

March 28, 1979

## **THE ENERGY CRUNCH: SHORT-TERM SOLUTIONS**

### **INTRODUCTION**

The national debate over energy policy was infused with a new sense of urgency by the December 26th shutdown of most of Iran's oil fields by militant strikers supporting the Ayatollah Khomeini. For several weeks, speculation raged over when the fields would come back into production, and at what level. The answer came on March 5th, when the new Iranian regime resumed production and exports at about half the level reached under the Shah. The new government also announced that henceforth all of its oil exports would be controlled by the National Iranian Oil Company (NIOC). Previously, a significant proportion had been handled through a consortium of western oil companies.

The actual impact of the Iranian production slowdown has been minimized to date by a combination of factors. First, other OPEC nations increased their production substantially to help make up the loss. Saudi Arabia was the most impressive contributor to this effort, raising its production a stunning 2 MBD over a self-imposed 10.5 MBD ceiling. Kuwait added 550,000 B/C to their exports; and Venezuela, Nigeria, Abu Dhabi and the rest of the emirates also helped. The total OPEC increase amounted to 3 MBD, leaving an actual shortfall of around 2 MBD. This was made up by drawing down world oil stocks which were, fortunately, high at the time. The long-term world position, though, is less promising. This month, Saudi Arabia, having already eased its production back to 9.5 MBD, plans to reduce its production by another 1 MBD, and there are fears that other OPEC members will follow suit. Also, world oil stocks are beginning to show the effects of helping to make up the 2 MBD deficit.

The spot market for oil, which generally runs slightly behind the world market price, now exceeds it by a substantial degree, with some sales ranging as high as \$25 per barrel, and most sales in the \$22 to \$23 range. These high prices it would appear have added credibility to arguments advanced by OPEC price hawks such as Libya and Iraq.<sup>1</sup> The result is that at their March 26th meeting, the OPEC ministers called for a 9 percent increase effective the 2nd quarter of this year, coupled with a \$4/bbl surcharge. This would bring the world market price to about \$18.61 per barrel.

Against this background, the Congress and the Administration are currently attempting to determine what steps to take to cope with the incipient shortage. It appears that the Administration's approach will focus on conservation, as was the case with the National Energy Act, although some attention may be given to a partial decontrol of domestic crude oil prices. Within the Congress, there appear to be considerable dissatisfaction with the proposals put forth by the Department of Energy to date and the beginnings of a move to broach a plan of its own. On balance, however, there remains a sense of uncertainty as to just what the most productive approach would be and what specific steps would best avert the crisis. To make matters worse, the specter of another Arab oil embargo looms ever more prominently in the background as a result of the Egyptian-Israeli peace negotiations. Any steps taken to cope with the current situation would, of necessity, be painfully inadequate should a full-scale embargo develop.

#### THE SCOPE OF THE U.S. SHORTAGE

Prior to the fall of the Shah's regime, Iran was producing 6.05 MBD, with 5 MBD earmarked for export. The United States share of Iranian production averaged 885,000 B/D for the first six months of 1978, or approximately 10 percent of total imports. That means that roughly 5 percent of our total oil consumption was provided by Iranian crude. The actual shortfall we have experienced to date has been somewhat less than the full amount of our Iranian imports, more nearly approaching 500,000 B/D at present, but that figure is increasing. Also, under a shortage sharing agreement administered by the International Energy Agency, we have agreed to reduce our consumption by 5 percent. Originally, it was thought that our share of the shortage would be calculated on the basis of imports and thus be in the range of 450,000 to 500,000 B/D. Other nations who were also signatories to the agreement but were more heavily dependent on imports, such as West Germany and Japan, objected, claiming that they were being unjustly penalized. As a result, the 5 percent will apply to total U.S. consumption, making our share roughly 1 MBD.

In order to assess our current situation, it is useful to compare our present position with that which existed at the time of the 1973 Arab oil embargo. In that year, the United States was

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1. See Heritage Foundation Background No. 76, "The Iranian Oil Crisis," by James A. Phillips, for a fuller discussion of the situation in Iran.

importing 35 percent of its oil. Of this 35 percent, 22 percent came from countries located in the Mid-East. Our domestic oil stocks were sufficient to provide a 54 day supply of oil, and at the height of the embargo were being depleted at the rate of 1.5 million barrels per day. Today, we import some 47.5 percent of our oil requirements, with 83.5 percent of these imports coming from OPEC member nations and 41.5 percent coming from nations located in the Mid-East. Our stockpile position at the time of the Iranian shutdown was significantly better than in 1973, with oil supplies adequate to provide for 70 days on hand. At present, the estimated shortfall of imports is in the range of 500,000 barrels per day, but is steadily rising. This situation could be further aggravated if the Saudis go through with their announced intention to reduce their production to 9 MBD.

As can be seen, the current situation is both better and worse than the one which existed in 1973. On one hand, world oil stocks are far higher and the current shortage far lower than that brought on by the embargo. On the other hand, the potential for long-term impacts is far greater, and other factors could seriously worsen the situation rather quickly. U.S. oil stocks are already being depleted, standing at 679 million barrels this month, which represents an 11.6 percent decline from the 758 million barrels we had stored at the same time last year. Gasoline stocks are down 10.6 percent, reflecting a decline from 272 million barrels to 246 million barrels. Distillate is down 27.7 percent, reflecting a decline from 152 million barrels to 119 million barrels; and crude oil stocks have declined from 334 million barrels to 314 million barrels, a 6.4 percent reduction.

Perhaps the most serious threat to our oil supplies is found in the specter of yet another full-scale Arab embargo. Yassir Arafat, head of the Palestine Liberation Organization, has called for such an action, and there is apparently sympathy in some quarters of the Saudi councils to impose one. Should an embargo occur, the impact would obviously be far more severe than in 1973; and, whereas Iran continued to export oil to the U.S. in 1973, its new government would almost certainly participate in an embargo this time.

It is evident that there are actually two problems facing us. The first is to cope with the near-term shortage which is at hand, and the second is to gird ourselves against the results of yet another cut-off of Mid-East oil exports. To accomplish this, we must take steps to encourage both conservation and the stimulation of additional production. The question is, then: How can we reduce our dependence on imports, by how much can we reduce them, and how soon can we reduce them? Surprisingly, there may be much more that we can accomplish in this regard than we now realize. The following six Executive initiatives make this quite clear.

## SIX STEPS TO MAKE UP THE DEFICIT

Step One: Convert industrial boilers which have dual fuel capability, and which are currently burning oil, back to natural gas. Both the Department of Energy and the American Gas Association have recently conducted surveys to determine the degree to which industrial boilers with dual capability can be converted to burn natural gas. The results of these surveys are startling. All indications are that very significant amounts of oil consumption can be offset in this fashion.<sup>2</sup> The most recent data available indicate that somewhere between 701,000 and 1,170,000 barrels of oil per day can be offset in this fashion. The lower limit represents the actual responses received by questionnaire recipients, and the upper range a projection of their responses to include those boilers not covered by the surveys. Further surveys are under way at this time which will include those not contacted during the initial research. What is most significant is that the savings reflected in these figures can be realized virtually immediately. The A.G.A. survey reached approximately 60 percent of the boiler owners in the nation, and the query specifically asked for figures related to conversions which could be accomplished during the winter/spring season of 1979. They therefore are a reflection of what can be accomplished by around June 1. According to the responses, additional savings can be realized by early next year, possibly raising the total offset to between 929,000 and 1,548,000 barrels per day.

In order to realize these savings, there are a number of administrative actions which must be taken. According to the most recent data available, the appropriate actions would include: 1) Extending the Power Plant and Industrial Fuel Use Act (FUA) public interest exemption rule-making to cover residual oil as well as distillate. 2) Overhaul the curtailment priority system currently in effect so that states will be able to categorize those boilers with dual fuel capability as "Firm." 3) Clarify the fuel pricing portions of the National Energy Act so that there will be some certainty as to the actual prices which will apply to various categories of gas, and implement those pricing policies in a manner which will not discriminate against any classification of customer.

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2. See Table 1.

4) Encourage state regulatory agencies to lift existing bans on natural gas use by industry. A final action which must be taken by the federal government is to give some indication that there will be consistency in their natural gas policies. Industries will not convert their boilers if they are afraid that they will be deprived of fuel by some arbitrary federal action after a few months or weeks. It is the uncertainty which now exists, perhaps more than any other factor, which is acting to inhibit such conversions at this time.

Step Two: Convert utility boilers with dual-fuel capability, and which are now burning oil, back to natural gas. As is the case with the conversion of industrial boilers, the potential for response in this area is extremely good. According to the Department of Energy, consumption of as much as 145,000 barrels of oil per day could be offset in this fashion in the near-term. Ironically, many of the boilers which would be affected if this step is taken have dual capability because they were forced to switch from burning natural gas by previous federal actions. As is the case with industrial boilers, the conversions can only be accomplished if the utility sector has assurances that they will not wind up subject to renewed curtailments after a few weeks or months. For many, the experience of being subjected to contradictory requirements by different federal agencies will be the greatest inhibition to implementing the conversion.

Step Three: Decontrol the price of domestically produced oil. From a purely administrative standpoint, one of the easiest steps which can be taken to help reduce our dependence on foreign oil supplies would be the removal of price controls on June 1. Present controls expire on that date, and the President may extend them, modify them, or allow them to expire as he sees fit. At present, it appears that some sort of modified or limited form of decontrol will be allowed by the Administration, coupled with some sort of so-called excess profits tax.<sup>3</sup> Depending on the form, lifting the lid on oil prices could result in reductions of import requirements of between 160,000 barrels per day and 800,000 barrels per day this year, and as much as 1.7 million barrels per day by 1985. The two forms of decontrol most frequently discussed are full decontrol and phased decontrol. Phased decontrol is considered to be the most politically neutral alternative. As yet, it is uncertain just

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3. See Table 2.

what form it would take, although most speculation has focused on "stripper" wells, those which would require enhanced recovery techniques such as steam injection, and new oil. Obviously, the specifics of a phased decontrol program would govern exactly how much oil would be added to domestic output, and how soon. One estimate of the possible result, based on a relatively simple phased program essentially freeing marginal wells and allowing gradual increases of all prices through 1981, would result in the addition of 100,000 barrels per day immediately, coupled with 60,000 to 80,000 barrels per day savings through increased conservation. A phased program of lifting oil prices of this nature would probably result in the additional production of 1,300,000 barrels of oil per day by 1985, and savings of 300,000 to 400,000 barrels of oil per day through conservation.

A straightforward decontrol would have greater impact in the near term. Assuming the President were to allow present controls on oil prices to expire on June 1, we would experience an increase of domestic production of some 500,000 barrels per day this year. There would also be savings through conservation in the range of 300,000 to 400,000 barrels per day. Over the long run, full decontrol would probably have effects similar to those of the phased approach, only at a far more rapid rate.

The price differential between the phased and full decontrol approaches would be somewhat less than one might anticipate, as the question is not whether or not we will pay more for our oil, but rather to whom the added revenues will be paid. To the extent that decontrol results in additional domestic production, it represents dollars which flow to Houston rather than to Riyadh. Ultimately, even with full decontrol, it is estimated that the end result will be an increase in the price of gasoline of between 4¢ and 7¢, and a similar increase in the price of home heating oil. For a family driving 12,000 miles per year, in an American car which averaged 15 miles per gallon, this would be equal to an additional \$32 to \$56 per year.

Step Four : Expand use of existing coal-fired facilities, and coal-capable facilities. This would be accomplished in two ways. The first would entail the wheeling of power produced by facilities in the Midwest and Mid-Atlantic states to the northeast,

to replace capacity which is currently fueled by oil. Depending on the extent to which this is accomplished, an offset of between 100,000 and 300,000 barrels of oil per day can be achieved. These savings would depend in part on the capacity factor of the plants in question, and in part on the shifting of some plants currently used as cycling or peaking facilities to base load generation. At a 57.5 percent capacity factor (i.e., the plant is operated at a level which produced 57.5 percent of the electricity it would generate if it operated 100 percent of the time), the offset is 100,000 barrels per day. Raising the capacity factor of these plants to 60 percent would increase the offset to 200,000 barrels per day. Shifting the peaking and cycling plants to base load would add the final 100,000 barrel per day increment to the offset.

The second part of expanding the use of coal would result from relaxing certain requirements under the Clean Air Act so that the levels of pollutants allowed under the State Implementation Plans required by the Act are not more stringent than those contained in the National Standard. This would allow a number of plants which are capable of burning coal, but which are currently burning oil in order to comply with these SIP's, to resume burning coal, reducing our domestic requirement by between 150,000 and 200,000 barrels per day.

The range of potential savings offered by implementation of this step then, is from 250,000 to 500,000 barrels of oil per day. The time frame for the lower range should be relatively similar to other actions outlined above, but the upper limit might take slightly more time as coal stockpiles might have to be built up and transportation and storage facilities arranged for. The key, of course, is to begin making the necessary plans and taking the necessary actions as soon as possible so as to minimize lead time. Also, as with natural gas conversions, it is unlikely that utilities will be willing to take the actions necessary to convert boilers from oil back to coal unless they have some assurance they will not have to reconvert after a few weeks or months.

Step Five: Expedite the licensing process for the six nuclear power plants which could come into operation this year.<sup>4</sup> There are currently 7,432 Megawatts of nuclear-fired capacity which could be in operation this year according to the Nuclear Regulatory Commission. These figures do not include the power plants which were shut down recently as a result of questions

4. See Table 3.

concerning their seismic hardening. All are either under construction or awaiting operating licenses. A conservative estimate of the potential oil offset these plants could provide would be in the range of 240,000 barrels of oil per day. Of this, at least 101,000 barrels per day could be offset by June 1. The key to accomplishing this, of course, lies in insuring that the licensing of these plants is not delayed by unnecessary bureaucratic red tape or by allowing intervenors to engage in dilatory tactics aimed merely at hampering the plant's licensing and not at any real health or safety concern.

It would also be of considerable value to encourage state regulatory commissions to try to assist in expediting the licensing of these plants. In some instances, state authorities seem to have seized on opposing nuclear power plants as a means to gain political support. Responsible actions on the part of such officials would go a long way towards alleviating some of the current sources of delay.

Step Six: Remove restrictions on the use of additives in gasoline refining and manufacture. As a result of actions by the Environmental Protection Agency, there are, at present, two major restrictions on the use of additives in gasoline. The first of these is the limitation on the amount of lead which may be added to a gallon of gas. The limit is .8 grams per gallon at this time, and will be further reduced to .5 grams per gallon as of October 1. The current limit only applies to about 20 percent of the nation's refiners, as the EPA has granted exemptions to the other 80 percent. Should the .5 gm per gallon limit be allowed to go into effect, however, these refiners would either have to get another waiver or comply. The result of the limitation on the free use of lead is that plants forced to comply wind up using from 7 percent to 15 percent more oil to manufacture gasoline. This means that we lose between 15,000 and 46,000 barrels of gasoline per day as a result of the restriction on the free use of lead. Should the more stringent .5 gm per gallon standard be imposed, this loss would skyrocket to 192,000 barrels by the end of the year. The second area in which restrictions on additives are limiting our maximization of domestic oil supplies concerns an additive for unleaded gasoline called MMT. MMT acts much the same as lead, and as such reduces the amount of crude oil used in manufacture.

At present, the use of MMT is banned by the EPA as the result of fears that it may cause damage to catalytic converters used in automobiles. This ban has resulted in an extra 24,000 barrels of oil per day



being used in the manufacture of gasoline. This means that between the restriction on lead and the ban on the use of MMT, our nation is losing between 39,000 and 61,000 barrels of oil per day. Moreover, this loss can be almost immediately recouped through the relaxation of the restrictions. Most refiners have stores of lead on hand, and it would be a simple matter for them to increase the amount of lead they are using in their processes. As for MMT, there is a plant capable of producing enough to satisfy domestic demand already constructed and ready to begin operations within 7 days. Assuming a week's lead time for receiving orders and making deliveries, within two weeks of the removal of the restrictions, manufacturers could begin using these additives in their processes, and the savings could be realized.

## CONCLUSION

While it might seem on the surface that the six steps outlined above are virtually self-evident, the fact that they have not been taken belies that notion. To a certain degree, all of the administrative initiatives discussed have been inhibited by political considerations. What has perhaps been lacking is the courage to take a hard stand in spite of the potential for controversy. Whether it is licensing nuclear plants or burning coal or decontrolling the price of oil, it sometimes seems that the only considerations have been the political consequences of the act. The time for basing such decisions on political considerations is past. Our energy future is too tenuous to do otherwise.

We currently are importing more than 40 percent of our domestic oil requirements, and that figure is increasing daily. We simply cannot afford to allow this trend to continue. It is estimated that we will pay some \$50 billion for oil this year. If the world market price of oil rises to \$20 per barrel as some fear it will, that figure will rise to nearly \$65 billion. A drain of that magnitude on our balance of payments would send shock waves through our economy. At the same time, our dependence is placing us in an untenable defense posture. The only alternative is to take positive action such as the steps outlined above. An overview of what they can accomplish is impressive.

If all six steps are implemented, this year we can reduce our dependence on imports by 1,544,000 barrels of oil per day at the lower range of the estimate. At the upper limit, it appears possible that we may be able to reduce our dependence by as much as 2,879,000 barrels per day.<sup>5</sup> This would mean a reduction of imports of between 17.6 percent and 33.1 percent by December. With regard to imports from the Mid-East, the proportions are even more significant. Assuming that the offsets were applied to imports from that

5. See Table 4.

region, we could reduce our dependence by between 42.7 percent and 79.7 percent this year, and even further next year.

In calendar year 1980, we could reduce our imports by 1,932,000 barrels per day at the lower end, and by as much as 3,594,000 barrels per day at the upper limit.<sup>6</sup> This would equal between 22.2 percent and 41.3 percent of total imports, and between 53.2 percent and 99.5 percent of Mid-East imports.

As can be seen, the means to reduce our dependence on imported oil are available. Many of the actions to reduce that dependence are relatively simple and, in many instances, relatively costless. The only thing lacking to date is the determination to implement them.

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6. See Table 5.

TABLE I

| POTENTIAL OIL OFFSETS: INDUSTRIAL & UTILITY BOILERS |                 |            |                 |            |
|---|-----------------|------------|-----------------|------------|
| Fuel Category                                       | 1979<br>bbl/day | Cost (1)   | 1980<br>bbl/day | Cost (2)   |
| Residual Oil<br>(No. 6)                             | 595,000         | 9.2        | 787,000         | 13.2       |
| Distillate Oil<br>(No. 2)                           | <u>106,000</u>  | <u>1.6</u> | <u>142,000</u>  | <u>2.4</u> |
| TOTAL ACTUAL  | 701,000         | 10.9       | 929,000         | 15.6       |
| Projected<br>Possible                               | 1,168,000       | 18.1       | 1,548,000       | 26.0       |
| Utility Boiler<br>Conversion                        | <u>145,000</u>  | <u>2.3</u> | <u>145,000</u>  | <u>2.4</u> |
| GRAND TOTAL   | 1,313,000 b/d   | 20.4       | 1,693,000 b/d   | 30.4       |

1. Cost is a reflection of expenditures which would be made overseas based on projections of the world market price of oil. For this estimate a price of \$15.50 per barrel was used.
2. The base figure used for these projections was \$16.81 per barrel.

TABLE 2

## UNION OIL ESTIMATE OF THE IMPACT OF PHASED DECONTROL OF LOWER TIER OIL\*

| <u>YEAR</u> | <u>BARRELS PER DAY</u> |
|-------------|------------------------|
| 1979        | 100,000 bbl/d          |
| 1980        | 200,000 bbl/d          |
| 1981        | 500,000 bbl/d          |
| 1982        | 700,000 bbl/d          |
| 1983        | 900,000 bbl/d          |
| 1984        | 1,200,000 bbl/d        |
| 1985        | 1,300,000 bbl/d        |

## CONNOCO ESTIMATE OF THE IMPACT OF PHASED DECONTROL OF LOWER TIER OIL\*

| <u>YEAR</u> | <u>BARRELS PER DAY</u> |
|-------------|------------------------|
| 1982        | 116,000 bbl/d          |
| 1983        | 379,000 bbl/d          |
| 1984        | 741,000 bbl/d          |
| 1985        | 1,136,000 bbl/d        |

\*NOTE: The wide disparity between estimates demonstrates the difference in the potential impacts of decontrol of lower tier oil stemming from different pricing schemes. The Union Oil estimates assume a fairly straightforward approach decontrolling both lower and upper tier oil at a similar rate. The Connoco estimates assume a more complex pricing scheme.

TABLE 3

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NUCLEAR POWER REACTORS CURRENTLY  
APPROACHING FINAL LICENSING\*

|               |                |           |                   |
|---------------|----------------|-----------|-------------------|
| Sequoia       | 1,148 Mwe      | May       | 36,506 b/d        |
| Salem II      | 1,115 Mwe      | June 1979 | 35,457 b/d        |
| Diablo Canyon | 2,200 Mwe      | June 1979 | 69,960 b/d        |
| Lasalle I     | 1,000 Mwe      | Dec. 1979 | 31,800 b/d        |
| Watts Bar     | 1,159 Mwe      | Dec. 1979 | 36,856 b/d        |
| Zimmer        | <u>810 Mwe</u> | Dec. 1979 | <u>25,758 b/d</u> |
| TOTALS        | 7,432 Mwe      |           | 236,338 b/d       |

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\*Source: United States Nuclear Regulatory Commission.

TABLE 4

## 1979 OIL OFFSETS POSSIBLE

| <u>STEP</u> | <u>OIL OFFSET</u> | <u>Low Range</u>       |                           |
|-------------|-------------------|------------------------|---------------------------|
|             |                   | <u>% TOTAL IMPORTS</u> | <u>% MID-EAST IMPORTS</u> |
| ONE         | 701,000 b/d       | 8.0%                   | 19.4%                     |
| TWO         | 145,000 b/d       | 1.7%                   | 4.0%                      |
| THREE       | 160,000 b/d       | 1.8%                   | 4.4%                      |
| FOUR        | 250,000 b/d       | 2.9%                   | 6.7%                      |
| FIVE        | 240,000 b/d       | 2.8%                   | 6.6%                      |
| SIX         | <u>39,000 b/d</u> | <u>.4%</u>             | <u>1.3%</u>               |
| TOTAL       | 1,544,000 b/d     | 17.6%                  | 42.7%                     |
|             |                   | <u>High Range</u>      |                           |
| ONE         | 1,170,000 b/d     | 13.4%                  | 32.4%                     |
| TWO         | 145,000 b/d       | 1.7%                   | 4.0%                      |
| THREE       | 800,000 b/d       | 9.2%                   | 22.1%                     |
| FOUR        | 500,000 b/d       | 5.7%                   | 13.8%                     |
| FIVE        | 240,000 b/d       | 2.8%                   | 6.6%                      |
| SIX         | <u>61,000 b/d</u> | <u>.7%</u>             | <u>1.7%</u>               |
| TOTAL       | 2,879,000 b/d     | 33.1%                  | 79.7%                     |

TABLE 5

## 1980 OIL OFFSETS POSSIBLE

| <u>STEP</u> | <u>OIL OFFSET</u> | <u>Low Range</u>       |                           |
|-------------|-------------------|------------------------|---------------------------|
|             |                   | <u>% TOTAL IMPORTS</u> | <u>% MID-EAST IMPORTS</u> |
| ONE         | 929,000 b/d       | 10.7%                  | 25.7%                     |
| TWO         | 145,000 b/d       | 1.7%                   | 4.0%                      |
| THREE       | 320,000 b/d       | 3.7%                   | 8.9%                      |
| FOUR        | 250,000 b/d       | 2.9%                   | 6.9%                      |
| FIVE        | 240,000 b/d       | 2.8%                   | 6.6%                      |
| SIX         | <u>61,000 b/d</u> | <u>.7%</u>             | <u>1.7%</u>               |
| TOTAL       | 1,932,000 b/d     | 22.2%                  | 53.2%                     |
|             |                   | <u>High Range</u>      |                           |
| ONE         | 1,548,000 b/d     | 17.8%                  | 42.8%                     |
| TWO         | 145,000 b/d       | 1.7%                   | 4.0%                      |
| THREE       | 1,100,000 b/d     | 12.6%                  | 30.4%                     |
| FOUR        | 500,000 b/d       | 5.7%                   | 13.8%                     |
| FIVE        | 240,000 b/d       | 2.8%                   | 6.6%                      |
| SIX         | <u>61,000 b/d</u> | <u>.7%</u>             | <u>1.7%</u>               |
| TOTAL       | 3,594,000 b/d     | 41.3%                  | 99.5%                     |