States does not provide any form of special treatment for these surplus funds. The move to limit future production may gain momentum if Saudi economic concerns are not resolved.

Saudi Arabia's huge internal development plans provide an unusual opportunity for U.S. businesses to reduce the growing U.S. trade imbalance while at the same time helping Saudi Arabia with its internal development. Although more than 300 U.S. firms and over 30,000 U.S. citizens are employed in Saudi Arabia, certain U.S. Government actions may inhibit further U.S. inroads into the Saudi market and may even reduce this presence. The cost of employing U.S. citizens in Saudi Arabia has increased significantly because tax incentives were eliminated by legislation and tax court rulings in 1976; as a result the U.S. competitive position may be jeopardized. Also, U.S. Antiboycott Legislation may reduce or eliminate participation of some U.S. firms in the Saudi Arabian market because of uncertainty over standards for compliance and fear of prosecution. SAG and the U.S. businesses we contacted have been concerned over both the Antiboycott Legislation and tax changes and believe these legislative actions will harm U.S. interests in Saudi Arabia.

The United States has enjoyed a special relationship with Saudi Arabia, nurtured over the years by the key role of four major U.S. oil companies in developing Saudi oil resources and more recently by U.S. Government assistance and cooperation. It appears that preserving and enhancing this relationship could provide a foundation for resolving the political, security, economic, and energy issues facing both nations. It would also provide the United States with greater influence in Saudi petroleum decisions.

Although Saudi Arabia's key role in world energy supplies is amply demonstrated, what may not be so evident is the increasing interdependence of the world community. Oil producing nations exercise considerable leverage over oil production and pricing, but they in turn are dependent on consuming nations' markets. Saudi Arabia and other major oil producers also recognize that world stability depends on a viable global financial system and maintenance

of a world power balance. Though some producers are rich in petrodollars, they are dependent on technology, capital goods, training, and the management expertise provided by the industrialized consuming nations. This report focuses on the important role of Saudi Arabia, but it is obvious that U.S. energy policy must emphasize reducing U.S. dependence on insecure oil imports. Therefore, we believe U.S. energy strategy should include actions to

- achieve energy conservation,
- seek new sources of oil and gas,
- accelerate the development of alternative energy sources, including renewable energy forms,
- cooperate in the search for energy solutions among industrialized nations,
- seek cooperation of producer nations while considering the use of leverage at U.S. disposal and avoiding unwarranted confrontations, and
- help strengthen the weakening dollar by aggressively seeking export opportunities for U.S. businesses.

Although Saudi Arabia's internal development plans offer tremendous export opportunities, there is no clear U.S. position on the extent to which the U.S. Government should be involved in Saudi Arabia's internal development. We believe that the U.S.-Saudi Arabia Joint Economic Commission may provide an excellent opportunity for the United States to develop imaginative and innovative proposals for increasing U.S. exports of goods and services to Saudi Arabia if consistent with U.S. foreign policy and economic goals. We plan a future review of operations by the Joint Economic Commission. The huge petrodollar accumulations of Saudi Arabia, its ambitious internal development programs and desire for U.S. assistance, and the need to improve the U.S. trade balance are reasons for greater U.S. export efforts in Saudi Arabia.

We did not request formal written agency comments on our report; however, a draft was provided to five executive departments and the Central Intelligence Agency for review and informal comment. Executive agency officials who reviewed our draft report generally agreed with the reporting thrust.

- State Department officials commented that the report accurately reflects their understanding of the Saudi positions on political, security, and economic matters.
- Defense Department officials said that the discussion of security considerations and the importance of the F-15 sale to the Saudis accurately conveys their understanding of the Saudis' views.
- Department of Energy and Central Intelligence Agency officials, while not disagreeing with our discussion of Saudi productive capacity and petroleum operations, cautioned that oil capacity expansion may be more difficult to achieve than seems to be conveyed by our report. They pointed out that developments since our fieldwork in late 1977 may indicate a slowdown in capacity expansion plans.
- Treasury and Commerce Department comments are reflected in the report where appropriate.



ESTIMATED WORLD OIL RESERVES AND1977 CRUDE OIL PRODUCTION

	Proved reserve estimates (note a)  (billions of barrels)	Percent of total	Crude oil production  (million b/d)
Free world:			
Saudi Arabia	150.0	27.4	9.2
Kuwait	67.0	12.2	1.7
Iran	62.0	11.3	5.7
Irag	34.5	6.3	2.3
United Arab Emirates	32.7	6.0	2.0
United States	29.5	5.4	9.9
Libya	25.0	4.6	2.1
North Sea	25.0	4.6	1.1
Nigeria	18.7	3.4	2.1
Venezuela	18.2	3.3	2.2
Others	<u>85.3</u>	<u>15.5</u>	<u>8.3</u>
Total	<u>547.9</u>	<u>100.0</u>	<u>46.6</u>
Communist:			
U.S.S.R.	75.0	76.5	11.0
China	20.0	20.4	1.8
Other	<u>3.0</u>	<u>3.1</u>	<u>.4</u>
Total	<u>98.0</u>	<u>100.0</u>	<u>13.2</u>

a/As of December 1977.

Source: The Oil and Gas Journal, Dec. 26, 1977.

## APPENDIX II

## APPENDIX II

ORGANIZATIONS INTERVIEWED BY GAODURING THIS REVIEW

<u>ORGANIZATION</u>	<u>DURING THIS REVIEW</u>	<u>LOCATION</u>
U.S. Government:		
Executive departments	Departments of Defense Commerce, Energy, State, and Treasury	Washington, D.C.
Executive agencies	Central Intelligence Agency Federal Energy Administration National Security Council	Langley, Virginia Washington, D.C. Washington, D.C.
Overseas missions	American Embassy  Army Corps of Engineers Consulate Liaison office Military Training Mission	Jidda, Saudi Arabia, Cairo, Egypt Riyadh, Saudi Arabia Dhahran, Saudi Arabia Riyadh, Saudi Arabia Dhahran, Saudi Arabia
Other	Congressional Research Service U.S.-Saudi Arabian Joint Economic Commission Office	Washington, D.C. Riyadh, Saudi Arabia
U.S. business firms and organizations:		
Construction	Bechtel Corporation Fluor Corporation J. A. Jones	San Francisco, California Los Angeles, California Jidda, Saudi Arabia
Finance	Bankers Trust Company Chase Manhattan Bank Citibank	New York, New York New York, New York Riyadh, Saudi Arabia
Petroleum	Aramco  Exxon Corporation Gulf Oil Corporation Mobil Oil Corporation Mobil Saudi Arabia, Inc. Standard Oil Company of California Shell Oil Company	Washington, D.C., New York, New York, Dhahran, and other locations in Saudi Arabia New York, New York Houston, Texas New York, New York Jidda, Saudi Arabia San Francisco, California Houston, Texas
Other	Aramco Services Lockheed Aircraft International U.S. Arab Chamber of Commerce	Houston, Texas Jidda, Saudi Arabia  New York, New York
Academic institutions:		
Harvard University	Institute for Middle East Studies	Cambridge, Massachusetts
Massachusetts Institute of Technology	Workshop on Alternative Energy Strategies	Cambridge, Massachusetts
Stanford University	Stanford Research Institute	Menlo Park, California
Saudi Arabian Government:		
Agencies	Petromin Saudi Arabian Monetary Agency	Riyadh, Saudi Arabia Jidda, Saudi Arabia
Ministries	Finance and National Economy Petroleum and Mineral Resources  Planning	Riyadh, Saudi Arabia Riyadh and Dammam, Saudi Arabia Riyadh, Saudi Arabia
Overseas Mission	Embassy Information Office	Washington, D.C.
Saudi business firms and organizations:	Arab Chamber of Commerce, Saudia Airlines	Jidda, Saudi Arabia
Note: Telephone contacts were made in April 1978 with the following companies or corporations: General Electric, Fluor, Westinghouse, Chicago Bridge and Iron, Bechtel, and E. I. du Pont de Nemours & Co.		

ENERGY SUPPLY AND DEMAND PROJECTIONSREVIEWED BY GAO

<u>Name of organization</u>	<u>Title of study and date</u>
Central Intelligence Agency	The International Energy Situation: Outlook to 1985 - April 1977
Chase Manhattan Bank	World Energy Outlook and OPEC Prices - January 1977
Congressional Research Service	Project Independence: U.S. World Energy Outlook Through 1990 - June 1977
Exxon Corporation	World Energy Outlook - April 1977
Gulf Oil Corporation	Executive Summary: Non-Communist World Petroleum Productive Capacity, Production, and Consumption 1977-1990 - March 1977
International Trade Commission	Factors Affecting World Petroleum Prices to 1985, and Appendices - September 1977
Irving Trust Company	International Oil Revisited: Could The Experts Be Wrong - December 1977
Mobil Oil Corporation	Internal Energy Projections - September 1977
Organization for Economic Co-operation and Development	World Energy Outlook - 1977
Petroleum Industry Research Foundation, Inc.	U.S. Oil Supply and Demand to 1990 - October 1977
Phillips Petroleum Company	Internal Energy Projections - March 1977
Standard Oil Company of California	Internal Energy Projections - April 1977
Stanford Research Institute	World/U.S. Energy Supply and Demand - March 1977
University of California, Lawrence Livermore Laboratory	New Developments Affecting the Supply of Oil to the Free World - October 1977
Walter J. Levy, London	Saudi Arabia's Approaching Choice - July 1976
World Bank Staff (Working Papers No. 221)	Energy Prospects in OECD Countries and Possible Demand of OPEC Oil Exports in 1980 - September 1975
Workshop on Alternative Energy Strategies-MIT	Energy: Global Prospects 1985-2000

TRENDS IN SAUDI OIL PRODUCTION AND RESERVE ESTIMATES

<u>Year</u>	Average daily crude oil production	<u>Estimated petroleum reserves</u>	
		<u>Proved</u>	<u>Probable</u> (note a)
	(thousand barrels)	(in millions of barrels)	
1950	547	(b)	(b)
1955	977	30,000 to 35,000	(b)
1960	1,314	45,600	(b)
1965	2,205	63,707	(b)
1970	3,799	88,063	123,908
1971	4,769	90,157	127,497
1972	6,016	92,992	156,393
1973	7,596	96,922	164,520
1974	8,480	103,480	172,529
1975	7,075	107,857	175,759
1976	8,577	110,187	177,532
1977	9,202	110,400 c/	177,600

a/Includes proved reserves.

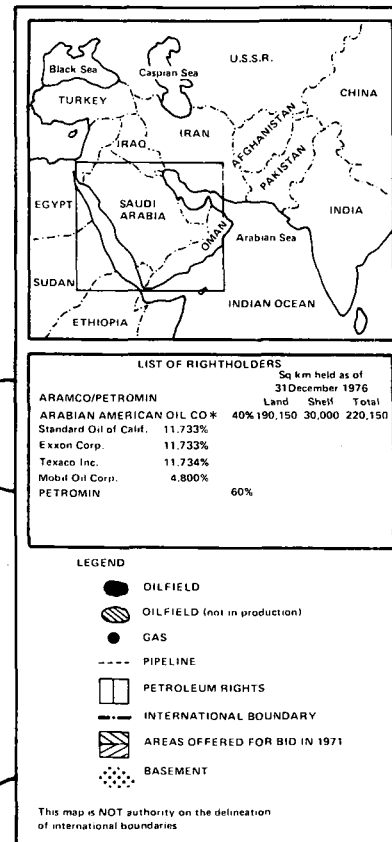
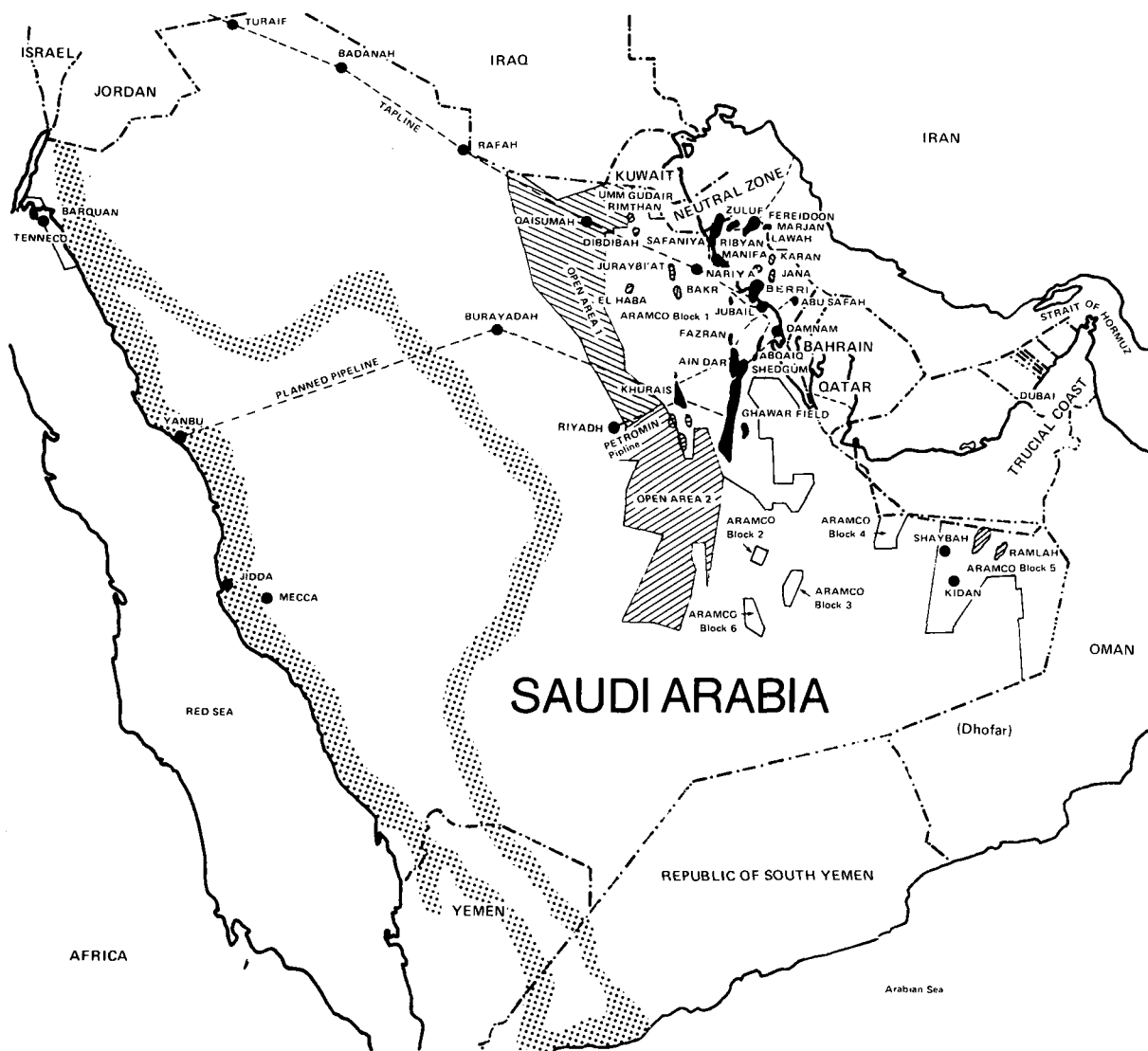
b/Not available.

c/The Saudi Arabian Government estimates proved reserves are 150 billion barrels.

Note: Cumulative crude oil production from 1938 to 1977 totaled 32.2 billion barrels.

Source: Aramco Annual Reports.

# SAUDI ARABIAN OIL FIELDS AND FACILITIES



POSSIBLE CONSEQUENCES OF PRICING OIL IN  
SPECIAL DRAWING RIGHTS

With the continued depreciation of the dollar in foreign exchange markets, OPEC officials have begun to discuss in earnest the possibility of pricing oil in Special Drawing Rights instead of dollars. (SDR is a unit of account used by the International Monetary Fund, and its value is based on a basket of 16 major world currencies in which the U.S. dollar is assigned a weight of 33 percent.) Although OPEC officials from the major oil producing countries have made strong statements supporting the dollar and will continue using the dollar as the medium of payment for oil at least for the foreseeable future, the prospect of a shift to SDR pricing has contributed to the dollar's weakness and raised doubts about its future stability. An understanding of the mechanics of an SDR oil pricing system and its possible consequences is important because of its potential impact on the United States.

The dollar now serves both as the medium of payment for oil and the unit in which oil prices are quoted. It is only the latter function which would disappear under SDR pricing. In October 1975, OPEC ministers agreed in principle to price oil exports in SDRs but failed to implement that agreement. Their intention was to cushion the price of oil from fluctuations in the foreign exchange market. Since SDR is a weighted index of both strong and weak currencies, movements in the value of the SDR tend to be more moderate than those of any single currency. Thus, if the dollar depreciated 10 percent against the deutschemark--all else being equal--the SDR-denominated value of a dollar would depreciate only 3.3 percent.

The present concern among OPEC officials stems not so much from fluctuations in exchange markets as from the steady decline of the dollar since July 1977. The depreciation of the dollar has had no impact on the price of U.S. oil imports, since oil payments are made in dollars. For countries with strong currencies, however, the recent depreciation of the dollar has made oil imports considerably cheaper in terms of their currencies. Thus, though the dollar price of oil has remained fixed since last June, a German importer now pays 13.2 percent less in marks for oil than he paid at the end of June.

OPEC's dollar receipts have not changed, but the purchasing power of these receipts outside the United States has steadily fallen. The magnitude of the erosion in OPEC's

purchasing power depends on its pattern of expenditures. About 80 percent of OPEC's imports originate outside the United States, the bulk of which is priced in the currency of the exporting country. In addition, only 27 percent of the total OPEC surplus was deployed in the United States in 1977, although the proportion channeled into dollar-denominated instruments was probably somewhat larger. The fall in OPEC's purchasing power as a result of the depreciation of the dollar was probably substantial.

Within OPEC, the impact of the dollar's depreciation varies considerably from country to country, reflecting differences in their trading and investment patterns. For instance, Iraq and Libya trade predominantly with non-U.S. economies and are therefore more adversely affected by the dollar's depreciation than Kuwait and Saudi Arabia, which have stronger ties with the United States. Even Kuwait estimates that its purchasing power fell by 5.4 percent in 1977, based on the decline in the value of the dollar against the "basket of currencies" it uses to purchase and invest.

#### EFFECT ON PRICES

Switching from dollar to SDR pricing would not in itself increase the cost of imported oil either for the U.S. or other consuming nations. If, however, the dollar depreciated significantly, the dollar price of oil would rise. The U.S. would have to pay correspondingly more for its imported oil. All other consumer countries would also have to pay more for their oil than under dollar pricing--although countries with strong currencies would still benefit from the depreciation of the dollar. OPEC's dollar receipts would increase, both from the United States and from Third-World countries. Thus, with a depreciation of the dollar, OPEC would be able to maintain the "purchasing power" of its earnings, by indirectly raising the dollar price of oil (assuming that the world market would sustain such a price increase).

If SDR pricing had been adopted last June after the 10-percent price increase to \$12.70 per barrel, the price in SDRs would have been 10.93 SDRs. With no change in the SDR price, by the end of December, oil importers in the United States would have been paying \$13.30 per barrel, and by March 22, 1978, roughly \$13.45. This would have resulted in an additional U.S. oil bill of roughly half a billion dollars between July 1977 and March 1978.

In the event of dollar appreciation, SDR pricing would make oil imports cheaper for the United States and would moderate the price increase for non-U.S. importers. OPEC's dollar receipts would fall and OPEC would be worse off than

under dollar pricing. This explains, at least in part, why OPEC dropped the SDR pricing issue in 1975, once the dollar recovered and began to make strong gains against major world currencies.

Given the uncertainties about the dollar's future, SDR pricing would appear to be a fairly simple way for oil producers to stabilize their export earnings. However, the choice facing OPEC decisionmakers is complicated by several other factors. The most important is the impact that a change in pricing policy could have on the dollar. Under SDR pricing, any weakness of the dollar would be translated into higher oil prices for the United States and, hence, in the short run, to an even larger U.S. trade deficit. This could have a negative effect on the market's perception of the value of the dollar. In addition, SDR pricing could be viewed as detracting from the dollar's international role--although OPEC officials insist that the dollar would continue as the medium for oil payments regardless of the pricing mechanism.

However, SDR pricing need not necessarily reinforce the depreciation of the dollar. As mentioned, if the dollar depreciates, SDR pricing effectively raises the dollar price of oil. Assuming no change in the level of oil imports, this in turn would result in both a greater outflow (supply) of dollars from the U.S. and a greater demand for dollars from other oil importers. But since non-U.S. oil imports could exceed U.S. imports, the demand for dollars from abroad would exceed the outflow of dollars from the United States. This in itself would tend to moderate the depreciation of the dollar. Theoretically, the ultimate fate of the dollar would then depend on how OPEC decided to spend and invest its additional dollar receipts.

Therefore, SDR pricing in itself does not imply a further depreciation of the dollar. Under the present conditions of exchange market unrest, however, a shift away from dollar pricing could have an adverse psychological impact on the market and, hence, on the value of the dollar. For this reason alone, responsible OPEC officials have been reluctant to change pricing policy. A further depreciation of the dollar would also affect those OPEC members who have a large portion of their assets denominated in dollars.

OPEC could also choose a "basket type" accounting unit rather than SDR, with any currencies and any weights. Designing such an accounting unit would be difficult, since OPEC members are hardly unanimous in their interests. The more aggressive OPEC members are likely to push for a closer alignment with such currencies as the deutschemark, Swiss franc, and the yen, because the greater the weights assigned



to stronger currencies, the larger the implicit price increase. Saudi Arabia and Iran, on the other hand, will want the dollar to retain its dominant position. In addition, some OPEC currencies might be incorporated into the pricing basket; the IMF Executive Board recently decided to include the Iranian and Saudi currencies in the SDR basket. The final pricing basket, if OPEC decides to switch its pricing policy, may have a somewhat different configuration than the SDR; but the impact would be much the same.

At the moment, an increase in the dollar price of oil--whether explicitly or under the guise of SDR pricing--is largely an academic issue, since OPEC is facing an international oil glut. The decision to postpone the oil ministers' meeting by a month reflects OPEC's predicament on the pricing issue. But SDR pricing may eventually be adopted, eliminating one of the buffers which Americans mistakenly believe insulate them from international economic and financial developments. And that could produce a positive result if U.S. officials became more sensitive to the international consequences of their policies than has recently been the case.

Note: According to Petroleum Intelligence Weekly, OPEC Oil Ministers meeting informally in Saudi Arabia during early May 1978 are considering the results of an April 1978 study by OPEC's Economics Department on alternatives to the U.S. dollar for oil pricing.

Source: First Chicago Corporation World Report,  
March-April, 1978