

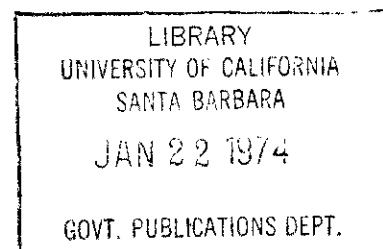
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THE ARAB OIL EMBARGO AND ITS IMPACT ON
WINTER FUEL SHORTAGES

DAVID M. LINDAHL
Analyst in Environmental Policy
Environmental Policy Division

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I. INTRODUCTION

The United States has been concerned over the possibility of a winter fuel crisis for the past year. Rising demand and falling supply have created a situation in which a shortage was extremely likely. The Arab oil cutoff has made that shortage inevitable and threatens to produce economic dislocations as well as personal inconvenience and discomfort. The factors behind the shortage, its impact on the Nation, and possible corrective measures are complex and subject to extensive analysis. This report, however, is a brief overview which is intended to place these actions and reactions in perspective.

II. DOMESTIC DEMAND

For the past several years, shortages of fuel oil have occurred during the winter months. Part of the recent shortages can be attributed to the appearance of new users who were unable to obtain natural gas because of curtailments starting in 1971 and were not permitted to burn high-sulfur fuels because of air-quality regulations. The shortage was particularly acute during last winter (1972-1973) because demand rose much more rapidly than did supply. The shortage could have been much worse, however, had it not been for the unusually mild weather experienced by many parts of the country.

Fuel oil demand for the winter of 1973-1974 is expected to be higher than for last year. The Department of the Interior has estimated that distillate demand this winter will increase 10.4% over last

year (4,048,000 b/d in 1973/1974 compared to 3,668,000 b/d in 1972/1973). ^{1/} If temperatures are colder than normal and increase demand by 3.9%, an extra 120,000 b/d would be required to prevent a shortage. ^{2/} The effect of cold weather on the demand for distillate fuel oil can be seen in Table 1.

Table 1. MONTHLY CONSUMPTION OF DISTILLATE FUEL OIL UNDER DIFFERENT ASSUMPTIONS OF WINTER WEATHER (CONSUMPTION IN MILLIONS OF BARRELS)

| | OCT. | NOV. | DEC. | JAN. | FEB. | MARCH |
|--|------|-------|-------|-------|-------|-------|
| <u>CASE A.</u> 6% Increase Over Last Winter | 87.2 | 102.0 | 131.3 | 132.0 | 115.6 | 109.7 |
| <u>CASE B.</u> Warm Winter | 75.2 | 87.0 | 115.6 | 118.1 | 101.1 | 97.0 |
| <u>CASE C.</u> Cold Winter | 89.9 | 110.3 | 148.1 | 153.7 | 131.1 | 119.5 |
| <u>CASE D.</u> Warm Early/ Cold Late Winter | 79.6 | 93.9 | 126.8 | 144.4 | 121.7 | 113.0 |
| <u>CASE E.</u> 10% increase Over Last Winter | 90.5 | 105.9 | 136.3 | 137.0 | 120.0 | 113.8 |

Source: Winter Heating Outlook, P.K. Verleger, Jr., and S. Haltmaier, DRI Review, Oct. 10, 1973, p. 3.

^{1/} The Distillate Fuel Oil Situation, Winter 1973-74, Dept. of the Interior, Sept. 15, 1973, p. 3.

^{2/} Ibid., p. 4.

In addition to the normal growth rate in heating oil demand and the possible effects of unseasonably cold weather, an increase of 130,000 b/d may result from the curtailment of natural gas sales because of shortages. ^{3/} The combined total of these demand factors indicates a distillate demand of 4,048,000 b/d over last year's figure of 3,668,000 b/d. This increase of 380,000 b/d, shown in Table 2, does not include crude oil or other refined products which would increase the total demand to over 17,000,000 b/d.

The U.S. demand for petroleum products of all types is estimated by the Bureau of Mines at 17,455,000 b/d in 1973. The demand in 1974 is predicted by the Independent Petroleum Association of America (IPAA) to rise to 18,525,000 b/d. ^{4/} Much of this increase can be attributed to the greater use of fuel oil, but demand for other petroleum derivatives is also expected to grow at comparable rates. The requirements for gasoline, propane, and petrochemical feedstocks are unprecedented, and shortages are likely to recur for those products as well as for fuel oil.

^{3/} The Distillate Fuel Oil Situation, p. 4.

^{4/} Report of the Supply and Demand Committee, IPAA Houston Meeting, Oct. 21-23, 1973, p. 7.

TABLE 2

U.S. Distillate Demand by Quarters and Winter Season
1971 through 1974

Millions of Barrels Daily

| <u>1971</u> | <u>1972</u> | <u>1973</u> | <u>1974</u> |
|-------------|-------------|-------------|-------------|
| 1Q 3.695 | 1Q 3.788 | 1Q 3.885 | 1Q 4.570 |
| 2Q 2.258 | 2Q 2.406 | 2Q 2.500 E | 2Q 2.630 |
| 3Q 1.886 | 3Q 2.011 | 3Q 2.150 F | 3Q 2.264 |
| 4Q 2.955 | 4Q 3.458 | 4Q 3.538 | 4Q 3.680 |

| <u>Winter Season</u> | <u>Millions of Barrels Daily</u> | <u>% Increase</u> |
|----------------------|--------------------------------------|-------------------|
| 71/72 | 3.369 | 3.7 |
| 72/73 | 3.668 | 8.9 |
| 73/74 | 4.048 | 10.4 |

E - Estimated

F - Forecast thereafter

Source: The Distillate Fuel Oil Situation Winter 1973-74, Department of the Interior, September 15, 1973.

III. DOMESTIC SUPPLY

The United States currently produces less than 70% of the petroleum it needs to meet domestic demands. With the exception of the addition of the Alaskan North Slope fields, productive capacity has been dropping as has actual production. During the shortage of last winter, it was apparent that the oil industry no longer had the capability of increasing production to match the peak demand.

This trend is likely to continue indefinitely. Domestic production of petroleum for 1973 has been estimated by the Bureau of Mines to be 10,961,000 b/d, compared to a demand of 17,455,000 b/d. Of the 6,494,000 b/d shortfall between domestic demand and supply, 6,251,000 b/d were expected to be made up by imports, leaving a shortage of 223,000 b/d. The IPAA predicted that domestic production would drop to 10,788,000 b/d, even though demand is likely to rise over 1,000,000 b/d compared to last year. ^{5/} Of the 7,737,000 b/d deficit forecast between supply and demand, 7,435,000 b/d were expected, before the Arab oil cutoff, to be made up with imported oil, leaving a net shortage of 302,000 b/d.

The most immediate supply problem is for fuel oil because of the onset of the heating season. Stocks of distillate fuel in November (203,656,000 bbl) are only slightly higher than they were a

^{5/} Report of the Supply and Demand Committee, p. 7.

year ago (197,750,000 bbl.). ^{6/} The gain in supply (3%) has been more than offset by increased demand (10%) with the net effect being a shortage 7% worse than last year.

The shortage of residual fuel oil, which is used primarily by electric utilities and heavy industry as a boiler fuel, is even more acute. Stocks of residual fuel oil on Oct. 26, 1973 were only 56,891,000 bbl. in contrast with 63,990,000 bbl. a year ago. ^{7/} With greatly increased demand pressures and lower stocks, a serious residual shortage appears inevitable. A further complication is that most of the residual fuel oil used in the U.S. is imported, and reductions in foreign production may worsen the supply situation here.

IV. IMPORTS

A. REQUIREMENTS

As has already been indicated, imports figure prominently in the supply/demand situation for petroleum. U.S. dependence on foreign sources of oil has grown rapidly in recent years, and it would now be impossible to prevent severe shortages without substantial imports. In 1972 imports accounted for 18.8% of the U.S. crude distillate supply (see Table 3). ^{8/} Imports now constitute over one-third of our total

^{6/} API Weekly Statistical Bulletin, Oct. 26, 1973, p. 2.

^{7/} Ibid., p. 2.

^{8/} The Distillate Fuel Oil Situation, p. 4.

TABLE 3

CRUDE OIL IMPORTS INTO THE U.S.

| COUNTRY OF ORIGIN | ANNUAL TOTAL FOR 1972 (In 42-Gallon Barrels) | POSTED PRICE PER | | U.S. EXPORT EMBARGO | MIDDLE EAST |
|----------------------|---|---------------------|----------------------|------------------------|------------------------------|
| | | BARREL, OCT. 1, '73 | BARREL, OCT. 31, '73 | | MONTHLY PRODUCTION CUT |
| Canada | 312,440,000 | | | | |
| Columbia | 1,695,000 | | | | |
| Ecuador | 5,331,000 | 3.600 | 5.250 | | |
| Venezuela | 93,300,000 | 4.610 | | | |
| Algeria | 31,753,000 | 5.000 | 7.000 | 100% | 10% |
| Egypt | 3,091,000 | | | 100% | 5% |
| Libya | 40,069,000 | 4.604 | 8.925 | 100% | 5% |
| Nigeria | 88,887,000 | 5.000 | 5.000 | | |
| United Arab Emirates | 26,873,000 | 3.110 | 5.538 | 100% | 5% |
| Iran | 49,700,000 | 2.995 | 5.091 | | |
| Iraq | 1,315,000 | | | 100% | 10% |
| Kuwait | 13,205,000 | 2.884 | 4.903 | 100% | 10% |
| Qatar | 1,263,000 | 3.143 | 5.343 | 100% | 10% |
| Saudi Arabia | 63,626,000 | 2.884 | 4.903 | 100% | 10% |
| Indonesia | 59,633,000 | 5.000 | 5.000 | | |
| Others | 18,954,000 | | | | |
| COMBINED TOTAL | 811,135,000 | | | | |

CRS-5a

Note: Total does not include indirect imports of refined products made from Middle Eastern crude.
Source: API Annual Statistical Review, April 1973, p. 9-10; Oil and Gas Journal, Oct. 29, 1973, p. 50;
Oil Daily, Oct. 26, 1973, p. 6

petroleum consumption, and the trend is toward even greater dependence on foreign producers. By 1980 the U.S. may be importing over 50% of its oil. Most of that increase was expected to come from the Middle East because of its extensive reserves. The supply of some products such as residual fuel oil is already dependent on foreign production. The demand for residual oil in 1972, for example, was 925,647,000 bbl. Of this, 637,401,000 bbl. was imported, amounting to over two-thirds of the total.^{9/}

Because of the drop in domestic production and the increase in demand for petroleum products, an estimated 640 million barrels of crude oil will have to be imported during the last quarter of 1973 and the first quarter of 1974 to avert a serious shortage.^{10/} If available on the world market, this much oil would represent an increase of 50% over 1972 U.S. imports. The Middle East is currently the only producing area in the world that has the proven reserves and productive capacity to meet those increasing requirements. The added cost of the incremental imports over last year's total would depend upon the price per barrel (which is rapidly escalating upward) but would probably be near \$8 billion.^{11/}

^{9/} API Annual Statistical Review, April 1973, p. 45.

^{10/} Winter Heating Outlook, P.K. Verleger, Jr., and S. Haltmaier, DRI Review, Oct. 10, 1973, p. 6.

^{11/} Ibid., p. 6.

The level of imports needed to meet the demand for distillate fuel oil also will be substantial. The Department of Interior has estimated that if domestic refinery capacity is to be used as expected and inventories are to be maintained at a level of 100,000,000 barrels or above, then imports of distillate must average more than 650,000 b/d.^{12/} If the weather is exceptionally cold, imports of 800,000 b/d may be needed during the cold spells. Even in normal circumstances such quantities may not be available for the United States on world markets. During the shortage last winter, for example, distillates were imported at an average rate of 400,000 b/d. Most of that distillate (80 to 85%) came from refineries in the Caribbean, with the remainder imported from Europe. Most of the European distillate and a substantial amount of the Caribbean distillate was made from Middle Eastern crude oil.

It is unlikely that as much distillate fuel oil will be available from Europe as that obtained last winter. Europe imports more distillate than it exports, and was able to provide extra distillate last year only because of mild weather. The largest quantity of distillate that the U.S. could reasonably expect to obtain from Europe this season is 165,000 b/d.^{13/} A cold winter would reduce that amount considerably.

^{12/} The Distillate Fuel Oil Situation, p. i.

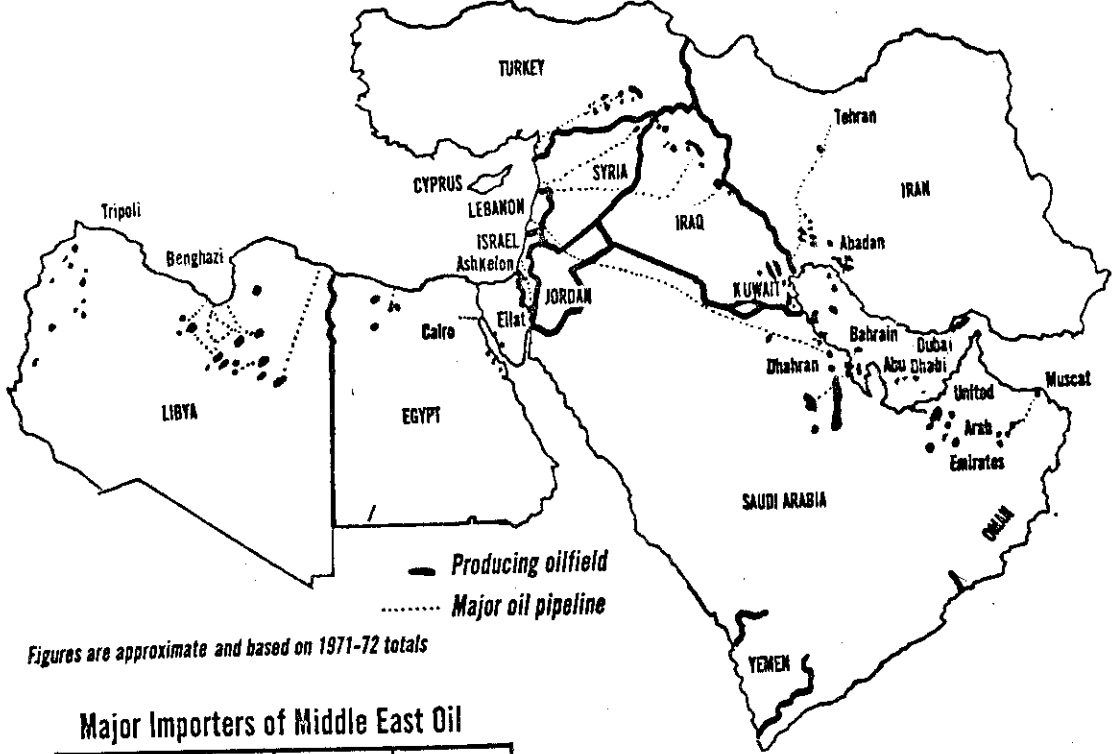
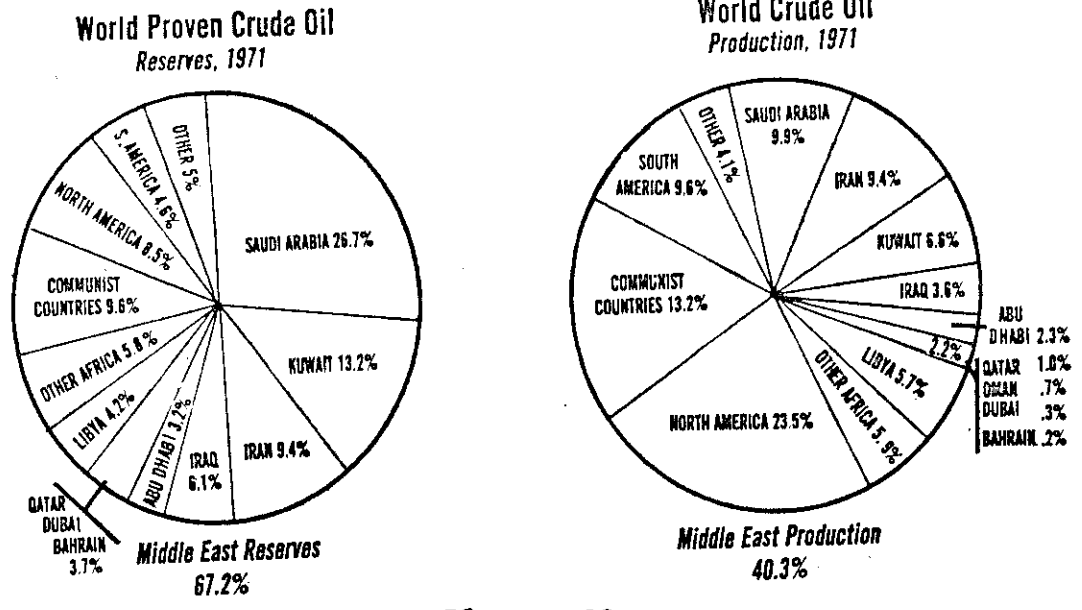
^{13/} Ibid., p. 12.

B. THE OIL PRODUCER'S BOYCOTT

The availability of oil to import into the United States has been drastically reduced as a result of renewed hostilities in the Middle East. The Arab countries that export oil have agreed to boycott the U.S. market in an attempt to influence U.S. policy towards Israel and generally to modify its Middle-Eastern policy. The use of oil as an instrument of diplomacy is not new, but it has never been applied as effectively on as large a scale as at present. The U.S. has been wholly cutoff from Middle Eastern oil, as has the Netherlands, because of its pro-Israeli policies. Canada has also been denied Arab oil for fear that it would send part of it to the U.S. The Arab states have also reduced production 10% initially for European customers and plan to cut it 5-10% each month thereafter. Additional cuts have been threatened and may be implemented. These actions are of vital concern to Europe and Japan where imports from the Middle East comprise 40%-85% of their petroleum supply (Fig. 1).

The Arab oil cutoff is certain to have a serious impact on the Nation's petroleum supply and upon the winter distillate inventories in particular. As Table 4 indicates, the 1972 shipments to the United States totaled 687,900 b/d, which was 5% of the U.S. distillate demand of 16,300,000 b/d. The level of imports in 1973, prior to the war, was much higher with Saudi Arabia exporting in July as much crude oil as all the Arab countries combined had exported in July of 1972. As Table 4 shows, imports of Arab crude oil in July were 2 1/2 times the rate a year earlier.

INTERNATIONAL DEPENDENCE ON MIDDLE EASTERN CRUDE OIL



Figures are approximate and based on 1971-72 totals

Major Importers of Middle East Oil

| Country | Oil Imports from Middle East (1000 bd) | Percentage of Total Oil Imports |
|----------------|--|---------------------------------|
| JAPAN | 3800 | 85% |
| ITALY | 2000 | 85% |
| UNITED KINGDOM | 1800 | 84% |
| WEST GERMANY | 1500 | 75% |
| FRANCE | 1200 | 62% |
| NETHERLANDS | 1200 | 80% |
| SPAIN | 600 | 81% |
| UNITED STATES | 380 | 10% |

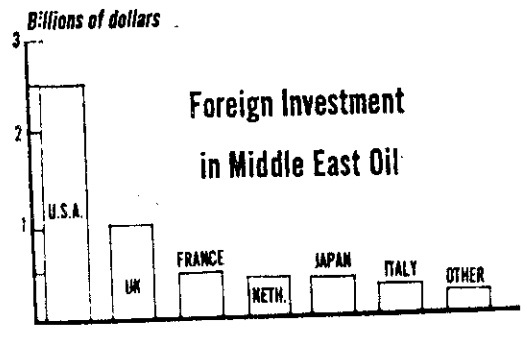


TABLE 4

| U.S. imports of Arab crude oil, July 1973 vs. June 1972 | | |
|---|---|------------|
| Producing country | Crude shipments to U.S. bbl/month | |
| | June 1972 | July 1973 |
| Nigeria | 2,380,000 | 4,595,000 |
| Egypt | | 653,000 |
| Iraq | | |
| Kuwait | 1,012,000 | 482,000 |
| Libya | 3,192,000 | 3,599,000 |
| Qatar | | 85,000 |
| Saudi Arabia | 5,145,000 | 19,958,000 |
| Tunisia | | 205,000 |
| United Arab Emirates | 1,452,000 | 3,169,000 |
| Total | 13,181,000 | 32,661,000 |

Source: Oil and Gas Journal, Oct. 15, 1973, p. 40.

* * *

C. SEVERITY OF THE SHORTAGE

When the production cutbacks and cutoffs were announced by the Arab oil-producing states, the initial reaction in the U.S. was that the loss of Mid-East supply was a minor complication that could be easily accommodated. It was reasoned that since only 2 1/2% of our oil consumption in 1972 was met with oil from the Middle East, the impact would not be very great. Those initial assessments, however, appear to be overly optimistic because they did not include several important considerations. First, the direct imports of Arab oil have averaged about 250% more for 1973 than for 1972, and were even higher in the period immediately preceding the cutoff. The direct imports of crude oil from the Middle East in 1973 amount to 1.1 million b/d

compared to the estimated U.S. demand of 17.5 million b/d.^{14/}

Second, the United States imports petroleum products, especially residual and distillate fuel oil, which are refined in Western Europe and the Caribbean from Middle Eastern crude oil. If both direct and indirect shipments of Arab oil are affected, the reduction in supply may amount to 3 million b/d or 18% of the U.S. daily demand. Third, Canada, which supplies the U.S. with more than any other country (1.1 million b/d in 1972), traditionally for geographical reasons has imported as much oil as it exported. Because Canada's producing areas are in Western Canada, it was expedient to sell the surplus oil there to the U.S. rather than to transport it to Eastern Canada. Now that Canada's imports are threatened, it has placed strict controls on oil exports and is planning to redistribute as much of its western production as is necessary to meet the requirements of its eastern provinces. The effect of this will reduce Canadian exports to the United States by a comparable amount (possibly 500,000 b/d), and probably would push the U.S. shortfall over 20%. Fourth, the general production cuts imposed by the Arabs have tightened world supply to the point where competition for the oil of Venezuela, Nigeria, Iran, Indonesia, and others may make it difficult for the U.S. oil industry to buy as much petroleum from those sources as it did last year. If the shortages resulting from normal demand growth, natural gas curtailments, low inventories, and an exceptionally cold winter are

^{14/} "U.S. Moves to Offset Loss of Arab Oil," Oil & Gas Journal, Oct. 29, 1973, p. 53.

added the total shortfall could be as much as 35%. While that is the worst possible case, it is unlikely that even an end to the Arab oil embargo and a relatively mild winter could reduce the shortage to 20% or less. That case, if it occurred, would minimize the gasoline problems that would otherwise develop next summer, but would come too late to prevent shortages this winter. The most likely prospect is for winter fuel oil shortages on the order of 25%.

Worldwide, the cutoff of Middle East oil has reduced world oil supplies by 4.7 million b/d.^{15/} It is expected that the production loss in November will be about 6 million b/d.^{16/} The Oil and Gas Journal reports that there is no alternate supply readily available to offset a reduction of this magnitude. Most non-Arab producers are already operating near capacity and are not likely to increase exports to the U.S., except for Indonesia which has offered to increase production slightly.

The impact of these shortages is certain to be felt by all consuming nations, but the U.S. and the Netherlands will likely be affected to the greatest extent, assuming that the complete embargo is not extended to other countries. Europe will be adversely affected since it gets approximately 80-85% of its oil from Arab states. The cutoff for Europe is not total, however, and many countries there have strategic reserves of approximately 90 days. The U.S., on the

^{15/} "World Shaken by Arab Oil-Export Cuts, Price Hikes," Oil and Gas Journal, Oct. 29, 1973, p. 49.

^{16/} "An Arab Oil Squeeze that Works," Wall Street Journal, November 6, 1973.

other hand, is now subject to a 100% embargo, has no strategic oil storage system, and expects domestic oil production to decline.

No one can say with certainty just how severe the shortage will be. It was widely predicted that there would be a fuel oil shortage this winter and that now appears to be inevitable. The foreign fuel oil that was imported last year will not be available this year because exporters face possible shortages in their own countries and could be cutoff entirely from Middle east oil if they transship crude oil or petroleum products to the United States.

The real effects of the cutoff have not yet been felt in the United States because oil that was shipped before the embargo is still in transit and the peak demands of the heating season will not be reached until late December. The shortage will be the most severe since World War II and will affect every energy consuming phase of American life. At the worst, some factories, schools, and businesses may have to close or limit operations and many personal activities may have to be curtailed. Many homes may be cold and many electric utilities may have to limit output because of fuel restrictions. If the shortage is severe and protracted, serious strains could develop in the U.S. economy.

The region of the United States that will probably be affected the most will be New England, and to a lesser degree, the upper Midwest. Half of the residual fuel oil imported to the East Coast is made from Arab oil. That oil is used primarily to produce 70%

of New England's electricity. If the oil supply is reduced by half, 35% of New England's generating capacity will be cut. Some power systems in New England are totally dependent on Mid-East oil and will have difficulty finding other sources, because residual fuel oil is not yet subject to mandatory allocation. The oil shortage problems of the Northeast and Midwest will be compounded by the fact that winters are usually colder there than in the rest of the country and consequently per-capita heating requirements are higher.

V. POLICY OPTIONS

The increasing U.S. dependence on foreign oil has greatly reduced the alternative courses of action available to the U.S. For the most part, it is unlikely that the two extreme options of total capitulation to Arab demands or of military intervention to restore supply lines would be used. The U.S. can respond in other ways that can be effective to varying degrees over both the short and long term.

A. INCREASED DOMESTIC PRODUCTION

An immediate increase in domestic production is, at best, only a partial solution. Certainly there is insufficient productive capacity, even including Naval Petroleum Reserves, to meet a shortfall of 4 to 4 1/2 million b/d. To the extent that this oil is available, however, the shortage can be reduced accordingly. During the oil shortage last winter, production controls were lifted on many U.S. fields but with only marginal success. It is doubtful that

U.S. production for this winter will match last year's total, let alone meet the greater demand of this year. The Oil and Gas Journal reported that U.S. oil fields do not have sufficient productive capacity to compensate for an Arab oil cutoff.^{17/} The Journal estimated that only 100,000 b/d of extra domestic production could be made immediately available. After 90 days, the Journal predicted, 250,000 b/d could be produced if pipeline capacity were increased, gas and brine-handling facilities were expanded. A maximum of 445,000 b/d could be obtained at the risk of reservoir damage, wasted natural gas through flaring, and pollution. This increase falls far short of the 1,053,600 b/d of crude oil imported from the Middle East in July 1973. It should also be noted that the 445,000 b/d increase is considered optimistic by many. The Texas Railroad Commission, which oversees the production of oil in Texas, has indicated that there is no excess capacity and that production could be increased only by damaging the reservoirs which would reduce even more the eventual production.^{18/} The major oil companies contend, on the other hand, that increased production is possible and have petitioned for increased allowables. Even the most optimistic estimates, however, predict that the cutoff will result in a substantial shortfall in supply at a time when inventories should be building up for the high demands of winter's heating season.

^{17/} "U.S. Fields Unable to Fill Gap If Arab Oil Is Cutoff," Oil and Gas Journal, Oct. 15, 1973, p. 39.

^{18/} Ibid., p. 40.

B. STRICT CONSERVATION MEASURES

Mandatory allocations of distillate fuel oil and propane were implemented earlier this year to deal with the predicted winter shortage. As the President indicated in his message of November 8, 1973, the Arab oil cutoff may require more extreme measures, and rationing may be necessary. Senator Henry M. Jackson has introduced a bill (S. 2176) which he claims could result in savings or additions to supplies of over 3 million b/d within 5 months.^{19/} The proposed legislation would require a declaration of national emergency when the shortage exceeds 5%, and would direct the President to issue requirements for rationing and conservation plans to be developed by state and local governments. The goal of the conservation plans would be to reduce energy consumption by 10% within 10 days and by 25% within 4 weeks after implementation.^{20/} Some of the measures may include maximum speed limits of 50 m.p.h. or less; mandatory tuneups of motor vehicles; a ban on advertising to promote the consumption of energy; mandatory inspection of commercial and industrial heating and air conditioning units; temperature limits of 65°F. in winter and 80°F in summer for all buildings owned or leased by the Federal Government; and mandatory carpooling. Temporary relaxation of air quality standards might be allowed to permit utilities to burn high-sulfur coal instead of oil, which would then be available for transportation and space heating.

^{19/} Oil and Gas Journal, p. 53.

^{20/} Ibid.

President Nixon, in his November 7th nationwide address on the energy situation, proposed a broad energy conservation plan that would give him the authority to ration gasoline and fuel oil, reduce speed limits, exempt industries from environmental controls, and to impose taxes on excessive energy use. The President asked the Congress to return the United States to permanent daylight saving time and ordered immediate cuts in the use of energy by the Federal Government in addition to the 7% cut ordered earlier. He ordered that Federal offices be heated to no more than 68°F. and that Federal vehicles not travel more than 50 m.p.h. In addition, the Atomic Energy Commission was asked to accelerate the rate at which nuclear power plants are being licensed and built. He directed that industries which presently use coal be prevented from switching to oil and encouraged utilities now using oil to convert to coal utilization. Individuals were asked to lower their thermostats, to form carpools, and generally reduce their consumption of energy. He urged that the following steps be taken at the state level: halt unnecessary lighting, stagger working hours, encourage greater use of mass transit, and adopt a 50 m.p.h. speed limit. In the legislation requested by the President was the authority to enable regulatory agencies to adjust the schedules of planes, ships, and other carriers in order to conserve energy.

C. COMMITMENT TO ENERGY SELF-SUFFICIENCY

One consequence of the Arab oil cutoff is an intensified interest in developing energy self-sufficiency within the United States. While such a goal would take years to realize, the U.S. does have large quantities of coal, oil shale, and offshore and Alaskan oil that ultimately could reduce dependence on foreign sources of oil. To accomplish a task of such magnitude would require a major commitment by the United States to that goal. As seen by some Members of Congress, most prominently Senator Jackson, attaining this goal would require a coordinated national energy policy fortified with adequate funds and manpower. Such a program would be designed to reduce the economic and technological barriers that stand in the way of large scale use of coal gasification and liquefaction, solar energy, breeder reactors, and fusion reactors.

Even if such a national energy program were initiated and were ultimately successful, it would probably not have much effect on energy supply for at least a decade. In the meantime, the United States may find it expedient to launch large-scale exploration and development operations in promising but politically secure areas of the world. The Orinoco heavy oil reserves of Venezuela may hold close to one trillion barrels of oil. Canada's Athabaskan tar sands 300 billion barrels, the Green River oil shale formation 600 billion barrels and the Naval Petroleum Reserve No. 4 in Alaska an undetermined

amount. ^{21/} The Atlantic Outer Continental Shelf which has not yet been explored may also contain large oil and gas reserves.

The lead time required to develop these reliable sources would be 8 to 15 years, ^{22/} so they could not be immediately brought to bear on the present situation. A national commitment to these resources, however, would be useful in negotiations with Middle-Eastern producers. This combined with the creation of an organization of oil consuming nations could conceivably reduce the prospect of arbitrary supply interruptions in the future and could promote international cooperation in the search for new sources of energy.

^{21/} "The Oil Crisis: This Time the Wolf Is Here," James E. Akins, *Foreign Affairs*, April 1973, p. 489.

^{22/} *Ibid.*, p. 489.

VI. APPENDIX

New light shed on Saudi oil actions

OIL-industry planners and forecasters are rather abruptly casting the Middle East generally and Saudi Arabia in particular in a new oil-producing role through 1990.

It is vastly different from scenarios that had the Saudis producing the major portion of a staggering 70-80 million b/d by 1990 for the Mideast. These forecasts were based on the premise that this is how much oil the Middle East would need to produce to balance the world's oil demand by then.

The rewrite of the script, though perhaps prompted by the Mideast war and embargo, has little to do with politics. And it in no way means that the western world, particularly the U.S., will not need that much Saudi oil.

Rather the thinking now is that Saudi Arabia as the major producer, has rationally decided in its own national interest that it cannot possibly absorb the huge inflow of money this would entail. Now it brings in \$100 million/month it can't spend internally, next year \$200 million/month.

This is the view shared to a degree by M. Ray Thomasson, Shell Oil Co.'s manager of planning and forecasting, and Stanford Field of Stanford Research Institute. Both discussed the energy picture through 1990 at the Nov. 2 annual technical meeting of the South Texas section of the American Institute of Chemical Engineers. Thomasson concentrated on the U.S., Field on the world.

Thomasson says the Saudis, like the Canadians, are "limiting their exports to us and charging higher prices because that is the best thing for them to do for their country."

Field says the cutback now is a political expedient, "but they are actually doing something that they wanted to do anyway, sort of killing two birds with one stone."

However, no matter what the Saudi Arabia role will be, both Thomasson and Field believe it will take a near superhuman effort to meet the world and U.S. energy needs in 1990.

Shell. Thomasson says the U.S. must launch a massive energy self-sufficiency program, which would include a large dose of conservation.

He referred to a recent Shell study, "The National Energy Problem." The

study says that energy conservation measures could help lower the projected cost of imported oil by 1990 (almost \$80 billion yearly based on published price forecasts) by as much as \$30 billion.

Shell estimates a savings of as much as 3.3 million b/d of crude-oil equivalent might be achieved by 1980 and that the amount could reach 8.5 million b/d by 1990.

The most critical area is transportation, where savings of as much as 3.6 million b/d might be realized by 1990. The biggest portion could come from substitution of compact and subcompact cars. Urban buses, reduced heating and cooling in private homes and commercial buildings (mainly from better insulation), and use of appliances and equipment that use smaller amounts of energy also are important.

U.S. industry could save 1.5 million b/d, but utilities are not expected to be a source of significant savings because of the overall system inefficiency of electric-power generation and because the growth rate of fossil-fueled, steam-electric plants is slowing due to the switch to nuclear.

Concerning energy output, Thomasson notes the long history of wrong forecasts for nuclear power by industry and by the AEC. He says the U.S. will have to have every bit of the 500 billion w forecast for 1990.

He points out one grim fact—to meet this goal means putting on line one new 1,000-mw plant every 10 days between 1980 and 1990.

But the present is crucial, too. Thomasson says he is on a National Petroleum Council committee charged with finding out how to handle a 2.5-3 million-b/d U.S. oil shortfall. The report is due in Nov. 11.

SRI. Field says oil will still be the dominant world energy source in 1990. During the period 1970 to 1990 energy demand will grow from 100 million b/d of oil equivalent to 255 million b/d. Oil will supply 45% of 1990 demand.

Field says there is no near-term shortage of the world's principal fuels, oil and coal. He notes the U.S. alone has coal reserves equivalent to three times the world's known oil reserves—1.8 trillion bbl. The U.S.S.R. has three times this much.

Field also sees a bullish future for natural gas, and expects big new Alaskan and Canadian finds on top of huge reserves in Russia and elsewhere. He says in the Middle East alone, 1.2 trillion cu ft is flared each year.

Field believes that Middle East production will not go up to the 70-80 million b/d that world demand indicates for 1990. He thinks the production growth rate will be limited to reach a figure of about 37 million b/d in 1990.

The western world, he thinks, will make up this shortfall by exploration in new areas, with new production in North America lifting the total there to 20 million b/d in 1990, 23 million b/d in the Soviet Union, and 16 million b/d from West Africa.

With low-sulfur oil commanding a \$2-3 premium, he thinks the emphasis on oil exploration will be outside the Middle East, for that reason and because the Mideast cannot absorb the money.

He feels that Nigeria, with its low-sulfur oil and 75 million people, is a place that could easily absorb the income from much production.

Field says his discussion is based on a world energy report that SRI is preparing for some 100 clients.

Kellogg awarded Agrico fertilizer-plant contract

AGRICO Chemical Co. has let contract to M. W. Kellogg Co. for design and construction of its \$46-million nitrogen-fertilizer plant near Tulsa (OGJ, Feb. 12, p. 52).

Engineering and site operations are under way at the site on the Verdigris River just east of the Port of Catoosa on the Arkansas River Navigation Channel.

Scheduled to be in operation in 1975, the plant's design capacity is 1,250 tons/day of ammonia and 1,800 tons/day of urea ammonium nitrate (UAN) solution. Kenneth F. Lundberg, Agrico's chairman, says the UAN facility will be the largest plant of its design in the U.S. and one of the world's largest.

Consumers brace for severe shortages

CRS-21

Earlier complacency among many industrialized countries has evaporated, and emergency plans are emerging in Europe, Japan, and U.S. Majors see no place to make up Mideast crude losses, say rationing necessary.

THE CONSUMING nations of the world began laying plans for a long, hard winter last week due to Arab oil cutoffs.

Much of the world was functioning under normal supply patterns early last week, but by midweek emergency plans began to surface in Europe, Japan, and the U.S. as an acute oil shortage loomed closer.

In the U.S., President Nixon went on nationwide television to warn the country of impending shortages and to recommend solutions that will change the flow and pattern of energy use sharply in the U.S. (See related story p. 108).

On the eve of the President's message, oilmen dealing in Mideast affairs were acutely aware of the severity of the Arabs' move to dry up supplies moving into U.S. markets.

"There is just no spare crude to make up for the loss of Persian Gulf crude," a spokesman for one international major said.

And another warned the U.S. will begin to suffer badly by Dec. 1 as result of Arab oil embargoes and shut-downs. He declared gasoline rationing is a must.

"It (rationing) is necessary today," he said. "But politically it won't happen. It will be pushed off. It is inevitable we will be short of oil this winter, and part of this will be reflected in a gasoline shortage. But the Government won't bite the bullet and do it."

EEC inaction. Holland discovered last week that she has few friends in the European Economic Community when it comes to oil problems with the Arabs.

The EEC meeting in Brussels on Nov. 5-6 labored mightily but produced nothing more than a rehash of earlier United Nations resolutions calling for Israeli withdrawal from the occupied territories.

Those countries on the Arabs' "friendly country" list—notably Britain and France—openly opposed the Dutch plea for a common-market approach to the oil crisis in Europe.

The EEC communique following the meeting made no mention at all of

such an approach. In fact, the only mention of oil came in its final paragraph, which said: "The council, conscious of the interdependence of the economies of the member states of the European communities, has asked the commission and the committee of permanent representatives to continue to follow attentively the situation resulting from the shortage of crude oil and to report to the council."

There was some hope at press time, however, that a solution of the oil crisis may be at hand. Reports from Cairo following the meeting between Dr. Henry Kissinger, U.S. secretary of State, and Egyptian President Sadat said both agreed that some progress toward peace had been made, and that a resumption of diplomatic relations between Egypt and the U.S., disrupted in 1967, was definitely possible.

Earlier encouragement had come in a little-publicized announcement from Cairo that normal oil output would be resumed when the U.S. indicated that it would pursue a more even-handed policy in the Middle East. Originally, the cutoffs of oil were declared aimed at total Israeli withdrawal from the occupied territories and restoration of "Palestinian rights."

Arabs sharpen cuts. The oil ministers of the Arab states met again in Kuwait on Nov. 4th to take stock of the success of the oil weapon and to assess the general supply situation.

The ministers left the meeting convinced that the oil weapon was indeed proving effective in their economic battle, and they decided to turn the weapon in the wound by ordering an immediate minimum cut in oil output of 25% based on September figures. Basing the cuts on September, usually a low-volume shipping month, made their effects even more lethal.

At midweek, Saudi Arabian oil production was down by nearly 38% to only 5.2 million b/d. Kuwait was down by 31% (compared to September) to 2.3 million b/d.

Overall, Arab oil output was off

about 5.7 million b/d.

The enormous decline in Saudi output resulted from the original 10% cut, the embargoes against Holland and the U.S., and suspension of shipments to Caribbean, Pacific, and Canadian refineries that ship products to the U.S.

The Saudi action has brought to a complete standstill a major expansion program Arabian American Oil Co. (Aramco) has been developing. At the beginning of 1973, Aramco's production capacity was 6.55 million b/d. Production was up to 8.3 million b/d in September. The company had a production target of 11.6 million b/d by 1975, but no new work has been authorized by the Saudis since Oct. 17.

The Nov. 4 Oapec meeting further warned the world that in the future, mere neutrality would not be enough to prevent an embargo against a consuming country. The Arabs want some positive actions by consuming countries to demonstrate support for their cause.

To insure such actions, Oapec dispatched Saudi Oil Minister Yamani and Algerian Oil Minister Abdesselam on a tour of European states to obtain promises of positive actions in exchange for guaranteed oil flows. The two ministers were further charged with seeing to it that any cooperative action by the EEC did not circumvent the Arab embargo on Holland.

The Arabs are convinced that their actions have had more telling effects on the U.S. than is acknowledged in Washington. They point to the Kissinger mission to the Middle East as evidence of this.

Meanwhile, Arab chiefs of state were keeping the roads hot between their respective capitals, as preparations began for a full-scale Arab summit conference, probably in Algiers, later this month.

Kuwait, Libya, and Algeria sponsored the call for the meeting. Its goal is to arrive at a common strategy in dealing with the Middle East peace maneuvers.

Effects felt. Consuming-country governments that days before seemed

Ibnu says Indonesia can double flow

INDONESIA has the capacity to more than double its 1.3-million-b/d production "in the next several years," according to Lt. Gen. Ibnu Sutowo, president-director of Indonesia's state-owned Pertamina.

And further, he said last week in New York, his country has "capacity to send you and other countries LNG (liquefied natural gas)" and to "supply your petrochemical producers and consumers with critically short products."

Speaking at a banquet on the occasion of the sixth anniversary of the establishment of a Pertamina office in New York, Ibnu said his country now supplies about 160,000 b/d of crude to the U.S. West

Coast. But he said, "In this time of shortage, I want you to know that Indonesia is endeavoring to increase its petroleum production and exports."

Ibnu said Arab states had not asked Indonesia to embargo oil shipments to the U.S., and he declared Indonesia would not use oil as a political weapon. "My job is to produce oil and get the best possible price for it," he said.

"Our policy in Indonesia today is clearly one of collaboration, not expropriation. We do not expect foreign investors to come to Indonesia to make a gift. We expect you to come to Indonesia to make a profit."

to display calm complacency concerning the Arabs action began to move in preparation for decisive conservation.

In Japan, industrialists fear the Arab oil cuts could reduce industrial output 10-15% by year-end and as much as 20% early in 1974.

The Ministry of Trade and Industry (MITI) is asking nine regional power companies to reduce production by 5-7% and will submit a bill to the diet in December to slap on rationing throughout Japan.

The lowest blow to Japan came when Saudi Arabia revealed that it was on its "nonpreferred" customer list.

Gulf Oil Corp., partner with British Petroleum in Kuwait Oil Co. (KOC), has notified Japanese refiners that Gulf is reducing crude-oil supplies by 34.7% for a 3-month period retroactive to Oct. 1. That is the amount of the cutback imposed on KOC by the Kuwait Government. Gulf, which supplies 8% of Japan's total imports, is expected to be followed by British Petroleum in the cutback.

Other western majors — Exxon, Royal Dutch/Shell, Mobil, and Caltex — which also supply Japan with crude oil, are expected to reduce supplies in proportion to production cuts imposed by the Arab states. At the same time, all western suppliers are passing along price increases imposed by Arab governments.

According to the Petroleum Association of Japan (PAJ), Japan last

week had a 79-day supply of crude and refined products. This included stockpiles of refined products, crude being processed, crude in storage and in tankers enroute to Japan. PAJ said the country's crude supply alone would cover only 27 days. The association called on the government to curtail refinery runs and to impose a 10% cut in domestic consumption of products.

Meanwhile, Japan's neutrality in the Arab-Israeli conflict was put to the test by Saudi Arabia's ambassador to Japan. The ambassador met recently with Foreign Minister Masayoshi Ohira and pointedly asked if the Japanese Government supported Arab policy in the Middle East conflict, according to Journal contacts in Tokyo. Ohira is understood to have replied in the affirmative.

Last week, at Ohira's request, the Japanese cabinet urged immediate Israeli withdrawal to territorial lines held before the 1967 conflict.

In Europe, all countries were on an oil-saving alert, largely on a voluntary basis.

Belgium joined Holland in banning Sunday driving, lowering speed limits to 62 mph, and ordering 20% cuts in home heating. Economic Affairs Minister Willy Claes said some of the measures will be voluntary, others obligatory.

The French Government, despite its assurances of friendship from the Arabs, appealed to the public to cut down on central heating by 2°, and

to hold auto speed to less than 62 mph.

The French Government is more concerned over rising prices for oil than over a shortage, however. Finance Minister Valéry Giscard d'Estaing said the recent crude-price increases would, in a full year, wipe out an expected 1974 trade surplus of 7-8 billion francs (\$1.7-1.9 billion) and result instead in a trade deficit of 1 billion francs (\$238 million).

Despite their confidence in the Arabs, the French were shaken when Algeria announced a 5% cut in oil deliveries to French companies and 10% to others.

The Scandinavian countries also were taking precautions. Shopkeepers in Denmark were asked to douse window lights at 10 p.m. and to not turn on Christmas lights until Dec. 1. A new 50-mph speed limit was also announced in Copenhagen.

West Germany last week passed a bill permitting the government to put restrictions on use of oil and products.

In Britain, the government was slowly beginning to admit that the oil crisis is real and that it can't be ignored simply because of Arab "assurances."

Trade and Industry Sec. Peter Walker repeated in Commons that Britain is safe from any Arab cutoffs and rationing time isn't yet at hand.

At the same time he announced that he is reestablishing the industry-government oil-supplies advisory committee, defunct since 1956. All major oil companies are represented on the committee.

To add to U.K. worries, a fire at Shell's Shell Haven refinery put one of two distillation units, responsible for half the plant's 200,000-b/d capacity, out of action. Shell said it could make up the shortfall, however, by using excess capacities at its other plants.

Spanish officials are deeply concerned about the country's oil import supplies as a result of disruption of crude shipments from Iraq via East Mediterranean ports.

The country's energy directorate has imposed an export ban on high-sulfur crude from the offshore Amposta field. Production is reported to be about 15,000 b/d from Amposta.

Presumably also a "friendly country," Italy depends on oil for 90% of its energy and is trying to maintain a tightrope balance between the Arabs and its EEC partners. Foreign Minister Aldo Moro met for 2 hr with

Egyptian Foreign Minister Ismail Fahmy Nov. 5th to review the entire Middle East situation. Officially, calm prevailed on the Italian scene. State airline Alitalia cut out some flights and issued a list of suggestions on saving oil supplies.

The Philippines—without any crude production of its own and relying on Middle East supplies for more than three-quarters of its needs—has imposed voluntary allocation of gasoline sales on retailers. The government has warned it may be forced to ration gasoline.

From war areas. Meanwhile in Israel, the government transport ministry limited the use of private cars to 6 days a week, giving each motorist his choice of the shutdown day. It also reduced speed limits.

Oil supplies to Israel have been reduced by the Egyptian blockade of Bab el Mandeb at the southern entrance to the Red Sea, but production from the occupied Sinai fields is about sufficient for Israeli consumption.

Israel says the Sinai oil fields are "intact" and producing on a regular schedule. Source in Israel says pro-

duction was shut in for 10 days at the height of the fighting and some storage tanks were hit. Production resumed about Oct. 25.

Syria's Baniyas terminal, which was exporting about 700,000 b/d of Iraqi crude before it was damaged by Israeli aircraft and naval bombardment, is reportedly back in operation at reduced rates.

Syrians said four tankers lifted oil from Baniyas the first of the month. Journal sources say bombing damage isn't as serious as previously believed.

Interior sets up Office of Petroleum Allocation

THE Department of Interior geared up for the fuels shortage this winter by creating an Office of Petroleum Allocation (OPA) last week.

Interior Sec. Rogers C. B. Morton designated Eli T. Reich, a retired three-star admiral, as administrator of OPA, reporting directly to the secretary.

The allocation program was severed from the Office of Oil and Gas, in anticipation of a major separate effort ahead to cope with a shortage of perhaps 15% so long as Arab nations embargo exports to the U.S.

OOG, meanwhile, will be absorbed in coordination of emergency machinery with industry to insure the best use of tankers and foreign supplies that are available.

Mandatory allocation. Morton created OPA amid preparations to go to mandatory allocation of crude oil and refined products, in addition to propane and middle distillates already covered under the mandatory program.

The administration asked the House appropriations subcommittee for a \$10-million supplement to fund allocation efforts during the current fiscal year. OPA wants to fill 387 new positions as a start, and will expand the total as necessary, congressmen were told. Earlier estimates were that it would take 900 to 1,000 persons to administer the program.

As Interior officials asked for funding of the expanded allocation effort, House-Senate conferees put finishing touches on legislation to require the president to allocate crude and products across the board on a mandatory basis, if the President doesn't

move first under existing authority.

The conference report contains a provision sought by independent producers stating the President need not require allocation of crude at the producer level. It provides for regulations specifying wellhead prices or a means for determining them, but exempts from price controls wells producing 10 b/d or less.

OOG and the new OPA have been deluged with applications for exceptions of relief under the new propane and distillate programs. The transition from the voluntary to the mandatory system Nov. 1 has created enormous problems for both suppliers and distributors, not to mention industrial plants and utilities.

OOG asked several suppliers last week to continue serving certain utilities in the Southwest during November to allow more time for adjustment.

The natural-gas shortage has affected producing states only recently, officials pointed out, forcing utilities and industrial customers to turn to fuel oil this year. These victims of gas curtailments have little if any historical base to obtain a supply under mandatory allocation, tied as it is to 1972 patterns, until OOG assigns a supplier to them.

Defense complicates problems. As refiners scramble to adjust to allocation procedures and curtailments in crude supplies, Defense Department requisitions of products to cover foreign losses is disrupting distribution patterns still further.

The military has lost at least 200,000 b/d of supplies it normally receives from foreign sources, including around 135,000 b/d from Ras Tan-

ura and Bahrain in the Persian Gulf. The Interior Department has issued an order under the Defense Production Act of 1950 giving Defense priority in replacing these supplies from domestic refiners.

As the military has exercised this right, refiners have had to invoke force majeure in existing commercial contracts they are unable to fill.

Defense considers its fuel situation to constitute an emergency. It has been forced to supply the Sixth Fleet in the Mediterranean from Norfolk, Va., for example, due to cancellation of liftings in the Persian Gulf and Western Europe.

Emergency committee. The Government dusted off the plan of action drawn up by the Foreign Petroleum Supply Committee during the 1967 Arab-Israeli war which was never used because the crisis subsided quickly.

On recommendation of the FPSC, an advisory group of 21 international oil companies based in the U.S., Interior convened the Emergency Petroleum Supply Committee, made up of virtually the same firms, to consider putting the plan into effect.

EPSC met in closed session at 10:30 a.m. Nov. 8 to analyze supply and transportation data and weigh whether to put the moth-balled plan into effect or draw up a new one. That afternoon, EPSC's supply and distribution subcommittee went to work with a special task force to implement full committee recommendations.

The meetings were kept secret "in the interest of national defense or foreign policy," according to the official order calling them.

Pressure mounts from Arab cutbacks

Consuming countries are getting set for a siege of shortages in wake of Arab production cuts which have climbed to 26% in Saudi Arabia, 22% in Kuwait. Refiners juggle tanker routings in scramble for crude.

THE Arab oil weapon grew sharper last week as consuming countries began taking steps to cope with reduced supplies stemming from production cutbacks and shipment embargoes.

Indications were that the full impact of Arab economic retaliation against countries supporting Israel in the Middle East conflict will hit consumers in late November or early December. And it became increasingly clear that Europe and Japan will suffer worse than the U.S.

At midweek, Saudi Arabian output was down a full 26%, while Kuwait had cut back at least 22%. Both are heavy suppliers to the U.K. and western Europe.

The reductions came from a 10% slash in Saudi Arabia, a 5% cut in Kuwait, plus embargoes in both countries on shipments to the U.S. and Holland.

Saudi Arabia, which took the lead role in imposing cutbacks and embargoes (OGJ, Oct. 29, p. 49), also is reported to have ordered a 10% cut in production of Japan's Arabian Oil Co. (AOC) from Khafji and Hout oil fields in the offshore Partitioned Neutral Zone. AOC currently produces about 450,000 b/d from the two fields, roughly 7% of Japan's total crude imports.

Oil companies around the world, meanwhile, are juggling tanker liftings and routings to pick up oil wherever it's available and deliver it where it's needed.

One major oil company executive told the Journal, "We're doing a lot of fancy footwork to try to keep our refineries supplied and our tankers in service."

Tanker demand. Shipments from East Mediterranean terminals were slowly resuming. But fluctuating demand for tankers set off wild gyrations in spot rates.

Normal shipments gradually resumed at Sidon and Tripoli terminals in Lebanon.

French and Arab tankers had been picking up about 500,000 b/d at Tripoli. Arabian American Oil Co. said Sidon liftings had risen to "considerably more than half" the terminal's normal

capacity of 475,000 b/d.

Syria's Baniyas port was in ruins because of the war. It was believed that emergency repairs were being made to try to get shipments going again, although at a much lower rate than its prime 700,000 b/d.

Spot rates, which had soared to WS 450-500, plummeted to WS 125 after the Arab-Israeli war broke out. Last week they rebounded to WS 225, mainly on the strength of 15 orders from European refiners who apparently managed to find crude at undisclosed sources.

Some companies reportedly were lifting less than full cargoes of crude, although this couldn't be confirmed.

"This is the toughest spot we've ever been in," a major company told the Journal. At some ports, a company spokesman said, tankers are lying at anchor, empty and waiting to at least get bunker fuel to let them depart.

A large number of tankers loaded before the Arab cutoff are on the high seas headed for Europe and the U.S. The big concern now, one source says, is "when these tankers unload, where are they going to pick up more oil? Those vessels are going to be laid up one way or another."

Arab harassment wasn't helping the situation.

One major company reports—and another confirms—that Arab port masters occasionally are blocking the loading of tankers of several countries—not just U.S. vessels or those destined to sail to the U.S. or Holland.

The companies said the Arabs' steps in turning away vessels "hasn't anything to do with embargoes" and apparently reflects hostility of individual Arabs in control of terminal liftings.

Bigger cutbacks? There were expressed fears in the oil industry that impatient Arab governments may well scrap the Oct. 17 call for 5%/month reductions in favor of much larger cuts over shorter periods of time.

These fears were bolstered by a report from Cairo's Middle East News Agency that quoted the Saudi delegate to the Arab League as saying the next Saudi cutback will be 5%

more on Nov. 1. Originally, the Saudis said the current cutback of 10% would be in effect until the end of November.

From Tokyo came a report that Kuwait is planning to cut production by its state-owned oil company by 35%. Technically, Kuwait National Oil Co. has no crude output of its own, but under its unratified participation agreement it would have been entitled to a 25% share of oil-company production.

Neither of these reports could be confirmed, however, and industry sources were prone to dismiss them.

In Kuwait, the Arab labor unions stepped up their demands for further cuts against the U.S.

Workers for Kuwait Oil Co. (KOC) called for strikes against KOC and American Independent Oil Co. (Aminoil) in the Neutral Zone.

The petrochemical workers union called for total nationalization of Aminoil and Gulf's 50% of KOC. This was an action demanded earlier by the Kuwait labor unions.

In addition to the cutbacks, the Arabs apparently are applying a "freeze" technique.

The Saudis, for example, said British, French, and Spanish shipments are to be the same as the average for the first 9 months of this year. Thus, there is to be no increase in shipments to take care of growing demand in those "friendly" countries.

In Qatar, a further swipe at the U.S. came when the tiny Arab state annulled the December 1971 accord permitting U.S. Naval units to use Qatar port facilities.

In Beirut, the council of the Federation of Arab Chambers of Commerce met to discuss boycott measures against U.S. products and to draw up new economic weapons that could be applied against U.S. interests as well as those of other "unfriendly" countries.

European impact. Crude supplies to Europe are down about 20%, or some 4.6 million b/d, as a result of the Arab boycott on shipments to Holland. But, the Journal was told, Europe can hold out for perhaps a couple of months

or more since it reportedly has about 60 days' supply of crude on hand.

The Dutch Government says 45% of the oil imported to Holland is throughput oil for Germany, Scandinavia, and other European countries.

There are five major refineries, including Shell's biggest one, in the Rotterdam-Europort area. Others belong to Chevron, Exxon, Gulf, and British Petroleum. Stocks for Mobil's refinery near Amsterdam also pass through Europort.

Besides the Dutch refineries, Rotterdam also routes crude to eight Belgian and German refineries.

The Dutch Government is gearing up for a siege of shortages.

It has banned all private driving on Sunday beginning Nov. 4. It also has assumed power to institute a rationing program, although Economics Minister Ruud Lubbers said it probably won't be activated soon.

Products supplies to distributors are to be cut by 10%, and the Sunday-driving ban is expected to cut overall consumption 6-10%.

The government has placed controls on products exports except to EEC member countries.

It also called for voluntary cutbacks in energy consumption.

"With a system of export licenses for oil and products already introduced," Lubbers said, "the government hopes that today's measures will keep import, export, and local consumption in balance. If they are unsuccessful and the boycott becomes more serious, the Dutch might be forced to introduce a system of rationing."

Meanwhile, the Dutch ambassador to Iran, Renardel de Lavalette, was dispatched by his government on a tour of Persian Gulf states to explain "misunderstandings" about Dutch policies in the Middle East.

He said after visiting Abu Dhabi and Qatar that he had been "quickly and well received," adding "but whether I have succeeded in my mission is to be decided by the governments."

He was expected to receive a cool but proper acceptance in Kuwait, where he was visiting at press time.

British preparations. The British Government wasn't sure the time had come for gasoline rationing, but it was preparing for the possibility. Ration books have been printed, and an enabling bill to begin rationing has been drawn up and could be put in force

Tankers reported diverted to U.S.

U.S. REFINERS were reported to be diverting loaded tankers to the U.S. last week in a scramble to replace supplies lost to Arab cutbacks and embargoes.

Union Oil Co. of California is diverting all its Indonesian crude—some 10,000-15,000 b/d—from Japanese markets to the U.S. The diversion, Union says, is permitted under terms of the company's contracts with Japanese customers.

The oil will supplement company supplies in both eastern and western U.S. marketing region, Union says.

In India, Caltex Oil Refining Co. (India) Ltd., came under fire from the government for announcing an unspecified reduction of Middle East crude imports for its 35,000-

b/d Visakhapatnam refinery.

The Oil Ministry's charge that Caltex (Standard Oil Co. of California and Texaco Inc.) is diverting Iranian crude exports to the U.S. was flatly denied by the company.

Canada's Energy Minister Donald Macdonald, meantime, is trying to head off reported diversions to the U.S. of tankers bound for eastern Canada ports.

In telegrams to major refiners, most of them subsidiaries of U.S. firms, Macdonald expressed strong objections to such diversions. He declared they would not be "in the best interests of Canada."

Canadian government investigations, however, haven't confirmed reports of these diversions.

within a week's time.

The government disclosed that it plans to place controls of products exports "beyond the EEC."

Prime Minister Ted Heath told the opening session of Parliament on Oct. 30 that he has "firm assurances from important oil-producing countries" that they have "no wish whatever to damage this country and that they will take all the steps within their power to prevent that happening."

Heath didn't name the countries, and the statement was taken with a grain of salt by oil companies and the press.

Other government officials said the assurances had been given to U.K. ambassadors in the Middle East.

The London press editorialized that "however valuable the producing countries' assurances may be in the short term, the security which they provide may be highly precarious." Some British journalists began to call for a common front among the consuming countries.

Earlier, Secretary of State for Trade and Industry Peter Walker called for voluntary restraint by Britons on oil consumption. He added that the government would do everything possible to speed up North Sea oil and gas development, but that would be of little help in the current crisis.

He said Britain has 79 days' supply on hand and another 30 days' at sea.

No crude sharing. The oil committee of the Organization for Economic Co-

operation and Development (OECD) held its scheduled meeting in Paris Oct. 25-26 and decided to postpone any action on a crude-sharing plan.

OECD Deputy Sec. Gen. Gerard Eldin said the 24 member states decided unanimously that it wasn't necessary to activate the existing arrangement for 19 European members to pool supplies, because the "state of shortage" to trigger the system had not yet been reached. He added that the members didn't want to give the impression of a confrontation with OPEC states.

The committee did decide, however, to take stock of member countries' supply situation on a monthly rather than a quarterly basis. EEC countries are comparing stock data weekly.

Paris sources said a political fear of antagonizing the Arabs further was a predominant factor at the meeting. Another session of the OECD oil committee is set for Nov. 21.

Japanese action. Japan seemed to be the most disturbed of the big consuming countries.

The government is prepared to begin rationing gasoline by Jan. 1. It estimates a 35% cut in crude shipments by that time.

Japan's Ministry of International Trade & Industry (MITI) has drafted a three-phase emergency oil-conservation plan that would begin with voluntary conservation by major oil consumers and ultimately go to retail

rationing if the situation warrants.

The country reportedly has a stockpile of nearly 60 days' supply, but it may soon impose a 10% cutback on refinery throughput.

Japan relies upon the Middle East for about 80% of its crude supply. Iran, however, provides about 35% of Japan's total imports and has assured Japanese customers their supply will not be reduced.

Complacency hit. Oil-company officials were disturbed by the apparent complacency of most consumer governments except Japan and Holland.

In Japan, the major companies have all warned the government of cuts in future deliveries ranging from 5 to 10% and of a 35-40% increase in the price of Mideast crudes.

European governments were cautioned by oil companies that plans for an allocation system for oil supplies should get under way at once.

The unexpectedly severe drop in shipments forced the companies to issue these warnings.

Impact on U.S. In the U.S., a broad spectrum of steps was being considered to increase domestic supplies and conserve oil (OGJ, Oct. 29, p. 53). The steps, however, could fall short of their goal to cushion the impact of Arab cutoffs.

An official of a major oil company told the Journal, "The plain fact is that we were looking at a really tough situation before the Middle East war started. Now with the complications of the war and embargoes, we are looking at something else—a disaster."

Even if sulfur restrictions were removed, "we still don't have the crude to run in U.S. refineries," the official said.

Another company pointed out that it had been depending on Europe for a large amount of products to see it

through the winter. "Now we're not going to get it," the company said.

Still another company believes the supply situation won't grow too severe if Arab cutbacks and embargoes are lifted within 30 days.

South America. The pinch of Arab action also began to be felt in South America last week.

Texaco, Brazil's biggest supplier with 25% of total imports, has told the state-owned oil company Petrobras that crude deliveries will be cut 5-10%. And Exxon is understood to have told Petrobras it is making the same reduction.

Brazil imports about 520,000 b/d of crude. It has been receiving supplies from Iraq and, reportedly, Libya.

Esso Chile has notified the Chilean Government it will curtail shipments of crude to state-owned ENAP. There was no report on the volume to be trimmed from shipments.

Military suffering worst from Arab embargo

THE Arab embargo against oil shipments to the U.S. is hitting the military harder than the civilian market.

As a result, the military may preempt some supplies which already-fuel-short commercial airlines had counted on. It may also be the main beneficiary of any extraordinary production from the Elk Hills, Calif., Naval Petroleum Reserve. The Pentagon's 135,000-b/d-plus Persian Gulf loss offsets any gain from Elk Hills.

Interior Sec. Rogers Morton set the stage for civilian-fuel preemption Nov. 1 by authorizing the Office of Oil & Gas to require any refiner to supply defense needs regardless of existing contracts. Action was taken under authority of the Defense Production Act of 1950.

In view of the Middle East crisis, and the loss of at least 1.6 million b/d in direct and indirect imports from Arab countries, Congress is considered certain to authorize production from Elk Hills, which by law is reserved for "national defense" purposes.

Tapping of Elk Hills, which could produce up to 160,000 b/d after several months' preparation, has been urged by California utilities, which face shortage for electric generation in the first quarter of next year. But the Navy will have first call on any such output, and unless Arab ship-

ments to the U.S. are restored soon, the Navy will certainly demand its rights.

Defense Department officials have already approached the White House about preempting jet-fuel stocks which have been destined for commercial airlines. The airlines, in turn, have asked John A. Love, director of the President's Energy Policy Office, to create a special desk in the Office of Oil and Gas to consider airline needs in mandatory allocation of middle distillates, including jet fuel.

Defense requirements. The Defense Fuel Supply Center has been scrambling for supplies, especially JP-5 jet fuel, even before the Arab-Israeli war disrupted Persian Gulf liftings. Those liftings amounted to 18% of total purchases, the Pentagon said last week.

It has had trouble covering fiscal 1973 requirements, even though they were down to 273 million bbl from 291 million the previous year. DFSC satisfied its needs by picking up just over half its demand overseas, a departure from relying on domestic sources for most of its requirements.

Overseas procurement in the year ending June 30 rose from 122.659 million bbl the year before to 136.815 million. Liftings from U.S. refineries, meanwhile, declined from 168.216 million to 136.118 million bbl.

During the current fiscal year, barring an upset in the international situation, the Pentagon plans to reduce purchases another 19.5 million bbl, from 272.933 million to 243.416 million bbl.

But with loss of Persian Gulf products which made up one-third of its total foreign supply, the Pentagon must go for a bigger slice at home.

Product breakout. The biggest cut in Defense requirements in the current fiscal year will be JP-4 jet.

Demand for the gasoline-type jet fuel will fall from 152.121 million to 123.132 million bbl, accounting for the entire reduction in programmed procurement and then some.

Other product requirements for fiscal 1974 disclosed by the Pentagon:

- Aviation gasoline — 7.240 million bbl, down from 6.997 million bbl last year.
- JP-5 jet fuel — 27.652 million bbl, up from 22.723 million.
- Motor gasoline — 10.038 million bbl, down from 10.795 million.
- Distillates — 27.825 million bbl, down from 28.056 million.
- Residual fuels — 15.594 million bbl, down from 16.279 million.
- Navy Special fuel oil — 11.478 million, down from 19.501 million.
- Navy Standard distillate—20.444 million bbl, up from 16.434 million.

Treasury: U.S. can weather oil crisis

The country can stand loss of Arab oil now, study finds, but could not in a few more years without severe economic damage. Report hits emergency storage, backs major domestic energy development program instead.

THE U.S. can weather the current Arab embargo on oil shipments to the U.S. without severe economic damage, a government study concludes. But within a few years, when imports will be much greater it could not. So the U.S. should start now on a major program of domestic energy development and research, the study says.

Emergency storage, widely considered the best hedge against an imports cutoff, is rejected as too expensive and impractical by the Treasury Department report.

Energy policy is described as the key to future energy security, having "far more influence on our vulnerability to import disruptions than does any storage program we could hope to establish beyond 1980." By 1985, according to the Treasury analysis, U.S. oil imports could vary from as little as 4 million b/d, depending in large part on the federal energy policies adopted.

The lower figure is that projected by the National Petroleum Council if domestic energy prices are allowed to follow world prices upward and other conditions are met. The U.S. might even surpass projections in the NPC energy study, Treasury suggests, but adds that "political realities" indicate that the required policies "might not be forthcoming."

Emergency supply options. The U.S. can stand the present loss of Arab oil, according to Treasury calculations, although it will by no means be painless.

While the country faces curtailment of at least 2 million b/d (some industry sources put loss at 3 million b/d now), the study estimates that 2,500,000 b/d could be saved by rationing gasoline, diesel, and jet fuel without suffering "severe economic damage."

In addition, further savings of 400,000 b/d for emergency conservation, 300,000 b/d from increased oil production, 500,000 b/d from conversion of utility plants from oil and gas to coal are projected.

Beyond this, Treasury analysts believe that 2,400,000 b/d of emergency

supplies can be obtained for 90 days through a 50% drawdown of existing stocks, excluding amounts for working and reasonable purposes. This source could yield 1.2 million b/d for 180 days or 600,000 b/d if spread over 360 days.

The stock drawdown would of course have its own cost also. There would be "sporadic local shortages" plus an extension of conservation and rationing beyond the end of the imports cutoff to allow a buildup back to normal stock levels.

Based on July 1973 figures used in the study, Treasury says the U.S. has about 500 million bbl of seasonal and buffer stocks available for tapping, equal to about 82 days of imports at 6,100,000 b/d.

In 1974, the average increase possible from producing fields is placed at 570,000 b/d. But deliverable capacity through pipelines over a 180-day period is only about 331,000 b/d, or 60% of what could be produced in an emergency.

By 1978, by spending \$120 million for standby facilities and pipelines, an emergency excess capacity of 622,000 b/d, all of which could be delivered to refineries, could be available, the Treasury report contends.

For next year, according to NPC figures cited by Treasury, an average of about 1.7 billion cfd in seasonal-swung capacity for natural gas would be available for 180 days beginning in January.

Overall, Treasury believes there is a potential for emergency curtailment of around 3 million b/d, about the same as estimated by Sen. Henry M. Jackson (D-Wash.) in his legislation to deal with the Arab oil cutoff. That is about 9% of energy demand and 18% of petroleum demand. But, the agency concedes, careful planning and a high level of readiness are necessary for maximum use of this potential. Much of the savings would have to be obtained through voluntary compliance which, Treasury says, would probably be poor.

Storage played down. The study lowering strategic storage as insurance against an imports cutoff comes as the

Congress is considering legislation to establish such a program.

Congressmen have been reluctant to create a big reserve in storage before now, partly because of its huge cost. And when they see the price tag, and the small amount of protection storage buys, they will probably be even more reluctant.

Assuming a midrange projection for 1980 imports of 10 million b/d, a 90-day storage reserve would cost about \$6 billion initially, Treasury calculates, plus \$0.6 billion/year for more storage to account for import increases of perhaps 1 million b/d annually beyond 1980.

But where will the oil come from? In a period of tight supplies, the U.S. would have a hard time obtaining oil for the reserve, since it's difficult enough to purchase volumes to meet current demand.

To fill storage for 90-day requirements, starting in 1975, imports would have to average 500,000 b/d for this purpose alone. Considering that a round trip by tanker from the Persian Gulf takes 63 days, 15-20 300,000-dwt supertankers would be occupied full-time carrying oil to fill storage.

But once you've established major storage, what have you accomplished? Not very much, Treasury feels.

"We have become increasingly convinced that the other actions (development) are far more important," the study concludes. Also, it adds, "the U.S. would be unwise to rely upon a standby reserve or other emergency capacity as a major element in its energy and foreign policies.

"At best, standby reserves should be considered as a poor and expensive form of insurance that would allow us a brief time to make adjustments in an emergency. As a weapon to combat a willful denial of oil for political or economic purposes, any attainable level of emergency capacity is pitifully inadequate."

Alternatives proposed. The report lists several reasons why Arab producing nations might have incentives to produce only enough oil to meet their own financial needs, and there-

fore should not be counted on to gear output to the demand of the U.S. and other industrialized nations.

A severe supply disruption in the late 1970's or early 1980's could cause a major economic depression, Treasury warns. In those circumstances, a total cutoff of oil by major Arab producers "could be considered an act of war by oil-importing nations and might invite armed intervention by its very severity and stated intent."

The threat to our future economic well being, and future world peace, requires action now to prevent such a serious dependence on foreign oil, Treasury says, or to mitigate the consequences of any dependence that does develop.

The NPC case study (No. 1 among its options), pointing to 1985 imports of only 4 million b/d, is based on as-

sumptions of increased drilling, an increased finding rate, and an increased use of coal. With rapidly rising well-head prices making unproved recovery techniques economical, Treasury says it seems likely that we may increase recovery from new discoveries and oil fields as much as or more than projected by NPC in Case 1. Recent actions by OPEC countries indicate that prices may rise as high as or higher than the prices calculated by NPC to be necessary to obtain the substantial self-sufficiency, Treasury states.

The U.S. should at least approach these results, the study says, or perhaps do even better, if:

- Domestic energy prices are allowed to follow world prices upward.
- Research and development of coal gasification, liquefaction, and stack-gas cleanup are speeded.

- Implementation of secondary air-quality standards is delayed.

- Excessive environmental restrictions aren't allowed to prevent development of U.S. offshore and Arctic reserves.

- Effective conservation policies are adopted.

But everything turns on which course is chosen by the Government.

"If environmental restrictions prevent increased use of coal, if energy prices are rolled back or contained at low levels (causing investment money to flow elsewhere), and if the major U.S. companies are crippled by court action, then NPC Case 1 projections would appear to be highly optimistic," the report warns.

The report winds up with this cautious optimism: "We still have an opportunity to control our own destiny."

Moves spread to increase oil-export prices

FOUR more countries last week joined the move to jack up prices on oil moving into world markets.

Venezuela unveiled a 48% posted-price on crude and products. Ecuador raised its posted prices, and Nigeria was reported ready to follow suit. Indonesia's state-owned Pertamina announced it intends to raise oil-export prices by more than 20%.

The actions weren't much of a surprise to foreign-owned producers and refiners operating in the countries. The announcements came on the heels of a 66% rise in Persian Gulf posted prices (OGJ, Oct. 22, p. 18).

Venezuela, Ecuador. The Venezuela Government's move on crude and products sent the posted price soaring to an average of \$7.24/bbl, a rise of \$2.35/bbl over October.

The boost, the tenth since Jan. 1, brings the country's average oil take to \$3.99/bbl, according to Mines and Hydrocarbons Minister Hugo Perez la Salvia. He said this amounts to an increase of 150% since Jan. 1.

Oil companies pay a 58% tax on posted prices of exports. Thus, their tax payments will rise by \$1.363/bbl. Now producing about 3.4 million b/d of crude oil, companies export nearly 73% of this amount as crude or products. A large share goes to the U.S. East Coast and to Canada.

As announced by the government, the new posted prices will result in a

rise of 47% to \$7.12/bbl for crude from October's average of \$4.84/bbl. Products posted prices rose 49%—from \$4.99/bbl to \$7.48/bbl.

However, posted-price increases vary under the basic schedule set up last August for each type of crude and product. The posted price of 0.3% sulfur-content fuel oil, for instance, will rise to \$9.95/bbl from \$6.50/bbl, an increase of 53%.

In Ecuador, government action means the Texaco-Gulf combine, the country's single big producer, will have to pay taxes on a reference price of \$5.25/bbl for 28°-gravity crude exports. The team began production of crude for export in August 1972 and now produces about 200,000 b/d.

The provisional posted price in 1972 was \$2.50/bbl. Posted price rose in steps to \$3.60/bbl in June 1973.

Indonesia, Nigeria. Pertamina's increase would amount to a rise of about \$1/bbl or more on the country's low-sulfur crude, which now sells for prices varying from \$4.75-5.06/bbl. A Pertamina spokesman said last week the price hike will take effect shortly.

Indonesia currently is producing more than 1.3 million b/d—topping 1.4 million b/d for the first time in September. Domestic consumption amounts to about 14% of the supply. Japan imports about 73% of Indonesia's total output, while the U.S. imports about 11%, with the remainder

going to other buyers.

Since all crude is produced under production-sharing contracts, Indonesian prices are actual base selling prices, not tax-reference prices.

Although Arab members of the Organization of Petroleum Exporting Countries have asked Indonesia to join them in their cutbacks and controls on production, the country thus far has made no move in that direction.

There were no details on Nigeria's planned increases on crude-oil postings. Almost all the country's current production of about 2 million b/d is exported to the U.S. and Europe.

Arkansas seeks to bolster exploration

ARKANSAS' new Mineral Resources Commission, created to sort out the problem of abandoned severed mineral interests, will have its first public hearing Nov. 8 at Fort Smith.

Oral statements will be limited to 15 min. A second hearing is slated for El Dorado on Dec. 6.

In setting up the commission, the state legislature said such abandoned interests cloud the ownership of thousands of acres in Arkansas. It said this restricts and discourages exploration at a time when the country needs new energy supplies.

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EAST TEXAS field, still going strong after 43 years, is among six U.S. fields that could increase production substantially. This Cities Service Oil Co. lease is near Longview in Gregg County.

U.S. fields unable to fill gap if Arab oil is cut off

JOURNAL STAFF SPECIAL

CHANCES of a shutoff of Arab oil shipments to the West have moved from a faint possibility to a definite danger with the fresh outbreak of Arab-Israel war.

Whether it actually occurs may be determined by what happens in United Nations maneuvering over what to do about the fighting—especially the U.S. role in this.

If an Arab oil shutdown should come, what could the U.S. do to boost its own production to take up the slack? A Journal study indicates not much.

A few big U.S. oil fields still have the capacity to produce more oil, but not enough to cover a major emergency. And little of this could be turned on

quickly.

The National Petroleum Council last July (OGJ, July 30, p. 78) identified six fields which it felt could produce significant volumes of oil above and beyond their "present maximum efficient rates" (MER).

The projected situation calling for such drastic action was a short-term, 90-180 day denial of 25-50% of the nation's water-borne oil imports.

On this basis, NPC estimated that the U.S. could produce 403,000 b/d more oil over a 90-day period and 570,000 b/d over 180 days.

The bulk of this oil—222,000 b/d over 90 days and 388,000 b/d over 180 days—would come, NPC said, from these six fields: East Texas, Yates, West Hast-

ings, Tom O'Conner, and Hawkins in Texas and Elk Hills (Naval Petroleum Reserve No. 1) in California. The rest would be in dribbles from numerous fields.

Some operators and individuals knowledgeable about these fields agree with the NPC report. Some say the figures are too high in some cases. And some indicate some of the fields might be able to do better.

Journal figures indicate that these six fields could add only about 100,000 b/d to the country's oil production immediately — with equal amounts coming from Yates and Elk Hills.

With some additional time, say 90 days, and investment in new pipeline capacity and gas and brine-handling facilities, this figure could be jumped to about 250,000 b/d. Of this, Elk Hills could produce another 50,000 b/d, West Hastings about 60,000 more, and East Texas 40,000 b/d.

The output from the six could be increased still another 235,000 b/d or so, Journal figures indicate, at the risk of some reservoir damage and some temporary gas flaring and pollution. This would come from East Texas 120,000 b/d, Tom O'Conner 20,000, Hawkins 5,000, and still another 50,000 from Elk Hills.

That figures out to a grand total of 445,000 b/d more oil from the six. Elk Hills could do more—but not without substantial new drilling.

This stacks up—as a matter of interest—against crude imports into the U.S. from Arab oil-producing coun-

U.S. imports of Arab crude oil

| Producing country | Crude shipments to U.S.— bbl/month | |
|----------------------|---------------------------------------|-------------------|
| | June 1972 | July 1973 |
| Algeria | 2,380,000 | 4,595,000 |
| Egypt | | 653,000 |
| Iraq | | |
| Kuwait | 1,012,000 | 482,000 |
| Libya | 3,192,000 | 3,599,000 |
| Qatar | | 185,000 |
| Saudi Arabia | 5,145,000 | 19,958,000 |
| Tunisia | | 205,000 |
| United Arab Emirates | 1,452,000 | 3,169,000 |
| Total | 13,181,000 | 32,661,000 |

tries (see table) of 1,053,600 b/d in July, the latest month for which figures are available. The impact of any cutoff of Arab oil to American firms, however, would be considerably stiffer than this figure indicates. Large volumes of Arab crude have been

moving to refineries in the Caribbean, Virgin Islands, and East Canada which move products to U.S. markets.

Direct U.S. imports of Arab crude have more than doubled in the past year (they ran 440,000 b/d a year earlier), and they are expected (Arabs willing) to increase at a much faster rate in the future.

Imports in July this year from Saudi Arabia alone—nearly 20 million bbl—exceeded by far the total for all Arab countries for the same month a year ago.

Figures for the Texas fields are based on production over current MER's or allowables. MER's and allowables can be adjusted. And operator applications for such adjustments in East Texas and West Hastings now are awaiting decision by the Texas Railroad Commission. Earlier bids for production increases in East Texas and Yates were rejected by the commission.

TRC role. The Railroad Commission, which controls oil flow from five of the six fields named by the NPC, would figure heavily in any all-out U.S. producing effort.

In the past the three commissioners and staff have responded to numerous world crises, opening up the Texas oil throttle to supply both the U.S. and other consuming countries. But that was when Texas had capacity to spare.

Comm. Chairman Jim C. Langdon says he thinks the NPC conclusions about excess capacity in Texas fields are wrong. "I don't feel there is any possibility of producing any significant amount of oil for any length of time without damage to the reservoirs," he says. Damage to reservoirs is significant to the commission because this would result in waste (ultimate loss of oil)—something the commission is specifically enjoined by law from permitting to happen.

Any call, thus, for production rates which would, or might, involve reservoir damage or gas flaring, would run smack up against a commission legally committed to prevent both.

The agency might look favorably in an emergency, however, on increases in field MER's which would not cause waste.

Here's a Journal look—based on interviews with field operators and individuals and data in the public record—at NPC's six fields:

East Texas. The NPC study says East Texas field, biggest in the Lower

48 states, should be able to deliver an average of 40,000 b/d more oil over 90 days and 120,000 b/d more over 180 days. However, only 41,000 b/d additional trunkline capacity to refineries is available.

Major company sources say that the 40,000 b/d of additional production could be reached handily, and some say the 120,000 b/d extra could be achieved as well. But for the first few weeks some gas would have to be flared; and there might be some localized problems with water disposal.

At present the field is restricted to 86% of its 240,000 b/d basic allowable (222,000 b/d proratable, 18,000 b/d marginal) while most other Texas fields are at 100%.

The 86% rate results in actual production of about 209,000 b/d, which some operators contend is too high. They favor a cut to the 50% level, particularly in the south half of the field which long has had a low-pressure area.

But some other operators, particularly major companies, incline the other way. Mobil Oil Corp. and Exxon Co. USA have led battles before the Railroad Commission seeking to increase production from the field. Mobil's application to increase the field's basic allowable to 400,000 b/d recently was denied by the commission after nearly 3 years of study. Exxon's application for a production boost, along with two others calling for alternate actions, has reached the brief-and-reply stage of hearing.

In all of this testimony, one hearing observer says, "no one has presented any testimony that the field could not produce more than it is doing."

The problem areas, this source says, amount to about 7% of the 13,587 East Texas field producing wells on the July proration schedule, or about 5% of remaining reserves. The field, he says, probably is the only one in Texas where the allowable is cut to fit the poorest wells rather than the best.

What's possible? "We are absolutely convinced that East Texas can produce at 100% of allowable on a sustained basis and without waste," an Exxon spokesman says. He said the company already has made substantial investments to handle gas in anticipation of going to 100%, and that other plants probably can handle gas at that rate too.

Exxon does not feel that increasing

production would result in a major water-handling problem. Over 75% of the present water production is from marginal wells, the Exxon spokesman says, and these will not produce any more at 100% than at the present 86%.

The record shows that the basic allowable for the field for 25 years was 400,000 b/d. Although the field has not produced at this rate for an entire month since January 1912, the flow did reach 300,000 b/d for 2 months in 1950.

Mobil's projection of reservoir performance at 400,000-b/d MER, as indicated in exhibits introduced at the 1970 hearing, is that the bulk of the field would be above the 740-psi bubble point at abandonment.

The 240,000 b/d emergency rate put forward by the NPC would be only slightly over the field's present basic allowable and should be both reachable and sustainable, particularly after additional compression is installed and water-handling facilities are upgraded. Pulling another 80,000 b/d to reach NPC's second case would be more difficult, but there is some evidence that it might be possible.

Preparations. Regardless of projections and predictions as to how much production could be increased, the evidence is clear that nothing will be done by operators to prepare for such an eventuality until the Railroad Commission points the way.

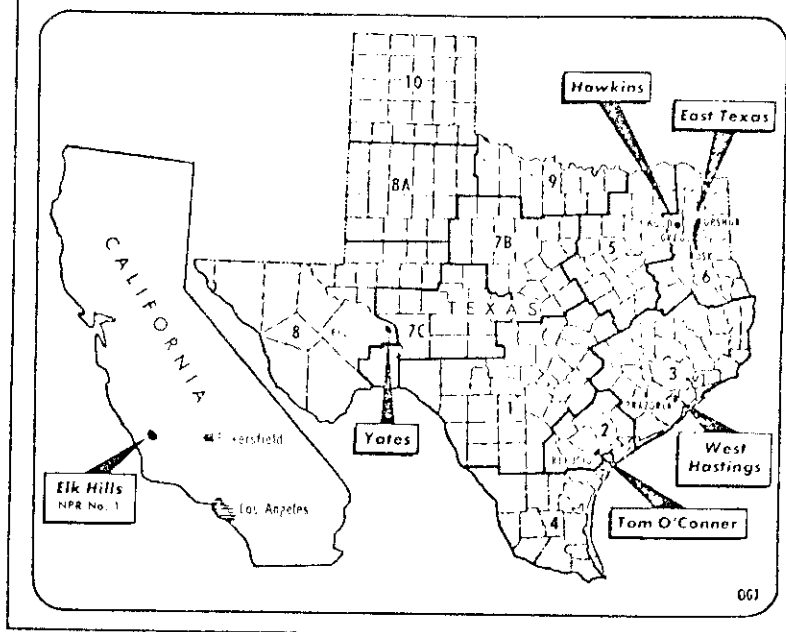
There is little for lease operators to do. In an emergency, the only real bottleneck would be pipeline capacity. Some gas might be flared, some salt water dumped. These situations could be rapidly corrected. Moving the oil, however, is another story.

Yates. The NPC report anticipates drawing an average of 50,000 b/d more from Yates field during a 90-day period after the start of an emergency, and 75,000 b/d more over 180 days.

This would amount to a 100% increase over the MER in the first case, and 150% in the second. Chances are excellent that the field could reach these rates temporarily and at least good that facilities would be available to handle the production in the field. Pipeline outlets look good, too.

Present MER for Yates is 50,000 b/d, a rate established many years ago. Marathon Oil Co., which produces about 26,000 b/d from the field, requested an increase to 100,000 b/d in 1967. Although this was denied by

Fields with bulk of added U.S. capacity



the Railroad Commission, field reports indicate that—in anticipation of a favorable decision—considerable effort was made to get Marathon's leases ready to go at the higher rate.

Part of this effort involved installation of a centralized gathering facility. Marathon has 43 leases with about 20 metering points. Crude flows from these to a central tank battery of about 75,000-b/d capacity.

Gas from the entire field is processed in a Marathon-operated plant owned by all field operators. Additional compression has been installed in recent years, and additional sulfur-recovery equipment is going in now.

The plant could handle all gas at 100,000 b/d but would have no standby compression. However, sources say Marathon has plans ready to install an additional 2,000 hp in compression and that this equipment could be rented on short notice.

Automation of the field also is pretty well along. About two-thirds of Marathon's wells are computer-operated, including testing, monitoring, and control of all well conditions.

Other operators, too, have centralized some facilities and upgraded equipment. Probably within 90 days most or all other operators in the field would be able to match Marathon's capabilities.

And the oil could be moved. The NPC study estimates that all of the

50,000 b/d additional oil available in 90 days could get to refineries, and 55,000 b/d in 180 days.

A look at area pipelines reveals two 8-in. and one 10-in. line already tied in, and an additional 12-in. line which runs within a half mile of the Yates system. None of these lines is at capacity, sources say.

West Hastings. This major Gulf Coast reserve has capacity to spare, according to its major operator, Amoco Production Co. But it will take 90 days to tap it.

The field presently is on an MER of 60,000 b/d. Amoco has asked the Railroad Commission to increase it to 75,000 b/d. The company says the field, with some new facilities, could produce 120,000 b/d without waste.

Furthermore, each increase in production rate will result in additional recovery, Amoco says.

However, some additional gas, water, and pipeline facilities will be needed.

To reach rates above 60,000 b/d, 8 miles of new pipelines and related facilities will be required at a cost of \$1 million. Amoco estimates that this will take 90 days. Existing facilities can handle initial, additional volumes of water and these facilities can be quickly and easily expanded, the company says. At 90,000 b/d, the rate anticipated by the NPC, additional compression would cost about \$900,000 and

related facilities about \$200,000.

Amoco, the principal operator with 323 wells out of 397, claims that West Hastings can do all that NPC expects—and more.

Tom O'Conner. The NPC report says this field could produce an average of 60,000 b/d more oil in an emergency and move 22,000 b/d of this to refineries. A spokesman for Quintana Petroleum Corp., biggest operator in the field, says no.

Considering the reserves, the 5,000-ft sand, the 5,900-ft sand, and Lake Pasture field as a single complex, there could be as much as 20,000 to 25,000 b/d emergency capacity above the current rate, a spokesman says.

But the current rate is not 100% of MER for the 5,800-ft sand. This reservoir was limited to 70% of its 27,000 b/d MER by the Railroad Commission after Pennzoil Producing Co., another principal operator, charged that waste was occurring and recommended a producing rate of 9,000 b/d.

Quintana and Exxon witnesses both supported the 27,000-b/d MER, and one offered the opinion that the field could produce as much as 40,000 b/d without waste.

So while there is testimony that the field could produce more oil in an emergency, the NPC estimate appears to be well above what the most optimistic operators believe possible. The Quintana spokesman says production from the entire Tom O'Conner-Lake Pasture complex—and this includes both the 5,800 and 5,900-ft sands—might be raised to as much as 120,000 to 125,000 b/d compared with its current rate of about 100,000 b/d.

Little could be done to better this, he says, noting that a major work-over program was conducted in 1972 when allowables first went to 100%.

He also says, as the NPC report recognized, that what little emergency capacity the field may have today, won't be there long. In the report's situation study for 1978, Tom O'Conner no longer is a factor.

Hawkins. The NPC report says this big East Texas reserve should be able to contribute 40,000 b/d of added oil. But field operators seem doubtful.

The present Hawkins MER is 112,000 b/d, from a great number of leases and operators. Almost all of it goes into an Exxon pipeline.

Under present conditions, a knowledgeable source says, the MER is correct. And if the field should be unitized, an effort which Exxon is

leading, the goal will be to maintain that rate over a longer period of time. Exxon has estimated publicly that unitizing the field would result in recovery of an added 175 million bbl.

Even if there is a little excess—and sources say there has been no study of this—not much will be able to get out of the field. The NPC report says only 5,000 b/d would be deliverable to refineries. And this probably represents about the additional volume that field facilities could handle.

Elk Hills. Of the four Naval Petroleum Reserves, only NPR-1 in Elk Hills field, California, has anything to offer on a hurry-up basis, the NPC study says.

NPR-1 is producing about 2,200 b/d, although the Navy estimates that with \$94 million worth of additional development, its production could be hiked to about 262,000 b/d. The NPC study estimates that an average of 32,000 b/d additional oil would be available over a 90-day period and 63,000 b/d over 180 days.

The Navy thinks it could beat this. Given the congressional go-ahead, it says, the field could move quickly to 50,000-60,000 b/d, which could be accommodated by existing transportation facilities, and within 60 days the field could reach 100,000 b/d, which probably would require some pipeline expansion either to the north or south.

Given 90 days, production could be increased to 150,000 b/d without drilling additional wells, sources say. And Asst. Sec. of the Navy Jack L. Bowers says that given 3 years and expenditure of \$280 million, NPR-1 production could hit 350,000 b/d. Some sources, however, question how long these rates could be sustained.

Pipelines. The pipeline picture is a confusing one, but in general it shapes up like this: If all the extra oil the NPC thinks can be produced in an emergency really were produced, some of it would be blocked by lack of pipeline capacity.

The West Texas situation seems pretty clear cut: what Yates can produce probably can get into a pipeline. And there are no other fields in the area which are expected to produce significant volumes of emergency oil.

In the East Texas and Gulf Coast areas, however, there are a number of complicating factors. While there are several lines connecting these fields, few, if any, have any room to spare for more oil. Adding a big slug of East Texas field oil, for example,

would require substantial diversion of other oil, and if this were not possible, little emergency oil could be moved.

"We could do a lot in 12 to 14 months, but practically nothing before then," a pipeline executive said. "We would have to add more pumps, more horsepower, and eventually more pipelines."

This situation should ease in the future if the projected Texoma pipeline goes through. This 300,000 b/d is planned to run from the Gulf Coast into Oklahoma through the East Texas area. But at best it will be early 1975 before it can be operable.

So this leaves not just the question of how much more oil the U.S. could squeeze out in a crisis but how much it could move from the fields.

If worst comes to worst in the Middle East, operators may well get the chance to find out.

Supreme Court to review FPC's small-producer decision

THE Supreme Court has agreed to decide whether the Federal Power Commission acted properly in removing small gas producers from direct price regulation 3 years ago.

The high court last week voted to review the appeals court decision of last December overturning FPC. The U.S. Court of Appeals for the District of Columbia held that FPC's action amounted to deregulation of all but about 70 producers in violation of the Natural Gas Act. That administrative step, the court found, was in effect an amendment of the law which only Congress can change.

Unless the Supreme Court reverses the appellate decision, small producers (with annual interstate sales of less than 10 billion cu ft) must go back and obtain FPC approval for each sale. Under the 1970 exemption, small producers could obtain blanket certification for sales, irrespective of regulated ceilings.

The Department of Justice, in seeking a review, argues that FPC's action is authorized by a clause in the law which allows the commission to "classify persons and matters within its jurisdiction and prescribe different regulations for different classes of persons or matters."

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BIGGEST BLOW to U.S. and world consumers in crude-oil cutbacks was dealt by Saudi Arabia which had been building up production capability rapidly in the world's largest oil field—Ghawar (above)—and others to supply the major increment of soaring world oil demand.

World shaken by Arab oil-export cuts, price hikes

MILITARY and economic chaos beset the global oil industry last week.

At press time, two cease-fires had crumbled in the Arab-Israeli war. And Arab oil pressures tightened on oil-consuming countries, especially the U.S.

While the full effects of production cutbacks and embargoes on shipments would not begin to be felt for about a month—the average time for a Persian Gulf-west tanker voyage — government authorities in all the big consuming countries began preparing for the worst.

Journal information is that U.S. firms, under Arab orders, have ceased loading tankers at Arab ports for U.S. and, in some cases, Dutch destinations. Empty tankers were being diverted to non-Arab terminals, but there was no report on whether they were finding substitute cargoes of oil.

On the producing-country side, there was remarkable unity in following the

decision by the Organization of Arab Petroleum Exporting Countries (Oapec) to cut production by at least 5%. The cutback, along with embargoes on oil shipments to the U.S. and Holland, served as an economic weapon to strip Israel of its supporting nations.

Most large companies operating in Arab countries were still assessing affects of cutbacks and embargoes at mid-week in a rapidly changing pattern of developments.

But one of the biggest international firms estimates the reduction in oil supply at 4.7 million b/d the rest of October and in November. This amounts to a reduction of more than 9% in supplies for the world outside Communist areas.

The company points out "there is no alternate supply readily available to offset a reduction of this magnitude."

The U.S. stands to feel the biggest jolt from Arab action, the company said.

How crude-oil prices have soared

| Type | Gravity | Posted or tax-reference price fob loading port | | Type | Gravity | Posted or tax-reference price fob loading port | |
|---------------------|---------|---|---------|-----------------------|---------|---|---------|
| | | Oct. 1 | Oct. 31 | | | Oct. 1 | Oct. 31 |
| PERSIAN GULF | | | | MEDITERRANEAN | | | |
| Abu Dhabi | | | | Libya | 40 | 4.604 | 6.925 |
| Murban | 39 | 3.144 | 6.045 | Algeria | 43 | 5.000 | *5.000 |
| Umm Shaif | 37 | 3.110 | 5.5379 | Arabian light (Sidon) | 34 | 4.205 | 17.148 |
| Zakum | 40 | 3.185 | 5.964 | Kirkuk | 36 | 4.243 | 17.213 |
| Iran | | | | SOUTH AMERICA | | | |
| Basrah | 35 | 2.977 | 5.061 | Ecuador | 28 | 3.600 | 5.250 |
| Light | 34 | 2.995 | 5.091 | Venezuela | 11-39 | 4.610 (Av.) | †4.610 |
| Heavy | 31 | 2.936 | 4.991 | NIGERIA | | | |
| Iraq | | | | Light | 34 | 4.287 | 4.291 |
| Kuwait | 35 | 2.884 | 4.903 | Blend | 27 | 4.148 | 4.148 |
| Qatar | | | | INDONESIA | | | |
| Dukhan | 40 | 3.143 | 5.343 | Kasim | 43.5 | 5.000 | 5.000 |
| Marine | 36 | 3.037 | 5.163 | Minas | 34 | 4.750 | 4.750 |
| Saudi Arabia | | | | | | | |
| Light | 34 | 3.011 | 5.119 | | | | |
| Medium | 31 | 2.884 | 4.903 | | | | |
| Heavy | 27 | 2.725 | 4.632 | | | | |

*Spot 7.00/bbl. †Estimated. ‡Adjustment due Nov. 1 to take account of OPEC increases.

The reduction in refined products available for consumption in the U.S. is estimated at about 3 million b/d, or 17% of the nation's total consumption.

This results from a halt in direct crude and products shipments to the U.S. from Arab countries as well as an embargo on crude shipments to third-country refiners who export products to the U.S.

A big part of the reduction in U.S. supply will be in the form of low-sulfur crudes and products "critically needed to meet environmental standards," the company said.

Saudi action. Saudi Arabia surprised industry observers by taking the lead and announcing a full 10% cutback coupled with an embargo on all shipments bound for the U.S. and Holland.

The Saudi move quickly triggered 5-10% cutbacks and similar embargoes in Kuwait, Abu Dhabi, and Algeria. Qatar embargoed shipments to Holland after a 5% cutback. And Libya ordered a 5% cutback, a U.S. embargo, and a big jump in posted price.

The Saudi Government slapped Arabian American Oil Co. (Aramco), the country's sole producer, with a 1.8-million-b/d reduction in crude production effective Oct. 18. The company promptly pinched back production to 6.5 million b/d from 8.3 million b/d in the Middle East's biggest producing country.

The reduction stemmed from the 10% cutback order and the Saudi embargo which banned shipments of

crude and products to the U.S. "and to locations known to be processing crude for shipment to the U.S."

Aramco said the 10% order lopped 800,000 b/d off its production rate, the embargo another 1 million b/d plus.

And the double-barreled order hit Aramco's future production plans even harder. The company is in the midst of a huge expansion program.

Even if the government doesn't order further cutbacks, the current production rate is 2.3 million b/d or 26% below planned production of 8.8 million b/d for October and 2.6 million b/d or 29% below planned production of 9.1 million b/d for November.

Further cuts are on the way, however. After November, production is to be reduced by another 5% by government decree.

The Oct. 18 action came after Saudi King Faisal warned that flow of oil to the U.S. would be cut off unless efforts to sway the American pro-Israeli foreign policy produced "immediate tangible results."

The Saudis also hinted at more embargoes in Europe, especially West Germany and Portugal whose airports were claimed to have accommodated the U.S. arms airlift to Israel.

Iraq nationalizes Dutch. Holland also came in for more Arab blows in Iraq, where the government announced it was nationalizing the Dutch portion of Royal Dutch/Shell's interest in Basrah Petroleum Co. The action, the government said, was "punishment for Holland's support of Israel."

The Shell group's 23.75% interest in Basrah is owned 60% by Dutch interests and 40% by British interests. Early in the Arab-Israeli war, Iraq had nationalized the Mobil and Exxon 23.75% holding in Basrah.

Iraq didn't announce a cutback in production last week, for the war, eliminating shipping from eastern Mediterranean terminals, had already taken care of that. Iraq was believed to have been exporting only about 500,000 b/d from Lebanon's Tripoli terminal.

It was assumed, however, that Basrah, producing in southern Iraq, would be ordered to cut its output by at least 5%.

Libya boosts prices. Libya provided one of the most dramatic actions of the Arab oil campaign. It ordered a total embargo against oil shipments to the U.S. as of Oct. 21, an overall 5% cut in production, and a fantastic rise in its posted price.

Using its new OPEC authority to set prices unilaterally, Libya said that its new posting is \$8.925/bbl. This includes a base price of \$6.979, a \$1.336 sulfur premium, a \$0.458 short-haul allowance, and a \$0.152 Suez-closure allowance.

Prices are to be revised, the Libyans said, on the 23rd of each month "in relation to the average price enforced by other producing countries." Also, new changes are to take effect whenever the average world price of crude increases or decreases by 0.5% from the preceding month.

Abu Dhabi cuts U.S. Abu Dhabi's oil minister told a news conference there that his country was cutting off shipments of oil to the U.S. and Holland and slashing production by 50%. Holland imports about 2% of Abu Dhabi's 135-million-b/d output.

Minister Otaba also shed a little light on whom the Arabs might consider "friendly" states which may receive preferential treatment on oil shipments. These might include, he said, France, Italy, Spain, and Yugoslavia.

Queried on Japan, he said "They could do more."

He cited no unfriendly countries other than the U.S.

Kuwait down 10%. Kuwait announced a 10% cut in production and an embargo against the U.S. on Oct. 23. Kuwait also banned shipments to Holland, involving about 300,000 b/d or one-fifth of Holland's imports.

But Kuwaiti Oil Minister Atiki sounded the only note of restraint in the Arab turmoil. He challenged an Iraqi call for Arab takeover of U.S. oil firms, saying that present cutbacks would be enough "to let the world feel our suffering."

Still, Kuwait's action against the Dutch may foreshadow further direct Arab moves against European consumers.

Algeria joined Kuwait in banning oil shipments to The Netherlands as well as to the U.S. Algerian shipments to Rotterdam have averaged about 35,000 b/d, another 2% of Holland's imports.

The moves against The Netherlands could greatly endanger Arab relations with the European Economic Community (EEC). They could also lead to a total ban on products exports by all the Low Countries, thus dragging countries that buy those exports into the fray.

About 65% of Holland's oil imports are reexported as refined products to West European countries, and the loss of Arab crude imports could seriously endanger products supply for EEC.

The Algerian cutoff to Holland and the U.S. followed a 10% cut in production by Sonatrach, which emphasized that it was ordered by the company and not by the government.

Qatar, 100. Tiny Qatar joined the cutback parade with orders to Shell and Qatar Petroleum Co. to slice about 60,000 b/d off the country's output as of Oct. 19.

The cut is good for 4 weeks, and after that there is to be the usual 5%/



U.S. contractors working on major pipeline construction and production expansion projects in Saudi Arabia—as in the Williams Bros. project (above) in the Ghawar area—report no interruption in work due to the Mideast war.

month further reduction, based on production during the preceding 4 weeks.

Qatar also embargoed shipments to Holland, which imports about one-third of Qatar's total output of 570,000 b/d.

Others reluctant. Non-Arab members of OPEC continued to produce and apparently were not inclined to join with Oapec moves.

Manuchehr Eghbal, managing director of National Iranian Oil Co., said Iran wants no involvement in the war and will never use its oil as a weapon. At a Tokyo news conference, following a fortnight's visit there, Eghbal said he didn't expect Japan's imports of Iranian oil (about 40% of Japan's supply) to be affected.

Venezuela is prepared to hike its reference prices again on Nov. 1 in response to the OPEC increases. The Venezuela average now is about \$4.61/bbl. If Caracas imposes the OPEC 70% increase, the average could jump to \$7.84/bbl.

As for increasing production, Venezuelan oil officials say there is not much room for that—about 200,000 b/d tops. But Caracas is believed to be uninterested in boosting production above the current average of about 3.3 million b/d.

Nigeria indicates there will be no unilateral price increase there. Nor will it join in the Oapec cutback practice.

Nigeria exports all but about 40,000 b/d of its 2.1-million-b/d production. Also, Lagos still maintains diplomatic relations with Israel and is not predominantly a Muslim country. There had been reports soon after the Oct. 17 Oapec cutback announcement that OPEC had sent representatives to Iran, Nigeria, and Indonesia (all with large Muslim populations) to convince them to join in the cutbacks. These apparently were unsuccessful.

U.S. stake. U.S.-based oil companies hold a tremendous stake in the Arab world.

Annual shareholder reports prepared early this year showed the five biggest firms in the U.S. each obtained one-half or more of their oil production from Middle East and North African countries in 1972. The proportion is certain to have grown substantially this year due to major production expansions in Saudi Arabia and other Arab countries.

Exxon Corp., for instance, listed gross production of 2.59 million b/d and liftings of another 411,000 b/d in the Middle East and Africa. This 3,001-million-b/d volume made up 48.8% of its worldwide output of 6,145 million b/d during 1972.

Texaco Inc. showed gross production in 1972 of 1,742 million b/d in Saudi Arabia, 117,000 b/d in Libya, 35,000 b/d in Bahrain, and 15,000 b/d in Du-

bai for a total of 1.920 million b/d—47.4% of its 4,021-million-b/d global production. Texaco said it held 22,247 million bbl of net reserves in the Middle East, or 79.9% of the company's global volume.

Standard Oil Co. of California produced a net 1,734,929 b/d last year in Saudi Arabia and 117,000 b/d in Libya for 58.6% of the company's 3,159,530-b/d net.

Mobil Oil Corp. listed gross production of 1,127 million b/d last year in the Middle East plus 205,000 b/d received under long-term arrangements. This 1,332-million-b/d total amounted to 55.5% of the company's global output of 2,399 million b/d. Mobil's net production in the Middle East was 981,000 b/d, or 51.3% of its worldwide net of 1,911 million b/d.

Exxon, Texaco, Social, and Mobil are partners in Aramco, whose expansion program last year brought production boasts of 550,000 b/d in Ghawar field, 300,000 b/d in the offshore Berri field, and 150,000 b/d in Abqaiq field. To handle greater export volumes, Aramco built its fourth offshore terminal, designed to accommodate tankers of up to 260,000 dwt.

Full details of this year's expansion have not been disclosed.

Gulf Oil Corp. reported net production of 1,872,500 b/d in the Middle East—58.2% of its 3,213,700-b/d global output.

Other U.S. firms—majors and independents—also produce Arab oil.

Consuming countries wary. On the consumer side, the mood was one of great wariness about what the future holds.

Much depends on any action which may emerge from last week's meetings in Paris of EEC officials and the Organization of Economic Cooperation and Development (OECD).

They were trying to devise a strategy to be followed by the principal consuming countries to meet the supply and prices crisis.

OECD has the machinery for a sharing-of-supplies plan, but it includes only European members. An approach to expanding it to include the U.S. and Japan was the objective of last week's conferences.

EEC officials say that with extreme measures of rationing, the Common Market countries can hold out for about 6 months.

All of them have about a 65-day stock supply (France and Britain each have about 90 days' supply). An EEC

common market agreement is expected to take effect Oct. 1, 1973. It will include 50-day stocks in all the member countries, based on 1972 consumption.

EEC guidelines have been drawn up to form the basis for meeting in November to arrive at a common energy policy.

In Germany, Economics Minister Friderichs says no immediate oil shortage is foreseen. The country has 64 days' supply of gasoline, 62 days of light fuel oil, and 83 days of heavy fuel oil.

In Italy, government officials are holding urgent meetings of the Inter-ministerial Economic Planning Committee to study the effect of the cut-backs and price jumps.

The government also has tightened export controls by adding fuel oil to the banned list, which was applied earlier only to kerosine and heating oil. Further control was exerted on the latter by applying them to "temporary" crude imports that are usually used as feed in exporting refineries.

In Britain, the mood was one of watchful waiting.

Trade and Industry Minister Peter Walker was expected at press time to

declare a government strategy to deal with the crisis. It would be an immediate supply problem, but fuel oil was expected to add for voluntary savings on energy consumption by Britons.

Ration books are ready, but Britain hopes to avoid using them.

British Petroleum, with about half the retail market, said last week it was going to ask for at least a 2-pence rise in the price of gasoline, and that prices could go on rising "almost indefinitely."

France was to have had small products-price jumps on Nov. 1, but in view of the changed situation, much larger increases are slated—as much as 5% for gasoline, 25% for light fuel oil, and 40% for heavy fuel oil.

Even Russia was feeling the pinch. It was expected last week to cut its crude exports to West European countries to counteract loss of shipments from eastern Mediterranean terminals.

This year it has been importing about 300,000 b/d of Middle East oil, largely from Iraq. It has also been receiving Egyptian, Libyan, and Algerian oil, and it is committed to supply some 1.4 million b/d to the Comecon countries.

U.S. equipment exports to rise

THE value of all products and services sold by the oil-field machinery industry is expected to rise another 8% next year to \$1.3 billion.

Shipments of oil-field machinery by all manufacturers should reach more than \$1.2 billion in 1974, also a gain of 8%, the Department of Commerce predicts. Next year is due to be the second in a row recording increases of 8% in both these categories, according to the annual U.S. Industrial Outlook published by Commerce.

Exports are forecast at \$440 million next year, up 12%, compared to the 19% gain this year to \$395 million.

Prices of oil-field machinery have increased 28% since 1967, Commerce says, an average annual rate of 5.1% through 1972. The trend is expected to continue due to rising material and labor costs and production of more complex equipment.

Commerce continues to foresee good growth prospects, both in the U.S. and abroad, for this industry.

Between 1973 and 1980, shipments

are predicted to increase at a compounded annual rate of 5.6-6.4%, reaching between \$1.8 billion and \$1.9 billion.

Exports are due to hit \$650 million by 1980.

Soaring world demand and tight oil supplies also will spur exports, according to the government forecast. The value of exports has increased steadily, from \$174 million in 1967 to a record \$395 million last year, for a compound growth rate of 9.4%, Commerce says.

U.S. manufacturers now export about 35% of total shipments and are expected to continue their large role in the export market.

Employment in the oil-field machinery industry also hit a new high this year of about 38,800 persons, according to the survey. This was a 4% increase over the 1972 level of 37,300. The number of production workers in this industry returned this year to the 1970 record level of 26,000, up 4% from 1972.

Senate leaders, administration agree emergency measures needed. Likely provisions: producing Elk Hills, above-MER rates for some U.S. fields, dictating refinery runs, lifting emission regs, conservation, rationing.

GENE T. KINNEY
Washington Editor

THE administration has agreed with leaders of the Senate interior committee on the need for emergency legislation for rationing authority and other fuel-saving steps to offset the loss of Arab oil because of the Middle East conflict. The prospective losses include 1.1 million b/d of direct crude imports and another 1 million b/d or so of products, directly and indirectly.

Agreement on a bipartisan approach was reached Oct. 24 in a closed meeting between top officials in the Nixon administration and key members of the Senate committee.

Sen. Henry M. Jackson (D-Wash.), committee chairman, predicts that legislation will clear his committee as early as this week for action by the Senate. Similar measures will be placed before the House commerce committee for parallel action, according to Jackson.

Jackson and Sen. Paul Fannin (R-Ariz.), ranking Republican on the interior committee, discussed emergency plans with the press after meeting with Energy Policy Director John A. Love, Interior Sec. Rogers C. B. Morton, Undersecretary of State William J. Casey, and representatives of the Defense Department.

Jackson has already introduced a bill which he claims could result in savings or additions to supplies of over 3 million b/d within 5 months. This, he contends, would more than offset the loss of oil resulting from the Arab embargo on export sales to the U.S. because of American aid to Israel.

The administration objected to some of the provisions, the senator said, and was scheduled to offer its own bill by Oct. 27. The committee should be able to hammer out a compromise some time this week and send a bill to the Senate floor.

The emergency steps, reported last week, encompass a variety of conservation measures, production of the Elk Hills Naval Petroleum Reserve and a few U.S. fields at above maximum efficient rates for a few months,

forced conversion of utilities from gas and oil to coal where equipment is available, and rationing authority.

The legislative machinery was put in high gear as prospects for a shortage grew more certain, in spite of the achievement of a second ceasefire. The Arab export embargo was scheduled to continue until Israel withdraws from occupied territories, although this threat was discounted in Washington. A compromise was expected to restore exports during peace negotiations, contingent upon a halt to further arms shipments to the belligerents.

U.S. officials now expect no help from Europe this winter on fuel oil, since European countries have their own supply problems. One industry source calculates lost production due to the war at 3½ million b/d at least, perhaps more. Another estimates it at over 4 million b/d. This reduction will become greater if Arabs carry out their vow to pare output progressively 5% each month, until they regain territories occupied by Israel in the 1967 war.

Emergency legislation. The Jackson bill, which will provide the nucleus of legislation likely to become law, requires production of certain designated oil fields at rates in excess of current MER.

Besides Elk Hills, the fields expected to be singled out include five in Texas — East Texas, Yates, West Hastings, Tom O'Conner, and Hawkins. The National Petroleum Council said these fields could yield increases of 222,000 b/d over 90 days and 388,000 b/d in 180 days.

With Elk Hills, NPC estimates the increase could total 403,000 b/d more over 90 days and 570,000 b/d in 180 days. Senator Jackson, also a member of the Senate armed services committee, estimates Elk Hills could reach 160,000 b/d within 60 days, a figure considered optimistic by other sources.

Fields to be so designated for above-MER output under the Jackson bill would be selected by state officials or by the Office of Oil and Gas. They

would be picked for ability to produce at levels above MER for 90 days or more "without excessive risk of losses in recovery."

However, any production boost that would result in reservoir damage (ultimate loss of recovery) or gas flaring would run afoul of the Texas Railroad Commission which is specifically enjoined by law to prevent such waste from occurring (OGJ, Oct. 15, p. 40).

Legislation being weighed by the interior committee doesn't require immediate implementation of rationing and other emergency measures. It provides for contingency plans for use when the President declares a national emergency, triggered when requirements for energy or petroleum exceed available supply by 5% or more.

Within 30 days after enactment of the measure, the President is directed to issue requirements for emergency rationing, conservation, and contingency programs to be developed by each state and major metropolitan governments. These plans are to be put into effect in the event he determines there is an emergency fuel shortage.

The programs must be developed within 90 days of enactment of the bill, assuring maintenance of vital services and preventing unnecessary energy consumption.

Rationing, conservation. The rationing and conservation programs call for:

- A priority system and plan for rationing of scarce fuels among distributors and consumers during periods of critical shortages.
- Measures to reduce energy consumption in shortage areas by 10% within 10 days and by 25% within 4 weeks after implementation.
- Imposition by the president of programs for states or cities which fail to design and carry out contingency programs. These will include reduction in maximum speed limits on all roads to 50 mph or less, mandatory regular engine tuneups for all automotive vehicles, an end to advertising encouraging energy consumption, regular inspection and mainten-

ance of commercial and industrial heating and air-conditioning units, maximum winter thermostat settings of not more than 65° F. and minimum summer settings of not less than 80° F. in all buildings owned or leased by the federal Government, limitation of parking and access to certain critical areas to cars with three or more occupants, public education to encourage conservation in homes and the private sector including reductions in heating, hot water, and electricity consumption.

Refinery yields, construction. The legislation also authorizes the Office of Oil and Gas to dictate refinery yields in accordance with "national needs and consistent with priorities" set under the law.

OOG is further empowered to dictate mandatory allocation of crude oil to insure that all refineries are operating at maximum possible capacity.

OOG is to project product requirements and mandate refinery processing schedules to meet those anticipated needs.

Also, the President will adopt plans and programs as necessary to expedite "the greatest possible expansion of existing domestic production and refinery capacity."

Coal conversions. There was bipartisan agreement on the need to set aside clean-air standards, at least temporarily during shortages, in order to burn available high-sulfur coal and oil.

Jackson said legislation would empower the President to waive both primary and secondary standards, and grant variances to state enforcement plans. However, he added, this authority should be used only where necessary, with due regard to health hazards in areas with pollution problems.

Variances and shifts to higher-sulfur fuels will be approved with discrimination, according to Jackson, limiting actions to rural areas where possible.

Utilities will be required to shift from oil or gas to coal where capabilities to reconvert exist. Also, power plants in the planning process or under construction, which are designed to burn oil or gas, will be required to include the capability to burn coal as well.

Boycott impact minimized. Speaking for the State Department, Casey told the senators that U.S. imports from

Arab lands are running about 1.6 million b/d in direct shipments of crude and indirect shipments of products refined from Arab oil in third countries.

This is about one-fourth of total imports of 6.3 million b/d, and about one-tenth of total consumption of 17 million b/d. Casey's estimate is well under those of industry sources (see p. 49).

Its total loss would simply return imports and consumption potential to about last year's level, Casey said.

He expressed some skepticism that the boycott will be 100% effective, citing leaks of the attempted embargo during the 1967 war.

Even if it is 100% effective, the State official described its impact as depriving the U.S. of only a relatively small percentage of consumption. Nevertheless, the loss of any oil, on the eve of a winter heating season which already presented reduced supply prospects and some hardships, was said to be a matter of concern.

Casey painted a somewhat rosy picture of U.S. oil inventories. He said the most recent data show all oil stocks to be about 1 billion bbl, which he said was equal to about 2 months' supply.

"Combining this with shipments of oil already en route," Casey added, "I think you will agree that, although there will of necessity be some eventual reductions in available supplies, there is no reason to expect an immediate damaging impact from the Oapec boycott, particularly if sound and effective energy conservation measures are implemented."

Second-quarter gas-well drilling jumps

THE second-quarter report on gas supply by the Federal Power Commission reveals the apparent result of the recent intrastate and interstate price hikes—more exploration for gas.

Exploratory gas-well footage drilled in the second quarter gained 33% over the same quarter last year, FPC reported. Development gas-well footage gained 31%.

Gas wells drilled during the second quarter also showed a year-to-year increase of 23%. This provides a striking contrast to the 23% decline in the number of oil wells drilled.

For the previous 1½ years the number of wells drilled had declined in each succeeding quarter, FPC said.

Estimated annual volumes in new

He called on Congress to act immediately on legislation to lessen dependence on foreign oil, "taking rational and immediate steps to reduce our vulnerability to future oil threats."

Curtailed supplies present a much-greater threat to other developed countries, according to Casey.

The U.S. met with OECD countries in Paris last week, when the Oil Committee was convened to discuss the supply situation. European members of the committee will consider whether to implement their emergency oil-reapportionment plan, Casey said.

"The U.S. is not a party to this plan," he added, "nor do we contemplate associating with it at this point."

He pointed out, however, that the U.S. has been considering an OECD-wide emergency oil-sharing agreement which would include the U.S. The U.S. has been unwilling to commit its own oil production to the pool, preferring to limit it to oil moving in international trade.

Price impact. Casey said the recent price increase by the Persian Gulf states present the U.S. with a long-term import problem that will transcend any temporary interruptions or boycotts.

"The new average fob price of \$3.65, which was arbitrarily and preemptorily laid down by the producers, represents a very substantial increase in the price of most of the oil that we and other consumers now receive," he said.

The U.S. estimates that the increase will add about \$3 billion to the current oil-import bill of about \$6 billion/year.

sales contracts during the second quarter were only about half the volumes in the same quarter of 1972.

Seasonally adjusted marketed production and domestic producer sales to interstate pipelines each increased by about 2% from the first quarter of 1973. But in the latter case the sales remained below last year's.

FPC areas with the greatest increases in gas-well drilling activity during the second quarter, compared with a year ago, were the following: Permian basin, 106%, South Louisiana 70%, Rocky Mountain 57%, and Other Southwest 37%.

In the Appalachian Illinois area and the Texas Gulf Coast, drilling declined by 5% and 3%, respectively.

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