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BY THE COMPTROLLER GENERAL

**Report to the Chairman, Subcommittee on
Energy and Power, House Committee on
Interstate and Foreign Commerce
OF THE UNITED STATES**

**U.S. Strategic Petroleum Reserve At
A Turning Point--Management Of Cost,
Oil Supply Problems,
And Future Site Development**

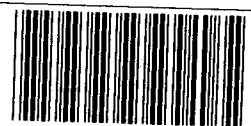
The Department of Energy's Strategic Petroleum Reserve Program has been plagued by problems since its inception in 1975. The Chairman of the Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce, asked GAO to examine

- efforts to control facility costs which have doubled,
- failure of four oil suppliers to deliver 10 million barrels of oil, and
- efforts to develop storage sites through combined design and construction contracting, a technique known as "Turn-key."

GAO recommends close monitoring of new systems to control costs and a thorough analysis of all factors related to future site development.



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EMD-80-19
JANUARY 2, 1980



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

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The Honorable John D. Dingell
Chairman, Subcommittee on Energy and Power
House Committee on Interstate and Foreign Commerce *HSC 02303*
House of Representatives

Dear Mr. Chairman:

Your letter of March 26, 1979, (see app. I), requested that we examine the effectiveness of the cost tracking or other cost control procedures used in the Strategic Petroleum Reserve program. We were also requested to examine the recent failure of oil suppliers to deliver oil for the Reserve under their contracts. Your office later requested that we examine the three noncompetitive turnkey contract negotiations for procuring new Strategic Petroleum Reserve storage facilities. This report contains the results of our examination.

As arranged with your office, we plan to distribute the report at this time to other interested parties.

Sincerely yours,

[Handwritten signature: James R. Starks]

Comptroller General
of the United States

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COMPTROLLER GENERAL'S REPORT TO
THE HONORABLE JOHN DINGELL,
CHAIRMAN, SUBCOMMITTEE ON ENERGY
AND POWER, HOUSE COMMITTEE ON
INTERSTATE AND FOREIGN COMMERCE

U. S. STRATEGIC PETROLEUM
RESERVE AT A TURNING POINT--
MANAGEMENT OF COST, OIL
SUPPLY PROBLEMS, AND FUTURE
SITE DEVELOPMENT

Bck. D I G E S T

The Strategic Petroleum Reserve, established to provide a cushion of as much as 1 billion barrels of oil against interruptions in imported oil supplies, has not met its initial goal of having at least 150 million barrels of petroleum products by December 1978.

The reserve has been plagued by problems, among them

--low initial cost estimates, resulting in cost overruns;

--an inability to meet oil storage goals; and

--the failure of four oil supply contractors to deliver their quotas.

As a result, the reserve is at a turning point in its management of facility costs, future oil supply, and future site development. Major changes being made in these three areas may significantly affect timely completion of the reserve at a reasonable cost.

COST GROWTH AND
CONTROL EFFORTS

7/c The Department of Energy was overly conservative in its original estimates of how much the storage facilities for the Strategic Petroleum Reserve would cost. Between December 1976 and February 1979, the estimated cost for constructing and operating facilities for the first 500 million barrels of oil jumped from \$765 million to \$1.5 billion--an increase of almost 100 percent. (See pp. 8 and 10.)

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END *HC*

It appears that DOE is instituting the systems and reviews that could help management control costs. DOE also has more time to emphasize cost control now because the oil fill schedule for the second 250 million barrels spans 6 years in comparison with the 2 years planned for the first 250 million barrels.

In mid-1978, DOE established a Configuration Control Board to review the technical and economic justification of proposed configuration changes. Recently it developed an automated Integrated Management Reporting System. This system could be used to provide timely information needed to identify and resolve potential cost and schedule problems. (See p. 12.)

These changes in approach and new systems, however, can only work if management diligently monitors them to ensure that they are actually controlling costs. Consequently, it remains to be seen how effective DOE's cost control program will be. (See p. 13.)

CONTRACTORS CLAIM SHORTAGES PRECLUDE OIL DELIVERIES

HC

Since October 1978, four contractors have failed to deliver 10 million barrels of crude oil--about 9 percent of current Strategic Petroleum Reserve purchases. To replace this oil would cost about \$92 million more than the oil cost in the original contracts. (See p. 14.)

The contractors claim that the tight oil market made it impossible to obtain and deliver crude oil and claim that they should be excused from delivery at the original price. If the failures are not excused, the contractors would probably have to absorb some of the \$92 million cost increases. (See p. 15.)

The contractors' claims depend on their individual supply situation, documentation of which was requested by the contracting officer. However, three of the contractors

have failed to provide this data. Two of the contracts were terminated and a termination discussion is pending on the third. The fourth has submitted documentation which was being evaluated by the contracting officer. (See p. 16.)

FUTURE SITE DEVELOPMENT

7/c To meet its 1981 goals, DOE is considering using noncompetitive "turnkey" procurement to purchase 80 million barrels worth of storage capacity. The turnkey procurement approach would place cost, schedule, and performance responsibility on the contractors. Having to administer and coordinate multiple contracts for design and construction has plagued DOE throughout the entire program. Three sites were selected for noncompetitive procurement because they have existing caverns or mines that can be developed quickly for use by 1981. (See pp. 22 to 24.)

~~However, there are several potential problems with noncompetitive procurement. One is that DOE may not get the lowest price or best terms. Previously, DOE had cancelled the competitive turnkey solicitation because of the unavailability of oil and also because the prices and terms offered were not acceptable compared to other options. GAO believes that it will be even more difficult to obtain reasonable prices and terms for noncompetitive sites than it was for competitive sites. (See pp. 24 and 25.)~~

7/c DOE justified noncompetitive procurement, in part, on the basis of need for the three sites in 1981. However, because of the tight crude oil market, DOE may not be able to fill this capacity in 1981, and may be unnecessarily committing itself to long-term noncompetitive contracts. Furthermore, DOE and the Office of Management and Budget are currently analyzing alternatives to a 1 billion barrel reserve, including reductions to 750 million or 550 million barrels. If DOE decides to reduce

the reserve to 550 million barrels, it may not need any of the turnkey sites. (See pp. 24 to 26.)

Moreover, the Ironton, Ohio, site--one of the three sites DOE is considering--has several problems which affect the cost and flexibility of the site and may make it undesirable for storage. For example as currently planned, oil from the site could only be used by one refinery. (See pp. 25 and 26.)

RECOMMENDATIONS

To ensure maximum effectiveness of future site development and the cost control actions, the Secretary of Energy should make a thorough analysis of all factors related to future site development, including the

- impact of uncertain oil availability on the timing and amount of storage capacity needed,
- size of the reserve, and
- potential impact on cost and flexibility of problems related to the Ironton site. (See p. 27.)

The Secretary should direct the Deputy Assistant Secretary for Strategic Petroleum Reserve to evaluate and report to him within 6 months of the issuance of this report on the effectiveness of the Configuration Control Board and the Integrated Management Reporting System in helping to control costs. (See p. 13.)

AGENCY COMMENTS

GAO discussed this report with Energy Department officials and pertinent sections with Defense and contractor officials. They agreed with the findings and recommendations. Their comments were incorporated as appropriate in the report. (See pp. 13, 21, and 27.)

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ABBREVIATIONS

GAO	General Accounting Office
SPR	Strategic Petroleum Reserve
DOE	Department of Energy
OMB	Office of Management and Budget

CHAPTER 1

INTRODUCTION

The Chairman of the Subcommittee on Energy and Power, House Committee on Interstate and Foreign Commerce, requested that we examine the cost tracking or cost control procedures used in the Strategic Petroleum Reserve (SPR) program. The request was prompted by concern over the cost overruns that the Department of Energy (DOE) program has had. 1/ We were also requested to examine the recent failure of SPR oil suppliers to deliver oil under their contracts. Later, the Subcommittee staff requested that we examine the three non-competitive turnkey contract negotiations for procuring new SPR storage facilities.

The reserve is at a turning point in its management of facility costs, future oil supply, and future site development. The reserve is undergoing major changes in these three areas which will have significant impact on timely completion of the reserve within current cost estimates. This report focuses on DOE's management of the Strategic Petroleum Reserve program's facility costs, oil supply, and future site development.

OIL FILL GOALS

In order to reduce this country's vulnerability to interruptions of its foreign oil supplies, the Energy Policy and Conservation Act, 42 U.S.C. 6201 et seq., required DOE to create a petroleum reserve of up to 1 billion barrels, with at least 150 million barrels in storage by December 1978.

In December 1976, DOE gave the Congress an implementation plan 2/ for a reserve which would contain 150 million barrels by December 1978 and 500 million barrels by December 1982.

In a March 1977 memorandum, DOE's Acting Assistant Secretary for Resource Applications stated that, by Presidential mandate, the storage goals were being

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, 42 U.S.C. 7101 et seq.

2/Strategic Petroleum Reserve Plan, dated December 15, 1976.

accelerated to 250 million barrels of oil by the end of 1978 and 500 million barrels by the end of 1980. DOE submitted amendments to the plan in May 1977 to establish new storage targets of 250 million barrels by December 1978, 500 million barrels by December 1980, and in May 1978, to expand the reserve to 1 billion barrels by the end of 1985. According to the Assistant Secretary's memorandum, the stated purpose for accelerating storage goals was to put oil underground as quickly as possible and thus avoid near-term supply interruptions and projected oil price increases.

By December 1978, however, DOE had only about 68 million barrels of oil in storage--180 million barrels less than its goal and 82 million barrels less than the law specified. Later, DOE again revised its storage goals to 190 million barrels by the end of 1979 and 250 million barrels by December 1980. DOE had about 92 million barrels of oil in storage at the end of October 1979. DOE's April decision to temporarily suspend new SPR oil procurements, thus freeing limited supplies for domestic consumption, makes it certain that the revised 1979 goal of 190 million barrels will not be achieved. Moreover, it is unclear what effect the President's recent decision to limit oil imports will have on the SPR storage goals. On July 15, 1979, the President stated that the United States would not use more foreign oil than we used in 1977 (about 8.5 million barrels a day). He also stated an additional goal of reducing our dependence on foreign oil by one-half by the end of the next decade--a reduction of more than 4.5 million barrels of imported oil per day. Finally, a billion-barrel reserve may never be reached because the Congress and the Office of Management and Budget (OMB) are reconsidering the need for so large a reserve.

OIL STORAGE FACILITIES

After studying various storage options, DOE concluded underground storage in mines and salt caverns was the least costly, most feasible way to store large amounts of oil. GAO analyzed the advantages and disadvantages of the various storage options and reached the same conclusion. 1/

An SPR storage facility consists of a single mine or several caverns for storing the oil and related systems for moving and safeguarding the oil, such as pipelines, pumps, cavern entry wells, firefighting systems, security

1/"Information on Department of Energy's Management of the Strategic Petroleum Reserve," EMD-79-49, Mar. 22, 1979.

systems, and maintenance buildings. Salt mines are created through conventional mining methods, such as blasting and digging, while caverns are created by leaching, a process which depends on water to dissolve the salt. In leaching, fresh water is pumped into a salt formation called a salt dome. Next, the saturated salt water or brine, as it is called, is pumped out of the cavern and disposed of by deep-well injection or disposed offshore in the Gulf of Mexico. As the cavern grows, it is usually kept full of brine, which helps support the walls and ceiling. After leaching, crude oil is forced into the cavern displacing the brine. This process is shown in the chart on page 4. Crude oil is withdrawn from the cavern by reversing the fill process and injecting fresh water or brine to force the oil out. In the case of mines, there is no brine to dispose of, so the oil can be freely pumped into or out of the mine.

POSSIBLE FOUR PHASES OF SPR DEVELOPMENT

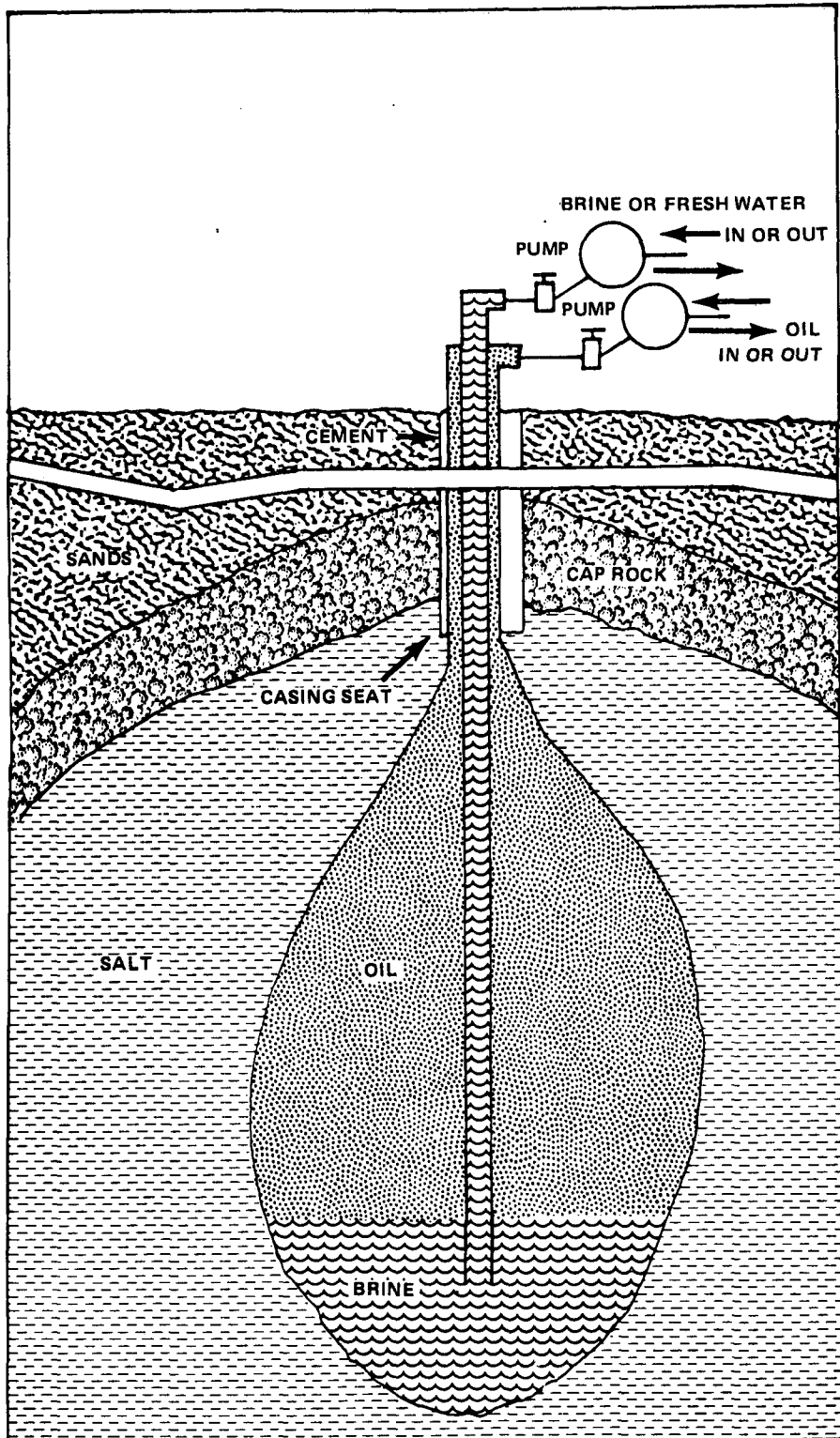
DOE is developing the SPR in three phases of about 250 million barrels each, but it has not yet decided on a method for developing the fourth 250 million barrels. In Phase I, DOE purchased five sites, four with existing caverns at Bayou Choctaw, West Hackberry, and Sulfur Mines, Louisiana, and Bryan Mound, Texas; and one with an existing mine at Weeks Island, Louisiana. These sites were originally developed for commercial purposes, not for crude oil storage. DOE began filling three sites in July 1977. Phase I construction was essentially complete in October 1979 for three sites and the St. James terminal. The other two sites are scheduled for completion in the spring of 1980.

Phase II, which started in early 1979, involves expansion of Bryan Mound and West Hackberry by leaching new caverns. As new volume is created, it will be filled with oil in time-phased increments beginning in 1981.

In Phase III, new sites will be developed to provide 222 million barrels of additional storage space. DOE is considering non-competitive turnkey procurement as an option for part of the space needed in this phase. In turnkey, DOE will purchase or lease storage space in completed facilities which will be developed by private industry.

The contractor, under turnkey, is responsible for completing the facility within cost, specifications, and schedule goals. If the contractor does not complete the facility according to specifications, DOE could refuse to accept and pay for the facility, in which case the

OIL STORAGE OPERATION IN A SALT DOME



contractor would be responsible for the costs. This contrasts with Phases I and II where DOE procured the sites and contracted separately for design and construction.

Early in the SPR construction, DOE supervised the project in Washington, D.C. DOE, in a December 1977 management study, found that no manager or organization was dedicated to the construction project on a full-time basis or had total project control. DOE was also managing over 100 active contracts for the SPR, an activity that it found it was unable to effectively perform with its available resources.

In an effort to improve SPR management, DOE reorganized project management in January 1978. A Project Management Office was established and was subsequently moved to New Orleans, which was closer to the oil storage sites. The role of the Construction Manager, Parsons-Gilbane, was also expanded to include negotiation and management of new sub-contracts. The current organizational structure is shown on page 6.

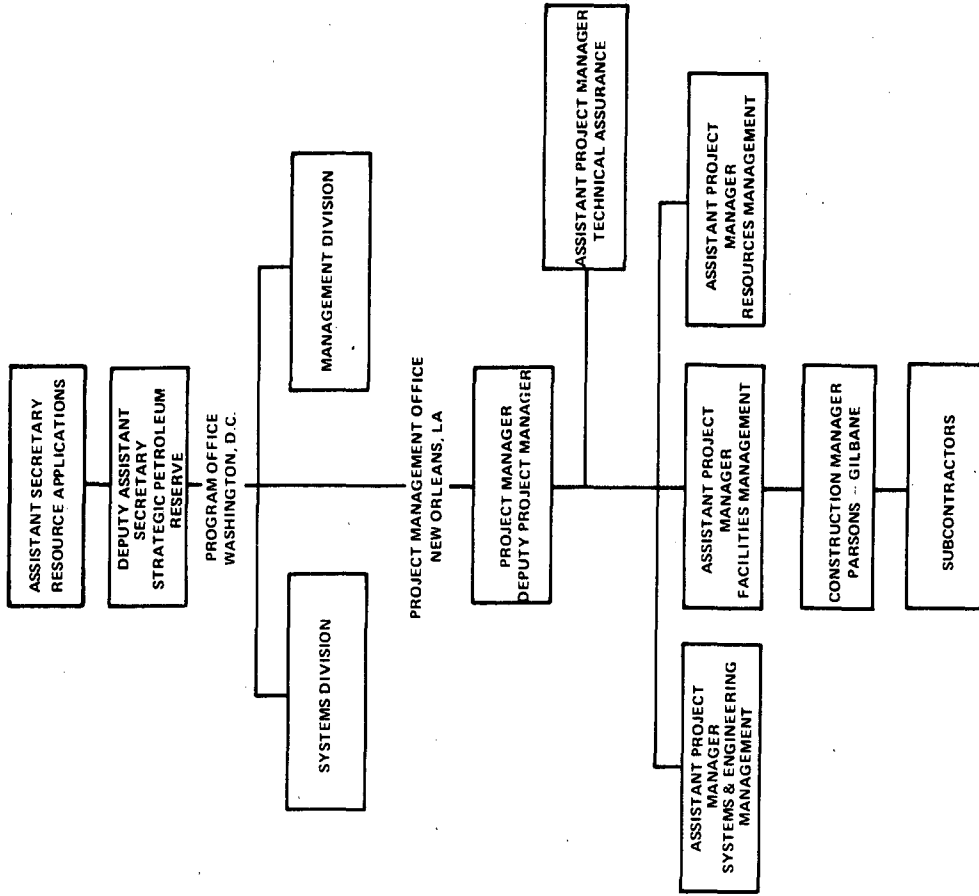
SCOPE OF REVIEW

We interviewed officials and obtained documentation for our review at DOE offices in Washington, D.C.; the Strategic Petroleum Reserve Project Management Office in New Orleans, Louisiana; the Department of Energy's Office of Inspector General, Washington, D.C.; the Department of Defense's Fuel Supply Center in Alexandria, Virginia; one of the oil storage sites; and the St. James, Louisiana, terminal. We also interviewed several contractors, including Parsons-Gilbane, the project Construction Manager.

Our review of Strategic Petroleum Reserve management systems emphasized those systems related to cost control and performance for the period January 1978 to June 1979, as this represented the period of maximum construction effort for the SPR. As agreed with the Subcommittee Chairman's office, because of the short timeframe for this review, we did not examine DOE's contracts with the prime contractors or their subcontractors, or the validity of DOE's budget justifications. We did review contractor-prepared cost estimates and explanations of cost growth, but did not contact the contractors who prepared these estimates.

We reviewed available justifications and correspondence between the Defense Fuel Supply Center and oil suppliers who failed to provide oil for the SPR under their contracts.

STRATEGIC PETROLEUM RESERVE



We also discussed the oil supply delays with Defense Fuel Supply Center, DOE, and four oil supply contractor officials.

In our review of Phase III procurement of oil storage facilities being considered by DOE, we limited our access to files on noncompetitive solicitations because of ongoing negotiations. We did interview DOE officials concerning the three noncompetitive turnkey sites being considered, but did not contact owners of these sites.

CHAPTER 2

SPR COST GROWTH AND EFFORTS TO CONTROL IT

Storing crude oil in salt caverns and mines was a pioneer experience for the Federal Government. Although crude oil has been stored underground in France and West Germany, the U.S. Strategic Petroleum Reserve program is larger than either of these crude oil storage programs.

A strategic petroleum reserve storage facility consists of mines or caverns for storing oil and related systems for moving the oil, such as pipelines, pumps, cavern entry wells, firefighting systems, security systems, and maintenance buildings. From December 1976 to February 1979 (the latest estimate available), DOE's estimate for constructing and operating the reserve storage facilities for the first 500 million barrels of oil increased almost 100 percent from \$765 million or \$1.53 per barrel to about \$1.5 billion or \$2.94 per barrel.

There have been similar patterns of costs spiraling after conservative initial estimates were made in other large projects. For example, the Trans-Alaska Pipeline was originally estimated in 1968 to cost \$863 million, whereas in 1977, the administration estimated final costs to be between \$10.5 billion and \$13.7 billion.

The President's May 1977 decision to accelerate oil fill also increased facility development costs. The original reserve target called for 150 million barrels by December 1978 and 500 million barrels by December 1982, whereas the 1977 Presidential mandate required 250 million barrels by December 1978 and 500 million barrels by December 1980.

INCREASES IN DOE'S PER BARREL COST ESTIMATES

The initial \$1.53 per barrel cost estimate for the reserve was extremely conservative and did not adequately consider all costs of a program the size of the reserve.

The table below summarizes the types of cost increases for about 50 percent of the facility cost growth for the first 250 million of the reserve. DOE could not quantify what additional factors caused the remaining \$471 million of cost growth, because when the original cost estimates were prepared, DOE did not develop detailed, consistently-used cost categories to track costs to the original cost estimates or to subsequent cost increases.

<u>Types of cost increase</u>	<u>Cost increase</u> (000 omitted)
Inflation in construction (7.8 percent per year since 1976), compressed construction schedules	\$80,000
The required site improvement and quality of dikes, roads, well pads, oil-brine separators, and brine ponds	40,000
Larger diameter pipe, extensive fire system, increased pipe runs due to pump area relocations	33,000
Increased cost for site services such as bringing permanent power to site, power for interim fill and handling, and storage of Government furnished equipment never envisioned in feasibility or conceptual studies	20,000
Rig costs have more than doubled, partially due to availability, addition wells, and directional drilling	19,000
Greater flexibility at St. James Terminal	13,000
Large buildings for labs, personnel equipment, offices, etc. versus small buildings	12,000
Present design for instrument covers, more meters, automation, and data acquisition equipment	10,000
Weeks Island Salt Mine shaft redesign in order to minimize impact on the Morton Salt Company; additional mine work	8,000
Interim fill system costs were more than envisioned in feasibility studies	<u>4,000</u>
Total	<u>\$239,000</u>

INITIAL ESTIMATES WERE CONSERVATIVE

Initial cost estimates for any large engineering project should be based on thorough planning, design engineering, and certification tests, if possible. Clearly, the public interest is served by insisting on realistic initial assessments. Lacking historical data, the most reliable basis for establishing budget estimates is the development of preliminary engineering design based on as much site-specific data as is economically practicable.

We believe key factors resulting in the poor initial estimates were the lack of historical experience for a project of similar size and the lack of site-specific engineering designs.

For the Strategic Petroleum Reserve, the cost estimates were based on preliminary feasibility studies that did not adequately describe the facilities that would be required. Several costly items, such as marine terminal facilities, dikes around wellheads, and fire fighting systems, were omitted from early cost estimates. Other items, such as pipelines, buildings, and instrumentation were not the right size or quality to do the job. DOE did not develop detailed engineering studies until early 1978--studies which could have provided a basis for realistic cost baselines. Moreover, the early estimates of cost, based on 331 million barrels of existing capacity, were extremely optimistic as later surveys and certification tests disclosed. Only 244 million barrels of capacity could be used for storage. The earlier overestimate of capacity will require DOE to develop or acquire 87 million barrels of additional storage capacity with potentially higher cost than existing cavern space. In addition, the original cost estimates did not include estimates of inflation.

ACCELERATED CONSTRUCTION SCHEDULES

Following the Presidential mandate to accelerate oil fill to 250 million barrels by December 1978 and 500 million barrels by December 1980, DOE officials made a conscious decision to give priority to getting oil into storage. Although the oil fill goal is important, we believe that cost control is also important and should have received greater attention. DOE recognized that the accelerated program would involve higher construction costs but expected that savings from buying oil sooner at lower prices would more than offset them. The May 1977 estimate for accelerating construction was \$25 million, excluding inflation. In April 1978, DOE estimated that compressed construction schedules and inflation in construction had increased costs

about \$80 million. However, DOE did not quantify the extent of the increase due to inflation, increased labor, or other costs which would rise due to an accelerated construction schedule.

EFFORTS TO CONTROL COSTS

Controlling costs in a construction program the size of the SPR requires:

- A basis for measuring progress against a realistic cost and schedule baseline based on detailed engineering study.
- A comprehensive management control system, integrated throughout the project's management, to provide information upon which to judge progress, identify problems, and analyze the impact of alternative courses of action.
- Competent management which is committed to controlling costs.

Early cost estimates were based upon feasibility and conceptual studies and detailed engineering studies were not developed until early 1978. As indicated earlier, until recently, DOE management was committed to getting SPR oil in the ground as quickly as possible, not to the development of systems to control costs. SPR management measured progress in terms of success in achieving oil storage goals. However, the reserve is at a turning point in the management of facility costs. It appears that DOE is instituting the tools it will need to better manage and control costs.

OMB in 1977 expressed concern that implementing SPR facilities within the budget ceiling be accorded as much importance as meeting the SPR development schedule. In late 1978, OMB and DOE agreed that DOE funding requests for a new storage site, an expansion of an existing storage site, or a new or expanded transportation facility, will be based on engineering studies. The assessments would include identification of major uncertainties. Engineering cost data for general design would be developed and include the actual cost experience on similar sites.

In addition, DOE agreed to institute budget control at the site level so that site budgets would vary by no more than 10 percent in a given year. DOE will submit both an annual financial plan and a quarterly report to the President through OMB on implementation progress and problems, including cost and schedule variance both by site and for

the overall program. The reports provided OMB would be those DOE uses for management.

DOE has taken other actions which may help control future cost growth. In mid-1978, DOE established a Configuration Control Board composed of Project Management Office representatives to evaluate proposed configuration changes, which includes, among other things, requested cost increases. The Project Manager, Chairman of the Board, makes all final decisions involving changes in construction up to \$25 million.

From January 1979 to June 1979, the Board was presented with 235 changes. Most were authorized. However, 16 were not, and action was deferred on 57. We did not review individual decisions of the Board for technical and economic adequacy.

DOE began implementing an automated Integrated Management Reporting System in September 1979. As currently planned, the new system will:

- Present cost, schedule, and technical baselines and track actual performance against plans.
- Identify variances from baseline and planned levels.
- Allow DOE to assess the financial impact of planned actions to the whole project.
- Provide information to all levels of management.

This system could be used to provide the information requested by OMB and to provide DOE management with the information it needs to identify and resolve potential cost and schedule problems in a timely manner.

In addition to these systems, DOE should be better equipped to control costs in the future due to the following factors:

- The current tight oil supply situation has allowed SPR management the time to evaluate its past performance and approach. In addition, the oil fill schedule for Phase II spans 6 years in comparison with the 2 years planned for Phase I.
- OMB now requires greater planning, engineering design studies, and adherence to the budget.

CONCLUSIONS

It appears that DOE is instituting the systems and reviews needed to help management control costs. In addition, DOE has more time to emphasize cost control now because the oil fill schedule for the second 250 million barrels spans 6 years in comparison with the 2 years planned for the first 250 million barrels.

These changes in approach and new systems, however, can only be as effective as management makes them by diligently monitoring the systems to ensure that they are actually working to control costs. Consequently, it remains to be seen how good and effective DOE's cost control program will be.

RECOMMENDATIONS

In order to ensure maximum effectiveness of the cost control actions being taken, we recommend the Secretary of Energy direct the Deputy Assistant Secretary for the Strategic Petroleum Reserve to evaluate and report to him within 6 months on the effectiveness of the Configuration Control Board and the Integrated Management Reporting Information System in helping to control costs.

AGENCY COMMENTS

We discussed this chapter with Energy officials. They agreed with our findings and recommendations. In commenting on the chapter, they stated the information they gave us on page 9 may not be reliable. However, they could not at this time give us updated information.

CHAPTER 3

CONTRACTORS CLAIM THAT WORLDWIDE

SHORTAGE PRECLUDED SPR OIL DELIVERIES

Although DOE has overall responsibility for the SPR, it has delegated crude oil procurement responsibility to the Defense Fuel Supply Center, because the Center is experienced in buying refined oil products for the Department of Defense. DOE determines the types and amounts of oil needed and orders the oil in accordance with contract schedules. The Center determines the acceptability (price and quality) of offers, selects crude oil suppliers and administers the supply contracts.

Since October 1978, four contractors have failed to deliver 10 million barrels of crude oil or about 9 percent of all SPR purchases. The contracting officer has terminated two contracts for default because the contractors had not supported their contention that oil was neither on hand nor available. A decision is pending with respect to another contractor who failed to provide documentation to support its case. The contracting officer is currently evaluating data which the fourth contractor submitted on September 4, 1979. This chapter discusses the options available to the contracting officer for settling these contracts and the current status of the four contracts.

WERE THE DELIVERY FAILURES EXCUSABLE?

Following the declaration of martial law in Iran, a general strike reduced October 1978 oil production by about 10 percent or 500,000 barrels per day. Production was cut back another 2 million barrels per day in November, and stopped completely on December 26. This cutoff, softened to some extent by increased exports from other sources, lasted until early March 1979. Since then, Iranian exports have increased, reaching about 65 percent of historical levels by June 1979. However, since November 12, 1979, the United States has not purchased oil directly from Iran.

Since the market began to tighten in late October 1978, four contractors have failed to deliver over 10 million barrels of crude oil. Because of recent price increases, the 10 million undelivered barrels would cost about \$92 million more than the original contract price. The question, therefore, becomes whether the delivery failures were excusable or not. If they were excusable, the contracts could be modified to reflect current costs, terminated for the convenience of the Government (Government remains liable

for any allowable termination costs incurred) or if the contractor agrees, terminated at no cost to either party. In any case, the Government's cost would increase at least \$92 million over the original contract price. If the failures were not excusable, the contracts would be terminated for default and the contractors would probably be responsible for these cost increases.

The contractors argue that their delivery failures were excusable principally because the tight oil market made it impossible to obtain and deliver crude oil. Since this was beyond their control, they argue that the contracts should be terminated for the convenience of the Government. Thus, the contractors would not be required to deliver oil and the Government would be responsible for any allowable termination costs already incurred by the contractor.

The contracting officer disagrees. He argues that the inability to obtain oil, if proven, would only justify delaying delivery until supplies became available. Moreover, he believes the contractors must document that they neither had nor could obtain oil. This documentation is important for two reasons. First, the Iranian revolution, and the resulting decrease in worldwide supplies, do not by themselves demonstrate that the failure to deliver oil was beyond the contractors' control. Three of the four contractors were to provide non-Iranian crudes. As Iranian production decreased, the demand for other crude types increased, thereby making them more difficult to obtain. This effect, however, was at best indirect. Also, 61 percent of the oil should have been shipped prior to December 26, 1978, while Iran was still exporting oil at a reduced but significant level.

Secondly, since the Iranian disruption first began, the Center has had nine suppliers. Five suppliers did deliver over 26 million barrels of oil through June 30, 1979. For example, Coastal States Trading Inc., missed its scheduled delivery of 2.7 million barrels of Libyan oil between November 1978 and March 1979, the height of the supply squeeze. Faced with a cutback from its supply source, Coastal initially said it could deliver only 60 percent of the oil. After further negotiations, it delivered 258,000 barrels of low sulfur Libyan oil at \$16.80 per barrel and 2.4 million barrels of a lesser quality high sulfur Iranian heavy oil at \$16 per barrel. After appropriate adjustments for differences in the last known officially stated selling prices and transportation costs, the price for both crude types was about what would have been paid under the initial contract. Thus, the contractor met his obligations by using a substitute crude and extending the delivery schedule to the second quarter of 1979.

ONLY ONE CONTRACTOR HAS DOCUMENTED
HIS SUPPLY SITUATION

The contracting officer recognizes that each contractor's supply situation is critical. Since December 1978, he has repeatedly asked the four contractors to document such matters as their overall supply availability, efforts to obtain additional supplies, and explanations of any deliveries to other customers during the period in question. Without this type of data, the contracting officer cannot determine if the delivery failures were excusable.

Only one of the four contractors involved has provided detailed documentation concerning his supplies. The contracting officer is currently evaluating this data, which was not provided until September 4, 1979. Because adequate documentation was not submitted, two contracts were terminated for default in 1979, and a decision has not been made on the other contract. One of the default decisions has been appealed to the Armed Services Board of Contract Appeals.

Since the delivery failures occurred, DOE has been aware of the situation and has agreed with the contracting officer's effort to obtain oil or to get the contractors to supply data supporting their claims. DOE has also agreed with the default decisions. The contracting officer has chosen to use default only as a last resort because his principal remedy--reprocuring the oil and charging any additional cost to the contractor--is not currently available for the following reasons:

- The contracting officer's decision to terminate for default can be appealed to the Armed Services Board of Contract Appeals--an administrative board which reviews disputed Department of Defense contracts--the United States Court of Claims and the Supreme Court. Such legal challenges, if they occur are not only expensive but could take up to 6 years or more to resolve.
- The Center has not received any bids on several procurement solicitations since late 1978. Consequently, the Center could not have reprocured oil.
- Since April 12, 1979, DOE has suspended new SPR procurements, including procurements for defaulted contracts, thereby freeing limited supplies for domestic consumption. Thus, even

if the Center were offered reasonably priced oil, it could not buy it.

Furthermore, it has been alleged that some oil producing countries will reduce their oil production if DOE resumes its oil purchases for the reserve. We discussed this allegation with several DOE and State Department officials, who said there is no factual basis for the allegation. For example, according to a State Department official, some countries have previously criticized the reserve but none has prevented oil companies from selling to the reserve.

Below is a listing of the undelivered quantities for each disputed contract and a brief summary based on documents obtained from the contracting officer as well as discussions with contractor representatives.

CONTRACTS IN DISPUTE

<u>Contractor</u>	Type of crude (note a, b)	Number of barrels contracted	Undelivered oil Delivery schedule	Number of barrels	<u>Comments</u>
		(000 omitted)		(000 omitted)	
Derby and Company, Inc.	Various sweet and sour	5,550	1/79-3/79	2,479	Under review by the contracting officer.
Trans-Asiatic Oil	Iranian sour	10,000	1/79	2,000	Terminated for default on October 18, 1979.
Marc Rich and Company	Libyan sweet	3,440	1/79-2/79	2,840	Contracting officer attempting to obtain data.
Hideca Trading Company	Libyan sweet	<u>3,000</u>	12/78-1/79	<u>3,000</u>	Terminated for default on January 9, 1979.
Total		<u>21,990</u>		<u>10,319</u>	

a/ The Center defines sweet crude as having less than 0.5 percent sulfur content. Sweet crude purchased for the reserve had an American Petroleum Institute gravity of between 35 degrees and 42 degrees. API gravity is the measure of mass of the fluid relative to water that ranges from about 10 degrees for heavy crude oils to 45 degrees for light crude oils.

b/ Sour crude is defined as having more than 0.5 percent sulfur content. Sour crude purchased for the reserve had an American Petroleum Institute gravity of 32 degrees to 36 degrees.

Derby and Company, Incorporated

During the first quarter of 1979, Derby and Company, Incorporated, a U.S. trading company, delivered about 3 million of the 5.55 million barrels of crude oil required under two contracts. Derby believes its failure to deliver the remaining 2.48 million barrels is excusable principally because it could not obtain oil at a price the Government was willing to pay.

Additionally, Derby claims that it met its contractual requirements by offering to deliver Iranian oil at \$22 per barrel in February 1979. The contracting officer believes this was not a valid offer because the price was based on auction bidding rather than an increase in the officially stated selling price and because the oil could not be delivered within the contract delivery period.

After a series of meetings the contracting officer, by letter dated April 18, 1979, asked Derby to document its claim that it neither had nor could obtain oil. A series of deadlines were established and subsequently extended, culminating in the submission of detailed documentation on September 4, 1979. The contracting officer said he allowed the delay because Derby, unlike the other contractors, was attempting to reach an agreement with the Government. His opinion is supported by the delivery of about half of Derby's contractual commitment during the first quarter of 1979 and its repeated efforts to reach an agreement on the undelivered oil.

The contractor and contracting officer are negotiating a revised agreement under which the contractor would provide the undelivered oil at current costs. Approval of the agreement by the contracting officer depends on whether the contractor's data demonstrates that oil was neither on hand nor available. The contracting officer is still evaluating the data.

Hideca Trading Company

On January 9, 1979, the contracting officer terminated for default that portion of the Hideca Trading Company contract representing 1.2 million barrels of Libyan crude scheduled for December 1978 delivery. Another 1.8 million barrels were to be delivered in January 1979. Because Hideca also failed to deliver the remaining barrels, the contracting officer terminated the remainder of the contract on May 7, 1979. Hideca is incorporated in the Grand Cayman Islands, a British protectorate.

A Hideca representative told us these delivery failures were due to his inability to obtain oil as described in the documentation provided to the contracting officer. This documentation indicates Hideca failed to deliver initially because its suppliers failed to meet their delivery obligations and later because of the disruptions in Iran. The Government's initial order was placed on September 25, 1978, for delivery in November, 1 month before the Iranian exports were reduced and 3 months before they were halted. Also, the contract called for Libyan, not Iranian, oil. As such, its availability would have been indirectly affected by the disruption in Iran.

Attempts to recover damages have been unsuccessful. On December 5, and again on December 13, 1978, the Center tried to reprocur the oil and charge any additional costs to Hideca. However, no bids were received. On February 7, and again on June 5, 1979, Hideca appealed the default decisions to the Armed Services Board of Contract Appeals. A hearing has not yet been scheduled as of November 29, 1979.

Marc Rich and Company and Trans-Asiatic Oil

The contractors failed to deliver 4.84 million barrels of Iranian and Libyan oil between January 1979 and February 1979. The first contractor, Marc Rich and Company, has related ownership and identical management of oil supply operations with United States and South American Enterprises, agent of the second contractor, Trans-Asiatic Oil. Marc Rich is a U.S. trading company and Trans-Asiatic Oil is a Panamanian company.

Since his December 28, 1978, discussion with Marc Rich, the contracting officer has repeatedly asked both contractors to supply oil or document their overall supply situations. At this point, the only relevant documentation which has been received was a letter from Euravia AG Zug, a third party crude oil supplier, refusing to deliver oil to Marc Rich because it did not have Iranian oil to provide in exchange. Neither company has documented its overall supply situation, its efforts to obtain additional supplies, nor its deliveries to other customers.

On October 18, 1979, the contracting officer terminated the Marc Rich contract for default for the 2.8 million barrels of undelivered oil. As of November 19, 1979, the contractor had not appealed this decision. A decision on the Trans-Asiatic contract is still pending receipt of additional data from the contractor.

CONCLUSIONS

While the worldwide shortage indicates that deliveries may have been difficult between October 1978 and March 1979, the contractors' claims must rest on their individual supply situations. Without documentation, the contracting officer cannot determine if the failure to deliver was excusable or not. The contracting officer has terminated two contracts for default and is attempting to obtain additional data from the third. He is still evaluating the data submitted by the fourth contractor. Assuming these default decisions are upheld the contractors may have to pay for some of the price increases that have occurred since the time delivery was originally scheduled.

AGENCY COMMENTS

We discussed this chapter with Energy, Defense, and contractor officials. They agreed with our findings. Defense officials said the chapter was essentially accurate and provided updated information. One contractor expressed concern about the tone of the information on its contract. Accordingly, we made changes which affected tone but did not affect the findings or conclusions.

CHAPTER 4

FUTURE SITE DEVELOPMENT

In Phase III of the SPR, DOE planned to add about 220 million barrels of oil storage capacity at several new sites. To minimize the problems it experienced during the first phase in administering separate contracts for design and construction, DOE was considering turnkey procurement of these sites. In this regard, DOE asked for competitive proposals ranging from 20 million to 600 million barrels of capacity and noncompetitive proposals for about 80 million barrels of capacity.

However, DOE is now at a turning point as it reassesses turnkey as well as the overall size of the reserve. On August 30, 1979, DOE cancelled the competitive turnkey solicitations. A separate decision on whether to award the noncompetitive turnkey contracts is expected soon. This chapter discusses the turnkey concept; the factors which led to cancellation of the competitive solicitation; the size of the reserve; and the potential impact of these factors on the noncompetitive solicitations.

TURNKEY CONCEPT

The intent of turnkey is to place cost, schedule, and technical responsibility for an entire storage site with a private sector contractor. A single contractor is responsible for acquiring the land, and then designing and constructing a storage facility which meets Government performance specifications. The contractor is also responsible for filling the facility with Government-furnished oil and for operation and maintenance. For example, a turnkey solicitation for one site required the contractor to provide, among other things, a facility of at least 20 million barrels which will last 20 years and which can be emptied in 150 days, and refilled in 500 days or less.

The contractor upon completion of the site must demonstrate to the Government that the facility satisfactorily meets the performance specifications. If, however, the Government finds the site was not completed according to specifications, it can refuse to accept the site. In which case the contractor would bear all costs in correcting the deficiencies.

In contrast to other procurement procedures, turnkey requires the Government to maintain a limited involvement

during the contract because the contractor is responsible for design, construction, and initial operation of the facility.

COMPETITIVE TURNKEY SOLICITATION CANCELLED

On November 13, 1978, DOE issued a competitive turnkey solicitation for crude oil storage facilities. DOE had hoped to obtain completed facilities by December 31, 1985, by drawing on industry experience and innovative abilities. It received 11 priced proposals for about 660 million barrels of capacity.

On August 30, 1979, DOE cancelled the solicitation, largely because uncertainties about crude oil availability made a 20-year commitment to a turnkey contractor unwise. The solicitation required the earliest possible oil fill without any constraint on oil availability. In explaining the cancellation, a DOE official said the recent ceilings on oil imports, together with the current tight crude oil market, indicate that there will be serious, continuing constraints on the availability of crude oil for the SPR. DOE, therefore, believed it should not make a long term commitment when it could not be sure that oil fill schedules would be met. DOE also felt the proposals were unsatisfactory because the offerors were willing to accept only limited liability and responsibility for the storage containers and stored crude oil, and in addition, the proposals were not cheaper than existing alternatives nor were any technical innovations offered.

NONCOMPETITIVE SITE DEVELOPMENT

DOE also planned to procure storage at three sites through a noncompetitive procurement. The three sites--Ironton, Ohio; Napoleonville, Louisiana; and Cote Blanche, Louisiana--were selected because they have existing mines or caverns and could be developed in a relatively short period compared to other sites. Negotiations have begun for the three sites.

STATUS OF THREE STORAGE SITES

Ironton

This site, which is located in Ohio, consists of an abandoned limestone mine capable of storing about 20 million barrels of oil. The site will be connected to a refinery near Catlettsburg, Kentucky, by way of a 14-mile pipeline to be built by the contractor. Oil from the Gulf Coast

would move through one or more of the three major common carrier pipelines into the Ashland Pipeline system which serves the Catlettsburg refinery.

DOE has received technical and cost proposals from the site developer and negotiations are underway.

Cote Blanche

This site, which is located about 90 miles southwest of New Orleans, Louisiana, consists of an operating salt mine capable of storing 30 million barrels. The site is also located near and would use an existing DOE-owned pipeline.

DOE has not yet received either a technical or cost proposal for this site. According to DOE officials, the delay was caused primarily by the time required for the Department of Justice to respond to a DOE request for an opinion regarding the acceptability of the title being offered. DOE and the owners are now discussing the possibility of a sale or lease arrangement.

Napoleonville

This site consists of existing salt caverns for about 30 million barrels of storage located near Baton Rouge, Louisiana. This site would also use an existing DOE-owned pipeline. Negotiations are underway.

POTENTIAL PROBLEMS WITH NONCOMPETITIVE SITE DEVELOPMENT

Before making a decision on noncompetitive site development there are three issues we believe DOE must consider. First, the uncertainty of future oil availability, which led to the cancellation of the competitive solicitation, will also be a problem with these noncompetitive procurements, unless it can develop other dependable sources of oil for the reserve. DOE is assessing several alternative sources of oil including royalty oil, Elk Hills Naval Petroleum Reserve, and Alaskan oil.

DOE justified noncompetitive procurement partly because the three sites were needed during 1981. It appears, however, that because of the tight world crude oil market, DOE may not be able to fill this capacity in the timeframe originally stated. As discussed above, DOE decided that for competitive procurement it would not be in the best interest of the Government to enter into such a long term commitment, based on fill schedules which DOE may not be able to meet.

Secondly, noncompetitive procurement should be avoided when possible because it is generally expensive. This is why Government procurement regulations require that procurements be made on the most competitive basis possible under existing conditions and circumstances. In our opinion, full and free competition is the best way to be reasonably certain that services are being offered at truly competitive prices and terms.

DOE cancelled the competitive turnkey solicitation, in part, because the initial offers were not acceptable when compared to other options available to the Government, namely, further expansion of Phase II sites or purchase and development of a sixth site. Since acceptable offers were not sufficiently attractive under competitive bidding, we question whether DOE will be able to obtain more favorable terms noncompetitively.

Finally, several problems relate specifically to the Ironton site, one of the three noncompetitive sites being considered. We believe there are several disadvantages which DOE must weigh before proceeding with this site:

- In order to fill the mine within 1 year, as required by DOE, Ashland Pipeline Company will have to increase the capacity of its pipeline. The Government cost of this upgrade would have to be negotiated.
- DOE will have severely limited flexibility in using the oil because it can only be pumped to the Catlettsburg refinery. Alternative distribution routes would be necessary if the Catlettsburg refinery could not use the oil for any reason or if DOE did not wish to allocate the oil to the refinery. At the time of our review, DOE had not included alternative distribution routes in its plans. In addition, DOE would have less flexibility in purchasing crude oil for the site because it would have to meet quality specifications for one refinery.
- DOE may not be able to refill the mine within 500 days as required in the site specifications. Following a supply disruption, the oil companies would, like DOE, attempt to refill their reserve stocks. To the extent the total oil to be shipped exceeds the common carrier pipeline capacity, each pipeline customer would receive

a pro-rata share of its shipments, so that all customers could be served. Therefore, DOE might not be able to refill Ironton as quickly as required. This is not a problem with the other two sites because they would use DOE-owned pipelines.

SIZE OF THE RESERVE

In June 1979, we issued a report on "Factors Influencing the Size of the U.S. Strategic Petroleum Reserve" ^{1/} which observed that no study has shown that 1 billion barrels is the optimum-size reserve. A 1 billion barrel reserve is larger than that of any other nation, and is sized to meet a supply disruption of far greater magnitude than ever experienced in the past. We noted that other options could be used in conjunction with a federally funded reserve including improving demand and supply management and establishing an industrial reserve.

DOE and OMB are reevaluating the size of the reserve. A DOE study is considering a 550 million barrel option as well as 750 million and 1 billion barrel options. Because of the preliminary stage of their deliberations, we were not able to review any of their recent internal work. However, if DOE decides to reduce the size of the reserve to 550 million barrels, the turnkey sites may not be needed.

CONCLUSIONS

DOE offered turnkey procurement as an option for developing Phase III sites because turnkey would relieve DOE of responsibility for awarding and administering separate contracts for design, construction, and operation and maintenance of storage facilities. In evaluating the 11 competitive proposals, DOE concluded that, given the continuing uncertain availability of oil, and unacceptable initial prices and terms offered in the competitive proposals, it was not in the Government's best interest to enter into a long-term commitment for a turnkey contract.

DOE justified noncompetitive procurement by saying it would assure quick completion of the three sites. We believe, however, that the reserve is now at a turning point in that the need and timing of future site development must be analyzed in the context of ongoing discussions concerning the size of the reserve and of uncertain oil

^{1/}ID-79-8, June 15, 1979.

supplies. In addition, DOE must consider the added risk of trying to obtain better prices and terms on a noncompetitive basis than it could competitively.

RECOMMENDATIONS

We recommend the Secretary of Energy make a thorough analysis of all factors related to Phase III site development, including:

- The impact of uncertain oil availability on the timing and amount of storage capacity needed.
- The size of the reserve.
- The potential impact on cost and flexibility of problems related to the Ironton site.

AGENCY COMMENTS

We discussed this chapter with Energy officials. They agreed with our findings and recommendations, but felt one recommendation related to justifying noncompetitive procurement was unnecessary because it is already required by procurement regulations. We deleted that recommendation from the report.

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SUBCOMMITTEE ON ENERGY AND POWER

OF THE

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

WASHINGTON, D.C. 20515

March 26, 1979

The Honorable Elmer B. Staats
Comptroller General of the United States
U. S. General Accounting Office
441 G Street, N. W.
Washington, D. C. 20548

Dear Mr. Staats:

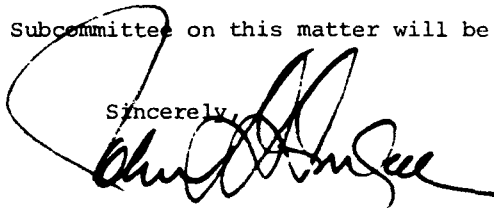
The Subcommittee on Energy and Power has been reviewing the activities of the Strategic Petroleum Reserve Program, as it is administered by the Department of Energy. This has been the subject of several Subcommittee hearings. At our most recent hearing on the subject, Mr. Dexter Peach and other representatives of the General Accounting Office appeared and testified about a report by your office on the Reserve Program. The assistance of the General Accounting Office throughout the Subcommittee's review has been most helpful.

Oil suppliers to the Program are now avoiding compliance with their contracts to deliver oil because of events in Iran. Suppliers have refused to offer the government any more oil except at double the normal price. In addition, the Subcommittee has received testimony that the Reserve Program does not have an effective "cost tracking" system, or other cost control procedures. Contracts have been substantially increased because of cost overruns and lack of cost controls. It is requested that the General Accounting Office look into both of these matters and provide the Subcommittee with a report on its findings.

We have informally discussed these matters with members of your office. If you have any questions, please contact Michael Barrett of the Subcommittee staff at 225-1030.

Your assistance to the Subcommittee on this matter will be appreciated.

Sincerely,



John D. Dingell
Chairman

JDD:Bmd

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