

March 29, 1995

IG-1

INFORMATION: Report on "Audit of Staffing Requirements for the Strategic Petroleum Reserve"

The Secretary

BACKGROUND:

The audit was undertaken in response to a request from the Deputy Secretary of Energy to determine whether current staffing levels for the Reserve were necessary to effectively accomplish current and future anticipated mission requirements. As of May 31, 1994, over 1,650 full-time equivalents were employed by the Department and its contractors to manage and operate Strategic Petroleum Reserve (Reserve) programs.

DISCUSSION:

We compared Reserve performance levels and staffing practices with those for similar functions in the private sector and other DOE contractors. The audit disclosed that the Reserve staffing levels were significantly higher than those organizations against which it was benchmarked. We estimated that the realization of industry performance levels by selected Reserve activities would enable the Reserve to eliminate 329 positions, with annual savings of about \$16 million. Developing objective and supportable estimates of staffing needs is a highly technical and complex process. For this reason, we obtained expert advice from a nationally recognized organizational management consultant firm.

We recommended that the Assistant Secretary for Fossil Energy: (1) reduce staffing in eight functional areas by 329 positions; (2) increase the span of control for Reserve managers to one manager for at least ten subordinates; (3) conduct additional analysis to determine if further staffing reductions were feasible; (4) provide incentives to management and operating contractor to reduce staffing and costs; and (5) perform periodic evaluations of Reserve staffing requirements using appropriate external benchmarks and other performance data.

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The Assistant Secretary for Fossil Energy indicated that actions had been taken or were planned for each of the report recommendations. However, the Assistant Secretary did not agree with the specific staffing reductions and savings cited in the report and contended that additional analysis was needed to determine the appropriate staffing levels. For this purpose, the Reserve had formally commissioned a streamlining initiative on December 9, 1994.

/s/

John C. Layton
Inspector General

Attachment

cc: Deputy Secretary
Under Secretary
Assistant Secretary for Fossil Energy
U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL

AUDIT OF
STAFFING REQUIREMENTS FOR THE
STRATEGIC PETROLEUM RESERVE

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Date of Issue: March 29, 1995 Oak Ridge, TN 37830
AUDIT OF

STAFFING REQUIREMENTS FOR THE
STRATEGIC PETROLEUM RESERVE

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U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDITS

AUDIT OF
STAFFING REQUIREMENTS FOR THE
STRATEGIC PETROLEUM RESERVE

Audit Report Number: DOE/IG-0370

SUMMARY

The Department of Energy's (Department) Strategic Petroleum Reserve (Reserve) is responsible for storing large quantities of crude oil, currently about 592 million barrels, to reduce the impact of any future supply disruptions. The Reserve facilities consist of a marine terminal and five underground storage sites located in Louisiana and Texas, and program and administrative offices in New Orleans and Washington, D.C. At May 31, 1994, 1,692 Departmental and contractor personnel were employed in the operation, maintenance, and administration of Reserve activities and the Fiscal Year 1994 Congressional Appropriation was about \$207 million.

The audit was requested by the Deputy Secretary of Energy to assist Departmental management in evaluating the human resources required to meet Reserve program requirements. Specifically, the objective of the audit was to determine whether current staffing levels for the Reserve were necessary to effectively and efficiently accomplish current and future anticipated mission requirements.

The Secretary's goal of having the Department and its contractors embrace the best management practices in other Government agencies and industry to improve processes and eliminate waste has not been fully realized by Reserve management. We identified industry performance levels and staffing practices that, if achieved by the Reserve, could enable the Reserve to eliminate approximately 329 positions in eight functional areas with potential annual savings of about \$16 million. Our analysis indicated that additional staffing reductions are possible over the long term through further application of industry practices and decreases in the number of managers. However, such staffing reductions will require further analysis by management to determine the specific number of staffing reductions that are attainable.

The actual staffing reductions realized by the Reserve will be heavily influenced by several factors. These include: the levels of proficiency attained by the Reserve work force; the manner in which the recommendations are implemented; the degree of success in obtaining waivers to Federal and Departmental regulations; and the extent to which the organizational alignments and operating systems are streamlined.

The differences in staffing levels existed because the Reserve had not compared its staffing practices and performance levels against those of industry, management control was overly centralized, and no effective contracting incentives existed to improve efficiency and lower costs.

The Assistant Secretary for Fossil Energy indicated that corrective actions had been taken or were planned on each of the report recommendations. However, the Assistant Secretary did not agree with the staffing reductions and related savings set forth in the report and indicated that a streamlining study was underway to provide the additional analysis needed to determine appropriate staffing levels for Reserve activities.

(Authenticated)
Office of Inspector General
PART I

APPROACH AND OVERVIEW

PURPOSE AND OBJECTIVES

The audit was requested by the Deputy Secretary of Energy for the purpose of assisting Departmental management in ensuring that human resources were properly aligned with program priorities and that maximum use was made of effective management practices. Specifically, the objective of the audit was to determine whether Departmental and contractor staffing levels at the Reserve were necessary to effectively and efficiently accomplish current and anticipated future mission requirements.

SCOPE AND METHODOLOGY

The audit was performed primarily at the offices of the Strategic Petroleum Reserve Project Management Office (Project Management Office) and DynMcDermott Petroleum Operations Company (DynMcDermott) in New Orleans, Louisiana, and a marine terminal and three storage facilities in Texas and Louisiana, from June 14 through September 1, 1994. We also obtained information from and interviewed personnel in the Office of the Deputy Assistant Secretary for Strategic Petroleum Reserve in Washington, D.C. The audit included such tests as determined necessary to satisfy the audit objective and for an assessment of significant internal controls associated with the determination of staffing requirements. The following specific methodologies were used:

- o Examined applicable Departmental orders and regulations;
- o Reviewed pertinent provisions in the Department's contracts and DynMcDermott's subcontract with Wackenhut Services Inc. (Wackenhut);
- o Reviewed Departmental and DynMcDermott policies and

procedures for developing, reviewing, and approving staffing levels for specific functions;

- o Reviewed current and future staffing plans for the Reserve;

- o Interviewed Departmental and DynMcDermott managers to gain an understanding of the role and operations of each organizational element and their interface with other Reserve organizations;

- o Identified work processes, staffing practices, and performance levels from the private sector, including other Departmental management and operating contractors, for functions that were common or similar to those performed by Reserve organizations; and

- o Compared industry staffing practices and performance data with Reserve staffing practices to determine impacts upon staffing levels.

Determining the optimum staffing for a large organization such as the Reserve is an imprecise process. This process is affected by a number of variables including the dynamic nature of organizational goals and objectives, and the programs, procedures, and processes that flow from those goals and objectives; employee turnover; unexpected events; differing capabilities of employees; requirements of higher organizational levels and other regulators; and technological advances.

Nevertheless, in both the private and public sectors, reasonable estimates of staffing levels are obtained by using various analytical techniques. In this connection, we utilized the services of management consultants from the firm of KPMG Peat Marwick LLP. These consultants had broad knowledge of, and in-depth experience in, evaluating organizational and staffing issues in the oil, gas and utilities industries whose activities paralleled those of the Reserve. Also, the consultants had access to data bases of industry benchmarks and performance data for operations and maintenance and various support functions, such as human resources, finance, administration, and procurement.

Two complementary techniques or methodologies were used to estimate the number of employees that would be required if Reserve staffing requirements were based on industry practices. These techniques included: (1) analyses of tasks and activities for each function; and (2) comparisons of performance data for the Reserve with performance data from companies in the private sector. Each is discussed in the following paragraphs.

The analysis of work tasks or activities compared to those generally used by industry was the primary basis used to determine staffing requirements for most Reserve functions. A key component for determining how work processes may be simplified is to evaluate how much time people spend on specific activities. The primary sources of information on the time

devoted to specific tasks were a prior staffing study by Boeing Petroleum Services Company, Inc. (Boeing) and interviews with appropriate Reserve managers. By comparing time expenditures associated with each activity, determinations can be made as to whether greater or fewer resources should be devoted to the performance of each activity.

Industry performance data and benchmarks were used in two different ways to estimate staffing requirements. For certain functions, the benchmarks were used to compute staffing levels while for other functions the benchmarks were used to validate the reasonableness of staffing levels developed from an activity analysis. To illustrate, we relied upon industry performance data contained in a study conducted by the Bureau of National Affairs to develop staffing needs for the Reserve's human resources function. For the maintenance function, performance statistics from a refinery and a petrochemical plant were used to evaluate the reasonableness of the staffing estimates developed by the consultants from a detailed analysis of activities for the maintenance function.

This report does not contain the names of the companies that provided data on performance levels and management practices used in the audit. This is necessary because the companies considered such data proprietary.

The audit was made in accordance with generally accepted Government auditing standards for performance audits. We reviewed internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objectives. Since our audit was limited, it would not necessarily have disclosed all material internal control deficiencies that may have existed at the time of our audit. We relied on computer-generated data for staffing levels, number of managers, and related information. However, this information was verified by observation and discussion with senior Reserve managers during the audit.

We discussed this report with the Project Manager, Project Management Office, and members of his staff on November 10, 1994.
BACKGROUND

Mission of Strategic Petroleum Reserve

The Reserve was authorized by the Congress for the purpose of maintaining a large crude oil stockpile to minimize the impact of any disruptions in the supply of crude oil. The Reserve facilities are designed to store up to 750 million barrels of crude oil and to draw down 4.5 million barrels a day. However, in 1994, problems with gases in storage caverns and high crude oil temperatures had reduced the drawdown capability to about 2 million barrels a day. Five underground storage sites are located at Bayou Choctaw, Weeks Island, and West Hackberry in Louisiana, and Bryan Mound and Big Hill in Texas. In addition, the Reserve has a marine terminal in Saint James Parish, Louisiana. Each site is linked through Department-owned pipelines to commercial crude oil distribution systems and marine

terminals for water-borne distribution.

The Reserve is operated and maintained by the Department and its contractors. The management and operating contractor for the Reserve is DynMcDermott. The Assistant Secretary for Fossil Energy has overall programmatic responsibility for achieving the goals and objectives of the Reserve. This responsibility is delegated to the Deputy Assistant Secretary for Strategic Petroleum Reserve. The Project Management Office carries out day-to-day project activities including contract administration functions. Appendix A depicts the entire Reserve organization from the Assistant Secretary for Fossil Energy to the crude oil storage sites and terminal.

The acquisition of new crude oil inventories was terminated in July 1994. The Department had no plans to increase the current crude oil inventory of 592 million barrels through Fiscal Year 2000. Currently, the Reserve's primary mission is to maintain the operational readiness of crude oil storage facilities through cavern pressure monitoring, cavern and well maintenance, testing of integrity, conducting preventive and corrective maintenance, exercising equipment, performing readiness exercises, and assuring compliance with state and Federal laws.

Staffing Levels

Reserve staffing requirements had increased significantly since the original Reserve Plan was approved by the Congress. The original plan, submitted to the Congress in December 1976, envisioned a work force growing to over 1,000 employees during the design, construction and inventory building phases. After the crude oil inventories had been acquired and placed in storage, the plan envisioned a work force of no more than 200 employees would be required to maintain the crude oil inventories and storage facilities.

Many changes occurred since 1976 in the size and location of Reserve facilities and in operating philosophies. The crude oil storage capacity was increased from about 500 million barrels to over 750 million barrels. Different storage sites than those considered in the original plan were acquired and developed. The original plan provided for the filling of storage facilities by 1982. However, the Reserve was still acquiring crude oil stocks in the 1990's.

At May 31, 1994, 1,692 full-time equivalents were employed by the Department and its contractors to carry out Reserve mission requirements, of which, 1,349 were employees of DynMcDermott and its subcontractors. Of the 1,692 positions, 813 were located in New Orleans, 818 at the five storage sites and terminal, and 61 in Washington, DC. A breakdown of staffing by function and organizational entity as of May 31, 1994, is shown in Table 1 (see Appendix B for abbreviations):

Other Department Contractors		Functional Area Total	Department	DynMcDermott & Subcontractors
		Maintenance & Materials (M&M)	14	308
0	322	Engineering and Construction (E&C)	25	171
98	294	Security (SEC)	4	286
1	291	Operations (OPS)	30	207
9	246	Project Planning & Control (PP&C)	15	90
40	145	Procurement & Property (P&P)	16	113
3	132	Finance & Administration (F&A)	18	42
16	76	Environmental, Safety, and Health (ES&H)	14	54
3	71	Quality Assurance (QA)	7	51
10	68	Project Management (PM)	11	12
2	25	Human Resources (HR)	7	15
0	22			
		Total	161	1,349
182	1,692		----	-----
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Prior Audits

We issued two prior audit reports that addressed staffing

issues at the Reserve. In an October 1988 audit report entitled "Plant and Facilities Management at the Strategic Petroleum Reserve," we recommended that engineered standards be developed and used in determining staffing requirements. Departmental management partially concurred with that recommendation and subsequently developed engineering standards. In a December 1992 audit report entitled "Boeing Petroleum Services, Inc., Use of Overtime at the Strategic Petroleum Reserve," we recommended that the contractor monitor work shifts to determine if they achieved the desired results of reducing overtime costs. The Project Management Office concurred with the recommendation and took actions to reduce overtime costs.

OBSERVATIONS AND CONCLUSIONS

The Secretary has expressed the desire for the Department and its contractors to implement the "best management practices" in order to improve efficiency and reduce costs. The Reserve had undertaken various initiatives and was considering other initiatives to improve the efficiency and economy of its operations.

Despite these initiatives, our comparison of industry performance levels and staffing practices with the Reserve showed opportunities for the Reserve to better achieve the Secretary's expectation of improved efficiency and lower costs. This condition existed because Reserve performance had not been compared with management practices in industry, management control was overly centralized, and limited incentives existed for contractors to improve efficiency and thus lower costs. The potential staffing reductions in eight of eleven functional areas could result in annual savings of salaries and fringe benefits of about \$16 million. Further staffing reductions may be possible by having managers supervise more employees and implementing additional industry practices and performance levels. The exact number of possible staffing reductions will require further analysis by Reserve management.

In our opinion, the Department should consider the need to improve Reserve staffing performance as a reportable problem when preparing the yearend assurance memoranda on internal controls.

PART II

FINDING AND RECOMMENDATIONS

Staffing Practices

FINDING

Policy guidance established by the Secretary requires the Department and its contractors to identify and implement the best management practices of other Government agencies and industry to improve the efficiency and economy of Department operations. Our comparison of industry performance levels and staffing practices with those of the Reserve showed that the Reserve had higher staffing levels than those generally found in industry. This

condition existed because Reserve staffing performance had not been compared with industry management practices, management control was overly centralized, and limited contract incentives existed to improve efficiency and lower costs. We estimate that the application of industry performance levels would enable the Reserve to eliminate approximately 329 positions and realize potential annual savings of about \$16 million. Additional staffing reductions of over 400 positions may be possible. However, further analysis will be required of the staffing requirements for selected functional areas and manager positions to accurately establish the staffing reductions that are practicable.

RECOMMENDATIONS

We recommend that the Assistant Secretary for Fossil Energy:

1. Direct that actions be taken to implement the staffing reductions described in Part II of this report for eight functional areas by improving performance levels through redesign of work processes, revisions in organizational operating policies and procedures, further automation of systems, and obtaining appropriate waivers from Departmental orders and other regulations.
2. Implement a 3 year goal to reduce overcentralization and increase the span of control for Reserve managers to an average of one manager for each 10 subordinates, and to reduce total staffing levels by the number of supervisory positions so eliminated.
3. Require further research and analysis of the potential long term staffing reductions listed in Appendix D of the report to determine the specific number of positions that should be eliminated to improve efficiency, productivity, and operating costs.
4. Provide contract incentives for the management and operating contractor and Federal managers to reduce staff and operating costs for the Reserve.
5. Ensure that Reserve staffing requirements are evaluated on a periodic basis by using appropriate benchmarks, comparative statistics, and other performance measures from the private sector and/or other Departmental management and operating contractors.

MANAGEMENT REACTION

The Assistant Secretary for Fossil Energy indicated that corrective actions would be taken to address each of the report recommendations. The Assistant Secretary did not agree with the estimated savings cited in this report because of major reservations concerning the scope and methodology used to develop staffing needs. For this reason, the Reserve planned to conduct additional analysis to arrive at what it considers to be appropriate staffing levels. Details on managements comments

along with our response, are included in Appendix C of the report.

DETAILS OF FINDING

INITIATIVES TO IMPROVE STAFF EFFICIENCY AND REDUCE COSTS

Many companies in the private sector have undertaken aggressive programs to redesign work processes to improve their competitiveness and cost effectiveness. An integral part of these initiatives is the "benchmarking" of staffing practices and performance levels with those of other companies to identify and adapt successful approaches and practices of these other companies. Work processes are streamlined by using benchmarks and other work process redesign techniques. Further, a current trend in the staffing practices of many companies is to decentralize operations by delegating responsibility and accountability and then reducing the layers of management and managers.

In recent years, similar initiatives were undertaken by the Federal Government to improve the efficiency and economy of Federal programs. To illustrate, in April 1994 the Secretary issued a strategic plan entitled Fueling a Competitive Economy. This plan included goals and strategies relating to the manner in which the Department will conduct operations, including management practices. One of the goals for management practices was that the Department and its contractors embrace the best management practices in industry and other Government departments and agencies. The objective was to improve processes and customer satisfaction, prevent defects, and eliminate waste. Moreover, the National Performance Review report stated that a goal of the Federal Government was to reduce the number of managers by about 50 percent in order to prune unnecessary layers of management.

For Federal Government agencies to fully realize the same benefits as those attained by the private sector it may be necessary to revise or obtain waivers from selected Federal or agency regulations. The need for such revisions or waivers is demonstrated by the experiences of the Bonneville Power Administration. This Federal agency had identified 250 regulations which slowed production and provided no value to customers. The estimated annual cost of meeting the requirements in these regulations was \$6 million and required over 90 full-time employees. As of mid-1994, the Bonneville Power Administration had obtained waivers to 163 of the 250 regulations. We concluded that the current emphasis on Federal Government reinvention may provide a unique window of opportunity to obtain those waivers needed to make Reserve operations more cost effective without compromising safety, security, and the overall strategic plan for this Department.

APPLICATION OF INDUSTRY PRACTICES COULD REDUCE STAFFING NEEDS

For the most part, the Reserve's staffing practices and

performance levels did not compare favorably with industry and other organizations. We compared Reserve performance levels and staffing practices with those in industry for 11 functional areas. We found that the Reserve's staffing levels exceeded those considered necessary by other companies and organizations for the accomplishment of similar functions. This is most evident from our comparison of performance levels and the span of management control. Concerns in these areas were recognized by DynMcDermott in its proposal on the current contract, in which it stated that gains in productivity and reductions in the span of management control were key factors to realizing improved efficiencies.

Performance measures and benchmark data from various companies for 8 of the 11 functional areas was of sufficient detail and substance to warrant immediate/near term action (within 1 year) by Reserve management to reduce staff. Our analysis indicated that Reserve staffing levels in these eight functional areas exceeded average industry staffing levels by about 329 positions, including 45 management positions. (See Appendix D for details by functional area.)

Our analysis showed that additional long term reductions of over 400 positions are possible. For instance, staffing reductions involving another 303 positions may be warranted in 10 of the 11 functional areas. However, additional analysis by management will be necessary to determine which of these potential staffing reductions are appropriate. Furthermore, we estimated that the Reserve could eliminate another 139 management positions by increasing the span of management control to that being obtained by other companies and organizations. (See Appendix D for details by functional area.)

For example, DynMcDermott's operations compared unfavorably with two other Departmental management and operating contractors for selected support functions. This conclusion provides another basis for the staffing reductions proposed in this report. DynMcDermott's support staff was significantly larger, as a percent of total staff, than those of two other Department of Energy contractors as shown in Table 2.

Table 2			
Comparison of Staffing For Selected Support Functions			
	DynMcDermott	Reynolds Electric	EG&G Rocky Flats
Total Support Staff @	174	262	232
Total Staff	1,349	3,087	6,337
Support Staff As Percent of Total Staff	12.9%	8.49%	3.66%

	Note: @ Support staff includes human resources, finance	
	and administration, project planning and control,	
	and procurement and property.	
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Details on our findings relating to performance levels for the eight functional areas cited above, and the span of management control are discussed in the following sections of the report.

Performance Levels

Security

The Reserve had a significantly higher number of security personnel for Reserve facilities than was experienced by industry.

The Reserve had 291 personnel involved in the physical security of Reserve facilities, of which 268 were employed by Wackenhut, a subcontractor of DynMcDermott. Of the 268 Wackenhut employees, 227 were guards with the remaining 41 employees being responsible for training, management, and support functions. All but 26 of the guards were located at the six field sites. Twenty-three Department and DynMcDermott personnel were involved in program administration and oversight functions. Security staffing requirements are essentially directed by the Reserve's Site Security Plan. This plan delineates the potential threats to Reserve facilities and the staffing to counter potential threats.

The Reserve employed about 3.6 times more guards than the average number employed by industry. The Reserve had 227 guards at seven locations for an average of 32.4 guards per location. For comparison with industry practices, we relied upon data obtained by Security Magazine in 1992 from an extensive survey of security management practices in industry. The 150 companies participating in the Security Magazine survey had an average of 9 guards per site.

The average staffing levels reflected in the results of the Security Magazine survey were higher than those at seven petroleum facilities. We contacted six petroleum refineries and a petrochemical plant and determined that these facilities had an average of 5.5 guards.

Moreover, the logic behind concentrating large numbers of guards at Reserve crude oil storage sites requires careful scrutiny. This policy provided only limited assurance that crude oil stocks may be successfully transferred and used by petroleum refineries. Under the current arrangement, should drawdown occur, the Reserve's crude oil was subject to major vulnerabilities for which the Reserve's security force did not or could not provide protection. Because of security factors we are precluded from describing these vulnerabilities in this report. However, current staffing of guards at the Reserve's sites is

highly questionable.

The Pacific Northwest Laboratory, a Department of Energy facility, operated by Battelle Memorial Institute, conducted a vulnerability assessment of Reserve sites in 1993 and concluded that the level of site security should be reduced. The report recommended that the level of protection be made consistent with an industrial security program and Departmental Order 5632.6, "Physical Protection of DOE Property and Unclassified Facilities," which would enable the Reserve to reduce the number of overhead and protective force positions. The report did not indicate the specific number of positions that could be eliminated.

We concluded that the Reserve could reduce guard staffing levels to an average of 11 per site, which is still substantially higher than industry averages. As a consequence, 150 guard positions could be eliminated (includes 21 manager positions). The proposed staffing level would permit the continuation of full time rovers for each shift. With a smaller guard staff, complementary reductions should also be possible in the administration, oversight and support areas of the security function.

Procurement and Property

The productivity of the personnel who staff the procurement and property function was from 25 to nearly 90 percent below that of petroleum industry companies and other major Departmental management and operating contractors.

The Reserve had 132 personnel involved in procurement and property functions. The bulk of the procurement and property personnel, 113 individuals, were employed by DynMcDermott, of which 63 employees were located in New Orleans and 50 were located at field sites.

Three external sources of benchmark data were used for our comparisons of industry and Reserve staffing levels for the procurement and property function. One involved a study conducted by Arizona State University's Center for Advanced Purchasing Studies of 20 petroleum companies. The second source was a consultant study of four petroleum companies. The third source involved data obtained as part of Office of Inspector General audits involving other Departmental management and operating contractors.

Our comparisons showed that DynMcDermott had five times as many procurement personnel as the average number of procurement personnel for 20 petroleum companies included in the Arizona State University study (for our comparisons we included the 56 DynMcDermott employees assigned to procurement functions). Yet it only purchased about 11 percent of the average dollar value procured per employee (for a 12-month period) by these 20 companies -- \$.95 million versus \$8.5 million.

We also evaluated the productivity of DynMcDermott's

employees with that of employees from petroleum companies. In all cases, the productivity of the petroleum companies was significantly higher than that of DynMcDermott with respect to the purchase orders processed, inventory maintained, and line items received by procurement and storeroom employees. The results of our comparisons are shown in the following table:

Table 3		
Comparison of Performance Between DynMcDermott and Petroleum Companies		
	DynMcDermott	Petroleum Companies
Purchase orders per employee	173 @	1,531
Blanket purchase orders per employee	6 @	16
Inventory (Line items) per employee	321 @	2,751
Line items received per employee	278 *	2,355
Note: @ Based on total number of procurement employees.		
* Based on total number of storeroom employees.		

In addition, we compared DynMcDermott's performance in this functional area with that of other Departmental management and operating contractors, which are more similarly situated in terms of procurement requirements than companies in the private sector. We found that the performance levels of five other Departmental management and operating contractors also exceeded that of DynMcDermott, in some cases by a very wide margin, as shown in Table 4.

Table 4		
Comparison of Performance Between DynMcDermott and Other Contractors		
Contractor	Per Employee	
	Procurement Actions	Procurement Dollars (in millions)
DynMcDermott	173	\$.95
Martin Marietta Energy Systems	1,536	3.30
EG&G Rocky Flats	748	3.25

Reynolds Electrical & Engineering	307	1.50
Westinghouse Waste Isolation Div.	237	1.36
Westinghouse Savannah River Co.	232	2.50

Energy Systems appeared to be the most productive of the management and operating contractors we evaluated. Two factors contributing to the productivity level of Energy Systems were the extent of automation and differences in procurement processes. Energy Systems used an automated procurement system that significantly reduced the amount of time required by buyers to process individual procurement actions. Also, Energy Systems used a large number of blanket purchase orders and had a high dollar threshold for competitive procurements, which reduced the amount of paperwork and manpower required to process procurement actions.

If the Reserve attained the same level of productivity as Energy Systems and the other petroleum companies it could eliminate 64 procurement and property positions (includes 15 manager positions). Such a reduction would require increased automation; streamlined and revised procurement policies including increased use of blanket purchase orders and multiple year subcontracts; reduced reporting requirements; and consolidated storerooms. All of these actions represent significant improvements over existing processes.

Maintenance and Materials

The Reserve's staffing of the maintenance and materials function exceeded by up to five times those of a refinery and petrochemical plant for similar activities. One exception was the number of instrument and control technicians and electricians employed by the petrochemical plant.

The maintenance and materials function had primary responsibility for maintenance programs, logistics support, on-site technical assistance, and inventory management. Of the 322 positions in this function, 308 were staffed by DynMcDermott employees and 14 by Departmental employees.

The following table summarizes the results of our comparisons with a refinery and petrochemical plant.

Table 5			
Comparison of Staffing for Maintenance Functions			
	Reserve	Refinery	Petrochemical Plant
Maintenance Planning Staff			

Planning Staff as			
percent of total			
maintenance staff	9%	4%	5%
Mechanics			
Pumps and motors			
maintained per employee	13	70	51

As Table 5 shows, the refinery and petrochemical plant used in our study were able to function with a much smaller maintenance planning staff, in proportion, than was the Reserve. The private sector companies also were able to assign maintenance responsibilities for pumps and motors to fewer employees than the Reserve. We believe these are important indicators of Reserve overstaffing. If the Reserve could obtain the same level of productivity for the planning staff and mechanics as that attained in industry the Reserve could eliminate 35 positions in the maintenance and materials function.

Operations

If the Reserve followed industry practices for the staffing of operations shift teams it could reduce staffing levels.

The operations function is primarily responsible for managing site operations to maintain drawdown readiness and to ensure that crude oil meets required specifications. Two hundred forty six individuals were assigned to this function, including 207 DynMcDermott employees, 30 Departmental employees and 9 other contractor employees.

Reserve practices relating to the size, number, and composition of operations shift teams resulted in increased staffing compared to those practices generally followed in the petroleum industry (excludes supervisory positions). This conclusion was reached based on the following comparisons of Reserve and industry practices:

- o The Reserve used full-size shift teams for all shifts and for all days of the week. Such a practice is not followed by petroleum refineries. The operations shift teams at refineries are smaller in size after daylight hours or on weekends even though the process runs continuously. Minimum staff is provided at the refineries until the day shift returns.

- o The Reserve had five operations shift teams with one of the teams being a relief team, whereas, industry normally operates with four shift teams, including the relief shift team. While the use of five teams reduces total overtime costs, such savings are more than offset by the increased costs of salaries and fringe benefits for the members of the fifth shift team.

- o Staffing levels for the Reserve relief teams were about 50 percent greater than for industry relief teams. About 16 percent of the Reserve's operations staff were assigned to the fifth or break shift team, whereas in industry the break shift accounted for about 5.5 to 8.5 percent of the total operations staff.

- o Each relief shift had a shift supervisor and control room operator. This overlap is redundant and not found in industry.

- o It is questionable whether rovers are needed at the sites since all systems are electronically monitored from the control room and security guards rove the sites and should be able to easily spot any major fluid leaks.

If the Reserve followed industry practices for the staffing of operations shift teams it could eliminate 31 positions, including 6 manager positions.

Project Planning and Control

Certain project planning and control activities were also staffed in excess of that normally found in industry.

Included in the project planning and control function were such activities as support and operation of computer equipment and systems, office services, program scheduling, publications, mail room, and communications. Included in the 145 employees assigned to this function, 90 were DynMcDermott or DynMcDermott subcontractor employees, 15 were Departmental employees, and 40 were employees of other contractors or subcontractors.

Staffing of project planning and control functions could be reduced by 23 positions (including one manager) through the consolidation of common support activities, increased reliance on commercial sources for computer software, and changes in the tracking of program activities.

Consolidation of activities. Both the Project Management Office and DynMcDermott operated mail distribution and graphics activities. The consolidation of these activities would enable the Reserve to eliminate four positions.

Reliance on commercial software. About 50 percent of the staff of the Management Information Systems group was dedicated to computer applications software and software development and upgrade efforts. Much of the current programming workload is for systems where commercial packages are available or could be satisfied through the outsourcing of such work to commercial vendors. Such changes in the software area would enable the Reserve to eliminate 14 positions in the Management Information Systems group.

Tracking of programs. An excessive amount of time and money is devoted by the Reserve to the tracking of detailed

milestones. DynMcDermott tracked about 900 separate milestones. Such detailed tracking exceeded normal industry practices. If the number of milestones to be tracked were reduced and/or the tracking was delegated to the responsible management level, we estimate that about five positions could be eliminated.

Quality Assurance

The Reserve had devoted a greater number of resources to the quality assurance function than that normally found in the private sector.

The quality assurance function is responsible for developing, managing, and overseeing the implementation of quality assurance criteria, procedures, and techniques by other Reserve organizations. Included in the 68 individuals assigned to this function are 51 DynMcDermott employees, 7 Departmental employees, and 10 from another Federal agency. Of the 51 DynMcDermott employees, 27 were located at field sites.

The trend in quality management over the past 10 years has been to reduce quality assurance staffs and to integrate quality practices into the planning and execution of each organizational level. Such integration of quality is called "internalized quality". Many oil and gas companies had successfully internalized quality, and quality departments were typically very small central units consisting of quality specialists. These quality specialists are responsible for:

- o Setting quality standards and guidelines in consultation with operating units;
- o Providing expertise and advise to operating units; and
- o Conducting periodic reviews and audits of quality related practices and flagging problem areas;

We found that the Reserve had made significant progress in internalizing quality practices. This should allow the Reserve to operate with fewer quality personnel. Based on industry practices and our activity analysis, two quality assurance personnel at each field site, or 12 employees, plus 6 chemists/laboratory technicians should be sufficient for Reserve requirements. This would result in the elimination of nine quality assurance positions at field sites.

Finance and Administration

The Reserve could improve its performance levels based on our comparison with the performance level of companies in the private sector.

The Reserve had 76 employees involved with finance and

administration functions. Of this number, 42 were employed by DynMcDermott and its subcontractors, and 34 were assigned to the Project Management Office and Headquarters (18 were Departmental employees, and 16 were employees of another contractor).

For comparison purposes, we used a benchmark study completed in 1994 by KPMG Peat Marwick LLP based on inputs from 130 commercial entities. Based on our comparisons, the Reserve's productivity for finance activities was substantially below the average for companies in the KPMG Peat Marwick LLP study. Further, the cost per processed unit was significantly higher than those reflected in the study. The following are illustrative of the results of our comparisons between the Reserve and companies included in the KPMG Peat Marwick LLP study.

Table 6		
Comparison of Performance Levels Between the Reserve and KPMG Study		
	Reserve	KPMG Study of 130 Companies
Finance staff as percent of total staff	4.5%	3.4%
Project Management Office - cost per unit		
Accounts payable	\$89.31	\$3.17
Travel vouchers	43.47	5.95
DynMcDermott - cost per unit		
Accounts payable	\$32.22	\$3.17
Travel vouchers	26.32	5.95
Payroll	4.48	3.04

If the Project Management Office and DynMcDermott were able to attain the same performance levels as the average companies in the study, we estimate that 11 finance positions could be eliminated. The 11 positions did not include any supervisory positions.

Human Resources

Our comparison of the Reserve's staff for human resources functions with industry performance levels also indicated inefficiencies.

The Reserve has 22 individuals involved in such human resources functions as employee relations, compensation and data

services, employee benefits, public affairs, and training and developmental activities. Of the 22 positions, 7 are filled by Departmental employees, and 15 by DynMcDermott and a subcontractor.

Reserve officials contended that DynMcDermott needed a large human resources staff to develop basic human resource policies and procedures because DynMcDermott was a new corporation specifically created to manage the Reserve. Such a need appears questionable based on the size and experience of the companies that comprise DynMcDermott and their prior dealings with the Federal Government, including the Department of Energy. DynMcDermott was owned by four large and mature corporations which undoubtedly have extensive human resource capabilities. Moreover, three of the four companies had previously done extensive work for the Department.

The Reserve staffing levels exceeded the average staffing levels in the Bureau of National Affairs Survey No. 59 of Human Resources Activities, Budgets, and Staffs for the years 1993 and 1994. The number of human resources employees per 100 employees was 2.4 for the Project Management Office and 1.4 for DynMcDermott. The Bureau of National Affairs survey showed an average ratio 1.5 for an organization the size of the Project Management Office and 1.0 for DynMcDermott.

If the Project Management Office and DynMcDermott attained the same level of performance as that of the average companies in the Bureau of National Affairs survey it could eliminate six positions in the human resources functional area. The six positions included two manager positions.

Span of Management Control

The current trend in industry and the Federal Government is to reduce the layers of management as well as the numbers of managers with the objective of lowering costs and improving quality.

Layers of Management

The Reserve had about twice as many layers of management as the petroleum industry. The Reserve's layers of management averaged about 13 and reached from the Deputy Assistant Secretary for Strategic Petroleum Reserve to the lowest level of management at the storage sites. This compared to an average of about seven layers for a large, multi-site, integrated oil company. The number of management layers for a typical integrated oil company was computed from the chief executive officer to the lowest level of management at a refinery.

The major factor contributing to the high number of layers of management was that multiple organizations were involved in the operations, management, and oversight of Reserve operations. The three major organizations being the Department, DynMcDermott,

and Wackenhut. Because of the differing responsibilities and contractual relationships it would be difficult to reduce the number of layers of management to the average number in the petroleum industry. However, such obstacles do not exist with respect to reducing the numbers of managers within each of the organizations as discussed in the following section of the report.

Number of Managers

The Reserve also had an excessive number of managers compared to the petroleum industry and other organizations. The average ratio of managers to subordinates in the petroleum industry was about 1 to 6, with leading edge companies moving towards a ratio of 1 to 10. A world class company with world-wide organizations had ratios that significantly exceeded 1 to 10. Seven other Departmental management and operating contractors had ratios ranging from 1 to 7 to 1 to 18. Further, the National Performance Review had established a goal of 1 manager for each 15 subordinates for Federal departments and agencies. In contrast, the average ratio of managers for the Reserve was 1 to 3.8. Ratios for individual elements were: 1 to 3.2 for Departmental activities; 1 to 3.5 for Wackenhut; and 1 to 4 for DynMcDermott.

DynMcDermott exceeded the average number of employees supervised by managers of seven other Departmental management and operating contractors by 75 to 350 percent as shown in Table 7. One of the contractors with a ratio of 1 to 7 was moving towards a ratio of 1 to 10.

Table 7		
Comparison of Span of Control For Selected Departmental Contractors		
Contractor	Average Number of Employees Supervised	Percent Higher than DynMcDermott
DynMcDermott	4	
Westinghouse Waste Isolation Div	7	75
Sandia National Laboratories	7	75
Martin Marietta Energy Systems	7	75
EG&G Rocky Flats	7	75
Westinghouse Hanford	8	100
Reynolds Electrical & Engineering	9	125
EG&G Idaho Falls	18	350

A significant portion of the Reserve's 295 managers (Department, DynMcDermott, and Wackenhut) supervised small numbers of subordinates. For example, over 60 percent of DynMcDermott's 197 managers supervised 5 or fewer employees.

We believe that an average ratio of 1 manager to 10 subordinates is a reasonable and attainable goal for the Reserve. Some managers would have fewer subordinates while most would have a greater number of subordinates. The implementation of this average ratio would result in a significant reduction in the number of Reserve managers. We estimate that the application of such a ratio would eliminate 184 managers (includes 45 manager positions discussed in the preceding section of the report dealing with performance levels) and lead to reductions in overall staffing of the Reserve.

Besides inflating staff and costs, excessive numbers of managers and layers of management contribute to inefficient operating practices which could lead to:

- o Unreasonable delays in the decision-making process;
- o Duplication of work effort by two or more organizations;
- o Proliferation of paperwork to provide higher level managers with information needed to make decisions; and,
- o Lack of accountability.

FACTORS CONTRIBUTING TO HIGHER THAN NEEDED STAFFING LEVELS

These inefficiencies existed because Reserve staffing needs were not compared with industry management practices, management control over operations was overly centralized, and inadequate contract incentives existed to improve staff performance and lower costs.

Comparisons with Industry

Neither the Department nor DynMcDermott had validated or evaluated current staffing levels for Reserve activities with industry practices, benchmarks, or other performance data for similar functions. The only detailed analysis of Reserve staffing requirements was conducted in 1990 by Boeing which was limited to staffing needs of the Reserve management and operating contractor. No evidence existed that this analysis considered management practices or performance levels in industry in evaluating the reasonableness of current and planned staffing levels.

Highly Centralized Management Control

The trend in the private sector is to decentralize the decision-making process. Such initiatives have contributed to improved quality of products, increased efficiency and

productivity, and reduced operating costs.

The Reserve has moved in an opposite direction by overly centralizing management over Reserve operations. This is evident from the fact that over 50 percent of the Reserve employees (874 out of 1,692) were located in Department headquarters activities in Washington, D.C., and New Orleans, and DynMcDermott headquarters activities in New Orleans.

The centralized control was a primary factor contributing to unnecessary layers of management and excessive staff. This centralized control had evolved into a process whereby Department activities issued detailed work guidance to contractors who prepared detailed implementing guidance. The Department then monitored the implementation and frequently requested the contractor to provide the Department with detailed reports. DynMcDermott was required to submit 317 different types of reports to the Department (See Appendix E). Many of these reports covered minor or inconsequential matters and flowed from the lowest level at field sites, up through DynMcDermott and the Project Management Office headquarters to the Project Manager. Examples of such reports are discussed below:

- o A recent weekly maintenance and operations report for the Project Manager contained information on a spill of one quart of oil, a subcontractor employee who tripped over a shovel, and an employee who was stung by an insect.

- o Daily security reports provided to the Project Manager and other senior Project Management Office and DynMcDermott executives included information on the denial of access to a sales representative because she was not a U.S. citizen, a guard who had a flat tire, and a fight between two subcontractor employees.

The preparation and processing of such reports increases workload of senior Reserve managers and contributes little, if anything, to the efficient operations of the Reserve.

The centralized management philosophy also resulted in a pervasive culture of multiple reviews, committees and approvals that not only hinders decision-making, but also dilutes accountability for decisions. Simple tasks had become complex processes. Compared to industry where a telephone call could obtain needed services or materials, in the case of the Reserve such services or materials would require the submission of multiple forms and approval by several management levels. Approvals by up to eight DynMcDermott employees were required to purchase a non-stock item, even one costing only \$1.50.

Incentives to Eliminate Staff and Lower Costs

The Department had not provided DynMcDermott with sufficient financial incentives to improve staff efficiency and lower costs. To the contrary, Departmental contracting practices tended to encourage the management and operating contractor to increase or maintain current staffing levels. This is evident from the

following two examples.

o The Department's request for proposal on the current Reserve management and operating contract required that the successful contractor hire the entire incumbent Boeing work force except for a few key managers. As a result, the Department lost a unique opportunity to critically evaluate Reserve staffing needs and realize substantial reductions in staffing levels and program costs.

o We were told by a senior Reserve management official that if any Reserve field sites were leased the staff currently assigned to those sites would not be terminated but, instead, would be reassigned to another Reserve field site.

Although DynMcDermott had reduced its staff since April 1, 1993, most of these reductions were offset by increases in subcontractor staff. In its proposal on the current management and operating contract, DynMcDermott stated that it planned to reduce staffing by 78 positions no later than October 1, 1993. DynMcDermott did eliminate 78 positions from its organization and, at May 31, 1994, its total staff was 978. However, at the same time, it increased the subcontractor staff by 54 positions, so that the net reduction in staffing was 24, not 78.

Moreover, the contract performance award fee criteria for the Departmental contract with DynMcDermott did not contain sufficient potential rewards or additional fees for staffing reductions realized by DynMcDermott. For example, one of the award fee criteria for the first half of Fiscal Year 1994 was for DynMcDermott to "Continue to maintain staffing levels to meet the average headcount for FY 1994 of 978." The use of cost-plus-award fee contracts provides little incentive for DynMcDermott to control costs and staffing levels, especially since the fee is based in part on the estimated contract costs.

POTENTIAL SAVINGS

Implementation of higher performance levels and an increase in the span of management control would enable the Reserve to realize significant reductions in salary and benefit costs. We estimate that if the Reserve attained the performance levels of other companies and Departmental contractors for eight functional areas it could eliminate approximately 329 positions in the near-term and save about \$16 million in annual salaries and benefits. The savings during the period of employee separations would be reduced by any severance pay or unemployment benefits received by the separated employees. Table 8 shows a breakout of the potential staffing and cost savings.

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| Table 8 |
|-----+

Summary of Potential
Staffing Reductions and Cost Savings

	Staff Reductions	Cost Savings (in millions)
Security	150	\$ 5.982
Procurement & Property	64	3.649
Maintenance and Materials	35	1.996
Operations	31	1.767
Project Planning and Control	23	1.292
Finance & Administration	11	.627
Quality Assurance	9	.513
Human Resources	6	.371
Totals	329	\$16.197
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Opportunities existed for further staffing reductions in the future, possibly involving over 400 positions (see Appendix D for details). The realization of these staffing reductions would require further increases in the span of management control and the implementation of other industry practices and performance levels. However, more detailed analysis of these opportunities by program officials is needed to validate these potential reductions.

CONCLUSIONS

This audit of staffing requirements for the Reserve has identified a number of areas in which significant near term reductions in staffing are possible. We have also identified other programmatic areas in which additional reductions are possible based on further analysis by Reserve management. If the recommendations in this report are adopted by management, fundamental changes in Reserve operations will be necessary, requiring the active involvement of Departmental officials in Headquarters, at the Reserve's Project Management Office in New Orleans, and at the various other Reserve sites. The Reserve's major contractors will also play an important role in implementing such changes. Change is difficult in any organization. For that reason, we recognize that the actual staffing reductions realized by the Reserve from the implementation of the recommendations in this report will be heavily influenced by several factors. These include: the levels of proficiency attained by the Reserve work force; the manner in which the recommendations are implemented; the degree of success in obtaining waivers from selective Departmental and other Federal regulations; and the extent to which the organizational alignments and operating systems are streamlined.

PART III

MANAGEMENT AND AUDITOR COMMENTS

The Assistant Secretary for Fossil Energy, in responding to a draft of this report, indicated that corrective actions were underway or planned for each of the report recommendations. The Assistant Secretary did not agree with the staffing reductions and related savings set forth in the report because of serious reservations as to the adequacy of audit coverage and the applicability of external benchmarks to the unique nature of the Reserve's mission and operations. For this reason, the Reserve had undertaken a streamlining initiative to provide the additional analysis needed to arrive at appropriate staffing levels. The Assistant Secretary stated that the information contained in this report would be used as supporting information for the streamlining study.

The corrective actions outlined by the Assistant Secretary are responsive to the intent of the report recommendations. However, we do not agree with the management statements concerning the deficiencies in audit coverage or the applicability of the benchmarks used to compare with Reserve activities. Adequate consideration was given to definitive current and future mission requirements and benchmarks used from industry and other DOE contractors provided highly conservative and reasonable estimates of the Reserve's staffing needs.

The complete text of the Assistant Secretary's summary comments on the audit methodology and recommendations is contained in Appendix C, along with our comments. The Assistant Secretary provided additional detailed comments which we considered in preparing this report and, where appropriate, revisions were made to the report.

APPENDIX A

STRATEGIC PETROLEUM RESERVE ORGANIZATION CHART

APPENDIX B

ABBREVIATIONS

Abbreviations	Title of Function
PM	Project Management
PP&C	Project Planning and Control
OPS	Operations
M&M	Maintenance and Materials
E&C	Engineering and Construction

ES&H	Environmental, Safety and Health
QA	Quality Assurance
P&P	Procurement and Property
F&A	Finance and Administration
HR	Human Resources
SEC	Security
DOE HQ	Department of Energy Headquarters
SPRPMO	Strategic Petroleum Reserve Project Management Office
DCMC	Defense Contract Management Command
Tucker	Tucker and Associates, Inc.
Wackenhut	Wackenhut Services, Inc.
Walk Haydel	Walk, Haydel and Associates
Mitre	Mitre Corporation

APPENDIX C

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ASSISTANT SECRETARY'S SUMMARY COMMENTS

ON OFFICIAL DRAFT REPORT

SUMMARY MANAGEMENT COMMENTS AND OFFICE OF INSPECTOR GENERAL REPLY

Management took issue with the Office of Inspector General approach and characterization of the findings. Below are management's verbatim comments and our reply thereto.

Management Comments

Management questioned the consistency between the stated objectives of the audit and what the audit actually accomplished. Specifically, management stated that:

"Stated objectives of the audit were to 'assist...in evaluating the human resources required to meet Reserve program requirements' and 'to determine whether current staffing levels...were necessary to effectively and efficiently accomplish current and anticipated future mission requirements.'

The report does not address, in sufficient detail, the current and future anticipated requirements of the SPR, nor does it demonstrate that an in-depth analysis of 'requirements' was performed to arrive at the staffing recommendations. Rather, the report relies extensively on a 'numbers' comparison of industry

staffing practices and performance levels to those of the SPR, the comparability of which is not fully established, without a discussion of the 'requirements' that underline these statistics. Therefore, the audit did not achieve its stated objective of matching staffing levels with mission requirements. Staff reductions are advocated on questionable grounds leaving it to the SPR to redefine its mission requirements to be that which is achievable with the recommended staffing levels. Most changes to the SPR mission requirements would necessitate policy changes requiring Presidential, Congressional, and/or Secretarial approval.

The report also states that 'the audit was requested...for the purpose of assisting Departmental Management in ensuring that human resources were properly aligned with program priorities...' However, the report does not address program priorities or relate staffing considerations to them."

Auditor Reply

We disagree. The review effort expended on this audit was comprehensive and of sufficient scope to satisfy the purpose and objective of the audit. Details on the scope and methodology of the audit are set forth on pages 3 through 5 of the report.

We fully considered current and known future requirements impacting upon the mission of the Reserve in developing our estimates of staffing needs. Also, we performed sufficient "in-depth" analyses. For example, we:

- o Conducted interviews with over 100 senior Department and DynMcDermott officials to gain an in-depth understanding of Reserve requirements;

- o Visited Department and DynMcDermott offices in Washington, D.C., New Orleans, and four Reserve field sites;

- o Reviewed about 80 major documents covering regulations, orders, studies, and plans impacting upon the Reserve;

- o Utilized management consultants from a major public accounting firm which had conducted over 150 studies of the organizational structure and staffing of major petroleum and petrochemical companies; and

- o Analyzed, in detail, a 1990 staffing study by the prior management and operating contractor at the Reserve.

* * * * *

Management Comments

Management questioned the comparability of Reserve activities with the petroleum and petrochemical industries and

said that:

"Without any significant comparative requirements analysis in the report, there is questionable validity of the IG's comparisons of the benchmark industry staffing practices and performance levels to those of the SPR given the many differences between industry and SPR requirements and operating environment. Organizations which are driven by a different set of requirements will exhibit different performance characteristics. Comparison of the SPR and its mission to commercial oil business can be misleading and presents the following comparability issues that were not addressed by the report:

1. The SPR is a 'Strategic' Federal facility in a unique role of long-term storage of large volumes of oil as opposed to a private commercial production facility with routine daily operations. The SPR has mission readiness requirements to be capable, within 15 days of a Presidential declaration, to move approximately 50 times the throughput of the benchmark facilities (4.5 million barrels of crude oil per day and 4.5 million barrels of water per day) that is far in excess of the capability of any one oil company's facilities in the United States. In a drawdown, the SPR sells and distributes oil to numerous buyers at numerous locations, in more compressed time frames than industry, whereas a commercial oil business would be responsible for far fewer plant locations, with daily operations that are familiar and routine. The benchmark facilities adjust staffing based on fluctuating workloads and business conditions, whereas the SPR must staff to achieve a continuous state of operational readiness at six geographically dispersed sites, and 315 miles of large diameter pipelines.
2. The SPR is a unique National Security Asset and therefore, its security posture should not be necessarily compared to a profit-based 'industry standard.' The SPR security program is based on a Department-approved threat statement and an approved Site Security Plan that established the overall security posture, staffing, and physical protection systems necessary to reasonably protect the Reserve's mission capability, personnel, facilities and equipment from malevolent acts such as sabotage, vandalism, and theft. The auditors recommended staffing reduction would not allow the SPR to conduct its currently-approved security mission. It is questionable whether an industry standard can be legitimately applied to the SPR in light of its Congressional-mandated mission and operational readiness requirements.
3. A major portion of the SPR and its contractor staffs are devoted to monitoring cavern integrity, analyzing cavern and mine data, scheduling, supervising, and performing workovers, and associated sampling of the oil storage caverns and brine disposal wells. None of these functions are preformed by the benchmark industries that the IG used for staffing comparisons. The IG report does not address these Cavern Operations and Cavern Engineering functions of

the SPR staff.

4. SPR, as a Federal Facility, is not only subject to all the laws and regulations governing private industry activities, but is also subject to additional Federal Government regulations and policies designed to promote a wide variety of public interests such as compliance with the National Environmental Policy Act and use of Small and Disadvantaged business. These additional requirements add resource requirements to SPR operations, however, the report appears to ignore them. Unlike private enterprises, SPR does not operate with the 'measuring stick' of the profit line as it pursues effective programs that are in accordance with the Federal Government regulations and policies."

Auditor Reply

We normalized benchmarking data from industry to reflect the Reserve's unique characteristics so that comparisons with industry would include explicit adjustments for unique Reserve requirements. Reserve operations are more comparable to the commercial sector than most other major Departmental facilities. The benchmarks used were not for those companies considered to be "Best-in-Class" but rather, they were for the average or median companies. Therefore, the benchmarks used were conservative with respect to comparisons with the Reserve.

While it is often desirable to use similar companies or industries for benchmarking purposes, seemingly dissimilar companies can be where organizations have similar functions. To illustrate, Xerox Corporation, an information technology company, benchmarked its operations with performance data from L. L. Bean, a clothing distributor, to identify opportunities for improving the efficiency of its distribution and logistics systems. The key in benchmarking is to identify a common denominator (such as major items of equipment maintained) and to compare similar job descriptions. While end products and/or services may vary, the process to manufacture products or provide services is very similar allowing for realistic benchmarking.

We agree with management that differences do exist between an oil refinery/chemical plant and Reserve facilities (management item number 1 above). But it is the similarities that count. Both facilities maintain similar items of equipment, such as, valves, transmitters, motors, and pumps. Mechanics at an oil refinery repair valves and pumps as do mechanics at Reserve facilities. Also, both facilities maintained equipment of differing age, manufacturer, and size, but the types of maintenance performed on the equipment was basically the same. Our comparison focused on the number of items of major equipment maintained per mechanic at the oil refinery and petrochemical plant with the number maintained by mechanics at Reserve facilities. Although the Reserve facilities were designed to transfer 4.5 million barrels of crude oil a day, as stated on page 6 of the report, various

problems had reduced the current drawdown capability to about 2 million barrels.

Commercial facilities face similar threats and have similar physical protection requirements (management item number 2). Oil refinery facilities can also be considered as a National Security Asset. Without refineries, the crude oil stored in Reserve facilities is of no value or use. It is reasonable to assume that managers of oil refineries are equally concerned about sabotage, vandalism, and theft. Further, world conditions and threats have significantly changed since the Site Security Plan referenced by management was published.

We did consider the Cavern Operations and Cavern Engineering functions discussed in item number 3 as part of our analysis of staffing needs. Specific reference is made to these functions in the detailed report prepared by KPMG Peat Marwick LLP and furnished to Reserve management.

The impact of Federal laws and regulations were considered in determining staffing needs (management item number 4). The Reserve initially contended that its performance level was lower than industry in procurement because it was subjected to regulations that were more restrictive than those imposed on oil refineries. Subsequently, we developed comparative statistics showing that DynMcDermott's performance in the procurement area was also significantly below that of other DOE contractors who were subject to the same laws and regulations as the Reserve (see pages 14 through 16 of this report).

* * * * *

Management Comments

Management contended that the audit team did not provide Reserve management with sufficient data to independently evaluate the benchmarks for the reasons stated below:

"The report states that a detailed analysis of work tasks or activities was the primary basis used to determine staffing requirements for most SPR functions. The report further indicates that assessments were made by comparing SPR activities to those of other agencies, companies, or industries to identify more efficient methods to accomplish these activities. For the SPR to have a complete understanding and appreciation of the useful application of the audit conclusions and recommendations, additional information would be necessary on what industry staffing practices and performance data were used for comparison, what considerations, including any staffing adjustments, was given to governmental and unique SPR requirements, and what specific methods were identified for SPR to more efficiently and effectively accomplish its activities. The request for this additional information was made to the audit team in meetings held in New Orleans during October 11D12, 1994. The auditors could not adequately answer such questions then, and this draft report provides little additional

information that addresses such questions. In particular, industry performance data, referred to by the auditors for validating staffing estimates resulting from activity analyses, is not made available for review in this report."

Auditor Reply

The performance data or benchmarks used to arrive at the near-term staffing reductions of 329 positions are discussed on pages 4 and 5 of the report and additional details were included in the KPMG Peat Marwick consultant's report provided to Reserve management. Moreover, additional details on the review methodology were provided to Reserve officials subsequent to the October 11-12, 1994, meeting and at a follow-on meeting on November 10, 1994. As stated in a draft of this report, the names of companies used for some of the performance data were not included in the report because the companies considered such performance data to be proprietary (see page 5 of this report).

* * * * *

Management Comments

Management contended that the report did not recognize the efficiencies and effectiveness benefits to be realized from the Reserve's Life Extension Program and indicated that:

"The SPR's Life Extension Program and its potential for enhanced efficiency and effectiveness was not considered in the report. Life Extension Program replacements and modernizations will not only extend the useful life of the SPR, but will extensively simplify its systems and facilities (e.g., elimination of many components now found in the SPR), leading to substantial economies in operations and maintenance, along with related support functions. This program will make significant contribution to streamlining because it is requirements driven and mission oriented. The IG report should recognize the value of this near-term investment of funds and manpower resources to achieve long-term efficiencies in SPR operations."

Auditor Reply

Contrary to management's contention, the benefits of the Life Extension Program were considered in evaluating staffing needs and we concluded that the program would enhance efficiency and effectiveness. For example, we recognized that this program would reduce staffing needs in the procurement and property areas. Details on this issue were included in the KPMG Peat Marwick consultant's report provided to Reserve management.

* * * * *

Management Comments

Management questioned the management layers the auditors had computed because of the following factors.

"In the report's discussion of span of management control, it is not clear what constitutes a management layer, particularly the 13 layers purported for the SPR. During meetings with the auditors, the auditors acknowledged that the SPR chain of command and the nature of its various contractual relationships were not fully understood, and were overstated in the report. The "industry standard" often referred to in the IG report applies to a typical industrial site generally, like a process manufacturing facility (refinery) or a discrete manufacturing or distribution operation (a terminal, a steel mill) which does not directly compare to a seven-site crude oil storage operation."

Auditor Reply

Rather than overstated, the number of management layers in the Reserve was understated. The layers of management cited for the petroleum industry were based on the number of layers from the chief executive officer to the lowest level of management at a refinery plant for an average large, multi-site, integrated oil company. The chief executive officer would be comparable to the Secretary of Energy. To be conservative, we started from the Deputy Assistant Secretary for Strategic Petroleum Reserve. If we had started at the Secretary this would have added about three more management layers. The integrated oil companies were of equal or greater functional complexity than the Reserve.

* * * * *

Management Comments

Management disagreed with the auditor's conclusions regarding the impact of the centralization of functions and stated that:

"The report's discussion of 'highly centralized management control' is anecdotal rather than analytical. The report seems to confuse the difference between centralized management control and the centralization of like functions. The number of SPR employees located in Washington and New Orleans represent the centralization of functions commonly practiced to achieve organizational efficiencies in industry and Government."

Auditor Reply

We disagree that the issue of centralized management control is more anecdotal than actual or analytical. Our position is based on the following analytical evidence.

o 161 DOE employees were involved in the oversight of 1,349 DynMcDermott and subcontractor employees. A ratio

of about one DOE employee for every eight DynMcDermott and subcontractor employees.

- o DynMcDermott was required, by contract, to submit 317 different types of reports to DOE on their activities. Many of the reports included minor activities that should not be reported directly to the DOE's Project Manager.

- o More DOE and DynMcDermott employees were located in Washington, D.C. and New Orleans than at the field sites.

- o Minor decisions or minor procedural changes are reviewed by multiple layers of management or by committees.

* * * * *

Management Comments

Management advanced the following data to support its contention that the audit report did not accurately reflect the objectives of the the Fiscal Year 1994 award fee criteria.

"The report asserts, regarding contracting practices, that one of the award fee criteria for the first half of FY 1994 was for DM to 'Continue to maintain staffing levels to meet the average headcount for FY 1994 of 978' reveals a profound misunderstanding of what was being required of the contractor. The M&O contractor headcount in the award fee criteria was associated with a multiyear orderly staffing reduction that has been in progress since 1991 when the 750 million barrel capacity was completed. This particular headcount goal was associated with a fiscal year reduction of 50 full-time staff in one year (approximately 5 percent) in spite of new workload associated with Life Extension, hot/gassy oil, and the Weeks Island sink hole."

Auditor Reply

The referenced statements were included in the report to demonstrate two conditions. First, although DynMcDermott had decreased its staffing levels the reductions were largely offset by increases in the staffing of DynMcDermott's subcontractors. Second, the contract did not provide any incentives for DynMcDermott to reduce staffing levels in excess of that included in its contract proposal.

RECOMMENDATIONS

Recommendation Number 1: Direct that actions be taken to implement the staffing reductions described in Part II of this report for eight functional areas by improving performance levels through redesign of work processes, revisions in organizational operating policies and procedures, further

automation of systems, and obtaining appropriate waivers from Departmental orders and other regulations.

Management Comments

Management agreed that performance levels could be improved but did not agree with the number of positions recommended for elimination. As a result, management had initiated a new study to identify the appropriate staffing levels. Specifically, management stated the following:

"We agree that performance levels can be improved through redesign of work process, revisions in organizational operating policies and procedures, further automation of systems, and obtaining appropriate waivers from Departmental Orders and other regulations. In fact, we consider such an undertaking to be very compatible with Departmental initiatives already being pursued by the SPR (e.g., National Performance Review recommendations, contract reform, and Total Quality Management).

The recommendation states simply that direction be given by the Assistant Secretary to reduce the total staffing to a purported industry level for 8 of the 11 functional areas used by the IG, without benefit of any further analysis other than the IG's benchmark review. We cannot agree that a near-term reduction of the specific target of 329 FTEs in eight functional areas can be achieved based on the very limited information in this report. Although the recommendation suggests means for accomplishing the reductions, significantly more analytical work will be required before any specific level cuts can be made responsibly. While the draft report is useful for establishing pertinent lines of inquiry, it does not provide definitive answers in many functional areas.

Major reorganization and staffing reductions should be undertaken with a requirements based analysis emphasizing the SPR mission, streamlining, and the benefits of Life Extension investments to ensure that the SPR can meet its current mission requirements and expectations of its internal and external customers and stakeholders. These requirements include: SPR organizational requirements (Level I criteria), DOE and Executive Orders, statutes, regulations, and other Federal and Departmental policy and procedural requirements.

The SPR has already embarked on a requirements based analysis of its operations, staffing practices and performance levels. Attached is the Deputy Assistant Secretary for the Strategic Petroleum Reserve memorandum, dated December 9, 1994, which commissioned this SPR streamlining initiative. As part of this initiative, the SPR will arrive at an appropriate staffing profile with an objective of responsible reduction in staffing for the SPR by the end of 1996 with a potential further adjustment in staff requirements as decommissioning of Weeks Island is completed. This analysis and recommendation will be completed by July, 1995.

Also, it is important to note that the SPR staffing levels for those functional areas recommended by the IG to be addressed in the near-term, have already decreased from a total of 1,308 at May 31, 1994, to a total of 1,258 at November 30, 1994. This reduction of 50 represents about a 15 percent overall achievement of the total IG near-term recommendations of 329.

Obtaining appropriate waivers from Departmental orders and other regulations would be necessary for the SPR to achieve a significant degree of staff reduction. The appropriateness of exemptions can only be determined after a thorough review of each specific requirement to ensure that noncompliance would not impact on the operational availability of the SPR to meet its mission or violate a legal or regulatory requirement such as an OSHA standard or National Environmental Policy Act requirement. Furthermore, it should be recognized that many DOE requirements are based on sound needs and good practices. Therefore, even if the SPR were exempted from all DOE orders, it is still not readily apparent that SPR could achieve the significant staff reduction envisioned in this report since there would still be a requirement for effective programs associated with operations and maintenance, cost control, procurement, etc. The careful examination of requirements should also be expanded from DOE orders to include statutes, Executive Orders, regulations, and other Federal and Departmental policy and procedural requirements. However, staffing should not be the only factor when addressing the need for waivers. The appropriateness of any such waiver must also be fully investigated to ensure that it is compatible with Federal, Departmental, and programmatic policies, goals, and objectives. Since many waivers must be granted by authorities outside of Fossil Energy, our request for waivers that we believe to be justified does not ensure success. On this note, we do take issue with the reports statement on Page 11 that the example of Bonneville Power Administration's success in obtaining waivers is a sign of unique opportunity for SPR to obtain waivers. The Bonneville experience is not comparable to SPR since Bonneville has been designated in the National Performance Review as a 'Reinvention Laboratory' and as such has unique authority to seek waivers. The assessment we are undertaking, to be completed in July, 1995, will identify those orders, directives, and other regulations that can be proposed for elimination."

Auditor Reply

The management actions undertaken as part of the Reserve's Streamlining Initiative are responsive to the intent of the recommendation.

The management comments regarding the waivers obtained by the Bonneville Power Administration, however, appear to be contradictory. In the first place, management states that the Bonneville experience is not comparable to the Reserve because it was a "reinvention laboratory". We are not aware of any restrictions that would preclude the Reserve from requesting a status similar to that afforded to Bonneville. In another part

of the management response it is stated that the recommended actions are very compatible to Departmental initiatives being pursued by the Reserve as part of the National Performance Review recommendations. One of the recommendations of the National Performance Review was that all Federal agencies be required to review internal Government regulations over the next 2 years with a goal of eliminating 50 percent of those regulations. Specifically, management states that "The assessment we are undertaking to be completed by July 1995, will identify those orders, directives, and other regulations that may be proposed for elimination." How this action differs from that undertaken by Bonneville is left unexplained.

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Recommendation Number 2: Implement a 3 year goal to reduce overcentralization and increase the span of control for Reserve managers to an average of one manager for each 10 subordinates, and to reduce total staffing levels by the number of supervisory positions so eliminated.

Management Comments

Management agreed that a 1 to 10 ratio of managers to subordinates was reasonable but did not agree that managers could be eliminated on a one for one basis. Specifically, management stated:

"The one manager for each 10 subordinates is considered a reasonable goal for increasing the management control in Fossil Energy programs. The SPR Headquarters office, the PMO, and DM have all taken steps to improve the supervisor/employee ratio. These efforts to increase the ratio are continuing. SPR achievement of this goal will need to be evaluated as progress is made to ascertain if the goal can be met without a change in Departmental and OPM personnel policy.

However, we cannot agree to the portion of this recommendation which advocates a reduction of total staffing levels by the number of supervisory positions eliminated since most SPR supervisors perform significant technical duties as well as supervisor duties. Therefore, the elimination of supervisory positions will not provide a one to one reduction in overall staffing levels in each case.

Also, we are not in agreement regarding the report's contention regarding SPR overcentralization. Most of the centralization referred to in the report represents efficient and effective consolidation of similar crosscutting functions as opposed to centralization of authority. Making each SPR location self-sufficient in all functional areas would increase several staffing requirements, reduce efficiency, and result in the loss of advantages from the advantages from the standardization among SPR sites."

Auditor Reply

Management comments are responsive to the intent of the audit recommendation.

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Recommendation Number 3: Require further research and analysis of the potential long term staffing reductions listed in Appendix D of the report to determine the specific number of positions that should be eliminated to improve efficiency, productivity, and operating costs.

Management Comments

Management stated that the long-term reductions would be considered as part of the streamlining initiative as discussed below:

"We agree that further research and analysis will be required to ascertain the potential for the long-term staffing reductions addressed in the draft report. Since we see no practical distinction between the data supporting the near-term and long-term reductions in the report, we will integrate implementation of this recommendation with the SPR streamlining initiative mentioned in our response to Recommendation No. 1."

Auditor Reply

Management comments are responsive to the intent of the audit recommendation.

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Recommendation Number 4: Provide contract incentives for the management and operating contractor and Federal managers to reduce staff and operating costs for the Reserve.

Management Comments

As stated below, management planned to take steps to implement additional contract incentives.

"We agree that the use of appropriate incentives is an important management tool of improving the management and operation of the SPR. The Award Fee Determination Plan for the SPR M&O contractor includes a criterion for the effective, efficient, and economical use of resources (people, funds, equipment, and facilities) to carry out contract activities. A formal cost reduction program is in place. In addition, Fossil Energy, including the SPR, has participated in Departmental efforts to

implement the action recommended by the Contract Reform Team in the report entitled 'Making Contracting Work Better and Cost Less.' At the core of the contract reform initiative is the development of performance criteria, measures, benchmarks, and related incentives. SPR will take appropriate steps to implement these elements of contract reform. It must be recognized, however, that any incentive program must be balanced. Overemphasis on one attribute such as reducing staff can work to the detriment of other important considerations such as satisfying the basic mission requirements of customers and stakeholders."

Auditor Reply

Management comments are responsive to the intent of the audit recommendation.

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Recommendation Number 5: Ensure that Reserve staffing requirements are evaluated on a periodic basis by using appropriate benchmarks, comparative statistics, and other performance measures from the private sector and/or other Departmental management and operating contractors.

Management Comments

Management agreed with the recommendation and stated:

"We agree that staffing requirements should be evaluated periodically using comparative information to the extent that meaningful data is available for that purpose. Such evaluations must also give full consideration to the valid requirements of customers and stakeholders. SPR would seek appropriate benchmarks, comparative statistics, and other performance measures."

Auditor Reply

Management comments are responsive to the intent of the audit recommendation.

POTENTIAL SAVINGS

Management Comments

Management did not agree with the projected audit savings for the following reason.

"Due to our disagreement with the primary report finding that 329 Full Time Equivalents can be reduced within one year, we do not agree that the projected annual savings of \$16 million can be realized since this estimate is tied to the assumptions for

the targeted reduction of 329 Full Time Equivalentents in the eight functional areas used by the report."

Auditor Reply

Significant opportunities exist for the Reserve to improve the efficiency of its operations. The near-term staffing reductions cited in this report were based on the application of benchmarks or performance data from organizations considered to be "average" performers, not the "Best-in-Class". The Reserve's goal should be to attain staffing reductions in excess of projected staffing reductions computed from the application of the conservative benchmarks used on this audit.

APPENDIX D

PROJECTIONS OF NEAR-TERM
AND LONG-TERM STAFFING REDUCTIONS

Function	Staffing at 5-31-94	Potential Reductions	
		Near-Term@	Long-Term@
Maintenance and Materials	322	35	70
Engineering and Construction	294	0	119
Security	291	150	45
Operations	246	31	68
Project Planning and Control	145	23	60
Procurement and Property	132	64	5
Finance and Administration	76	11	20
Environment, Safety and Health	71	0	25
Quality Assurance	68	9	19
Project Management	25	0	11
Human Resources	22	6	0
 Total	 1,692 -----	 329 -----	 442 -----

Notes: @ Near-term is defined as those staffing reductions that the Reserve should be able to implement within 1 year. Those requiring over a year to implement due to the need for further analysis are listed under long-term staffing reductions.

APPENDIX E

DEPARTMENT REPORTING REQUIREMENTS FOR
STRATEGIC PETROLEUM RESERVE

EXAMPLE OF CUSTOMER RESPONSE FORM

IG Report No. DOE/IG-0370

CUSTOMER RESPONSE FORM

The Office of Inspector General has a continuing interest in improving the usefulness of its products. We wish to make our reports as responsive as possible to our customers' requirements, and therefore ask that you consider sharing your thoughts with us. On the back of this form, you may suggest improvements to enhance the effectiveness of future reports. Please include answers to the following questions if they are applicable to you:

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2. What additional information related to findings and recommendations could have been included in this report to assist management in implementing corrective actions?
3. What format, stylistic, or organizational changes might have made this report's overall message more clear to the reader?
4. What additional actions could the Office of Inspector General have taken on the issues discussed in this report which would have been helpful?

Please include your name and telephone number so that we may contact you should we have any questions about your comments.

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