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Security of Oil Supply to NATO and Japan

Submitted by

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Concurred in by the

UNITED STATES INTELLIGENCE BOARD

As indicated overleaf

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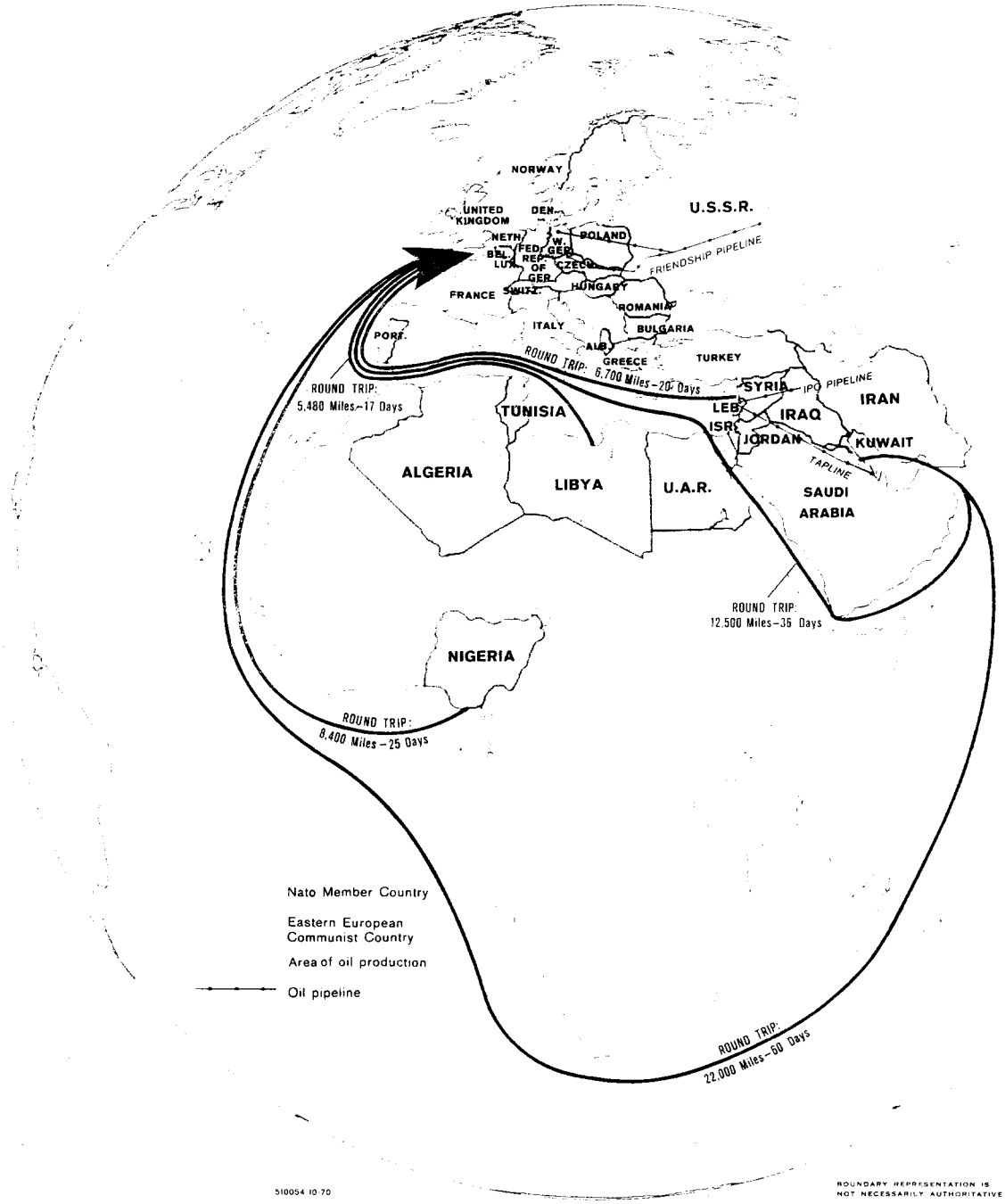

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SECURITY OF OIL SUPPLY TO NATO AND JAPAN

SCOPE NOTE

This Estimate discusses oil supply to Western Europe and Japan through 1975, and as far beyond that as possible. It also discusses the tanker situation, the role of the USSR and Eastern Europe in Middle Eastern oil matters, and prospective changes in the control of production and distribution of oil. It examines the conditions, short of general war, under which the flow of Middle Eastern [1] oil to NATO and Japan might be interrupted and assesses the impact of an interruption of oil flow from certain producing countries.

CONCLUSIONS

A. The European NATO countries and Japan consume imported oil in enormous quantities—over 10 million and 3.8 million barrels per day (bpd) respectively. Europe's reserve stocks are limited and unevenly distributed; and low sulfur (low pollution) industrial fuel oil is in short supply. The Syrian shutdown of TAPLINE (which brought Saudi oil to the Mediterranean) and production cuts in Libya have caused a strain on the world's tanker fleet, which has had to haul more oil from the distant Persian Gulf, without benefit of the Suez Canal.

B. The antagonism between Egypt and Israel appears to preclude the Canal's opening in the foreseeable future. Even so, we estimate that there will be enough tanker capacity to move oil from the producing countries to consumers during the next year, provided that there is no substantial decrease in the availability of short-haul Medi-

[1] In this paper, the term Middle East is used to include all the Arab states, including North African ones, and Iran.

terranean oil. The present tight tanker market, should ease substantially by mid-1971, because of new deliveries, and the increase in combined carriers expected to be available by the end of that year would provide a comfortable spare capacity.

C. The expansion of Soviet political influence in the Middle East has not been accompanied by any significant Soviet role in oil matters. There are compelling practical considerations that will continue to limit such Soviet participation; these include nationalistic attitudes in the oil producing states and the shortcomings of the Soviet oil industry. While the USSR will be able to produce enough oil to cover its domestic demand up to 1980, it would probably have to import about 1.5 million bpd from the Middle East if it is to provide most of the oil required by Eastern Europe and to export to other markets at present levels. The Soviets are unlikely to try to deny Middle Eastern oil to NATO or Japan, since the political and economic costs to the USSR of any such efforts would be prohibitive. It is possible, however, that the Soviets will gain an increasingly significant position in the oil industry in the Arab states over the long run.

D. There will be growing pressures over the next five to 10 years by the oil producing states to gain control over their oil production. By the end of the 1970s a substantial portion of production is likely to be under the control of the host governments. The traditional role of the international oil companies will probably be diminished and direct dealings between consuming and producing countries are likely to account for an increasing amount of the oil moving between them.

E. Although several past interruptions of Middle East oil flow have arisen in the Arab-Israeli context, others have been caused by political antagonisms between Arab states themselves. All in all, the oil producing countries, irrespective of their political ideology, have been motivated primarily by a desire for more income. They are heavily dependent on oil revenues to run their economies and hence are not likely to use denial of their oil as a political weapon against Western Europe or Japan.

F. Nevertheless, one or another major oil producing state could decide to risk its oil revenue for political ends. Seizure of all US (and/

or UK) oil operations in a major producing country would seriously disturb oil shipments for some months. NATO countries affected by such a move would act quickly to insure effectiveness of alternative arrangements for getting oil from producing countries. Syrian antagonism toward Iraq is likely to interrupt the flow of Iraqi oil at some time during the next five years.

G. In the event of a resumption of Arab-Israeli hostilities, some interruption of oil shipments seems almost certain. In such circumstances, moreover, one or more of the Arab oil producing countries might move directly against US oil companies, and US financial interests could be hurt badly. Sabotage attempts by Palestinian guerrillas are likely to occur in the foreseeable future. Although their effects could be serious they are not likely to cause a long lasting interruption of oil flow.

H. Certain specific contingencies involving interruptions in oil shipments to Western Europe and Japan are discussed at Annex.

DISCUSSION

I. THE PRESENT SITUATION

1. Although oil is the principal source of energy for the non-Communist world, two of the major consuming areas, Europe and Japan, have virtually no domestic oil supplies. At present, half of Western Europe's oil comes from east of Suez, another 30 percent from North Africa, and the rest from West Africa, the USSR and the Caribbean. Japan gets 90 percent of its oil from the Persian Gulf—roughly half from Iran and half from Arab states there. Uninterrupted access to adequate oil supplies is a vital matter for the Europeans and the Japanese.[2] This situation of dependence will prevail for the foreseeable future. Even though oil has been discovered in the North Sea in commercial quantities, the known reserves are not large enough to supply more than a minor share of the European market during the period of this Estimate. Japan has no oil reserves, although there are indications that oil in commercial quantities may be available in the China Sea. New discoveries in Indonesia may contribute significant supplies nearer at hand than the Persian Gulf.

2. The quantities of oil consumed in the European NATO countries and in Japan are formidable and have been growing at spectacular rates. The former

[2] The US, by contrast, now produces about three-fourths of the oil it uses. Most of the rest comes from nearby countries, only three percent of US consumption comes from the Middle East and Africa. The USSR is wholly self-sufficient in oil.

consumed over 10 million barrels of oil a day in 1970; the latter 3.8 million barrels per day (bpd). The growth of oil consumption for European NATO countries averaged about 11 percent a year in the past five years, while that of Japan has averaged 13½ percent over the same period. This growth has presented and will continue to present problems to the oil industry. The quantities of oil involved are so large that a single percentage point in the European figures alone amounts to 100,000 bpd; to transport this quantity of oil from the Persian Gulf around Africa to Northern Europe requires about 70 T-2s.[3]

3. Over the past several months oil supplies in Europe have tightened markedly; Western Europe has already experienced shortages and rises in prices of some oil products, as European consumption has grown in the 1965-1970 period more than had been foreseen by the oil companies. For one thing, the shift from coal, Europe's traditional source of energy, to oil occurred at a much faster rate than economic planners had anticipated. In addition, pollution restrictions designed to cut down emissions of sulfur put a premium on low-sulfur oils. Those crude oils which are low in sulfur, principally from North and West Africa, yield less fuel oil than the average Middle Eastern crude with higher sulfur content. The oil industry after June 1967 had adjusted to the closing of the Suez Canal by turning to ever larger and more efficient tankers for the long haul around Africa. These have not proved adequate, however, in the face of reduced availability of short-haul oil in recent months and the world's tanker fleet is now under considerable strain.

4. TAPLINE had been carrying about 500,000 bpd to the Mediterranean from Saudi Arabia. It was shut down in May 1970 after what appears to have been an accidental break, and the Syrian Government has not agreed to terms for repairing and reopening it. Early in the summer, the Libyan regime imposed successive cuts in production on several oil companies. Together, these two developments cut the availability of oil at terminals on the Mediterranean coast by over a million bpd, at their maximum impact. To transport oil from the Persian Gulf to Europe, as long as the Suez Canal is closed, requires five to six times the tanker capacity that is needed to move an equivalent amount of oil from the Mediterranean. The Libyan cutbacks and TAPLINE's closing virtually exhausted unused capacity in the world's existing tanker fleet, causing sharp rises in new charter fees.[4]

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[3] The T-2 tanker is a 16,765 deadweight tons (DWT) vessel with a speed of 14.5 knots. Tanker availability and employment is commonly expressed in T-2 equivalents (expressed as T-2s), and this terminology is employed in this Estimate. A T-2 tanker would carry about 125,000 barrels of oil (there are about 7.5 barrels to the ton). DWT is defined as the gross weight of a vessel less the weight of hull and machinery; it approximates the vessel's cargo carrying capacity.

[4] The Israeli pipeline between the Gulf of Aqaba and the Mediterranean has a capacity of 400,000 bpd, but its current throughput is estimated at only around 250,000 bpd. Most oil producing companies which have interests in Arab states are unwilling to use the pipeline because of Arab regulations.

5. The West European countries, aware of their vulnerability to disruption of supplies, have for many years been concerned with maintaining adequate reserve stocks of oil. These countries have as a goal the achievement of a 90 day oil reserve for Western Europe as a whole, but few have achieved it. Statistics on stocks are incomplete and unreliable; reporting varies in quality, coverage, and definitions, and different reporters employ different data bases. An Organization for Economic Cooperation and Development (OECD) report of 1 July 1970 estimates a 75 day stockpile for Western Europe. Other sources consider 45 days a more realistic figure. A more precise figure of European oil stocks is not presently available. European oil stocks fluctuate seasonally, going down about 15 days in the winter months and being replenished during the summer. The TAPLINE and Libyan developments have slowed restoration of reserves during the past summer to some extent, although probably not by more than a few days consumption. Moreover, oil stocks are not evenly distributed throughout the countries of Western Europe and already there have been shortages of certain products in some countries. Japan in the past has not kept oil stocks up to a 60 day supply; in mid-1970 its stocks may have been around 45 days.

6. Spare production of nearly 3 million bpd of oil is still available in the Middle East, but most of it is in the Persian Gulf. This spare capacity represents a much smaller fraction of world consumption than was the case in the crises which closed the Suez Canal in 1956 and in 1967. In addition, the position of the US as a relatively close alternative source of oil for Western Europe has about vanished. Whereas in 1960 the US had stand by production equal to about 60 percent of European consumption, today it has little stand by production which could be made available quickly to Europe.

7. Demand for oil in the non-Communist world has risen at about 7.7 percent annually in the past 10 years. Demand will continue to grow, but probably at a somewhat lower rate. Growth rates of oil consumption have already begun to decline in Western Europe. The rate of conversion from coal to oil is slowing, and natural gas continues to do better than hold its own as an energy source. Oil industry sources talk of a 6 percent average annual growth rate through 1975. The oil industry, however, has usually been on the low side in forecasting long-term growth. We think that average annual growth for 1971-1975 is more likely to be around 7 percent world-wide. This implies a growth of almost 8 percent in Western Europe, 4 percent in the US, and about 14 percent in Japan. Table I shows the quantities of oil that will be in demand at these two rates and also at 8 percent, although total world demand is unlikely to go that high.

II. THE TANKER SITUATION

A. Prospects for Reopening the Suez Canal

8. A basic reason for the tight tanker situation is that the Suez Canal remains closed. While many of the large tankers now in use or under construc-

tion are too big to pass through the Canal (before the June war, tankers of about 65,000 DWT could transit loaded and ones of about 150,000 DWT in ballast), its opening would provide additional flexibility in tanker movements. Shortening the route from Europe to the Persian Gulf would increase tanker transport capacity by the equivalent of about 800 T-2s, adding 8-9 percent to the world tanker fleet. How likely is it that the Suez Canal will be opened by 1975?

9. The physical task of opening the Suez Canal to shipping is not overwhelming. There are some 15 vessels of varying size sunk in the Canal. In addition to removing these vessels, some dredging would be required, although without the wash of moving ships, sedimentation probably has amounted to only half a foot or so on the average. In the absence of a thorough physical survey since the June 1967 war, estimates of the time and cost needed to put the Canal back in operation range from 4-6 months at a cost of $12-$15 million to over a year at $30-$35 million.

10. Of the parties directly concerned with the Canal, Israel has little economic interest in having it open and has a very heavy political stake in ensuring that the Canal does not open unless its flag vessels can use the waterway. Tel Aviv regards its military position along the east bank as important for holding its position in Sinai, and holding Sinai as a prime means of exerting pressure on Egypt to come to terms on an overall settlement. As long as Israel's forces hold the east bank, it can prevent the Canal from being used. Israel would forcibly resist any effort to open the Canal without its consent.

11. Egypt's interest is more complex. In the last full year (1966) of the Suez Canal's operation, Egypt earned about $220 million in foreign exchange from tolls. This sum has been more than compensated for by subsidies, agreed to at the 1967 Khartoum Arab Summit Conference, from Saudi Arabia, Kuwait and Libya. Egypt suffers certain economic disadvantages from a closed Canal; e.g., most of its oil production is on the wrong (southern) end of the waterway. Even if the Khartoum subsidies largely or totally disappeared, we believe that Egypt would choose to forego income from the Canal (which, at least in the near term, would be significantly less than it was before June 1967) rather than make money by opening it while Israel continued to occupy its eastern bank. Egypt wants to regain control of Sinai. Egypt might agree to open the Canal on terms short of a comprehensive settlement, e.g., if Israeli forces withdrew from the eastern bank, but even this is unlikely.

12. The USSR has experienced some political, strategic, and economic inconvenience from the Canal's closure. Its military and economic aid to South Asia and to Vietnam have had either to make the long journey around Africa or go overland. Its naval vessels similarly must make long voyages to show the flag in the Indian Ocean, and the USSR is unable to augment its Indian Ocean squadron in reaction to short-term crises in the Red Sea and the Persian Gulf.

An open Canal would ease these strains on Soviet maritime activity, adding the equivalent of five percent (in DWT) to the USSR's merchant fleet. Yet, the Soviet interest in an open Canal is not so great as to induce the USSR to endanger its position in Egypt. The Soviets almost certainly hope for a settlement which would allow the Canal to be opened, but in our judgment, Moscow would not put heavy pressure on Cairo to modify significantly its terms for a settlement primarily to get the Canal back in operation. Nor do we think that the USSR would assess the benefits of an open Canal as worth the risk of trying to open it by force.

13. Other former users of the Canal have been hurt, but perforce have adjusted to its being closed. While most countries would welcome the Canal's reopening, none of the users regards an open Canal as vital to their interests, nor does any of them have much leverage to exert if it wanted to get the Canal open. For all the above reasons, we expect the Canal to remain closed until some sort of Egyptian-Israeli settlement is reached. Such a settlement appears remote, but if it ever does come about, it will be achieved for reasons which have relatively little to do with the Canal as a route for ship passage. The discussion of future oil tanker requirements below assumes that the Canal remains closed.

B. World Tanker Capacity to 1975

14. In mid-1970, there was an oil tanker capacity of 9,354 T-2s available to the non-Communist world. In addition, the combined carrier (ore/bulk/oil) fleet consisted of 975 T-2s of which about 50 percent reportedly were in oil service, giving a total of about 9,840 T-2s available for transporting oil. The tanker market was tight; customary summer downturns in charter rates did not occur in 1970. Most observers of the oil industry agree that the tankerage available for charter was in the neighborhood of 2 percent of the total fleet. A 5 percent availability is regarded by oil industry watchers as providing sufficient spare for a "comfortable" market—i.e., charter rates are reasonable in an oil company's view and too low in an independent shipowner's view. High and rising charter rates through the third quarter of 1970—reflecting the TAPLINE shutdown and Libyan cutbacks—confirm judgments that the market remains tight.

15. Assuming that only about 2 percent of the 9,840 T-2 fleet was available for spot charter, about 10,140 T-2s (a 3 percent increase in the fleet) would have provided the 5 percent "comfortable" spare capacity. Table II takes this as the base figure, representing the T-2s needed to move oil in mid-1970, and calculates the requirements for the years 1971 through 1975 at 6, 7, and 8 percent growth in total oil demand. These calculations assume that the geographical distribution of sources of supply, regions of consumption, and the relative importance of tanker-carried oil in world demand remain roughly as

they are today.[5] Table III gives estimates of tankers available through 1973, taking into account present tankerage, scheduled deliveries of new tankers, likely slippage in construction schedules, and estimated losses due to scrapping and accident. Firm figures on deliveries—and hence on the tanker fleet as a whole—are not available beyond the end of 1973. Most shipyard capacity, especially that suitable for tankers of 200,000 DWT and over (more than 80 percent of the tanker tonnage now on order is of this size), is booked solidly through 1972 and fairly heavily into 1973. The total orders for late 1973, 1974 and beyond—some of which are already being placed—will reflect the demand oil companies and charter operators expect in the second half of this decade. Although there is unused capacity in US shipyards, the lead time for tanker construction in these yards would preclude any significant additional deliveries in response to new orders before the end of 1972. Further, the high costs would discourage customers unless they expected extraordinarily high tanker rates for several years ahead. (See Chart, page 9.)

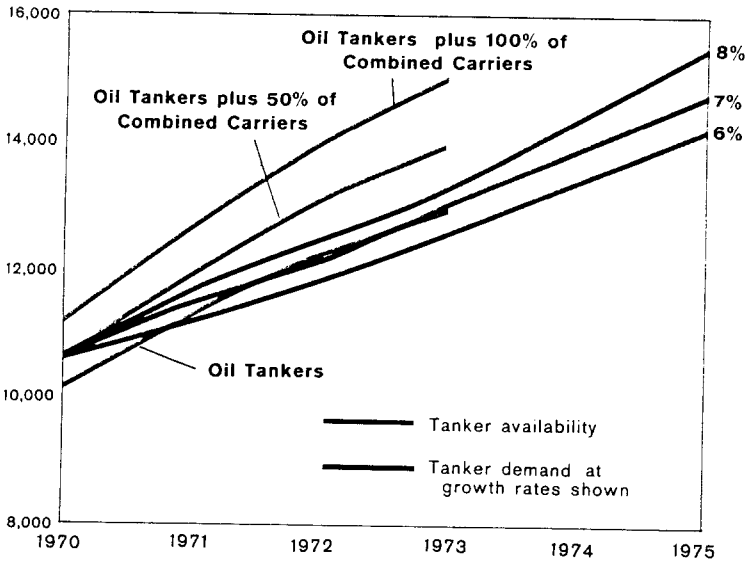
16. There will be enough tanker capacity to move oil from producing countries to consumers in the next year or so, assuming no change in the availability of short haul oil. Even recognizing likely delays in tanker production, deliveries through 1971 appear to be substantially in excess of the tonnage needed to cope with even an 8 percent rate of growth in demand (see Table III). Although tanker supply and demand will come into balance in the first half of 1971, assuming the continued availability of 50 percent of combined carriers, this is a period of peak tanker employment, which will probably make for extended stringency in the tanker market. Deliveries of new tankers in 1971 should substantially ease the tight market, with charter rates returning to more normal levels in the second half of the year. By the end of 1971, even an 8 percent growth in demand would require only 11,420 T-2s. This requirement would be met by a fleet of 11,280 T-2s and only 10 percent (140 T-2s) of the combined carrier fleet

[5] For the reasons indicated below, Dr. Ray S. Cline, the Director of Intelligence and Research, Department of State, does not accept this last assumption, which implies that tanker-carried oil and the demand for tanker capacity will grow at the same rate as consumption. First, production not requiring tanker capacity for delivery satisfies a major part of the consumption demand in the US and a minor part in Europe. From this, and the fact that the rate of growth in consumption is higher in Japan and Europe where all or the great bulk of consumption requirements is filled by tanker-carried oil, it follows that the overall demand for tanker capacity will grow more rapidly than overall oil consumption. Second, INR considers that the rate of growth of tanker-carried oil in US supplies assumed in the overall average growth rates given here and in Table II is subject to a large margin of error and that the share of the annual growth in US consumption that will have to be carried by tanker will probably increase. Finally, higher overall average rates of growth in tanker demand for the five year period would still understate the annual growth rates in 1971 and 1972 if, as evidence suggests, growth in the demand for oil declines over the 1971-1975 period, since tanker demand growth rates would be higher than the averages in the first half of that period and lower in the last half. Despite the foregoing, INR agrees that deliveries of new tankers and combined carriers through 1971 are likely to be adequate to cope with the growth in demand for oil, although not by the margin estimated in paragraph 16 below, and that, barring a further restriction in the supply of short-haul oil, Europe and Japan will get the oil they need.

in oil service which would provide a comfortable market with 5 percent spare capacity available. By the end of 1972, only 8 percent of the combined carrier fleet in oil service would be required to provide this spare.

17. Tanker deliveries appear likely to stay ahead of oil demand into 1974, which is about as far ahead as we can forecast on this point. There appears to be sufficient spare capacity to keep the market comfortable. Thus, even if TAPLINE remains closed and Libyan production remains restricted, Europe and Japan will get the oil they need. Sections III-IV below discuss the factors bearing on an interruption, Section V the likelihood, and the Annex the consequences of certain specific interruptions.

FREE WORLD TANKER FLEET
Estimated Availability and Demand*
(T-2 Equivalents)



*Based on growth in Free World oil demand at average annual rates shown.

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III. THE USSR AND MIDDLE EAST OIL

A. The Growth in Soviet Political Influence

18. The Soviet Union has firmly established itself as a major power in the Middle East. Although this area is not one where its most vital national [illegible] are involved—Eastern and Central Europe and Communist China are more important—Moscow views its expanded preserve in the Arab world as a partial

fulfillment of a long-sought goal to replace Western influence in contiguous countries and in the Mediterranean. The Arab-Israeli conflict, accompanied by increasing radicalism in the Arab states, has furthered Soviet leverage, and the USSR has had considerable success in exploiting other opportunities in the area.

19. The Soviets are probably optimistic about their ability to maintain and expand their influence in the Middle East over the long term. Radicalism is likely to grow in the Arab states whether there be an accommodation between the Arabs and Israelis or another round of war—and radicalism has tended to favor the Soviets at the expense of traditional Western interests. Middle Eastern radicalism typically blends strident anti-Western sentiment, nationalism, and pressure for social and economic reform into importunities for change in the status quo. It is likely in the years ahead to offer Moscow additional opportunities for expanding the Soviet role in various aspects of Middle Eastern life. The USSR, whose policy is aimed at increasing its influence in Algeria, Egypt, Syria, and Iraq, has established closer relationships with and has supplied arms to the new regimes in the Sudan and Southern Yemen, and more recently to Libya. Soviet prestige is also growing to some extent in such moderate countries as Lebanon, Jordan, Tunisia, and Kuwait, largely as a by-product of Soviet support for the Arabs against Israel and the US.

B. The Soviet Role in Oil

20. The continued expansion of Soviet influence in the Middle East has not been accompanied by an equivalent expansion of the limited role which the Soviets now play in the Middle Eastern oil matters. Moscow would almost certainly like to have a greater role for both economic and political reasons, but there are compelling practical considerations in the way. These include the essentially nationalistic attitudes of most Middle Eastern countries toward their mineral wealth, the difficulty of marketing vast quantities of oil, inadequacies in Soviet technology and equipment, and especially small tanker capacity. We indicate below certain constraints on Soviet activities over the next five years, along with developments which we consider fairly likely and which could affect the Soviet role.

21. The USSR is self-sufficient in oil and will remain so at least through 1975 and probably through 1980. Moreover, it will continue to export increasing quantities of oil from its own resources to Eastern Europe and will remain the major source of oil for this area. The level of Soviet exports both to Eastern Europe and to non-Communist countries will depend to a growing degree, however, on Soviet ability to procure supplemental supplies of oil from the Middle East for re-export. This will be especially true after 1975.

22. At present the USSR supplies the Communist countries of Eastern Europe with approximately 800,000 bpd, about 85 percent of the oil required by these countries—exclusive of Romania which is itself a net exporter of petroleum products. The USSR also exports another 800,000 bpd to other countries, nearly

700,000 of this to Western Europe. For many years Soviet exports of oil have helped to tie the economies of Eastern Europe to the USSR and exports to Western Europe have provided the Soviet Union with its most important source of convertible currency.

23. The USSR's rapidly growing domestic and export requirements for oil are becoming more costly and technically more difficult to satisfy. Soviet oil fields are being depleted more rapidly than expected, in part because poor extractive practices have made large quantities of reserves impossible to recover. More and more Soviet oil is coming from recently discovered deposits in Central Asia and Western Siberia, far from centers of consumption in the western part of the USSR. Extremes of climate, difficult terrain, reluctance of skilled specialists to work under such conditions, and shortage of suitable technology and equipment make exploitation of these reserves difficult and costly, and the rate of increase in total production of oil is slowing down.[6]

24. The USSR plans to produce about 9 million bpd in 1975 and will probably achieve this goal. This amount would be adequate to provide for all domestic needs, to satisfy most East European demand for oil, and to permit export of substantial quantities of oil to other Communist countries and elsewhere in the world. To facilitate deliveries to Eastern Europe, the Friendship Crude Oil Pipeline System from the Urals-Volga to Eastern Europe is being paralleled and when completed in the mid-1970s should be capable of transporting some 1 million bpd. If the USSR wishes to maintain exports to other areas at about present levels, modest quantities of oil, perhaps 200,000 bpd, may have to be procured from external sources. The USSR has already entered into agreements with several Middle Eastern countries—Iraq, Syria, Egypt, and Algeria—that could provide approximately this quantity of oil in 1975 in return for Soviet assistance in developing petroleum resources. Moreover, the USSR has also encouraged East European countries to seek supplemental supplies elsewhere in exchange for technical equipment and manufactured goods. By 1975 Eastern Europe probably will be importing small quantities of oil, perhaps 300,000 bpd, in addition to that from Russia. About one-third of this oil will be imported by Romania.

25. In 1980, Soviet production of oil probably will amount to about 10 million bpd as against a planned target of 11-12 million bpd. Although the USSR is capable of achieving the lower end of this target, we do not believe it will make the costly investment in technology, equipment, and oil exploration needed to do so. Its probable output of 10 million bpd would be more than adequate to cover domestic demand, but the amount available for export would be sharply reduced. By 1980, if the USSR wishes to provide most of the oil required by Eastern Europe and to maintain exports to other Communist countries and to the rest of its markets at or near present levels, it would have to procure sizable

[6] Drilling has become a significant obstacle to oil and gas development in the USSR. Soviet drilling equipment is ill-suited to the requirements of the Siberian fields, and the USSR is not doing sufficient drilling annually to sustain an adequate ratio of proved reserves to production.

amounts of oil, about 1.5 million bpd, from other sources, probably from Middle East nations. Combined Soviet and East European procurement of oil from the Middle East and North Africa by 1980 could total about 2.2 million bpd. Although this is a significant amount of oil, it would represent only a small share of Middle East and North African production.

26. It is by no means certain that the USSR could in fact procure this amount of oil from the Middle East. The oil producing countries have traditionally wanted hard currency for their oil. Some of them might find it necessary to provide oil to the USSR in exchange for civilian goods or to pay for military equipment. Such arrangements would improve Soviet export capabilities, but it is hard to visualize the bulk of 2 million bpd being subject to barter arrangements. The major oil producing countries are not so tied to the USSR—precisely because they have not needed Soviet equipment on credit—as to feel compelled to participate in such deals. The Soviets could act as brokers for sales of Middle East oil. This arrangement would be profitable, but their hard currency earnings would be much less than from exporting their own oil, and the Arabs probably would see but slight economic advantage in having Soviet middlemen in place of Americans or Europeans.

27. Nonetheless, the USSR will be increasingly interested over the next decade in participating, through assistance to the national oil companies, in the development of petroleum in the Middle East. Such participation could provide the USSR with a market for goods and services not otherwise readily exportable. However, oil plays too vital a role in the Soviet economy and military establishment for the Kremlin to contemplate extensive dependence on external sources. Oil acquired from the Near East will remain negligible for Soviet domestic requirements through 1975, although, on the most liberal assumptions, it could amount to about 60 percent of export availability in 1980.

28. We would not expect the Soviets to initiate any moves to deny Middle Eastern oil to NATO or Japan even were they in a position to do so. Denial on a small scale would serve as little more than an annoyance to the NATO allies, would not disrupt essential industry, and would moveover be costly to Moscow in terms of international good will. All NATO countries would view even limited denial efforts as an act of economic warfare and the price to the Soviets would be high in many respects. Such economic belligerency would be viewed with dismay by all raw material producing states in the underdeveloped world as a potential source of extreme disruption of the markets for their commodities. Finally, Soviet commercial interests probably coincide with those of the Arabs and of the oil consumers in dictating stability in international oil markets. Soviet as well as Arab exporters benefit from open markets and high prices.

29. Denial on a large scale seems even more remote. Even in the unlikely event that the Soviets acquired a major role as a broker for Middle Eastern oil, Moscow would be forced to sell it for hard currency rather than hold it off the market. The amounts involved are so huge, both in terms of the USSR's gold and convertible currency reserves and its ability to provide wanted goods to

the oil producers, that the Soviet Union would not be able to purchase a major portion of Near East oil for its own account.[7] Likewise, the Soviet Union would be hard put to persuade most of Europe's Middle East suppliers to withhold their oil for any length of time since oil revenues are so important to their economies and national goals. Middle Eastern oil becomes valuable only when it is processed, transported, and marketed.

30. It has not been Moscow's practice, so far as we can ascertain, to urge any of the Middle Eastern oil producing states to nationalize foreign-owned oil concessions or to cut off exports. What the Soviets have made clear is their willingness to assist state-owned oil companies. For example, Moscow has drilling contracts with the Egyptian, Syrian, Algerian, and Iraqi national oil companies, although it has become only peripherally involved in production or marketing. Should one or another of the producing states seize foreign-owned oil properties in the future, there is little doubt that, if asked, Moscow would provide some aid. But for many years the heavy Soviet commitment to the development of its domestic oil resources probably would limit the scope of such aid.

31. The actual Soviet role in the Middle Eastern oil industry over the next five years may take several forms. The USSR will probably continue to be involved in exploration for oil and in production, as it is, e.g., in Iraq at present. Moscow could become involved as well in the construction of pipelines—the Soviets are building part of the Iranian-Soviet natural gas line and may build an oil pipeline in Syria. Thus, it is possible in the long run for the Soviets to gain an increasingly significant position in the oil industry in the Arab states.

IV. CHANGING PATTERNS OF OWNERSHIP AND PRODUCTION

32. Irrespective of Soviet oil policies, the next five to 10 years are going to see growng pressures for change in the relationship between the Western producing companies and the oil states. The host countries will grow more determined to control the production of their own oil. Middle East governments will insist on some form of participation in all new concessions granted, with the private oil companies often relegated to the role of minority partners with, or service contractors producing oil for, these national companies. In some cases, presently operating companies may be forced into alteration of their concessionary status or may be replaced by other companies operating as contractors. Or parts of their facilities (e.g., pipelines and terminals) may be nationalized.

33. One type of participation in production and marketing is the joint venture, wherein the country with the oil resources forms a partnership with one or more foreign oil companies to exploit some part of the country's oil resources.

[7] Soviet gold holdings are estimated at $1.6 billion, palpably insufficient to carry out a preclusive action. Their holdings of convertible currency are negligible. Payments by foreign oil companies to Middle Eastern governments in 1969 totalled nearly $5 billion.

One of the partners is a state agency, usually the national oil company, which holds an equity interest in the concession; the other is the foreign oil company, which owns the remaining interest, provides technical expertise, and often markets most of the oil produced. Algeria's national oil company, SONATRACH, for example, participates in a number of such joint ventures.

34. National oil companies are also increasingly turning to exclusive exploration for and production of oil on their own. The expertise they may lack is provided by expatriate technicians, drilling companies, and the like, hired on contract. Lying somewhere between this "self-sufficient" national oil company and the joint venture is the service contract, under which a foreign oil company is hired to take complete charge of oil operations in a particular area of a host country. The foreign company explores for and produces oil for the account of the national company and in return is usually given the right to buy part of the produced oil at an attractive price. The foreign company also usually undertakes, if and when requested, to find buyers for at least part of the national company's share of the oil.

35. A new practice, still in the early stages of development, is that of direct bilateral marketing contracts between national oil companies and consumer countries.[8] Over the next five years this type of arrangement will probably increase markedly, in large part because national oil companies are growing in the producing countries; such arrangements will represent but a small part of world oil trade, however. Several national oil companies in the Arab states and Iran deal directly with state-owned oil corporations. Examples of such bilateral contract arrangements have been those between Iran and Romania, Saudi Arabia and Romania, Libya and Austria, Kuwait and Spain, and Egypt and Communist China. Iraq has also made a similar arrangement with the Soviet Union, in return for assistance in producing oil.

36. By the end of the 1970s, a substantial portion of Middle East oil production could be under the control of host governments—through joint ventures, service contracts, independent operations, and, possibly, partial or complete nationalization of present concessions. While nationalization of Middle Eastern oil does not necessarily imply denial of oil to Europe, Japan, or even the US, it could bring about substantial changes in the role of the international oil companies. The basic raison d'etre for these companies lies in their ability to assure to consumers a smooth, continuing, and reliable flow of oil. They can replace from another concession (or by purchase from other companies) the production from any one country which might have been interrupted for technical or political reasons. They also own or have under charter most of the Free World tanker capacity, and they own a large proportion of the refining, transportation, storage, and distribution facilities of Western Europe. For these reasons (and the cost of any alternatives), European countries have relied on the companies for the bulk of their mushrooming fuel requirements. We be-

[8] In virtually all cases, the government of the consumer country is involved in the arrangement to some degree.

lieve that they will continue to do so unless the international companies are unable to meet the need.

37. If nationalization should occur on such a scale that the companies could not obtain sufficient oil from alternate sources and if the companies then refused to deal with the holders of their former concessions, consumer country governments would feel compelled to step in, for example to arrange the terms of oil purchase. The companies would almost certainly retain their roles as transporters, refiners, and distributers of oil. Moreover, the desire to protect their vital interests would impel consumers to seek multiple sources of supply to avoid the potential hazards of relying on a single source. Producing countries would look for multiple markets for analogous reasons.

V. CIRCUMSTANCES IN WHICH THE FLOW OF MIDDLE EAST OIL MIGHT BE INTERRUPTED

A. General Considerations

38. For the most part, oil has flowed freely from the Middle East to markets abroad since 1945. There was one instance of complete long-term shutdown of a major oil producer. In 1951-1953, the Anglo-Iranian concessionary company boycotted the nationalized Iranian oil industry so successfully that no Middle Eastern host country has tried outright nationalization of an oil concession since. There have been other interruptions, however. During the 1956 war between Egypt and Britain, France, and Israel, the former blocked the Suez Canal and the Syrians blew up the Iraq Petroleum Company (IPC) pipeline which extends from Iraq to the Mediterranean. Both were out of use for about six months. Syria closed the IPC line for three months in late 1966 and early 1967. The 1967 Arab-Israeli war caused the closure of the Canal, and certain producing countries imposed a temporary selective embargo of oil shipments. TAPLINE has been cut twice—once by sabotage and once by accident—in the past two years. Libya imposed production cutbacks in 1970.

39. Of these interruptions, several took place in the context of the Arab-Israeli dispute. But even in 1956 and 1967, the Egyptians blocked the Suez Canal not so much to interrupt oil flow as to prevent the forces invading their country from using it. So also the Syrians closed the pipeline in 1956 with a view to harming Iraq as well as to hurting UK oil interests. Several other interruptions of oil by Arabs were not connected with the Israeli issue, e.g., Syria's closing of pipelines in 1967 and 1970 and the Libyan production cutbacks.

40. This record suggests that the host countries, irrespective of their political ideology, have been motivated primarily by a desire for increased revenue and, hence, increased oil production. Of the radical regimes which have appeared in the Arab world since 1950, none has chosen to risk the loss of major oil revenue by using oil for political purposes in disputes with Western countries. Qaddafi's seizure of the non-producing portions of the concession area of the [illegible] 1960 may have been an exception. This action did not interrupt production or

revenue, but it effectively retarded the growth of Iraqi oil exports and revenues for several years. By and large, the record shows clearly that it is circumstances of rapid change and high emotion—for example, the 1956 and 1967 Arab-Israeli wars—which are likely to produce impetuous action by host countries against Western oil interests.

41. Oil producing countries have been willing to collaborate, for example in the Organization of Petroleum Exporting Countries (OPEC), in bringing pressures to raise per barrel oil revenues generally. Consistently, however, individual countries have been willing, in fact anxious, to take advantage of one another's difficulty in order to gain more total revenue by expanding output. (Kuwaiti and Saudi Arabian production grew rapidly while Iranian production was shut down in 1951-1953. Iran and other Gulf states have been eager to make up Libyan cutbacks in 1970.) Among the Arab states, the rhetoric of Arab solidarity masks the same low level of real cooperation in the oil sphere as it does in military or political matters. Finally, the record shows that the quest for revenues has often led the host countries and the producing companies to the verge of a total rupture in relations over financial negotiations; in the end, however, mutual dependence and financial self-interest have consistently prevented a complete break.

42. Many of these trends continue; the need for revenue and profits is the principal one. Each producing country has been aware that each of the large oil companies could replace its oil by expanding production elsewhere. This acts as a constraint on even radical regimes. States with conservative political regimes and with close political ties to Europe or the US—e.g., Iran and Saudi Arabia—are even more reluctant to interrupt oil supplies than are the radical states.

43. The Middle Eastern countries could hold Europe hostage if they could agree to suspend all oil shipments until their demands were met. In theory they could get enormously increased prices for their oil by so doing, but in practice they simply do not trust each other sufficiently to be able to form such a solid front. Indeed, we see little likelihood that cooperation among the various oil producing countries would ever get to the point where even two or three major oil producing countries collaborated in this fashion, although more limited cooperation seems likely to continue.

B. Special Cases

44. It is possible, however, that a major oil producing state could come to be ruled by a regime which was willing to cutoff oil production in order to gain its own ends. The case of Libya has illustrated this point during 1970. Libya's strongly nationalistic leadership forced the oil companies operating in the country to agree to a sharp increase in posted prices and tax rates, and hence in payments to the government. This was brought about by unilateral cuts in the companies' production of crude oil and threats to seize their concessions unless the government's demands were met. With a strong foreign

exchange reserve position adequate to last for a lengthy period, even if Libyan oil revenues were restricted or stopped, the Libyans were in a very favorable position to carry out this pressure tactic, since Libyan oil is close to European consumers and is highly desirable because of its low sulfur content. These factors, combined with a tight tanker situation, gave the companies little choice other than to agree to Libyan terms.

45. The Libyan situation could be repeated elsewhere, although it would seem that few oil producing states, radical or conservative, could find themselves in such a fortuitous combination of circumstances as the Libyans in 1970—being located close to the market, possessing a premium type of oil, having very large foreign exchange reserves, and being able to curtail or suspend production at a time when transportation problems put the international oil industry in a delicate situation. Similar action in the distant Persian Gulf area, for instance, probably would have less impact. But a combination of circumstances might bring another such act by some other highly nationalistic regime—possibly even by the Libyans again or by the Algerians.

C. The Arab-Israeli Issue

46. Three years of violent peace since Israel defeated its Arab neighbors in 1967 have left their mark on the oil situation in the Arab countries. The close association of the US with Israel, the existence of numerous armed guerrilla organizations, and the steadily increasing dependence of Europe on Middle Eastern oil have provided greater incentive to the Arabs to interrupt oil supply for political motives. We discuss in the next few paragraphs the types of developments in the Arab-Israeli situation which, in the light of these changes, could impede the flow of oil to NATO countries and/or Japan.

47. As long as Israel and its Arab neighbors remain at military loggerheads, there is considerable potential for interruption of oil flow by Arab actions. The likelihood of interruption would increase sharply in the event of a sudden deterioration in the situation, e.g., a new outbreak of major fighting. The magnitude and duration of any interruption would be influenced by the scale and nature of the fighting and by the degree of involvement (real or imagined) of the US and of particular NATO countries. The US and the UK are the most likely targets.

48. Some of the moves which Arab oil producing countries are likely to make in such circumstances would be more symbolic than real. Few Arab regimes would be willing, or indeed able, to go to the lengths of a total embargo of oil. Most of them need oil revenues to run the day-to-day operations of their governments. Saudi Arabia, for example, has already budgeted virtually all its anticipated annual oil income. The Algerians badly need large quantities of money to finance an ambitious development plan; oil revenues would not even cover three-fourths of their needs. Other Arab governments have similar desires. Of all Arab [illegible] whose special case is discussed above, can most easily afford to let politi[illegible] siderations rule over economic ones.

49. Arab oil producing countries would probably try to prevent their oil from reaching certain Western countries. But a selective embargo of oil is hard to enforce and would be ineffective. Once oil leaves the terminal in a producing country, the country has virtually no control over it. It can go to a distribution point and thence reach an embargoed country. An embargo on shipments to the US would be easier to enforce. Since most Arab oil reaching the US is shipped directly to East Coast ports, non-compliance with an embargo would be harder to conceal. Because the US now gets only 2.5 percent of its oil supplies from Arab states, an embargo in these circumstances would impose few strains on US domestic consumption. However, liftings of oil for US military forces could be affected and, although the quantities involved are relatively small, replacing them would involve some logistic complications.

50. Circumstances could develop, moreover, in which one or more Arab oil producing countries might move against US-owned oil producing companies. Participation of US military units with Israel in fighting with the Arabs, for example, would probably occasion seizure of most producing companies. Such devices as partial or complete nationalization, or a prohibition against repatriation of profits could hurt the US badly. (US oil operations in the Middle East brought some $2 billion net inflow to the US balance of payments in 1969.) Similar moves are possible against British companies (whose contributions to the UK's balance of payments is considerably greater than in the case of the US) and are conceivable against other European countries; but most of the latter are unlikely targets in the context of Arab-Israeli hostilities.

51. Should one or more Arab states seize all US (and/or UK) oil operations, there would be serious disruptions in oil shipments, which could last for months. However, consumers must have the oil and—except for Libya—the producing countries must sell it fairly promptly in order to finance their economies. We believe that, in the event a country seized a company or companies which produced substantial quantities of oil not replaceable from other sources, affected NATO countries would find themselves compelled fairly speedily to make other arrangements to obtain the oil they need. We believe that, in most cases of disruption, a near normal flow of oil would be restored before many months had passed.

52. The Arab-Israeli situation has potential for yet another means of interrupting oil flow, i.e., sabotage by the Palestinian guerrillas. There have been a few minor instances of this sort already, and US and UK oil companies are likely to be targets of sabotage in the years ahead. Oil fields, storage tanks, loading facilities, tankers, and the like are vulnerable in varying degrees. It is relatively simple to blow up a pipeline or a wellhead, but these are also relatively easy to repair. Although repeated acts could be costly to the company involved, this type of sabotage is not likely to interfere more than marginally with oil shipments. A major shutdown of a company's operations would require sophisticated demolition of key units, e.g., destroying a large part of a tank farm, rendering a loading pier unusable for an extended period, or knocking out an electric

power plant. The oil companies and the host countries would, of course, guard against such actions, but they would be unable to protect against all contingencies.

53. In the sabotage operations they have tried so far within Israel and Israeli-occupied territory, the Palestinian guerrillas have struck at targets of opportunity rather than at targets of importance. We believe that, generally speaking, they would do the same if they turned more of their attentions to oil installations, especially as oil companies and local governments are taking steps to guard critical installations. To inflict damage heavy enough to interrupt a significant portion of oil flow would require a high level of competence in sabotage operations. We cannot judge the actual competence the fedayeen have or are likely to acquire. It should be noted, however, that many Palestinians work in Middle East oil companies, and they are a potential source of technical information for the fedayeen and of access to oil installations. Finally, while we judge it unlikely that any Arab country would destroy its own oil industry or sabotage another's, the fedayeen do not have this inhibition.

D. Interstate Political Rivalry

54. The desire to put pressure on Iraq for political reasons has figured in Syria's two closures of the IPC pipeline in 1956 and 1966-1967. This desire could cause Syria to close this line again. The two countries are ruled today by mutually antagonistic Baath Parties, and antipathy between Baghdad and Damascus has continued under a variety of regimes. Should the Syrians come to believe that, for example, Iraq was trying to overthrow their government, Damascus would probably retaliate. Since strong Syrian-Iraqi antagonism is likely to endure, we rate closing of the IPC line—for at least a period of months—as likely sometime in the next five years.

E. In Sum

55. We believe that, on the whole, oil producing countries will continue to put their own financial needs ahead of ideology and politics and that they will not attempt to deny, for more than a short period, significant quantities of oil to Europe or Japan on political grounds. There are other forces in the area, however, not under the constraints that affect the oil producing countries. The possibilities for interruption are so many, the political emotions so prominent, and the resentment against US policies—already strong and deep in many Arab states—so likely to grow over the years ahead, that partial interruptions of oil flow to NATO and to the US will probably occur during the next five years. Short of major Arab-Israeli fighting, such interruptions are likely to be temporary and to involve relatively small fractions of European supply; they might be varied in cause, as well as effect. Among the possibilities are a Syrian closure of the IPC pipeline and fedayeen sabotage of oil facilities. In the event of major Arab-Israeli fighting, some interruption of oil shipments seems almost certain and we would not rule out seizure of US oil interests.

ANNEX

CONSEQUENCES OF CERTAIN INTERRUPTIONS IN OIL FLOW

1. We discuss in this annex the consequences of the disruption of oil flow in the following circumstances: (a) Iraq Petroleum Company (IPC) pipeline shut down, (b) Libyan and Iraqi production stopped completely, (c) production from all Arab states stopped. The discussion assumes a seven percent average annual growth in aggregate world demand; it assumes that the Suez Canal remains closed and that TAPLINE does not reopen, it also assumes that a substantial part of the combined carrier fleet would be available for oil service. The specific details are those as of the second half of 1970, but we have tried to give as much precision as we could to the consequences of interruptions over the period to 1975. Generally speaking, the consequences of the interruptions posited in Cases I and II would be most severe if they occurred within the coming 12 months. Beginning in the second half of 1971, there will be more spare tanker capacity, in the event of an interruption in oil flow from some producers. However, the magnitudes of oil involved would be progressively greater as the years pass, and the dependence of certain European countries on particular oil producing countries might vary by a few percentage points; Iraqi oil production, and perhaps Libyan as well, is likely to grow below the average. Nonetheless, the overall patterns will remain.

A. Case I: The Iraq Petroleum Company Pipeline Closed

2. The IPC pipeline system currently delivers about one million barrels per day (bpd) of oil to terminals at the eastern Mediterranean. About 120 T-2s move this volume of oil to southern Europe. There is sufficient oil available from other sources to make up for this loss. However, if the loss was to be made up from Persian Gulf sources, about 720 T-2s would be required for this movement. If the event should occur in the next few months there would be insufficient transport capacity to meet the additional tanker demand (600 T-2s), even if 100 percent of the combined carrier fleet were put in oil service. By the end of 1971 the contingency could be met, if the tanker fleet were augmented by 50 percent of the combined carrier fleet.

B. Case II: Interruption of All Libyan and Iraqi Oil

3. Simultaneous interruption of all Libyan and Iraqi oil flow would take 4.5 million bpd off the market. All but .5 million of this is short-haul crude available at Mediterranean terminals. About 700 T-2s presently suffice to haul this oil from Mediterranean terminals to Europe, but some 2,900 T-2s would be needed to haul replacement oil from the Persian Gulf. The difference of 2,200 T-2s is far beyond the limited spare tankerage forecast for any time in the next five years. In fact, however, spare capacity in the Gulf is only about 3 million bpd, and even this would require about 1,500 T-2s, in addition to the 700 T-2s released from short-haul service. Although some replacement oil would probably come from sources closer to Europe, more tankers would be needed than would be available. Hence, there would be oil shortages. On an average,

the non-Communist world would be short of its needs by 8 percent for the first few months, until the tankers released from Libyan and Iraqi service could be rerouted to other longer haul sources. Western Europe would bear the brunt, since it is the destination of most Libyan and Iraqi oil.

4. The overall shortage of oil supply would persist well beyond three months. The shortage would require a reduction in oil consumption of about five percent world-wide. However, if cutbacks were not made so as to provide an equitable share of available supplies to all consumer countries, and Western Europe and Japan were compelled to bear the total effects of the loss of Libyan and Iraqi oil, reduction in consumption in these areas might have to go as high as 15 percent for several months.

5. After six months of continued denial of Libyan and Iraqi oil, supplies from other producing sources could be increased sufficiently to bring world-wide supply and demand essentially into balance. There would, however, continue to be a shortage of tankers to haul the oil. The reduction in deliveries of oil would force Western Europe to reduce consumption by about seven percent (or to draw down stocks by the same amount), assuming that the US did not reduce its own consumption and continued to use oil at presently estimated rates.

C. Case III: Total Denial of All Arab Oil

6. The denial of 14.5 million bpd for more than several weeks would be catastrophic. The oil shortage would amount to about 40 percent of production in the non-Communist world. Europe and Japan would have to ration oil consumption drastically. Their respective industries would suffer severely, and the economic consequences of reduced output on a massive scale beggar the imagination. In the short term, little if any improvement in the situation could be expected. After six months or so, forced draft production increases from non-Arab oil sources and reduction of consumption in the US could ease the situation somewhat. Total oil production in the non-Communist world would probably be off by 30-35 rather than 40 percent. Drastic oil shortages, ranging from 45 percent of consumption in Europe to 55 percent of consumption in Japan, would persist.

TABLE I

OIL CONSUMPTION IN THE NON-COMMUNIST WORLD: FORECAST FOR 1970 AND 1975 [a]

Area	Thousand Barrels Per Day			
	1970	1975		
		Average Annual Growth Rate [b]		
		6 percent	7 percent	8 percent
Free World Total	40,105	53,670	56,250	58,930
Western Europe	12,400	17,300	18,200	19,000
NATO	10,500	14,700	15,400	16,100
Other	1,900	2,600	2,800	2,900
Japan	3,800	7,000	7,300	7,700
US	14,600	17,200	18,000	18,900
Other	9,400	12,200	12,800	13,300

[a] Because of rounding, components may not add to the totals shown.

[b] These growth rates are forecast for *total* non-Communist consumption; growth rates vary for individual areas and the volumes shown under each forecast reflect the shares that each area is expected to represent of total consumption in 1975.

TABLE II

TANKER DEMAND IN THE NON-COMMUNIST WORLD, ASSUMING AN AVERAGE GROWTH AND CONSUMPTION 1970-1975 [a]
(In T-2 Equivalents)

	Average Annual Growth Rate [b]		
	6 percent	7 percent	8 percent
Mid-1970	10,140	10,140	10,140
End of 1970	10,570	10,570	10,570
1971	11,200	11,310	11,420
1972	11,880	12,100	12,330
1973	12,590	12,950	13,320
1974	13,340	13,860	14,380
1975	14,140	14,820	15,530

[a] All data are rounded to the nearest tens.

[b] Tanker demand based on average annual rates of growth in oil demand in non-Communist world.

TABLE III

ESTIMATED GROWTH—FREE WORLD TANKER FLEET
1969-1973 [a]
(In T-2 Equivalents)

	Date		Oil Tankers	Combined Carriers
1969	As of 31 December		8,801	824
1970	To 30 June	—Deliveries [b]	594	151
		Losses [c]	(44)	—
	As of 30 June		9,354	975
	To 31 December	—Deliveries [b]	730	100
		Losses [c]	(50)	—
	As of 31 December		10,030	1,080
1971		—Deliveries [b]	1,350	350
		Losses [c]	(100)	—
	As of 31 December		11,280	1,430
1972		—Deliveries [b]	1,000 [d]	390
		Losses [c]	(100)	—
	As of 31 December		12,180	1,820
1973		—Deliveries [b]	840	320
		Losses [c]	(100)	—
	As of 31 December		12,920	2,140

[a] Based on data from *World Tanker Fleet Review*, 30 June 1970. Includes tankers of 10,000 DWT and over. Does not include 375 T-2s, about 4 percent of the total world tanker fleet, under control of Communist countries. Figures after 30 June 1970 are rounded to the nearest 10.

[b] Deliveries after 30 June 1970 are estimates of probable deliveries, reflecting the cumulative effects of slippage of 20 percent in delivery schedules. Vessels representing slippage in one period were added to scheduled deliveries in the following period and the total was reduced by 20 percent to derive probable deliveries for the later period.

[c] Losses—scrapping and accident—are arbitrary, being somewhat lower than for the 12 months ending 30 June 1970.

[d] The lower deliveries listed for 1972 and 1973, as compared to 1971, are accounted for by obligations of shipyards for other types of vessels.

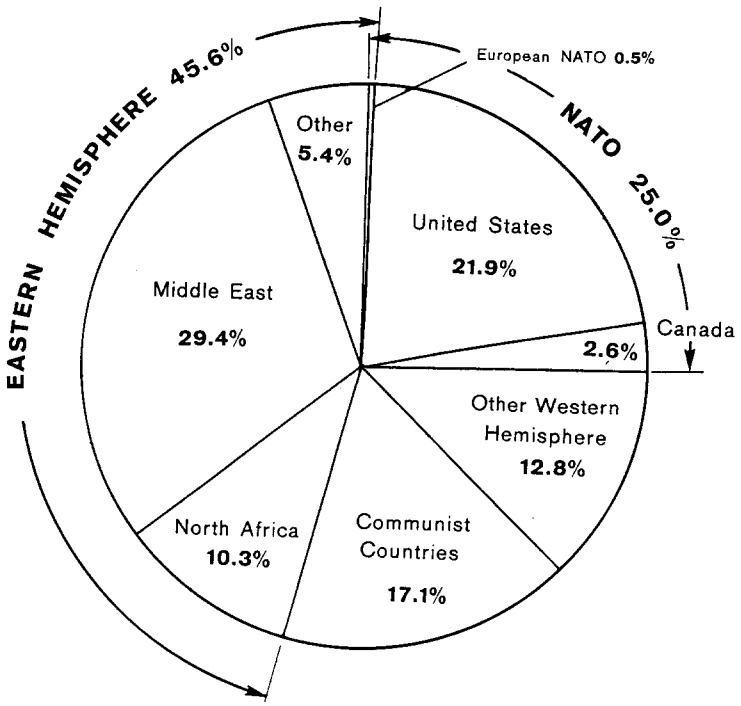
TABLE IV

WORLD CRUDE OIL PRODUCTION [a]
1960–1970 (SELECTED YEARS)

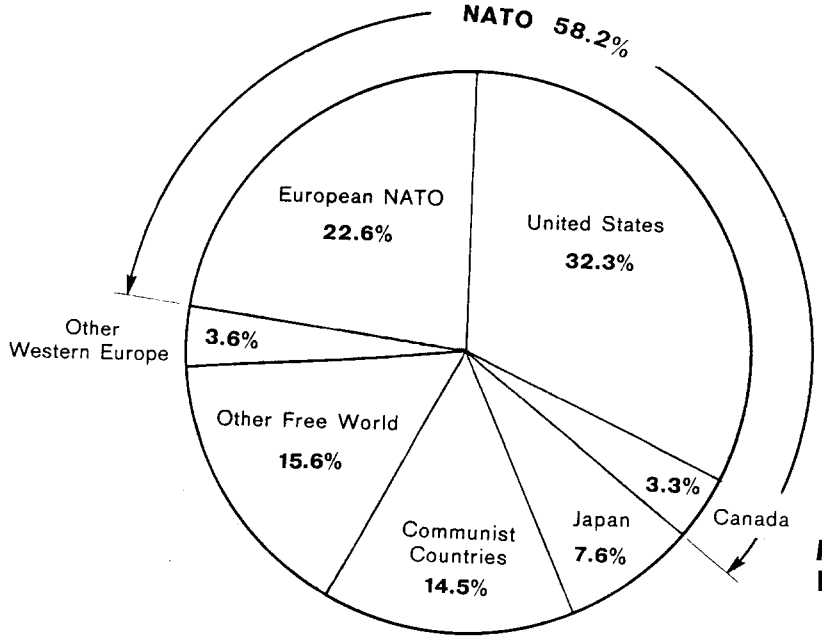
	1970 (ANNUAL RATE BASED ON FIRST HALF)		1969		1965		1960		PERCENT INCREASE 1970/1960	
	Thousand Barrels Per Day	Percent of Total	Thousand Barrels Per Day	Percent of Total	Thousand Barrels Per Day	Percent of Total	Thousand Barrels Per Day	Percent of Total	Average Annual	Total
World Oil Production	44,500	100.0	42,020	100.0	30,475	100.0	21,050	100.0	7.7	111
Free World	37,000	83.1	34,830	82.9	25,080	82.3	17,695	84.1	7.7	109
Eastern Hemisphere	21,000	47.2	19,145	45.6	11,655	38.2	6,365	30.2	12.7	230
Middle East	13,390	30.1	12,355	29.4	8,340	27.4	5,235	24.9	9.8	156
Iran	3,740	8.4	3,375	8.0	1,905	6.2	1,060	5.0	.....	.....
Saudi Arabia	3,630	8.2	3,245	7.7	2,205	7.2	1,315	6.2	.....	.....
Kuwait	2,920	6.6	2,773	6.6	2,345	7.7	1,685	8.0	.....	.....
Iraq	1,510	3.4	1,525	3.6	1,315	4.3	955	4.5	.....	.....
Abu Dhabi	610	1.4	600	1.4	280	0.9	0	0	.....	.....
Qatar	360	0.8	355	0.8	230	0.8	175	0.8	.....	.....
Oman	350	0.8	320	0.8	0	0	0	0	.....	.....
Other Middle East	270	0.6	162	Negl.	60	0.2	45	0.2	.....	.....
North Africa	4,800	10.8	4,305	10.3	1,905	6.2	245	1.2	34.6	1,859
Libya	3,550	8.0	3,110	7.4	1,220	4.0	0	0	.....	.....
Algeria	950	2.1	955	2.3	560	1.8	185	0.9	.....	.....
Egypt	300	0.7	240	0.6	125	0.4	60	0.3	.....	.....
Nigeria	900	2.0	545	1.3	275	0.9	20	0.1	.....	.....
Indonesia	850	1.9	715	1.7	480	1.6	415	2.0	.....	.....
Other Eastern Hemisphere	1,060	2.4	1,225	2.9	655	2.2	450	2.1	.....	.....
Western Hemisphere	16,000	36.0	15,685	37.3	13,425	44.0	11,330	53.8	3.5	41
United States	9,600	21.6	9,215	21.9	7,805	25.6	7,035	33.4	.....	.....
Canada	1,230	2.8	1,097	2.6	935	3.1	540	2.6	.....	.....
Venezuela	3,700	8.3	3,640	8.7	3,505	11.5	2,845	13.5	.....	.....
Other Western Hemisphere	1,470	3.3	1,733	4.1	1,180	3.9	910	4.3	.....	.....
Communist Countries	7,500	16.9	7,190	17.1	5,395	17.7	3,355	15.9	8.4	124

[a] Because of rounding, components may not add to the totals shown. Production does not include natural gas liquids, which in 1970 may be around two million bpd.

WORLD CRUDE OIL PRODUCTION, 1969



WORLD OIL CONSUMPTION, 1969



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Because of rounding, percentages may not add to 100%.

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