



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

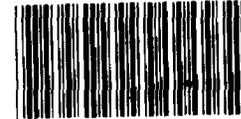
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ENERGY AND MINERALS
DIVISION

MARCH 27, 1979

B-178205



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The Honorable James R. Schlesinger
The Secretary of Energy

Dear Mr. Secretary:

The General Accounting Office (GAO) is continuing to review the Department of Energy's (DOE's) efforts to create a strategic petroleum reserve. As part of our current review, we examined (1) the oil withdrawal capabilities at each of the existing storage sites, (2) the status of the security measures taken or planned, and (3) to a limited extent the measures taken to account for reserve oil losses or gains.

Although we noted some problems during our limited review of the measures taken to account for reserve oil losses or gains, these problems have been corrected by DOE. However, with respect to security measures and oil withdrawal capabilities, we noted three issues that we believe warrant your attention.

- The three existing storage sites do not have permanent oil withdrawal capability and are not scheduled to have such capability until the summer and fall of 1979.
- Contingency plans for transferring oil in the event of a non-embargo emergency such as the West Hackberry, Louisiana, fire on September 21, 1978, have not been developed.
- DOE has not developed or implemented a site-specific security plan for each existing storage site, but does have some degree of actual security at each site.

As the oil fill progresses, the monetary value of the reserve program increases. Oil stored in salt caverns or mines without withdrawal capability is not readily available for use. Therefore, we believe permanent withdrawal capability at future sites should be available, to the extent

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practicable, when oil fill begins so that the oil can be used during a supply interruption. In addition, DOE should develop a contingency plan for transferring oil that is released during a non-embargo emergency situation, such as the fire that occurred at the West Hackberry storage site. We also believe security implementation plans should be prepared and implemented for each site, when equipment is installed and when oil fill begins, in order to protect site equipment and the oil itself.

BACKGROUND

Energy Legislation
The Energy Policy and Conservation Act (Public Law 94-163) dated December 22, 1975, required DOE ^{1/} to create a reserve to substantially reduce the Nation's vulnerability to interruptions of foreign petroleum supplies. This act required DOE to establish a reserve of at least 150 million barrels of petroleum products by December 1978 and provided, subject to congressional approval, for the eventual storage of up to 1 billion barrels of petroleum products.

In December 1976, DOE submitted a strategic petroleum reserve plan which stated that, in accordance with the act, the reserve would contain 150 million barrels of oil by December 1978. In addition, it proposed storing 500 million barrels by December 1982. Subsequently, DOE's May 1977 plan amendment established new reserve storage targets of 250 million barrels by December 1978 and 500 million barrels by December 1980. A May 1978 amendment increased the reserve to 1 billion barrels by the end of 1985.

Despite the emphasis DOE has placed on accelerating the storage time frames for the reserve, DOE officials said that the 1978 target of 250 million barrels of oil in storage is not expected to be achieved until about December 1980, and the 1980 target of 500 million barrels in storage will probably not be achieved until 1985. DOE had about 68 million barrels of oil in storage at the end of 1978--about 180 million barrels less than DOE's goal, and about 80 million barrels less than the amount specified by law. By mid-February 1979 DOE had increased the oil in storage to about 74 million barrels.

^{1/}DOE is referred to throughout the report. The functions of the Federal Energy Administration were assigned to DOE on October 1, 1977, pursuant to the Department of Energy Organization Act (P.L. 95-91).

Earlier GAO reports 1/ noted that storage targets for the reserve appear very ambitious. Both reports stated that tight time constraints, in part, have resulted in DOE taking actions without adequate analysis to minimize the risks of salt cavern and salt mine storage.

An accident investigation committee, comprised of Government and non-Government safety experts, stated in its report on the fire at West Hackberry that "* * * there has been a strong and overriding emphasis from the highest level of management to get oil in the ground." It further stated that "* * * a policy of giving predominant priority to getting 'oil-in-the-ground' was allowed to override prudent safety and contingency planning and implementation * * *" and "* * * may have contributed at least indirectly to the accident." That accident resulted in one fatality, one injury, and about 68,000 barrels of oil expelled from the cavern. About 33,000 barrels of this oil burned.

NO WITHDRAWAL CAPABILITY

Although DOE had about 74 million barrels of oil in cavern storage at three salt cavern storage sites as of mid-February 1979, permanent oil withdrawal systems are not scheduled to be installed until the summer and fall of 1979. Cavern-stored oil is withdrawn by displacing the oil with fresh water. The main components needed for displacement, water intake structures and power generation, have not been constructed.

In commenting on a draft of this report, DOE officials stated that priority has been given to obtaining and storing the crude oil as quickly as possible in view of the increasing cost of oil. They also stated that obtaining environmental permits has delayed construction of permanent withdrawal facilities at the existing storage sites. In his February 26, 1979, testimony before the Subcommittee on Energy and Power, House Interstate and Foreign Commerce Committee, the director of the reserve program stated that in retrospect it would have been desirable to have permanent withdrawal capability before beginning oil fill at each of the three sites. In the absence of such facilities DOE

1/"Questionable Suitability of Certain Salt Caverns and Mines for the Strategic Petroleum Reserve", EMD-78-65, August 14, 1978, and "Need to Minimize Risks of Using Salt Caverns for the Strategic Petroleum Reserve", EMD-78-25, January 9, 1978.

issued an interim withdrawal plan on January 1, 1979. This plan is based on using a temporary withdrawal system at each existing site.

The temporary plan would require use of the most readily available source of water supply and emphasizes the need to expedite construction and acquisition of adequate pumping capacity. Non-competitive (sole source) contracting authority would be required to expedite the construction and procurement of materials and engineering services needed to implement the temporary plan. Although the plan states that that withdrawal could begin within 14 days following a notice to proceed, the initial daily withdrawal rate would only be about 30,000 barrels. The maximum daily withdrawal rate of 520,000 barrels using the temporary system would not be achieved until about 12 weeks later, and total withdrawal of the oil in storage on January 1, 1979, would require about 8 months.

In contrast to the withdrawal rate using the temporary system, permanent facilities would significantly increase the withdrawal rate. According to a DOE official, assuming that the permanent facilities had already been tested for operational readiness, it would take only 1 day to achieve the daily withdrawal rate of about 1 million barrels. At this rate the total withdrawal of oil in storage on January 1, 1979, would only require a little over 2 months, as compared to the 8 months using the temporary system.

Withdrawal capability is essential if the Nation is to benefit from the reserve. Without it the reserve would be ineffective in helping to deal with the very situation for which it was created--an oil embargo or supply interruption.

We believe, therefore, that future storage sites should have permanent withdrawal capability prior to the start of oil fill.

CONTINGENCY PLAN NEEDED

Q In the event a non-embargo emergency causes oil to be released from a cavern, DOE should be prepared to transfer the oil to other locations. DOE, however, does not have a plan for dealing with such an event. Based on our past reports which show that unnecessary risks have been taken, and based on the recent illustration of a non-embargo emergency--the West Hackberry fire--we believe such a plan is necessary.

Most caverns in the reserve have a capacity of 8 to 15 million barrels. If, as a result of a non-embargo emergency, a substantial amount of the oil stored in a cavern is released, advance plans for transfer are essential to protect against the loss of oil. On September 21, 1978, a blow-out flamed up at the West Hackberry, Louisiana, site. Only after 6 days and after about 68,000 barrels of oil were expelled was the pressure sufficiently reduced to stop the oil loss and extinguish the blaze. During that time DOE's primary means of transfer for released and recovered oil was by truck. Alternate storage was provided for about 30,000 barrels by the temporary loan of barges and neighboring tanks. While this sort of "jury-rigged" operation may work for transferring small quantities, we believe a contingency plan should be developed for transferring and storing the oil that could be released should a future non-embargo emergency occur.

In commenting on a draft of this report, DOE officials agreed with the need for contingency plans.

NEED FOR SITE-SPECIFIC SECURITY PLANS

Although each storage site has basic security measures, such as guards and lighting, at the time of our review DOE did not have site-specific plans for any of the sites. DOE plans, however, to implement such security measures, which they believe will be capable of detecting, deterring, and responding to a broad spectrum of threats, ranging from vandalism to sabotage.

Direct theft of reserve crude oil from caverns or mines is considered unlikely because of the high visibility of heavy equipment needed to extract oil from underground storage. A Sandia Laboratories study ^{1/} of reserve security needs, however, pointed out that the high visibility of the reserve storage program during an embargo could make the reserve an attractive target for terrorist activity. According to both the Sandia study and petroleum industry representatives, the most common threats are tool and equipment theft during construction and, to a lesser extent, sabotage.

Despite the risk of theft and sabotage, as of February 1979 DOE had not implemented individual site security plans

^{1/}"Security for the Strategic Petroleum Reserve" (SAND 78-0769, Sandia Laboratories, undated).

for the three storage sites which contained about 74 million barrels of crude oil in salt cavern storage. A subcontractor has prepared a report 1/ which provides the estimated cost and features of various safeguards and security measures for each of the reserve sites. Because each of the three sites has its own distinct characteristics, the security measures and degree of security will vary by site. For example, two sites are located in a marsh area and another in a heavily wooded swamp area; some have several access roads and others are less accessible.

DOE has not decided on the appropriate security measures for each site and, according to a DOE official, has not set a target date for the decision.

We believe that the equipment and oil to be stored must have adequate site-specific security plans. Ideally, DOE should have implemented a security plan when equipment was installed and when oil began to be injected to minimize risks such as vandalism, theft, and terrorism. We also believe that security plans should be operational when equipment is installed and when storage begins at future sites such as Weeks Island where crude oil storage is scheduled to begin in the fall of 1979.

In commenting on a draft of this report, DOE officials agreed that although there are some security measures in place at the existing storage sites, site-specific security plans should be implemented at each site.

CONCLUSIONS

DOE established a reserve to offset the impact of an oil supply interruption and had a reserve storage target of 250 million barrels of oil by the end of 1978, while it was required by the Energy Policy and Conservation Act to have 150 million barrels stored by that date. Neither amount was met. Actual oil in storage at the end of December 1978 only totaled about 68 million barrels valued at about \$1 billion. DOE officials expect the fill rate to accelerate as the result of site improvements such as new pipelines which will expedite oil transportation by eliminating barge operations.

1/"Strategic Petroleum Storage Reserve Security Management Plan" (Mason-REgard, Oct. 31, 1978).

As the reserve continues to increase, both its monetary value and the role it can play in offsetting the impact of an oil supply interruption increase. Therefore, DOE should adequately protect this investment.

was noted
We ~~noted~~ the following deficiencies, which warrant DOE attention:

- The three existing storage sites do not have permanent oil withdrawal capability and are not scheduled to have such capability until the summer and fall of 1979.
- Contingency plans for transferring oil in the event of a non-embargo emergency such as the West Hackberry fire have not been developed.
- DOE has not developed or implemented a site-specific security plan for each existing storage site but does have some degree of actual security at each site.

DOE officials said that top priority has been given to attempting to meet the oil fill schedules. We believe DOE must also focus adequate attention on the need for safeguarding both the oil and the equipment at the storage sites. Oil withdrawal capability should be available at the storage sites in the event of an embargo, and emergency contingency plans should be developed for transferring oil that may be released during a non-embargo emergency.

RECOMMENDATIONS

To insure that the oil in the reserve can be withdrawn in an embargo, transferred in non-embargo emergency situations, and properly protected, we recommend that the Secretary, Department of Energy:

- install oil withdrawal capability at future storage caverns prior to oil injection;
- develop a contingency plan for transferring the oil that may be released in non-embargo emergency situations; and
- insure that site-specific security plans are implemented as soon as practicable at the existing storage sites and that such plans are operational when equipment is installed and storage begins at future sites.

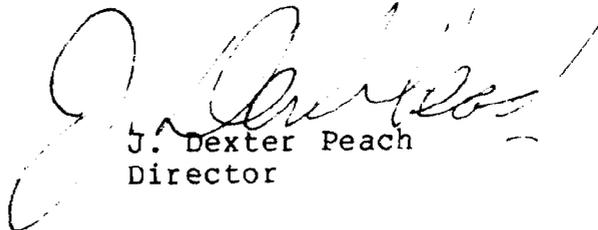
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We conducted our review at DOE offices in Washington, D.C.; the Strategic Petroleum Reserve Project Management Office in New Orleans, Louisiana; the Department of Defense's Defense Fuel Supply Center in Alexandria, Virginia; and the reserve storage sites at Bayou Choctaw in Iberville Parish, Louisiana; at West Hackberry in Cameron Parish, Louisiana; and at Bryan Mound in Brazoria County, Texas. We interviewed Defense and DOE officials and DOE contractor personnel. We reviewed legislation and agency records pertinent to the reserve program.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of Defense; interested congressional committees; and other interested parties.

Sincerely yours,



J. Dexter Peach
Director