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AUGUST 27, 1979

The Honorable Henry M. Jackson
Chairman, Committee on Energy
and Natural Resources
United States Senate

RELEASED

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Dear Mr. Chairman:

This is our response to your March 8, 1979, request for an examination of the apparent shortages caused by the Iranian oil cutoff, and for an analysis of measures the United States could take to reduce demand and increase domestic energy supplies.

This letter summarizes our review of the measures contained in the Department of Energy's (DOE's) Iranian Response Plan from the perspective of whether the measures can reasonably be expected to achieve the desired results in the timeframes indicated. Enclosure I contains our detailed comments on each of the measures.

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BACKGROUND

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In early March 1979, the United States entered into a commitment with the International Energy Agency (IEA) to lower petroleum consumption by up to 5 percent. This commitment would lessen the Nation's need for imports and thus help stabilize the world oil market, reduce upward pressures on oil prices, and rebuild petroleum stocks drawn down during the cutoff. The U.S. obligation under the agreement is to reduce its demand for imports by up to 1 million barrels per day (B/D) by the end of 1979.

The President outlined the steps needed to achieve this goal in his April 5, 1979, energy speech and an accompanying fact sheet. Later, DOE issued a more detailed discussion of the specific measures to be implemented in a report entitled "Response Plan: Reducing U.S. Impact on the World Oil Market."

To achieve the IEA commitment, the Response Plan proposes measures to reduce the need for imports by both decreasing U.S. petroleum consumption and increasing domestic production. These measures are intended to enable U.S.



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petroleum stocks to increase, in particular to assure adequate distillate oil supplies (home heating fuel and diesel fuel) for next winter. DOE reported that during the first quarter of 1979, petroleum stocks were drawn down at a rate of about 700,000 B/D higher than projected to compensate for reduced imports.

The Response Plan's objectives--reducing the need for imports and raising stock levels--may be, to some extent, incompatible. In a general sense, measures to reduce consumption and increase domestic production should help reduce import dependency, and also allow stocks to increase to the extent that fuels not consumed now can be stored for later use. However, a 1-million-B/D decrease in consumption would not automatically result in a comparable drop in imports if stocks are being replenished at the same time. Further, given the limits on current U.S. oil productive capability, the most likely way in the past to increase stocks quickly would have been to increase imports.

IRANIAN RESPONSE PLAN FEATURES

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The Response Plan contains eight initiatives that fall into three categories--~~namely, actions to~~

- increase domestic petroleum production,
- switch from petroleum use to other fuels, and
- reduce petroleum use through conservation measures.

DOE estimated that the measures should account for petroleum savings of from 844,000 to 1,509,000 B/D by the fourth quarter of 1979.

Increased production

The Response Plan projects increased domestic crude oil production by the fourth quarter of 1979 of from 80,000 to 250,000 B/D due to increased Alaskan and Elk Hills Naval Petroleum Reserve production, and from decontrol of crude oil prices. We believe it reasonable to expect increased production of up to 170,000 B/D from Alaska and Elk Hills, which should help achieve the import reduction goal by the end of the year. But this will not contribute much to the current rebuilding of distillate stocks, as the increases occur late in the year.

DOE's production increase estimate of 60,000 to 80,000 B/D due to decontrol is questionable. While there may certainly be some increase in production (and decrease in consumption due to higher domestic oil prices), we question the advisability of relying on any specific amount, due to the degree of uncertainty surrounding the estimate.

Fuel switching

The Response Plan anticipates petroleum savings of 350,000 to 600,000 B/D by the fourth quarter from (1) oil users temporarily switching to currently surplus natural gas use and (2) electric utilities transferring excess electric power from coal-burning and hydro-powered facilities to utilities which would otherwise use oil. Electricity transfers between utilities, a normal occurrence, and natural gas switching are currently taking place at levels that appear to be higher than previous years'. However, we believe most of these switches and transfers would have taken place anyway without the Plan due to (1) higher oil prices, (2) oil shortages, and (3) the 1978 Natural Gas Policy Act. While fuel switching will help reduce the need for imports, most of the fuel saved will be residual oil with the displacement of lesser amounts of distillate.

Decreased consumption

The Response Plan estimates reduced petroleum use to range between 414,000 to 659,000 B/D from measures to (1) restrict temperature settings in commercial and public buildings, (2) encourage States to develop their own conservation plans, and (3) reduce energy use in the Federal Government by 5 percent. The bulk of the savings (395,000 to 640,000 B/D) come from the first two measures, with the 19,000-B/D savings anticipated from the reduction in Federal energy use being more symbolic than substantive.

The temperature restriction plan is just now being implemented. While savings of the magnitude DOE is estimating (195,000 to 390,000 B/D) may be possible, compliance with the plan will be largely voluntary, and there is little DOE can do to ensure its success. Generally, past voluntary conservation programs have not been proven effective. Currently, DOE is not actively pursuing individual State conservation plans: the reduction in gasoline use anticipated by the plans is already being exceeded due to gasoline shortages.

CURRENT SITUATION

Four months have elapsed since the President announced his Iranian Response Plan. It will be difficult to precisely measure the impacts of some of the individual Response Plan initiatives, particularly the conservation actions, because of the U.S. energy supply and demand system's complex nature.

DOE recently announced that the United States has already achieved its IEA goal, as petroleum consumption is over 1 million B/D less than projections made before the cutoff. Imports are currently 300,000 B/D less than projected.

In our opinion, however, the Response Plan's achievements are not encouraging to date. Distillate stocks as of August 3 were 170 million barrels--only 57 million barrels higher than they were at the end of March. The existence of gasoline and diesel fuel shortages leads us to conclude that much of the reduction in total consumption and imports is due to the public's inability to buy sufficient quantities of these products rather than the impact of the Plan's measures.

Petroleum stock levels

✓ Petroleum stocks, and in particular, distillate stock levels, will be the key element in determining whether the Response Plan is successful. While the goal of the Plan is also to reduce the need for imports, the failure to achieve this goal will not carry with it the immediate adverse impact that the failure to achieve adequate stocks of distillate fuel oil for next winter will. ✓

The following table shows the level of petroleum stocks on March 31, and recent weekly levels as reported by DOE.

U.S. Petroleum Stocks

	<u>Mar. 31, 1979</u>	<u>Aug. 3, 1979</u>	<u>Percent change</u>
	(millions of barrels)		
Crude oil	308.7	319.9	+3.6
Motor gasoline	241.1	235.3	-2.4
Distillate fuel oil	113.3	170.0	+50.0
Other products	<u>420.0</u>	<u>460.0</u>	<u>+9.5</u>
Total stocks	<u>1,083.1</u>	<u>1,185.2</u>	+9.4

Crude oil stocks, which were at extremely low levels at the end of March, have increased somewhat, but are still below normal for this time of the year. Motor gasoline stocks, also very low for the end of March, have fallen, but only by 2.4 percent, and are actually higher now than they were last year. Total crude oil and product stocks have increased somewhat due, in part, to an increase in "other product" stocks, such as residual oil and jet fuel, which are produced in conjunction with gasoline and distillate production.

Distillate fuel oil stocks have increased by almost 50 percent, but are still at extremely low levels, even though peak demand for distillate will not occur until next winter. In order for stocks to reach the 240-million-barrel level that DOE originally set for October 1, 1979, stocks will have to increase by an average of 1.2 million B/D, an extremely large increase. In comparison, during July through September of 1977 and 1978, distillate stocks increased by an average of 804,000 and 688,000 B/D, respectively.

Given the extremely large buildup required, it is unlikely that the goal will be achieved by October 1. However, DOE officials informed us that they believe the 240-million-barrel goal will be achieved during October. They cited as evidence the recent improvements in rates of stock buildups, and the fact that refiners have been given individual stock level targets to reach and have indicated their ability to reach the targets.

For the 4-week period ended August 3, stocks increased by an average of 796,000 B/D, up from 374,000 B/D during May. The reasons for the improved rate of buildup include (1) seasonal reductions in distillate consumption, (2) increased distillate imports, and (3) increased crude oil imports. If buildups of the level recently achieved continue, stocks as of October 1 would be only 217 million barrels. If the buildup continues through October, however, stocks by the end of the month would be about 242 million barrels.

A key element in achieving the goal is crude oil imports and resulting refinery runs. Imports have recently been averaging 6.5 million B/D, compared to about 6 million B/D during May. This increase, combined with a drawdown in crude oil stocks, has permitted refiners to process greater volumes of crude oil, resulting in increased distillate production. During July, refinery runs of crude oil averaged slightly over 15 million B/D, compared to 14.5 and 14.7 million B/D during May and June, respectively. If imports remain at current higher levels, allowing refinery runs of over 15 million B/D, and seasonal distillate consumption declines continue, the goal may well be reached by the end of October. If crude oil imports decrease, however, DOE is faced with the following unpopular options:

- Ordering an increased percentage of refinery distillate output at the expense of gasoline production.
- Mandating further reductions in distillate consumption, which in June was already close to 4 percent less than a year ago.
- Ordering refiners to increase refinery runs by drawing down more on already low crude oil stocks.

Recent reports of planned increases in crude oil production and exports by Saudi Arabia and Iraq, if correct, make the prospect of the United States being able to sustain current or even higher levels of imports appear encouraging. The recent agreement in Tokyo by the United States to limit oil imports to 8.5 million B/D and the President's commitment to further limit imports in 1979 to 8.2 million B/D should not immediately affect our ability to increase imports to rebuild stocks since imports of crude oil and refined products are currently below those levels.

While the task of building up distillate stocks may be possible, the marginal progress that has been made since the

Response Plan was announced is discouraging. At that time, stock increases would have needed to average only 690,000 B/D.

Additional DOE actions

In addition to the specific Response Plan measures, DOE has taken some additional actions to help achieve the Plan's goals and manage current fuel shortages. DOE's approach to date has generally been to encourage rather than mandate that specific actions be taken. However, DOE has taken some mandatory actions and has stated that it will take additional mandatory actions if needed.

measures to assure
The major mandatory measures taken so far have been to assure, through DOE's petroleum allocation authority, that priority gasoline and distillate users receive sufficient supplies, and to update base periods for determining gasoline allocation fractions. These actions, however, are designed more to help manage the shortfall and not to achieve conservation savings or an increase in supplies.

Further recent actions include the following: (1) the President granted emergency authority to the State governors to take appropriate measures to reduce gasoline lines, (2) DOE provided a \$5-a-barrel subsidy for imported heating oil and diesel fuel to help rebuild stocks, and (3) DOE and the Environmental Protection Agency took actions to encourage additional production of unleaded gasoline.

DOE has made several appeals that refiners voluntarily take actions to deal with the distillate and gasoline shortages. Some of these appeals have been contradictory, thus confusing the public over the extent of the shortages and what should be done. In April DOE requested that refiners voluntarily build up distillate stocks to 240 million barrels by October. However, when spot market oil prices jumped due to the world-wide shortage, DOE discouraged U.S. oil companies from purchasing imported oil to reduce upward pressure on prices. Later, DOE reversed its position, encouraging companies to purchase on the spot market, and also instituted the \$5-a-barrel subsidy to help enable the United States regain its fair share of imported distillate. Some of these actions appear to contradict the purpose of the IEA agreement, which is to reduce current consumption, share the shortages, and reduce upward pressure on oil prices.

DOE realizes that it cannot wait until fall to take additional actions if distillate stocks are not high enough. According to a DOE official (1) the decision will have to be made during the summer to allow enough time for stocks to increase before winter and (2) DOE has no specified strategy or set of contingency plans designed to be implemented at a particular time. He said that DOE, however, does have an Emergency Policy Committee that meets weekly to keep abreast of the current situation. The Committee can recommend the implementation of additional measures, depending on its assessment of the situation at the time.

CONCLUSIONS

DOE's Iranian Response Plan has had little effect to date in increasing distillate stocks or reducing U.S. needs for oil imports. While DOE has stated that the 1-million-B/D reduction goal has already been met, the reduction is mainly due to shortages rather than the Response Plan. The Plan may have a positive impact on restraining the need for oil imports by the end of the year, but the Plan's role in helping to achieve the distillate stocks goal is uncertain.

In recent weeks, distillate stocks have increased dramatically, and may well approach the 240-million-barrel level if the trend continues. However, the main reasons for the increase are additional imports and seasonal reductions in consumption rather than the Response Plan measures.

Overall, the Response Plan measures have the potential for significantly reducing oil imports, but some of the savings estimates are overstated. We found little evidence that the savings claimed from the electricity transfers and oil to gas switching measures would not have been realized anyway because of normal transfer and switching activities. Further, most of the savings from these activities will be in residual fuel, not distillate. In addition, the savings from decontrol of domestic oil prices were questionable.

The measures to increase production from Alaska and Elk Hills may help reduce the need for imports by the end of the year, but will not help with the more immediate gasoline and distillate shortages.

The conservation measures have had little impact to date. The building temperature restriction plan is just now being implemented. And individual State conservation plans are not presently being acted upon by DOE because gasoline shortages have already forced reductions in gasoline consumption greater than the savings anticipated by the plans. The mandated 5-percent cut in Federal energy use is in effect, but any savings will be more symbolic than substantive.

In summary, the Iranian Response Plan's uncertain success to date does not speak well for the probable success of future voluntary sharing agreements among oil-consuming nations. Our Nation is finding it difficult to both buildup stocks and satisfy current petroleum demand, while living with constrained import levels. DOE appears to be counting on increased imports to solve the problem. Increasing imports may solve our immediate domestic supply problems but result in further dependency on foreign oil--the cause of our current energy problems which the Response Plan was designed to correct. If stocks are not restored, it is likely that the Response Plan measures will have to be extended through the winter and that stronger additional measures may be needed to deal with shortages of home heating oil and diesel fuel.

Need for improved energy
emergency planning

This most recent petroleum supply interruption--the second in 5 years--again points out the need for a better system of energy emergency planning. The United States committed itself in early March to reduce the need for imports by up to 1 million B/D, but the plan was not formally published until mid-April. Parts of the Response Plan are just now being implemented, and savings attributable to the Plan have been minimal. This is disturbing because, while the Nation may be able to adjust to reduced imports of Iranian oil, the additional loss of any other major oil supplies could be devastating, particularly in view of the state of U.S. preparedness to deal with supply interruptions.

While we certainly would not play down the efforts needed to meet this current contingency, the fact remains that there are no additional DOE plans which could be implemented quickly if this country should suffer further supply interruptions, with the possible exception of small amounts of oil available from the Strategic Petroleum Reserve. Although the United States

must deal with the current crisis, over the longer term, emergency planning efforts should be focusing on the question "What actions could be undertaken to deal with various levels of supply shortfall such as a loss of Saudi Arabian oil, or a loss of all OPEC oil?"

Lack of national energy
conservation program

In several previous reports, we have discussed the need for a strong, national energy conservation program. Even if the United States achieves its Response Plan goal, the effect will be temporary. The measures contained in the Plan are designed to be short-term in nature. Except for the savings estimated from decontrol of oil prices, none of the measures is intended to achieve any continuing conservation savings or discovery of new energy sources. Furthermore, the measures to increase production from Elk Hills and Alaska, and to switch to currently surplus natural gas, succeed only in borrowing against U.S. future oil and gas production.

While the United States is faced with the need for quick actions to meet the problems created by the Iranian oil shortfall, the Nation also must face up to the reality that it cannot continue to rely on short-term crisis management in the energy area.

A strong, coordinated national energy conservation program is essential to the orderly transition to renewable resources. Further, a strong conservation program would not only help mitigate the adverse impacts of future Iranian-type situations, but also would reduce the likelihood of oil embargoes being used as a weapon against the Nation.

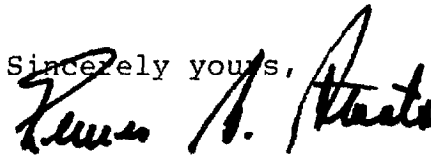
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As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of the report. At that time we will send copies to Senators Proxmire and Roth, who had expressed interest in this area; to the Chairmen of other congressional energy-related committees and subcommittees; and to others upon request. A copy will also be furnished to the Secretary of Energy.

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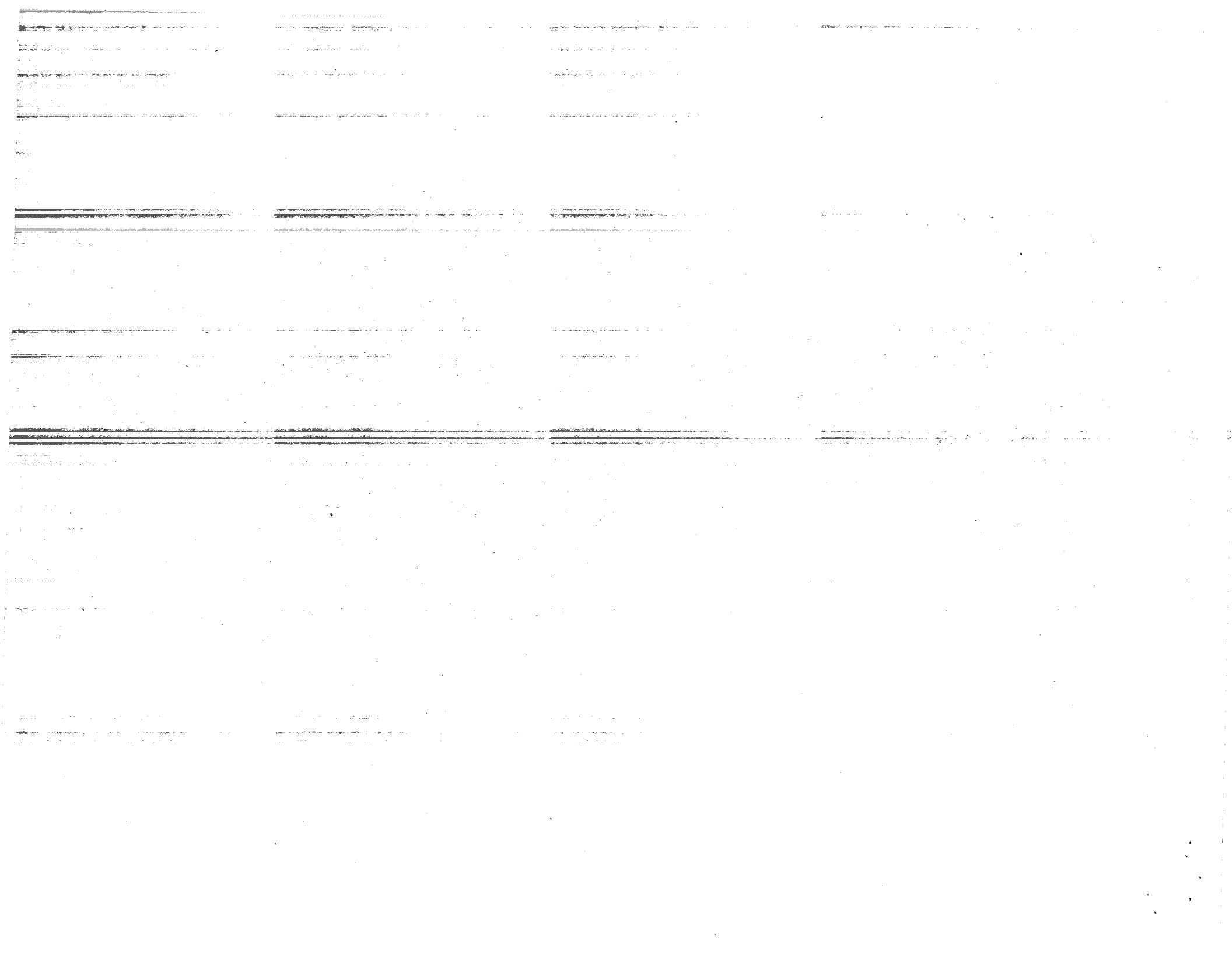
At your request, we did not obtain formal comments on this report; however, the facts were discussed with DOE officials, and their comments were incorporated as appropriate.

Sincerely yours,

A handwritten signature in black ink, appearing to read "James A. Abate". The signature is written in a cursive style with a large initial "J".

Comptroller General
of the United States

Enclosure



COMMENTS ON IRANIAN RESPONSEPLAN MEASURES

In early March 1979, the United States entered into a commitment with the International Energy Agency (IEA) to lower petroleum consumption by up to 5 percent as its contribution to offset the shortfalls brought about by reduced oil production in Iran. The 20 member countries of the IEA entered into this joint agreement to prevent shortfalls and stabilize the world oil market, relieve upward pressures on oil prices, and rebuild petroleum stocks drawn down during the cutoff. The U.S. obligation under the agreement is to reduce its demand for imports by up to 1 million barrels per day (B/D) by the end of 1979.

The President outlined the steps to be taken to achieve this goal in his April 5, 1979, energy speech and an accompanying fact sheet. Later, the Department of Energy (DOE) issued a more detailed discussion of the specific measures to be implemented in a report entitled "Response Plan: Reducing U.S. Impact on the World Oil Market."

The United States agreed to reduce its demand for petroleum imports by the end of 1979 by up to an amount equivalent to 5 percent of what total petroleum consumption would otherwise have been. DOE's Energy Information Administration estimated that, prior to the Iranian oil cutoff and subsequent price increases, U.S. petroleum consumption during the fourth quarter of 1979 would range from 19.5 to 20.6 million B/D. A 5-percent reduction in total consumption equals roughly 1 million B/D, which is the Nation's IEA commitment.

The Response Plan is designed to increase U.S. petroleum stocks, in particular distillate stocks. DOE reported that, during the first quarter of 1979, petroleum stocks were drawn down at a rate of about 700,000 B/D higher than projected to compensate for reduced imports. Consequently, gasoline stocks, which should have been close to their seasonal high, stood at 241 million barrels at the end of March compared to the normal range of between 245 to 267 million barrels. Distillate stocks, which include home heating fuel oil and diesel fuel and are normally at a seasonal low, stood at 113 million barrels--not only lower than the normal range of between 135 and 159 million barrels, but also lower than the minimum acceptable level of 119 million barrels. Spot shortages can be expected to occur below the 119-million barrel level.

The Response Plan contains eight initiatives that fall into three categories:

- Actions to increase domestic petroleum production.
- Measures to switch from petroleum use to other fuels.
- Measures to reduce petroleum use through conservation.

DOE estimated that the eight measures should account for petroleum savings of from 844,000 to 1,509,000 B/D by the fourth quarter of 1979.

The following are measures contained in the Plan, with their individual estimates of savings, along with our analysis of each measure.

DOE Estimated Savings From Response Measures

<u>Measure</u>	<u>4th quarter 1979 savings</u>
<u>Increased production:</u>	(thousands of barrels per day)
Increased Alaskan production	0-150
Decontrol of crude oil prices (note a)	60-80
Increased production from Elk Hills Naval Petroleum Reserve	<u>20</u>
Total increased production	<u>80-250</u>
<u>Fuel switching:</u>	
Increased use of currently surplus natural gas	250-400
Electricity Transfers	<u>100-200</u>
Total fuel switching	<u>350-600</u>

a/Decontrol savings represent a combination of increased production and decreased demand resulting from higher domestic crude oil prices.

Decreased consumption:

Implementation of standby energy conservation building temperature restriction plan	195-390
State, local, and private initiatives to save gasoline	200-250
Reduce Federal energy use by 5 percent	<u>19</u>
Total decreased consumption	<u>414-659</u>
TOTAL	<u><u>844-1,509</u></u>

INCREASED ALASKAN PRODUCTION

The Response Plan projects up to a 150,000-B/D increase in crude oil from the North Slope of Alaska. There is no question that production can be increased: rather, the issues are those of pipeline capacity, refining capability, and distribution.

The Trans-Alaska pipeline has a design capacity of 2 million B/D. As constructed, and at present, the capacity is about 1.2 million B/D. As production increases, the capacity can be expanded by installation of additional pumps. We contacted pipeline officials to determine the planned timing of the capacity increase. We were informed that plans call for the increasing capacity to about 1.36 million B/D by the end of 1979.

Thus, while the increased production may not be available during the entire fourth quarter, it appears reasonable to count on it by the end of the year. This production will have no effect on present efforts to rebuild stocks, but should help reduce demand for imports by the end of the year.

One constraint to the use of increased Alaskan production is refinery capability. North Slope crude is a heavier, more sour crude. Originally, it was thought that little of it could be handled by California refiners, who were set up for a lighter, sweet crude. The capability problem is one of fitting available, specific types of California and Alaska crudes to the processing capabilities of California refineries. However, as the California refiners gained experience with the Alaskan crude, they found ways to adapt

their operations to use it. Thus, it is likely that a significant portion of the 150,000-B/D increase could offset oil imports into California. 1/

Another constraint is the ability to transport oil that is not refined in California. Any crude that cannot be handled by California refiners must be moved east to refineries that can handle it. This is complicated by the lack of pipelines to move the crude oil, necessitating higher cost tanker shipment through the Panama Canal. Because of the lead time required for approval and construction of new pipeline projects, and restrictions on exchanges of crude oil with other countries, Canal shipment is the only alternative presently available.

Based on information received from pipeline officials, and on our prior related work, we believe that there is a reasonable basis to count on increased Alaskan production by the end of the year, and a decrease in imports.

CRUDE OIL PRICE DECONTROL

Although the President has announced his intention to phase out all crude oil price controls by October 1, 1981, the only oil affected by the fourth quarter of 1979 will be (1) production from marginal properties and (2) newly discovered oil.

Marginal wells are relatively deep wells which produce relatively small amounts of oil. As of June 1, 1979, 80 percent of marginal production can sell for the upper tier "new" oil price of about \$12.44 a barrel rather than the "old" oil price of about \$5.82 a barrel. This is designed to provide an incentive to producers to maintain marginal production because of the proportionately greater operating costs associated with these wells. Production of newly discovered oil would be allowed to sell for the world oil price to encourage exploration and development of new domestic supplies.

1/In a previous report, we noted that North Slope crude oil production was displacing oil imports into California to some extent, causing a downward trend in imports as Alaskan production increased. See "Effects of Alaskan North Slope Oil and Continued Crude Oil Production at Elk Hills Naval Petroleum Reserve" (EMD-78-78, July 19, 1978).

The Response Plan projects savings of 60,000 to 80,000 B/D as a result of (1) increased domestic oil production, resulting from the incentive provided by higher prices for crude oil and (2) restrained demand as a result of higher prices for refined products. Since the effect of this decontrol will begin to be felt later in the year, it supports the effort to restrict imports, but does not contribute to the current need to rebuild stocks.

According to a DOE official, these increases in production were based on computer model projections of the effect of new production only. The projection did not include any estimate of increased marginal production because of the uncertainty as to the effect this change will have on marginal production.

There is also a large amount of uncertainty surrounding any estimates of increased new production. Assumptions must be made concerning such factors as increased drilling rates brought about by the higher prices, and what the oil-finding rate will be. Further complicating the estimating process is the short time period (June 1 to December 31) available to develop new discoveries and bring them into production. While we are not taking issue with the results of the computer model projection, we do question the advisability of relying on the realization of any specific amount for purposes of the Response Plan.

The Congressional Budget Office (CBO) recently released its analysis of oil price decontrol. This study made projections on a fiscal year basis, and generally projected lower amounts of increased production and higher prices than DOE has forecasted. CBO's projection of increased production is a gradual build-up which peaks in 1983 but includes only a negligible amount--about 25,000 B/D--by the end of 1979. CBO's lower projection raises further questions about whether any particular estimate should be relied upon.

Projecting the results of oil decontrol is a difficult task at best, the results of which are easier to criticize than defend. There will probably be some increase in production, but any method of forecasting must begin with assumptions which are little more than informed guesses. For these reasons, it does not seem prudent to count on any particular level of increased production.

INCREASED PRODUCTION FROM
ELK HILLS NAVAL PETROLEUM RESERVE

The Response Plan calls for increasing production by about 20,000 B/D by the end of 1979 at the Elk Hills Naval Petroleum Reserve in California. DOE plans to increase Elk Hills production to 160,000 B/D by the end of 1979 by drilling new wells and developing a water injection system. The gathering system for the Elk Hills reservoir would also be expanded to accommodate the increase in production. DOE estimates that this would cost about \$20 million.

A DOE official advised us that the work to expand Elk Hills production is progressing on schedule using extra work shifts and overtime, and that this work should be completed to permit the 20,000-B/D production increase by the end of the year. This official also advised us that the decision to bring this production increase on-line sooner than scheduled was a direct response to the Iranian cutoff.

Prior to the start of the new developmental work at Elk Hills, the daily production rate was about 138,200 B/D. As of early July, production had already increased by about 14,000 B/D.

We have no reason to question DOE's ability to complete the work at Elk Hills and to achieve the 20,000-B/D production increase by the fourth quarter of 1979. And since this production results from an acceleration of the previous production schedule, the 20,000-B/D figure represents a valid decrease in what would have otherwise been imported.

The increased Elk Hills production would yield a light, sweet crude oil which would, according to DOE, offset imports of a similar type crude oil from Indonesia.

SWITCHING TO NATURAL GAS

The Response Plan projects savings for the fourth quarter of 250,000 to 400,000 B/D due to switching from oil use to natural gas. These levels represent incremental savings of 1979 over 1978 levels, and result from moving gas from the intrastate market to the interstate market. This is to be accomplished through (1) sales by intrastate pipelines to interstate pipelines or (2) direct purchase arrangements between end users and producers or pipelines. The Plan estimates that two-thirds of the savings will be residual oil and the remainder will be distillate.

There is, at present, a great deal of switching from oil to gas: The Response Plan states that savings reached over 200,000 B/D by early April. Other information we obtained supports the existence of a large amount of switching. DOE's Economic Regulatory Administration (ERA) has developed a monitoring system to provide data on the status of the fuel oil switching program. This system reports residual and distillate savings for both industrial and utility users. For the week ending June 8, 1979, the total oil displaced was reported at 290,000 B/D, of which one-fourth was distillate.

As these savings continue through 1979, they should somewhat help rebuild distillate stocks, and also reduce the need for imports. We have no reason to question the levels of switching projected by the Plan, but we are concerned that the bulk of the savings result from measures beyond the Plan's scope. That is, most of these savings would have taken place anyway.

According to a DOE official, this switching is the result of several factors:

- Economic considerations making gas use attractive.
- A response to the oil shortage.
- Enabling features of the Natural Gas Policy Act of 1978 (Public Law 95-621).
- Emergency sales of natural gas.

We noted, and the official concurred, that the only one of these features that represents an initiative associated with the Response Plan is the extension of emergency gas sales to lower priority users. Previously, they had been applicable only to high-priority users.

The broadening of the emergency sales of natural gas results from the adoption of new rules by ERA and the Federal Energy Regulatory Commission. These rules provide a means for lower priority users to arrange for transportation of gas that they may now purchase directly. These lower priority users are mainly industries and electric utilities which in the past have bought gas when available and used oil when gas was not available. Some of the new users may have switched from natural gas several years ago.

We believe that the savings unrelated to the new emergency sales serve to overstate the effects of the Response Plan, and represent actions which should have been reflected in any base measured against the Plan, instead of being attributed to the Plan. While we are unable to project the amount of these new emergency sales, we believe they represent only a portion of total switching activities. Accordingly, we believe the projections in the Plan are too high.

ELECTRIC ENERGY TRANSFERS

The Response Plan projects savings of 100,000 to 200,000 B/D through the transfer of excess electric power from coal-burning and hydro-powered facilities to utilities which would otherwise use oil. These transfers would be voluntary. The Plan states that achieving the higher level of savings would be possible if substantial transfers of power from Canada continue, and that the more likely level of savings is 100,000 B/D. Under either level of savings, about 85 percent represents residual oil, and 15 percent represents distillate.

ERA monitors electricity transfers and prepares a weekly status report. We were informed by ERA officials that the level of transfers is up over last year, but that it is difficult to make comparisons for several reasons, including

- the 1978 coal strike,
- increased oil prices,
- the present nuclear shutdowns, and
- the fact that the monitoring system has operated only since the end of March, and comparable data does not exist for 1978.

While the officials stated that, undoubtedly, transfers were greater than in 1978, they cited economic reasons (i.e., higher oil prices) rather than Federal action as the reason for the higher levels. They estimated that about 10 to 20 percent of total electricity transfers might be attributed to Federal actions. Transfers during May 1979 amounted to about 340,000 B/D of oil displacement--thus, the portion attributed to actions under the Response Plan might be about 34,000 to 68,000 B/D.

We were told that the primary motivation for utilities to make transfers was economic. Federal efforts under the Response Plan have increased or enhanced this activity primarily because the utilities knew that the Government was interested in maximizing transfers. Consequently, the utilities looked harder for transfer opportunities--even to the point that transfers which were only marginally economic would be made, where in the past they might not have been. The utilities believed that if they did not make transfers the Government might require them to do so.

Additional Federal actions would result in requiring transfers for other than economic reasons, such as mandatory transfers if warranted by emergency conditions. The Response Plan estimates such transfers to cost customers served by affected utilities from about one-half to one cent per kilowatt hour.

There are some constraints which may prevent higher levels of electricity transfers. These include:

- State regulatory requirements relating to recovery of the full cost of purchased power.
- Federal Energy Regulatory Commission regulations relating to transfer of electricity.
- State taxes on power generation, although there are current court actions in progress which may change the effect of such taxes.

Also, the current shutdowns of some nuclear facilities for safety or earthquake-resistance checks as well as the Nuclear Regulatory Commission's licensing moratorium have cut into the amount of transfer potential.

As of early July there were 13 plants temporarily shut down with a total generating capacity of 11,600 megawatts. Five are of similar design to the Three Mile Island plant, and an additional five are undergoing testing related to the ability to withstand earthquakes. In addition, three newly-constructed plants are ready to come on-line but for the Nuclear Regulatory Commission's 90-day moratorium on new licenses. A 900- to 1000-megawatt nuclear plant is roughly equivalent to 25,000 to 30,000 B/D of oil-generated capacity. To the extent these shutdowns require the substitution of oil-fired generating facilities, they will reduce the amount of oil

savings achievable from this portion of the Plan, or perhaps even result in a net increase in oil use.

We believe that the fourth quarter projection of 100,000 to 200,000 B/D is too high if it is intended to represent the increased transfers over what activity would have otherwise taken place. ERA officials believe that total fourth quarter transfers will be somewhere in the 250,000 to 300,000 B/D range. While we know of no way to precisely determine the amount of transfers attributable to the Response Plan, we believe that the incremental amount will be a reasonably small amount of the total unless the Federal Government (1) resolves regional tariff issues which make some transfers uneconomic or (2) requires transfers for other than economic reasons. Sixty-thousand B/D seems to be a generous assessment of the effect of the Federal role in the fourth quarter unless non-economic transfers are required.

EMERGENCY BUILDING TEMPERATURE RESTRICTIONS

The Energy Policy and Conservation Act (42 U.S.C. 6261) required DOE to prepare, for Congress' approval, one or more standby energy conservation plans. Once approved by the Congress, these plans would be available for implementation during a severe energy supply disruption or available to fulfill the Nation's obligation under the International Energy Program.

The standby plans submitted by DOE on March 1, 1979, consisted of the following three measures:

- Weekend gasoline sales restrictions.
- Building temperature restrictions.
- Advertising lighting restrictions.

The Congress approved the building temperature restriction plan, but rejected the other two plans. The President stated that he intended to implement this plan as a part of the Response Plan as soon as possible. Because of the time required to prepare the regulations governing the plan, it just went into effect on July 16.

The plan originally called for restricting thermostat settings in public and commercial buildings to no more than 65 degrees for heating and no less than 80 degrees for cooling, and reducing hot water temperatures to 105 degrees.

DOE estimated petroleum savings from the plan to range from 195,000 to 390,000 B/D during the fourth quarter of 1979. However, DOE adjusted the plan slightly based on public comments received during June. The 80-degree cooling limit was set back to 78 degrees because of comments made concerning possible reduced employee productivity, damage to retail items from mildew, and loss of business resulting from an 80-degree setting.

DOE adjusted the estimated savings figures slightly because of this change, but believes the savings will stay essentially the same. While more energy will be needed to achieve the lower 78-degree cooling setting, DOE estimates that the additional energy use will be offset by greater voluntary compliance to the more comfortable 78-degree setting.

The savings estimates consist of petroleum savings only. However, DOE has estimated that natural gas and coal would also be conserved, since all building heating and cooling systems would be covered, not just those fueled by oil. Although the coal savings are minor, the estimated natural gas savings could amount to the equivalent of 205,000 B/D of oil. This additional savings should be recognized, since the displacement of oil with currently available "surplus" natural gas is part of the overall Iranian response strategy.

This plan will be difficult to enforce. It calls for only 39 Federal and 278 State and local employees to monitor the Nation's buildings. Although DOE states that the plan is enforceable, the Department is vague on how it will be done. We see no more than token enforcement possible, with the plan's success being overwhelmingly dependent upon voluntary compliance.

Based on previous work, we question how effective voluntary conservation programs are. In June 1978, we reported 1/ on the results of the Nation's efforts to conserve energy following the 1973 oil embargo and the effectiveness of Federal energy conservation programs carried out during the 1973-76 time period. We concluded that some Federal energy conservation programs--primarily educational and consisting of public appeals to conserve--were initially successful due mostly

1/"The Federal Government Should Establish and Meet Energy Conservation Goals" (EMD-78-38, June 30, 1978).

to the prevailing circumstances of that time--supply disruptions (either actual or threatened) and rapidly increasing energy prices (both in actual and real terms). However, as the "crisis" situation subsided, consumers apparently reverted to previous energy consumption practices.

Thus, it is possible that current shortages and rapidly rising prices will also influence the public's energy consumption habits. However, based on experience, we fear that the public will again revert back to old habits if shortages diminish and prices stabilize.

If the plan receives a high rate of compliance, savings exceeding DOE's estimates might be achieved for reasons just discussed. However, compliance will be largely voluntary because of the small enforcement effort, thus DOE will be able to do little to ensure the plan's success.

STATE, LOCAL, AND PRIVATE INITIATIVES

Under this Response Plan measure, State and local government leaders are asked to develop and implement their own conservation plans for reducing oil consumption, particularly gasoline. Specific actions requested include a 10-percent reduction in gasoline usage by State governments and restricting thermostat settings in State buildings. DOE is to work with the States in establishing individual conservation goals and State-by-State targets for the reduction of gasoline use.

Also, DOE is to mount a major public information effort aimed at encouraging the public to use less energy by voluntarily restricting thermostat settings and reducing gasoline use. DOE claims that 450,000 B/D of oil could be saved if all drivers drove 15 fewer miles per week.

DOE estimated gasoline savings from this measure to range from 200,000 to 250,000 B/D commencing in the second quarter of 1979 and continuing at the same rate through the remainder of 1979. DOE anticipated that petroleum savings other than gasoline would also occur as thermostats were voluntarily set back. However, DOE included these savings in the savings estimates supporting its building temperature restriction plan. The gasoline savings estimates constitute roughly 3 percent of what gasoline consumption had been projected for 1979, and represent what DOE believed to be savings that were realistically achievable.

State conservation measures

States were asked to develop individual plans to reduce gasoline consumption. DOE was to work with the States in identifying measures that would reduce consumption, and would establish State-by-State gasoline reduction targets. In his April 5, 1979, speech, the President warned that if the States did not meet their targets, he would impose the weekend gasoline sales restriction plan.

However, several occurrences took place that have effectively served to render this plan obsolete. First, the Congress failed to approve the weekend gasoline sales restriction plan, so the States had nothing to fear if they did not develop an effective plan. Second, gasoline consumption for recent months is already down sharply--about 10 percent--compared to last year, due to the shortage. Consequently, the public was already forced to "save" gasoline in amounts considerably higher than had been anticipated by this plan.

DOE, in conjunction with the National Governors' Association, did develop a methodology for arriving at individual State reduction targets. Each State would have been asked to reduce projected 1979 gasoline consumption by 5 percent. But since actual gasoline consumption declines have exceeded the State targets, DOE is not pursuing this plan further at this time.

Several States, however, have already implemented plans on their own, including such measures as

- increased use of carpools,
- reduction in State employee travel,
- increased use of mass transit, and
- adjusted workweek hours.

Public awareness campaign

DOE is conducting a public awareness campaign to encourage voluntary energy conservation by the public. Its campaign messages describe for consumers many specific ways to conserve energy and save money, particularly on gasoline. Approximately 40,000 "Energy. We Can't Afford To Waste It" packages were distributed in April to radio and television stations, newspapers, State energy offices, mayors and county officials,

interest groups, and other organizations throughout the Nation. These packages include news features on energy conservation, pamphlets with energy-savings tips, and print ads suitable for reproduction in newspapers and magazines. Those packages sent to television and radio stations were accompanied by videotapes and audiotapes, for use on the air by the stations.

In June, DOE distributed a second batch of conservation materials. Also, DOE has distributed thousands of energy conservation posters for display on transit vehicles and in Post Offices throughout the country. Another energy package addressed specifically to corporations will be distributed in August.

According to a DOE official, response has been great regarding these energy packages; most organizations are using the materials and some are asking for additional information. However, DOE does not know, and has no control over, how many public service messages will ultimately reach the public through the mass media. DOE is relying on the goodwill of the media to get the conservation message across to the public.

DOE estimates the cost of the public awareness campaign at between \$500,000 and \$1 million. This includes the cost of developing and printing the packages and the spot ads for TV and radio, but does not include the value of any print space or air time donated by the media.

The value of the media time and space donated will undoubtedly be considerable. In a previous GAO report, 1/ The Advertising Council, Inc., stated that its \$675,000 contract with the Federal Energy Administration to conduct a public-service advertising campaign on energy conservation had resulted in media exposure worth \$85 million over a 2-year period, ending in September 1975. However, it is disturbing to us that DOE is conducting what it considers to be a "major" public awareness campaign but yet has no control over the extent and manner in which the conservation messages will be conveyed to the public. Furthermore, even after adding the value of donated media exposure, the question can be raised over how "major" DOE's campaign actually is when, in comparison, the Department of Defense's all volunteer force advertising campaign is budgeted (including funds for paid advertising) at \$104 million for fiscal year 1979.

1/"Federal Energy Administration's Contract with the Advertising Council, Inc., for a Public Relations Campaign on the Need to Save Energy" (PSAD-77-151, Aug. 31, 1977).

FEDERAL GOVERNMENT INITIATIVES

In a memorandum dated April 10, 1979, the President directed the heads of executive departments and agencies to reduce their agencies' energy consumption by 5 percent during the year, starting April 1979. Specific measures to be taken by each agency are to

--set thermostats in federally-operated buildings at no more than 65 degrees in winter and no less than 80 degrees in the summer and

--reduce use of automotive fuels by 10 percent.

Department of Defense operational readiness activities which, according to DOE, account for about half of total Federal energy use, are exempt from this memorandum.

This memorandum is, to some extent, a follow-on to a February 2, 1979, directive from the President that all executive departments and agencies reduce their use of petroleum fuels. The memorandum contained several suggestions for ways to reduce energy use, including setting thermostats back to 65 degrees, but did not mandate any specific actions. Agencies were to report to DOE on their plans for implementing the memorandum and, in subsequent quarterly reports on energy usage, identifying savings achieved.

DOE officials responsible for monitoring Federal energy use informed us that they obtained positive responses from most of the agencies regarding their intentions to cut back on petroleum use. However, statistics on Federal energy use during the first 3 months of 1979 are not yet available, so it is not yet known whether these good intentions have been translated into actual reductions.

DOE estimated that the measures contained in the April memorandum, by themselves, will save only about 40 percent of total savings needed to achieve the 5-percent savings mandated. Therefore, the President's memorandum also directs agencies to, within 30 days, identify additional measures to achieve the full 5-percent reduction goal and to report to DOE on how the goal will be achieved. The responses we examined were generally optimistic about their ability to achieve the 5-percent reduction, but did not offer many specifics on how the additional required savings would be accomplished. DOE's quarterly estimates of petroleum savings resulting from this

measure range from a low of 12,000 B/D during the second quarter of this year, before the memorandum will be fully implemented, to a high of 29,000 B/D during the first quarter of 1980.

Whether or not the Federal Government achieves the savings from in-house efforts that this plan envisions will not have much impact on the overall 1 million-B/D total savings goal. However, an aggressive, coordinated effort by the Government to conserve energy in its own operations and facilities can serve as an example to encourage additional conservation by the rest of the Nation.

DOE's role in this endeavor is to collect the energy usage statistics submitted quarterly by the other Federal agencies, and to report on whether the President's goal is being realized. In recent reports and testimony, we have stated that the Federal Government's efforts to conserve energy have not achieved their full potential because DOE has made an insufficient commitment to the Federal Energy Management Program.

We are concerned about the lack of direction and overall management effort that DOE is giving to the Federal conservation program. While the Federal Energy Management Program was established to manage the Government's overall energy conservation program, under DOE, the program has not been accorded an organizational status which enables it to do much more than collect, compile, and report on Federal energy consumption data.