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The Regents of the University of California operate the Lawrence Berkeley Laboratory as a Government-owned, contractor-operated facility under contract to the Energy Research and Development Administration. Berkeley maintains a computer facility to support its research in three primary areas: physical research, biomedical research, and energy and environment research. Findings/Conclusions: Although not designated as such, the Lawrence Berkeley Laboratory computer facility is essentially operating as a Federal Scientific Data Processing Center, offering its services to nonlaboratory Government users. The lower costs for this service saved the Government an estimated \$9.5 million in fiscal year 1974. Recommendations: The Energy Research and Development Administration and the General Services Administration should reach an agreement to establish a Federal Scientific Data Processing Center at the Lawrence Berkeley Laboratory. Implementing this and supporting recommendations could save the Government an estimated \$18.2 million annually. (Author/SW)

REPORT TO THE CONGRESS



*BY THE COMPTROLLER GENERAL
OF THE UNITED STATES*

Designation Of Lawrence Berkeley Laboratory Computer Facility As A Federal Scientific Data Processing Center Could Save Millions

Energy Research and Development Administration
General Services Administration
Office of Management and Budget

Although not designated as such, the Lawrence Berkeley Laboratory computer facility is essentially operating as a Federal Scientific Data Processing Center, offering its services to nonlaboratory Government users. The lower costs for this service saved the Government an estimated \$9.5 million in fiscal year 1974.

GAO recommends that the Administrator, Energy Research and Development Administration, and the Administrator, General Services Administration, reach an agreement to establish a Federal Scientific Data Processing Center at the Lawrence Berkeley Laboratory.

Implementing this and supporting recommendations could save the Government an estimated \$18.2 million annually.



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

B-115369

To the President of the Senate and the
Speaker of the House of Representatives

This report discusses the economies available by designating the Lawrence Berkeley Laboratory computer facility as a Federal Scientific Data Processing Center.

Our review was made pursuant to the Budget and Accounting Act of 1921 (31 U.S.C. 53) and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Administrators of the Energy Research and Development Administration and the General Services Administration and to the Director of the Office of Management and Budget.

A handwritten signature in black ink, reading "Thomas A. Stearns".

Comptroller General
of the United States

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ABBREVIATIONS

ADP Automated Data Processing
ERDA Energy Research and Development Administration
FDPC Federal Data Processing Center
FSDPC Federal Scientific Data Processing Center
GAO General Accounting Office
GOCO Government-owned contractor-operated
GSA General Services Administration
OMB Office of Management and Budget

COMPTROLLER GENERAL'S
REPORT TO THE CONGRESS

DESIGNATION OF LAWRENCE BERKELEY
LABORATORY COMPUTER FACILITY AS A
FEDERAL SCIENTIFIC DATA PROCESSING
CENTER COULD SAVE MILLIONS
Energy Research and Development
Administration
General Services Administration
Office of Management and Budget

D I G E S T

The Lawrence Berkeley Laboratory is one of the eight multiprogram laboratories funded by the Energy Research and Development Administration. (See p. 1.)

The laboratory's computer facility operates essentially as a Federal Scientific Data Processing Center, although not officially designated as such. It offers scientific data processing to nonlaboratory Government users on essentially the same basis as laboratory users.

Thus, outside users obtain the services of a large-scale computer at a much lower cost than from alternative sources. In fiscal year 1974, Berkeley's sharing program saved the Government an estimated \$9.5 million. But steadily increasing use has reached the point where the system has become saturated. The future availability of this resource to nonlaboratory users is in danger because funding limitations bar Berkeley from expanding its equipment capability to meet total user demands. (See pp. 5 and 6.)

The Administrator, Energy Research and Development Administration, and the Administrator, General Services Administration, should reach an agreement to establish a Federal Scientific Data Processing Center at the Lawrence Berkeley Laboratory. After agreement is reached, the Office of Management and Budget will have to use its authority to implement it. The administrators of these two agencies have agreed

to work together to establish the center at the laboratory.

Rates established for user charges should recover the full costs of providing computer support as defined by the Office of Management and Budget pricing regulations. Implementing these recommendations could save Government users of the Berkeley facility an estimated \$18.2 million annually. The Energy Research and Development Administration agreed to review its user charge policies. (See pp. 7 and 19.)

In addition, the Berkeley facility would be able to acquire additional equipment, as needed to meet user demand, by financing it through the Automated Data Processing Fund provided by Public Law 89-306 (the Brooks Act). (See p. 8.)

The Administrator, Energy Research and Development Administration, should develop a formal management policy to encourage the effective utilization of its data processing equipment. The policy should provide for such alternatives as granting long-term contracts for excess computer time and designating appropriate locations, in addition to Berkeley, as Federal Scientific Data Processing Centers.

CHAPTER 1

INTRODUCTION

The Energy Reorganization Act of 1974 (Public Law 93-438 Oct. 11, 1974) abolished the Atomic Energy Commission and vested its responsibilities in two new agencies--the Nuclear Regulatory Commission and the Energy Research and Development Administration (ERDA). ^{1/} Under the act, the Nuclear Regulatory Commission assumed all licensing and related regulatory functions of the Atomic Energy Commission. The act provides for ERDA to consolidate and direct all Federal research and development on the various sources and efficient use of energy and to continue the military and production activities and basic research efforts of the Atomic Energy Commission.

In general, ERDA operates in a manner similar to that of the Atomic Energy Commission. Headquarters develops policy and coordinates programs while operational responsibilities are carried out by contractors. Major research and development is provided by eight Government-owned multiprogram laboratories operated by contractor organizations. In fiscal year 1974, ERDA had an operating budget of \$2.5 billion with the eight multiprogram laboratories receiving \$715.4 million. As of February 10, 1975, total automated data processing (ADP) equipment owned or leased by ERDA was valued at \$416 million, with \$221 million of the equipment located at the multiprogram laboratories.

Programs of the laboratories vary. Altogether, they cover the range from the most fundamental research programs in the physical and life sciences to the most advanced design and development programs in nuclear reactors and nuclear weapons. One of these multiprogram laboratories was included in our review: the Lawrence Berkeley Laboratory located in California.

The Regents of the University of California operate the Lawrence Berkeley Laboratory as a Government-owned contractor-operated (GOCO) facility under contract to ERDA. In fiscal year 1974, ERDA funded \$32.5 million and others reimbursed \$8.5 million of Berkeley's total operational costs of over \$41 million. Berkeley maintains a \$17 million general-purpose computer facility to support its research. Its programs involve three primary areas: physical research, biomedical research, and energy and environment research.

^{1/}For the purpose of this report, we have used ERDA as the agency name regardless of the time period involved.

CHAPTER 2

NEED FOR A FEDERAL SCIENTIFIC DATA

PROCESSING CENTER AT THE

LAWRENCE BERKELEY LABORATORY

Through participation in the General Services Administration's (GSA's) ADP-sharing program, Berkeley has evolved into a successful national data processing center providing low-cost ADP services to an extensive scientific community in the Federal Government. In fiscal year 1974, Berkeley's sharing program saved the Government an estimated \$9.5 million in ADP costs.

The future availability of this sharing resource is in danger. Due to funding limitations for the Berkeley programs, the laboratory cannot expand its equipment capability to meet total user demands. We believe that designating the laboratory computer facility as a Federal Scientific Data Processing Center (FSDPC) would relieve this restriction and provide for its continued operation on a Government-wide basis with an estimated recurring annual savings of \$18.2 million to Government users.

SUCCESSFUL SHARING ACTIVITIES

Over the last 25 years, internal scientific demands at Berkeley have led to the development of a high level of computational expertise and the acquisition of sophisticated ADP equipment. In fiscal year 1972, Berkeley's funding was reduced, including the funds for computing.

To retain the computational power required by ongoing research projects and yet realize the economies dependent on optimum utilization, Berkeley increased the sharing of its computer with others. The amount of sharing has steadily increased from about 10 percent of its billing units in fiscal year 1969 to about 80 percent in fiscal year 1975.

Sharing users are located in 24 States. (See app. I.) Many of the sharing organizations are ERDA-funded, the rest are drawn from other segments of the Federal Government, both civil and defense. The following table shows the source of computer revenues in fiscal years 1974 and 1975.

Berkeley Computer Revenues

<u>Users</u>	<u>FY 1974</u>		<u>FY 1975</u>	
	<u>Amount</u> (millions)	<u>Percent of total</u>	<u>Amount</u> (millions)	<u>Percent of total</u>
Laboratory	\$1.025	25.0	\$1.154	19.5
Other ERDA	.518	12.6	1.255	21.2
Non-ERDA	2.560	62.4	3.509	59.3
Civil	\$1.100	26.8	\$1.380	23.3
Defense	1.460	35.6	2.129	36.0
Total	<u>\$4.103</u>	<u>100.0</u>	<u>\$5.918</u>	<u>100.0</u>

To evaluate the data services provided by Berkeley and develop information on the users, we sent questionnaires to all fiscal year 1974 users, the latest full year of operation at the time of our review. Both internal laboratory and sharing users were contacted.

The sharing community places similar computing requirements upon the laboratory to those of the internal users. Thus, the computer facility at Berkeley is primarily dedicated to scientific processing and is not adversely affected by sharing users' placing conflicting demands on it. Sharing users, many of whom are small in terms of their annual use of the system, can patronize Berkeley for their scientific applications while processing their administrative or business-oriented work at other locations. Our projection for the users' workload composition follows.

	<u>Number of accounts</u>			
	<u>Total</u>	<u>Scientific</u>	<u>Adminis- trative</u>	<u>Mixed</u>
Berkeley	160	137	8	15
Sharing	<u>482</u>	<u>428</u>	<u>24</u>	<u>30</u>
Total	<u>642</u>	<u>565</u>	<u>32</u>	<u>45</u>

The Berkeley user community is satisfied with the data processing services provided. Responses to our questionnaire show that more than 98 percent of the user community rate the overall services as average or better. One user commented that:

"The Lawrence Berkeley Laboratory's computer facility is one of the best in the world. I have had considerable experience in the use of computers in scientific research for the past twenty years, and I have never seen the equal of LBL's [Berkeley's] facility. It is strongly user oriented, very well managed and provides superb service."

Sharing has allowed Berkeley to maintain the level of computer equipment and computer science expertise required to support its various research projects. In addition, the presence of non-ERDA work has not adversely affected the users at the laboratory nor the ERDA users in other places. Our analysis of the questionnaires indicates that 75 percent of the users at the laboratory and 90 percent of the other ERDA users reported no adverse affects.

The Berkeley user community has benefited from the economies of scale and specialization achievable through optimum utilization of large-scale ADP equipment tailored to scientific processing. The laboratory applies a uniform billing rate to all Federal users which recovers all computer center direct and indirect operating costs, except depreciation. In this regard, Office of Management and Budget (OMB) Circular A-25 specifies that user charges will be based on full cost recovery. Full-cost-recovery rates, as defined by ERDA, for computer services to other Federal agencies excludes depreciation and a 20-percent 1/ overhead rate to cover ERDA's management and supervisory costs normally charged for other services. ERDA's pricing policy, therefore, does not provide for full cost recovery, as defined by OMB Circular A-25.

We tabulated, from 142 users' responses, their estimates of charges from other sources for the type of scientific computing being done by Berkeley. They estimated that alternative sources, both Government and non-Government, charged an average of about 5 times more than Berkeley. Individual users' estimates of this cost factor ranged from 0.5 times to 25.0 times Berkeley's charges. This fluctuation represented the individual users' experiences. For example, one user had processed the same job at the laboratory and at another Federal installation where the cost was 5 times more. In addition, a commercial firm recently made a comparable machine available at 4 times Berkeley's rate.

1/At the time of our review the ERDA overhead rate was 15 percent; it was subsequently increased to 20 percent.

Actual fiscal year 1974 sharing at Berkeley was 68.4 million units of computer use ^{1/} at \$0.045 per unit for a cost of about \$3.1 million billed to Government users. From the cost factor we developed by averaging the actual experience of Berkeley users who processed jobs at other Government and non-Government installations, we estimated that the use of alternative sources for the same workload would have cost about 5 times more than the \$3.1 million charged, or about \$15.3 million. Hence, Government users realized a \$12.2 million savings. To estimate the savings if depreciation was included in costs, we computed a full-cost-recovery rate for computer usage by adding depreciation and ERDA overhead costs to the 1974 laboratory costs. The cost per unit of computer use on this basis would have been \$0.085 instead of the \$0.045 used by Berkeley. Thus, billings based on full cost recovery, including depreciation, would have been about \$5.8 million (68.4 million units x \$0.085 per unit). Even if Berkeley had used the full-cost-recovery rate, the Government users would have saved about \$9.5 million, the difference between the cost of alternative sources of \$15.3 million and the full-cost-recovery charges of \$5.8 million.

LIMITATIONS ON CAPACITY AVAILABLE FOR SHARING

Berkeley has effectively and economically provided computational support to sharing users. However, the laboratory's ability to continue at this level is limited to its existing capability and ERDA's growing need for this resource. In December 1974 degradation of service was experienced as a result of system saturation when user demands exceeded system capacity for certain periods. We recognize that because saturation occurred, alternative actions were required for those users who were adversely affected or who believed they would be so affected. Also, the near-term non-Berkeley ADP workload from other ERDA laboratories could be transferred to Berkeley in a manner that might create short-term saturation conditions and cause associated problems for users. An example of this condition is the recent transfer of work from the ERDA Lawrence Livermore Laboratory to Berkeley.

The following table shows the users' evaluation of overall service and timeliness of system response before and after the saturation date.

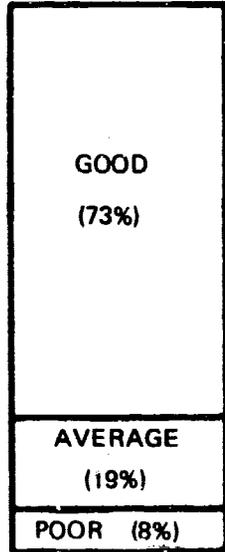
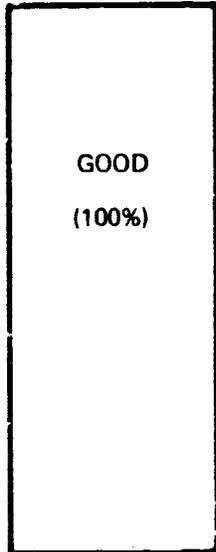
^{1/}A unit of computer use is a measure of the usage of the various components of the computer system to be used for billing users.

OVERALL SERVICE

TIMELINESS

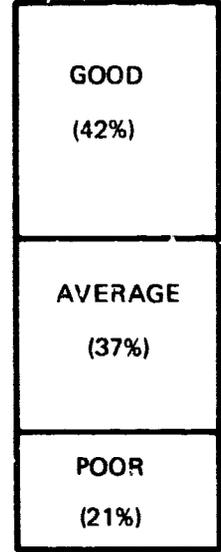
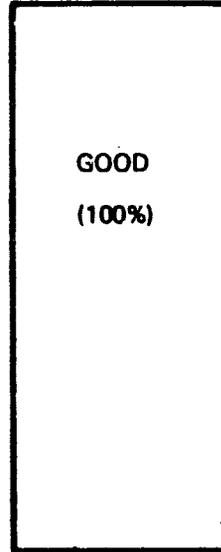
BEFORE SATURATION DATE

AFTER SATURATION DATE



BEFORE SATURATION DATE

AFTER SATURATION DATE



SAMPLE OF 233 RESPONDENTS

SAMPLE OF 225 RESPONDENTS

We believe the system saturation existed long enough to impair the effectiveness to individual users. One Department of Defense contractor commented:

"Our experience with the LBL computer center was generally very satisfactory, until late 1974. The LBL * * * [computer] had the core memory and 'number crunching' capability required for our large * * * Department of Defense calculations. * * * These conditions formed the type of computing environment we needed to be as responsive as possible to our government sponsor's requests.

* * * * *

"If the difficulties we are now experiencing continue we will be forced to perform our computing * * * [elsewhere]. * * * the long range requirements of * * * [our sponsors] must take precedence over any such short term difficulties."

We found that accelerated growth in the sharing users' demands on the system was responsible for saturation. Over the last 7 years, both segments of the sharing community, ERDA and non-ERDA, had steadily increased their use of the system. As an ERDA contractor, however, Berkeley cannot expand its capability to meet the total user demand, only

the ERDA portion. ERDA requirements, at the laboratory and other locations, have priority. The laboratory cannot guarantee service to the non-ERDA Federal community. If the historical utilization trends continue, ERDA requirements will saturate the existing configuration by fiscal year 1979. In the interim, Berkeley will be able to satisfy less and less of the non-ERDA ADP demand.

Users who were affected directly or indirectly by saturation will probably be considering alternatives to Berkeley even if computer time is available, because of the uncertainty of continuity of service. Non-ERDA users have already expressed concern about the continued availability of service. The laboratory's inability to guarantee future service to a large-volume user influenced the latter's decision to procure additional equipment at a cost of \$6 million.

As a Federal Scientific Data Processing Center, the laboratory could tailor its capabilities to total demands, ERDA and non-ERDA. User requirements would help determine equipment needs, which could be financed through the General Services Administration's ADP Fund as provided for in Public Law 89-306. Annual savings of \$18.2 million could be realized by Government users through this action, as shown in the following schedule.

<u>User</u>	<u>User costs</u>		
	<u>Existing facility</u>	<u>As an FSDPC</u>	<u>FSDPC savings</u>
	(millions)		
Laboratory	\$ 1.8	\$ 1.3	\$ 0.5
Other ERDA	3.1	2.3	0.8
Non-ERDA	<u>27.4</u>	<u>10.5</u>	<u>16.9</u>
Total	<u>\$32.3</u>	<u>\$14.1</u>	<u>\$18.2</u>

Our estimate of savings is derived from full-cost-recovery rates of operating Berkeley in its current mode and as an FSDPC and is based on estimated fiscal year 1976 total user demand. The cost to operate Berkeley as an FSDPC includes the cost of additional computer equipment, computer center direct and indirect costs including depreciation, and both ERDA and GSA overhead costs. The additional computer equipment, which is estimated to cost about \$13 million for a large-scale system, will nearly double the workload capacity of the Berkeley computer center. The cost of operating Berkeley as it now exists includes the higher costs to process

elsewhere the user demand that cannot be satisfied with Berkeley's existing computer equipment. We forecast that only 120 million units of computer use, of a projected user demand of 218.4 million units, could be accommodated with existing equipment. Both Berkeley and ERDA sharing users will benefit by the designation as an FSDPC because of savings attributable to the economies of scale principle. The cost per unit of computer use will be less as an FSDPC because the fixed costs, including the cost of additional equipment, will be distributed over a much larger user demand, 218.4 million units of computer use.

LEGISLATIVE PROVISIONS FOR
ESTABLISHING AND FINANCING A
FEDERAL DATA PROCESSING CENTER

The Congress enacted Public Law 89-306 (the Brooks Act) in October 1965 to provide a coordinated and Government-wide program for the efficient and economical acquisition, utilization, and maintenance of ADP equipment. The Congress charged OMB with fiscal and policy control and GSA with the operational aspects of the program.

The act provides that optimum use of ADP resources is to be achieved through increased sharing and the establishment of multiagency service centers, commonly referred to as Federal Data Processing Centers (FDPC). A revolving fund, the ADP Fund, was also authorized to finance these activities.

The House Government Operations Committee conducted hearings on the administration of the act in the summer of 1976. In its report, 1/ dated October 1, 1976, the Committee reaffirmed the concept of using the ADP Fund to provide adequate support for FDPCs.

ERDA'S ACTIONS TO ESTABLISH A FEDERAL
SCIENTIFIC DATA PROCESSING CENTER

Over the last year and a half, Berkeley personnel and GSA Region IX officials have held preliminary discussions regarding the designation of Berkeley as an FSDPC. To this end, GSA has prepared proposals and drafted interagency

1/Administration of Public Law 89-306; Procurement of ADP Resources by the Federal Government, House Report No. 94-1746, October 1, 1976.

agreements. However, to date their action has not been fruitful, primarily due to ERDA's unwillingness to agree to this designation.

ERDA officials expressed concern that designation of their facility as an FSDPC might adversely affect its ability to satisfy the mission-related ADP requirements of ERDA, which they project will saturate the laboratory's system in the near future. ERDA is concerned that it may suffer program degradation because computer support is not available. Any program degradation is unacceptable to ERDA. Also, they are reluctant to turn over managerial control of the Berkeley computer facility to GSA.

We agree that ERDA demands on the laboratory are growing. However, as an FSDPC, Berkeley would still be able to respond to ERDA requirements. Presently, the sharing environment has not hindered the achievement of ERDA mission-related goals because ERDA has been able to deny the use of the Berkeley computer to non-ERDA users. As a result, non-ERDA users have suffered some program degradation while searching for other sources of computer support--commercial sources, other governmental agencies, or acquisition of their own computers. The acquisition of similar services from other Government and non-Government sources was obtained at prices considerably in excess of Berkeley charges. (See p. 5.) Thus, ERDA's denial of Berkeley computer facilities to other governmental agencies substantially increased the cost of this type of support to the Government. ERDA has been able to deny non-ERDA users access to Berkeley, which have not entered into long-term commitments for its use. We believe the FSDPC designation would not affect the ERDA mission because additional equipment, if and when needed, could be obtained by GSA using the ADP Fund rather than the ERDA budget. In addition, enough equipment could be obtained to meet both ERDA and non-ERDA user needs. Thus, users including ERDA should not experience degradation of their programs due to the lack of computer support.

Managerial and operational control of the Berkeley computer facility could be maintained by ERDA because Public Law 89-306 allows GSA to delegate these responsibilities to any agency. GSA officials assured us that they would be willing to delegate these functions to Berkeley. The Department of the Air Force now has such a delegation of authority from GSA for operating the Federal Computer Performance Evaluation and Simulation Center, which is a Federal Data Processing Center. Air Force officials informed us they had been able

to maintain managerial and operational control of the facilities.

ERDA COMPUTER REQUIREMENTS

The Congress appropriated \$33.1 million for fiscal year 1976 and the transition period, to satisfy ERDA's major computer equipment requirements. This included the acquisition of two \$9.0 million large-scale systems, for two ERDA contractors--Computer Sciences Corporation (Richland, Washington) and Aerojet Nuclear Company (Idaho Falls, Idaho). Both of these contractors have used the Berkeley facility.

During hearings 1/ before the Subcommittee on Public Works, House Committee on Appropriations, an ERDA official defended these two acquisitions due to the overloaded conditions at both sites and to a continually decreasing availability of time at other ERDA sites.

As the computer processing capability is increased at other ERDA laboratories, such as Richland and Idaho Falls, then more capability would be available at Berkeley for non-ERDA users. Furthermore, computer time could possibly be available at the new facilities at Richland and Idaho Falls.

1/Public Works for Water and Power Development and Energy Research Appropriation Bill, 1976, Part 5, Energy Research and Development Administration, Hearings, Subcommittee of the House Committee on Appropriations 94th Congress, 1st sess., Apr. 1975.

CHAPTER 3

CONCLUSIONS, RECOMMENDATIONS, AGENCY

COMMENTS, AND OUR EVALUATION

CONCLUSIONS

We believe the designation of the Lawrence Berkeley Laboratory as a Federal Scientific Data Processing Center, as provided for by Public Law 89-306 (the Brooks Act), would be economical for the Government and save users an estimated \$18.2 million annually. Under this legislation, officially designated centers can procure additional equipment through the ADP Fund. With this source of funding, the Berkeley computer facility could tailor its equipment capability to the total user demand and be maintained as a cost-effective ADP resource. —

Proper management of the equipment at this laboratory could save the Government millions of dollars annually and meet all the computing requirements of its users so that none would experience any program degradation due to the lack of computer support.

In view of the significance of our findings at Berkeley, it would be desirable for the Energy Research and Development Administration to review the possibilities of a similar potential for sharing computer facilities and establishing centers at its other multiprogram laboratories.

We recognize that the Office of Management and Budget has restricted expenditures from the ADP Fund for a number of years ^{1/} because of the fiscal and policy considerations involved. Therefore, OMB's participation in this program is essential if the Government is to achieve the savings possible through establishment of the proposed FSDPC.

RECOMMENDATIONS

We recommend that the Administrator, Energy Research and Development Administration, and the Administrator,

^{1/}See our report, "Further Actions Needed to Centralize Procurement of Automatic Data Processing Equipment to Comply with Objectives of Public Law 89-306" (LCD-74-115, Oct. 1, 1975).

General Services Administration, negotiate with the objective of reaching an agreement to establish a Federal Scientific Data Processing Center at the Lawrence Berkeley Laboratory. After agreement is reached, the Office of Management and Budget will have to use its authority to implement it.

We also recommend that the Administrator, Energy Research and Development Administration:

- Develop user rates that provide for recovery of full costs as defined in OMB guidelines.
- Reach an interagency agreement with the Administrator, General Services Administration, as to whether additional studies, such as cost-benefit analysis, are necessary.
- Evaluate the current and projected utilization levels and nature of the user populations and requirements for the automated large-scale scientific data processing equipment at other ERDA contractor-operated locations.
- Develop formal management policy to encourage the effective utilization of ERDA ADP equipment. It should provide for such alternatives as granting long-term contracts for excess computer time and designating appropriate locations, in addition to Berkeley, as FSDPCs.

AGENCY COMMENTS AND OUR EVALUATION

We asked for and received comments from the Energy Research and Development Administration and the General Services Administration.

ERDA comments

The Controller, Energy Research and Development Administration, generally agreed with our recommendation that ERDA reach an agreement with GSA to establish a Federal Scientific Data Processing Center at the Lawrence Berkeley Laboratory. (See app. II.) However, reservations were expressed, as follows.

- No degradation of support to ERDA programs can be allowed and any such agreement with GSA must include such a provision, as well as the necessary management flexibility to achieve its implementation.

- Converting Berkeley from an ERDA Government-owned contractor-operated computer facility to a Federal Scientific Data Processing Center, without adding additional capacity, would simply continue the current saturated condition and diminishing savings to non-ERDA users.
- It should, therefore, be understood that any discussion of converting the Berkeley facility to an FSDPC must be predicated on advance assurance that GSA will augment the capacity of the facility.
- A thorough and current cost-benefit analysis is needed before making any decision as to the facility's becoming a Federal Scientific Data Processing Center.
- The cost-benefit analysis should be balanced against the projected long-term demand since the savings generated by expansion assumes a large suppressed demand that would be in existence for many years and would be sufficient to recover the fixed cost of expansion as well as higher operating costs.
- ERDA is concerned whether expansion of this facility for the purpose of providing computational services outside of ERDA would be in accord with Government policy of reliance on the private sector.

We believe that the issues underlying the six major points raised by ERDA can be or have been resolved so that Berkeley can become a Federal Scientific Data Processing Center.

We agree that no degradation of ERDA programs should occur due to lack of computer support. With regard to ERDA's concern that designation of Berkeley as an FSDPC might degrade its ability to handle ERDA's computer needs, we believe ample computer capacity can be provided by GSA. We believe also that the interagency agreement to establish an FSDPC can provide the mechanism by which future demand can be forecast and action can be taken to assure satisfaction of the requirement.

ERDA's concern regarding the need for a thorough and current cost-benefit analysis, including consideration of projected long-term demand, is well taken. While we agree that there is an ongoing need for this type of analysis, we believe the facts contained in this report show the potential for substantial annual savings.

ERDA is concerned that expansion of the facility may not be in accord with the Government policy of reliance on the private sector as set forth in OMB Circular A-76. Since Berkeley is contractor operated, rather than Government operated, it is excluded from the provisions of OMB Circular A-76. In any event, we believe the overriding issue is the cost to the Government. Our analysis shows the potential of substantial annual savings well in excess of guidelines, such as the 10-percent justification presently required for exception to the basic Circular A-76 policy of reliance on the private sector. Moreover, they exceed also the 25-percent limit currently under consideration as a revision to Circular A-76. Therefore, Berkeley would be economically justified as an FSDPC.

Finally, ERDA is reviewing the Office of Management and Budget's full cost recovery policy to determine whether it might not be appropriate to include depreciation charges for specialized services, such as its automated data processing installations.

GSA comments

The Deputy Administrator, General Services Administration, indicated that GSA agrees with our recommendations and will continue working with ERDA to establish an FSDPC at Berkeley. (See app. III.)

CHAPTER 4

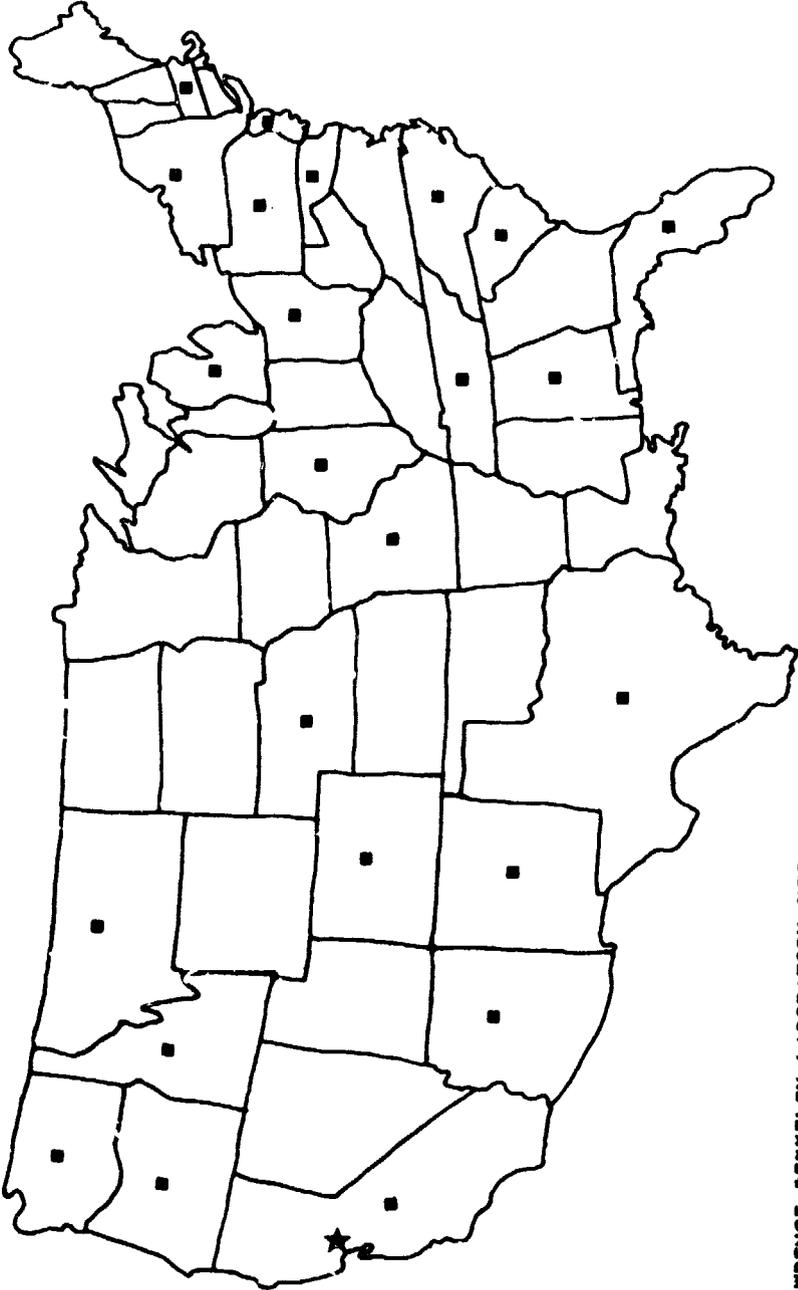
SCOPE OF REVIEW

We made our review at the Energy Research and Development Administration, Germantown, Maryland; General Services Administration, Washington, D.C., (Central Office); New York, N.Y. (Region II); and San Francisco, California (Region IX); the Lawrence Berkeley Laboratory, Berkeley, California; and the Brookhaven National Laboratory, Brookhaven, New York.

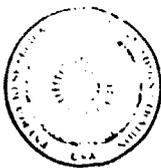
At these locations we interviewed agency officials, examined records, and compiled data. Our primary effort was concentrated at the Lawrence Berkeley Laboratory. Our review did not include an audit of the financial statements provided by Lawrence Berkeley Laboratory on which our cost computations were based, nor of the costs or method of allocation of the ERDA agency-wide overhead rate.

We sent questionnaires to all fiscal year 1974 users of the Lawrence Berkeley Laboratory computer facility. Of the 642 questionnaires sent to users, 339 (53 percent) were returned. To raise our response rate, we contacted 10 percent of the sharing users who had not responded. Statistical analysis was used to compare the results developed in the follow-up with those obtained through the mailing. From the analysis we determined that the sharing users which did not respond would not affect our findings. Computer analysis techniques were used to assist in evaluating all returned questionnaires.

GEOGRAPHIC DISTRIBUTION OF LAWRENCE BERKELEY LABORATORY USERS



- ★ LAWRENCE BERKELEY LABORATORY SITE
- ONE OR MORE USERS LOCATED IN THIS STATE



UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
WASHINGTON, D.C. 20545

Mr. Monte Canfield, Jr., Director
Energy and Materials Division
U. S. General Accounting Office
Washington, D. C. 20548

SEP 27 1976

Dear Mr. Canfield:

Thank you for the opportunity to review and comment on the draft report of June 22, 1976, entitled "More Effective Use of Computer Facilities at Laboratories Could Save Millions," and the revised draft report of September 3, 1976, entitled "More Effective Use of Computer Facilities at the Lawrence Berkeley Laboratory Could Save Millions."

The revised draft report recommends that ERDA and GSA reach an interagency agreement to establish a Federal Scientific Data Processing Center at the Lawrence Berkeley Laboratory (LBL). The recommendation is made because GAO found that \$9 million has been saved by the Government through sharing of this facility. However, further savings to non-ERDA users will be limited because of the increasing ERDA programmatic requirements for the LBL computer facility. The revised draft report states that the expenditure by GSA of an additional \$13 million to increase the computer capacity at LBL would provide for even greater savings in the future.

ERDA concurs in the draft report finding that the LBL computer facility is providing a high level of service both to ERDA and external users and that this facility's high level of service has enabled the Government to save substantial sums of money. The possibility of having GSA significantly augment the facility with additional equipment and designating it as a Federal Data Processing Center is worthy of consideration and ERDA and GSA management met in September 1976 to pursue the feasibility of such an arrangement. Prior to entering such an agreement, we believe the following issues require careful consideration.

The LBL computer facility exists to support important ERDA mission requirements. In addition to the energy program of LBL, the current capacity at LBL is being utilized by other ERDA locations to solve critical ERDA computational needs. For example, the Magnetic Fusion Energy Computation Center, located at the Lawrence Livermore Laboratory (LLL) cannot provide its programs current computational requirements and plans have been formalized for this important program to use the LBL computer facility. Non-classified, high priority energy work from the LLL Computer Center is being processed



at LBL via a remote terminal from LLL. Among other ERDA users of the LBL facility are Fermi Laboratory and the Argonne National Laboratory. Sharing at LBL has thus far not hindered ERDA's mission-related goals because ERDA has maintained total management responsibility over the LBL facility and has not made long term commitments for its non-ERDA use which at a later time could conflict with ERDA's mission needs. No degradation of support to ERDA programs can be allowed and any such agreement with GSA must provide such a provision as well as the necessary management flexibility to ensure its implementation.

Converting LBL from an ERDA Government-owned Contractor Operated (GOCO) computer facility to a Federal Data Processing Center, without adding additional capacity, would simply continue the current saturated condition and diminishing savings to non-ERDA users. It should, therefore, be understood that any discussion of converting the LBL facility to a FDPC must be predicated on advance assurance that GSA will augment the capacity of the facility. However, it must also be noted that the expenditure of \$13 million by GSA for more equipment at LBL may not automatically result in any additional savings. A thorough and current cost benefit analysis needs to be performed prior to making any decision as to the facility becoming a Federal Data Processing Center. This cost benefit analysis should consider factors such as:

1. The procurement lead time in acquiring and receiving new computer equipment;
2. The effect of a shakedown period after receipt of the equipment;
3. Facility requirements, i.e., whether a new building or extensive existing building modifications will be needed.

Then these factors need to be balanced against the projected long term demand since the savings generated by expansion assumes a large suppressed demand, that would be in existence for many years, sufficient to recover the fixed cost of expansion as well as higher operating costs.

Finally, we are concerned as to whether expansion of this facility for the purpose of providing computational services outside of ERDA would be in accord with the Government policy of reliance on the private sector. The primary thrust of the GAO recommendation is that LBL become a Federal Data Processing Center to enable GSA to greatly expand its existing capacity, as compared to the current situation of sharing LBL's existing capacity. While this governmental policy is inapplicable to a GOCO, we believe that augmentation of the LBL facility for the purpose of converting it to a FDPC might be viewed as within this policy and as creating competition against the private sector rather than reliance upon it.

A peripheral issue raised in the revised GAO draft report regards the charging of depreciation as part of user charges. On Page 7 it is stated: "Berkeley's pricing policy, therefore, does not provide for full-cost recovery as defined by ERDA." ERDAM Appendix 1701, Part 1, Page 5, K states:

"1. Charges for computer usage and related services will be based upon the full-cost recovery policy, except that full-cost less depreciation and the added factor may be charged for such services provided to:

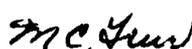
a. Other Federal agencies.

b. ERDA cost-type contractors and cost-type contractors of other Federal agencies."

Therefore, LBL's user rates are consistent with ERDA's full-cost recovery policies. Nevertheless, we are reviewing these policies to determine whether it might not be appropriate to include depreciation charges for specialized services such as our ADP installations.

[See GAO note 1.]

Sincerely,



M. C. Greer
Controller

- GAO notes:
1. A portion of this letter has been deleted because it is no longer relevant to the matters discussed in this report.
 2. The page reference in this appendix may not correspond to the page number in the final report.

UNITED STATES OF AMERICA
GENERAL SERVICES ADMINISTRATION
WASHINGTON, D.C. 20405



August 23, 1976

Honorable Elmer B. Staats
Comptroller General of the United States
General Accounting Office
Washington, DC 20548

Dear Mr. Staats:

We have reviewed the GAO draft report, "More Effective Use of Computer Facilities at Laboratories Could Save Millions." As you note, GSA has been working with the Energy Research and Development Administration (ERDA) regarding the establishment of a Federal Scientific Data Processing Center at the Lawrence Berkeley Laboratory within the limits of our authority. You will be interested to know that our regional office in New York has made a major effort to find other agency users to better utilize the Brookhaven ADP facility. For the third quarter of FY 1976, Brookhaven shared its resources with 22 other Federal agencies resulting in substantial savings.

We agree with your recommendations to the Administrator of ERDA. In particular, the reasons we support the establishment of the interagency agreement are twofold:

(1) A Center is available to all users on an equal basis, assuring other agencies continuity in satisfaction of their scientific computer needs, and

(2) A Center analyzes the workload of the entire user community when evaluating equipment changes, and so additional equipment is justified on the largest possible scale.

We plan to continue to assist ERDA in market analyses and feasibility studies to determine the economics of the actions proposed in your report.

Sincerely,


TERRY CHAMBERS
Deputy Administrator

PRINCIPAL OFFICIALS RESPONSIBLE FOR
THE ACTIVITIES DISCUSSED IN THIS REPORT

Tenure of office
From To

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

ADMINISTRATOR:

Dr. Robert C. Seamans, Jr.	Dec. 1974	Present
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ATOMIC ENERGY COMMISSION

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Dr. Dixy Lee Ray	Feb. 1973	Dec. 1974
Dr. James R. Schlesinger	Aug. 1971	Feb. 1973

GENERAL SERVICES ADMINISTRATION

ADMINISTRATOR OF GENERAL SERVICES:

Jack Eckerd	Nov. 1975	Present
Arthur F. Sampson	June 1973	Nov. 1975
Arthur F. Sampson (acting)	June 1972	June 1973

OFFICE OF MANAGEMENT AND BUDGET

DIRECTOR:

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Foy L. Ash	Feb. 1973	Feb. 1975
Caspar W. Weinberger	June 1972	Feb. 1973