

DOCUMENT RESUME

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By Making the Lawrence Berkeley Laboratory a Federal Computer Center the Department of Energy Can Save Millions while Serving Government Agencies. EMD-78-30; B-115369. February 2, 1978. 16 pp. + 3 appendices (26 pp.).

Report to Rep. Jack Brooks, Chairman, House Committee on Government Operations; by Elmer B. Staats, Comptroller General.

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In order to consolidate agency automatic data processing resources, legislation was passed in 1965 calling for multiagency service centers, referred to as Federal Data Processing Centers. The Lawrence Berkeley Laboratory Computer Facility, now owned by the Department of Energy (DOE), has been operating essentially as a Center for many years although it was not designated so officially. In 1976, GAO recommended that it be designated as a Center, thereby saving an estimated \$18.2 million annually. A consultant, under contract with the former Energy Research and Development Administration to review GAO's report, concluded that it was not necessary to designate the Berkeley facility as a Center because there was no demand for scientific computing which was not being met by Federal facilities. Findings/Conclusions: GAO questioned the validity of the contractor's conclusion because inadequate information was used in its study and because the conclusion seemed to be contradicted by private industry attempts to meet computing needs in the Berkeley area. Berkeley has been increasingly concentrating on meeting DOE needs rather than the needs of outside users. This has caused outside users to seek more costly alternatives. The Defense Nuclear Agency has proposed its own computer services facility. Most of this agency's computing needs could be met by designating Berkeley as a Federal Center, although the agency's classified workload may present a problem. The General Services Administration agreed with GAO that Berkeley should be designated as a Center. Recommendations: The following actions should be taken to designate the Berkeley facility as a Federal Scientific Data Processing Center: establish an interagency agreement for the operation of the

Center and agree on the extent of expansion necessary to meet existing and future demand. (HTW)



*UNITED STATES
GENERAL ACCOUNTING OFFICE*

**By Making The Lawrence Berkeley
Laboratory A Federal Computer
Center The Department Of Energy
Can Save Millions While Serving
Government Agencies**

In 1976 GAO reported that millions of Federal dollars could be saved annually if a federally owned computer facility was converted for use by all Federal agencies rather than just by its owner. The Department of Energy--the owner--disagreed. Taking a second look at this situation GAO reports that the conversion would be beneficial and that actions to do so should begin now.



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

B-115369

The Honorable Jack Brooks
Chairman, Committee on Government
Operations
House of Representatives

Dear Mr. Chairman:

In response to your request of June 24, 1977, here is our report on the desirability of designating the Lawrence Berkeley Laboratory computer facility as a Federal computer center. This report is a followup to our December 1976 report, "Designation of Lawrence Berkeley Laboratory Computer Facility As A Scientific Data Processing Center Could Save Millions."

We plan no further distribution of this report until 30 days from the date of the report. At that time we will send copies to interested parties and make copies available to others upon request.

Sincerely yours,

A handwritten signature in cursive script, reading "Thomas B. Staake".

Comptroller General
of the United States

Enclosure

COMPTROLLER GENERAL'S REPORT
TO THE COMMITTEE ON GOVERN-
MENT OPERATIONS
HOUSE OF REPRESENTATIVES

BY MAKING THE LAWRENCE
BERKELEY LABORATORY A
FEDERAL COMPUTER CENTER
THE DEPARTMENT OF ENERGY
CAN SAVE MILLIONS WHILE
SERVING GOVERNMENT AGENCIES

D I G E S T

The Lawrence Berkeley Laboratory computer facility has been operating essentially as a Center for many years although not so designated officially. It has provided responsive, highly cost-effective service to various Federal agencies. They have had access to a large-scale computer at less cost than alternative sources. (See p. 1.)

This facility is now owned by the Department of Energy. GAO recommended in 1976 that it be designated a Federal Scientific Data Processing Center, thereby saving an estimated 18.2 million Federal dollars annually. Expansion to nearly double the current capacity and adoption of the current full-cost recovery price structure were included in deriving this savings estimate.

The former owner, the Energy Research and Development Administration, contracted with a consulting firm to review GAO's 1976 report. The consultant agreed with GAO that Berkeley was providing effective, efficient, responsive service at an impressive cost-effective price and that it qualified to be a Center which could provide services at a cost below commercial sources. But it found no demand for scientific computing not already being met by Federal facilities. The consulting firm and the Energy Research and Development Administration concluded that it was not necessary to designate the Berkeley facility as a Center. (See p. 3.)

GAO analyzing the consultant's report, questions the validity of its conclusions as to demand because:

--A source used to determine the computer service demand is recognized as having

inadequate information on this issue.
(See p. 4.)

--Although the consultant reported that no demand existed for scientific computing services, a subcontractor is now trying to establish a private company in the Berkeley area to service scientific computing needs, which tends to contradict the consultant's conclusion. (See p. 5.)

The General Services Administration analyzed both the GAO and consultant reports and recommended that Berkeley be designated a Center, agreeing with GAO.

Berkeley's workload has completely reversed from one that provides the majority of its services to outside users to one that is now used primarily by the Department of Energy. Internal workload has increased from 41 percent in fiscal year 1975 to 72 percent in fiscal year 1977. (See p. 7.)

This situation has caused a decrease in services available to outside users, resulting in these users seeking more costly alternatives. Unless the facility is designated as a Center, all of these outside users eventually will be forced to look elsewhere for scientific computing services. (See pp. 9 and 10.)

To meet their computer needs, some present and past outside users have or are in the process of taking the following actions:

- A former Berkeley user has requested authority to obtain a 5-year facilities management services contract for scientific computing with an annual value of \$3 million. (See p. 10.)
- Another customer has begun to upgrade its facility because additional time was not available at Berkeley. (See p. 11.)
- Yet another has estimated expenditures of approximately \$7.5 million over the next 3 years to obtain scientific computer support from a private contractor.

If additional time were available for their use at Berkeley, this customer estimates that \$2-3 million could be saved. (See pp. 10 and 11.)

These users have expressed a willingness to consider using the Berkeley facility if satisfactory service and access are guaranteed, as was the case in the past.

At the request of the Chairman, GAO reviewed the Defense Nuclear Agency's proposal for its own computer services facility. GAO believes most of this agency's computing needs can best be met by designating Berkeley as a Federal Center but recognizes that the agency's classified workload may present a problem. (See app. I.)

Enough studies have been done on the issue of designating the Berkeley facility as a Center. It is time to make the conversion.

Meetings between the Department of Energy and the General Services Administration have been held but additional meetings have been postponed until later in 1978 to give the new Department time to get organized. These meetings should be aimed not at whether the Berkeley facility should be designated a Center, but how best that can be accomplished. (See p. 14.)

RECOMMENDATIONS

The following actions should be taken to designate the Berkeley facility as a Federal Scientific Data Processing Center:

- Establish an interagency agreement for the operation of the Center and
- Agree on the extent of expansion necessary to meet existing and future demand.

AGENCY COMMENTS

The Department of Energy said that it is willing to discuss the proposal with the General Services Administration but cautioned that it is not willing to accept

any degradation of Department computing services as a result of designating the Berkeley facility a Center. (See p. 15.)

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ABBREVIATIONS

DNA	Defense Nuclear Agency
ERDA	Energy Research and Development Administration
GAO	General Accounting Office
GSA	General Services Administration

CHAPTER 1

INTRODUCTION

Federal agencies, like most other organizations, tend to act independently of each other, develop parochial views on issues, take actions which may not be of greatest benefit to other agencies, and resist changes where they see any resulting losses of power. These tendencies are at work in the area of automatic data processing resources.

To combat these tendencies, in 1965 the Congress passed legislation ^{1/} for a coordinated and Government-wide program for more efficient and economical purchase, use, and maintenance of automatic data processing equipment. One section of this legislation calls for increased sharing of automatic data processing resources by the various Federal agencies through multiagency service centers, commonly referred to as Federal Data Processing Centers. These Centers, it was envisioned, could service the computing needs of various agencies on a centralized basis. The consolidation and centralization would be an economic advantage.

In December 1976 we issued a report on the savings that could be realized by designating a federally owned facility --the Lawrence Berkeley Laboratory Computer Facility--as a Center. We reported that this action could save the Government an estimated \$18.2 million annually. This savings includes a full-cost recovery user rate and expansion to nearly double the facility's workload capacity.

The then owner of the facility--the Energy Research and Development Administration (ERDA) ^{2/}--contracted with a consulting firm to review our report's findings and recommendations. On the basis of the consultant's report, ERDA concluded that there was no need to designate the Berkeley facility as a center.

At the request of the Chairman, House Committee on Government Operations, we have made a followup review of various aspects of the same issue. The remaining chapters of this report deal with

^{1/}Public Law 89-306, commonly referred to as the Brooks Act.

^{2/}ERDA ceased to exist as an agency on October 1, 1977, when it was merged, along with other agencies, into the new Department of Energy.

- the consultant's report to ERDA and how it was developed;
- the current status of the workload at the Berkeley facility, with particular attention to the non-ERDA users of the facility; and
- our conclusions, observations, and recommendations.

CHAPTER 2

ERDA CONSULTANT'S REPORT--THE BASIS FOR

ERDA'S DECISION AGAINST THE CENTER

After receiving our 1976 report in draft form, ERDA contracted with a private consulting firm to

- analyze the Berkeley facility's cost of services and the needs of users,
- develop an updated estimate of the projected total demand for services of the Berkeley facility over the next 5 years by ERDA and other Government users,
- verify the magnitude of the potential cost savings to be realized through the establishment of a Center at the Berkeley facility, and
- estimate the operating cost of the new facility as well as the cost of comparable services from alternative sources.

In February 1977 the consultant issued its report. It agreed with our report in several important areas. It agreed that the Berkeley facility has (1) operated in a highly effective state-of-the-art system for advanced scientific data processing, (2) provided responsive service to all customers, including its non-ERDA ones, (3) produced high customer satisfaction while sharing computer resources, and (4) operated in a highly cost-effective manner. The consultant stated that the Berkeley facility had the qualifications to be considered as a Center and could provide data processing services at a cost substantially below commercial sources.

But the report concluded that Berkeley should not be designated a Center at that time because

"* * * no significant present demand for large-scale scientific data processing services was identified which is not currently being met through sharing on other existing Federal installations."

On the basis of the consultant's report, ERDA took the position that because there was "no significant unsatisfied demand," there was no need to designate the Berkeley facility as a Center.

However, the Administrator of the General Services Administration (GSA) in a July 1977 letter to ERDA stated:

"We find that the [consultant's] study tends to reinforce GAO's findings. After careful analysis of both studies we are again proposing to delegate GSA authority to ERDA such that the Berkeley computer facility can be managed and operated by ERDA as a FSDPC [Center]."

At GSA's request, a meeting concerning the proposed Center was held in September 1977. Further discussions have been delayed until later in 1978 to give the new Department of Energy an opportunity to get organized.

ANALYSIS OF THE CONSULTANT'S REPORT

We analyzed the consultant's report and the methodology used to develop it. We identified several items which raise questions on the validity of the study's conclusion regarding the demand for computer services. These items, discussed in more detail in the following sections, are

- the use of an unreliable information source to determine computer services demand and
- the fact that a consultant subcontractor reached findings which tend to contradict the report's conclusion and subsequently acted to establish a privately owned scientific data processing capability in the Berkeley area to serve Federal needs.

Unreliable source of demand information

The consultant hired a subcontractor to identify the demand for Berkeley services. The subcontractor told us he contacted six Berkeley users who happened to be at the facility during his visit. These contacts, along with some additional work ^{1/}, led him to conclude that a demand did exist for Berkeley-type scientific computing services.

^{1/}We were unable to evaluate the subcontractor's documentation because of his refusal to make the data available. Because of the tight reporting time frames for this assignment, we did not press this issue.

Rather than rely solely on the subcontractor's work, the consultant's project team contacted by telephone 7 of the 10 GSA regional offices to determine if there was a demand for Berkeley services. These telephone conversations were not documented or recorded 1/. Primarily on the basis of these contacts, the consultant's project team disagreed with the position of its subcontractor that a demand did exist and concluded that there was no unsatisfied demand for computer services. Both the subcontractor and consultant's project team made projections on when the demand for Berkeley services would exceed its capacity. The subcontractor shows saturation of Berkeley by fiscal year 1978 while the consultant's project team shows saturation by fiscal year 1982.

We contacted GSA headquarters officials to find out if GSA regional offices are a good source of information on such a question. They said that the GSA regional personnel contacted would not readily know all or even most of the current or future data processing requirements in their region. Another GSA headquarters comment expressed concern as to how an understanding of the time-sharing availability and demand could be obtained through telephone contacts.

To get an understanding of what was discussed during the telephone interviews, we contacted the regional GSA personnel that the consultant's project team identified. Of the seven persons contacted, only five remembered talking to the consultant's representative and, of these five, most did not recall what was discussed. Moreover, by talking with these officials we were unable to get the kind of information that would give clear indication of whether demand for scientific computer services existed.

Subcontractor actions tend to contradict consultant's report

After the consultant's report was published, it was disclosed that a subcontractor responsible for determining the demand for Berkeley services planned actions which tend to contradict the consultant's report. ERDA informed its consultant that the subcontractor whose position on demand had not been accepted had contacted Berkeley officials in late April or early May 1977--several months after the consultant's report was issued--about establishing a private computer facility to meet the unsatisfied demand for scientific computing services.

1/In commenting on this report, the consultant stated that documentation had been prepared but was discarded.

The consultant was instructed to look into the matter and report back to ERDA. In a May 24, 1977, letter, the consultant told ERDA that its report data was obtained during December 1976, and the subcontractor did not begin to consider his business venture until mid-March 1977. Also, the letter goes on to say that the final report was not a product of one particular individual but a project team effort.

We have obtained an undated "Berkeley Project" discussion paper prepared by a private business venture group with whom the subcontractor is associated. This group is contemplating the establishment of a privately operated facility which would offer scientific data processing in the Berkeley area to serve the Federal Government. The initial market for their facility is identified as coming from excess demand by Berkeley users that can not be satisfied at that facility. In our view, this potential venture provides additional support that a demand for Berkeley services does exist and tends to contradict the consultant's position that no demand exists.

CHAPTER 3

INCREASING USE OF BERKELEY FACILITY BY ERDA CUSTOMERS

CAUSES NON-ERDA CUSTOMERS TO LOOK ELSEWHERE

Although not designated as such, the Berkeley facility has been operating somewhat as a de facto Center since the late 1960s, providing millions of dollars of service and savings to non-ERDA Government users. However, because of recent usage trends and policy decisions, the opportunity for non-ERDA users to use this facility is diminishing, and these users are having to seek alternative facilities at increased cost to the Government.

This chapter discusses the makeup of the current workload at the Berkeley facility and the effect that ERDA's decision against the Center has had on non-ERDA users of the facility. Also, at the request of the Chairman of the House Government Operations Committee, we reviewed the request of a user of the facility to acquire its own computer facility.

CURRENT WORKLOAD AT THE BERKELEY FACILITY

ERDA's utilization of the Berkeley facility increased from 40.7 percent in fiscal year 1975 to 71.7 percent in fiscal year 1977. Much of this increase is due to transferring computing workloads from other ERDA laboratories. This shifting of workloads appears to be justified. Berkeley's 5-year plan predicts that ERDA usage will continue to increase until the facility is used 100 percent for ERDA projects in fiscal year 1981. This increase has been and will continue to be accompanied by a reciprocal decline in time available to non-ERDA users.

Additionally, computing efficiency was increased from 74.4 percent during fiscal year 1975 to 86.1 percent during fiscal year 1977. Berkeley's system was saturated during the latter months of fiscal year 1977 due to increased ERDA usage and usage stimulated by the approach of the fiscal year's end. This situation abated after the beginning of fiscal year 1978.

The following table summarizes the usage of the Berkeley facility.

PERCENT OF BERKELEY UTILIZATION

	Fiscal years			
	1975 (note a)	1976	1976 transition	1977
Users:				
<u>ERDA funded</u>				
Berkeley Laboratory	19.5	24.4	25.2	21.8
Livermore Laboratory	-	-	5.5	15.3
Richland Laboratory	5.0	7.4	7.3	9.6
Other	<u>11.6</u>	<u>16.6</u>	<u>16.5</u>	<u>14.2</u>
	36.1	48.4	54.5	60.9
<u>ERDA not ERDA funded</u>				
Lawrence Berkeley Laboratory Collaboration (note b)	-	-	-	2.5
National Science Foundation ERDA-related	<u>c/4.6</u>	-	-	-
	-	-	-	<u>8.3</u>
Total ERDA users	<u>40.7</u>	<u>48.4</u>	<u>54.5</u>	<u>71.7</u>
Non-ERDA users:				
National Aeronautics and Space Administration - AMES Laboratory	14.4	0.5	-	-
Boeing Corporation	6.7	6.0	0.9	0.3
Defense Nuclear Agency Space and Missile Systems Organization, U.S. Air Force	7.5	5.7	1.1	1.0
	7.3	9.1	2.5	2.5
Army Corps of Engineers	4.0	4.5	4.5	5.9
U.S. Geological Survey	1.3	2.4	2.4	1.8
Other	<u>18.1</u>	<u>23.4</u>	<u>14.1</u>	<u>16.8</u>
Total non-ERDA	<u>59.3</u>	<u>51.6</u>	<u>45.5</u>	<u>28.3</u>
Computer Efficiency (percent)	74.4	64.3	64.2	86.1

a/1975 percentages are based on revenue data while those of later periods are based on formulas that measure usage directly. Consequently, exact comparisons cannot be made, but the percentages can be used as general trend indicators.

b/This category refers to special contractual relationships between Berkeley and other parties that provide for joint research efforts of a general nature which ERDA considers beneficial to both parties.

c/After fiscal year 1975, this user was recategorized into non-ERDA group.

CERTAIN POLICIES DISCOURAGE
USE OF NON-ERDA USERS

Not only is less time available to non-ERDA users, policies concerning the use of Berkeley's system have discouraged non-ERDA users from using the system. These policies are:

- Berkeley will not guarantee system access to non-ERDA users.
- Beginning in June 1977, non-ERDA users were banned from interactive 1/ use of the facility from the hours of 10 a.m. to 6 p.m., Monday through Friday--the "prime time" for interactive use of most customers.
- In August 1977 Berkeley gave ERDA and ERDA-related users program execution priority over non-ERDA users. Berkeley rescinded this policy in October 1977 when saturation conditions receded.

According to Berkeley officials, these policies were implemented to protect ERDA's access to an ERDA resource--the latter two in reaction to saturation conditions--and were not directed at non-ERDA users to discourage them from using the system. This contention is partially supported by the fact that ERDA has, in our opinion, given fairly liberal interpretation of what is ERDA mission-related to allow non-ERDA funded users to have equal access to the facility. For example because part of the U.S. Geological Survey's research includes earthquake effects on nuclear powerplants, ERDA designated all Geological Survey work on earthquakes as ERDA-related.

Regardless of the motives, these policies have caused non-ERDA users problems in using the facility. When enormous processing backlogs occurred during the saturation conditions, non-ERDA users with low priorities experienced very long program execution delays. Also, interactive users can no longer use the facility during normal working hours. Finally, in combination with the above effects, an announced 27-percent 2/

1/Interactive means that users engage in active communication with the computer while writing, testing, or executing their programs.

2/Implemented to comply with Comptroller General Decision B-136318, January 21, 1977, requiring full-cost recovery charges to non-ERDA users. Depreciation is included in these charges.

rate increase to non-ERDA users effective October 1, 1977, --caused some significant non-ERDA users to begin seeking alternative computer resources. It should be noted that the cost for Berkeley services are still well below those of alternative sources.

NON-ERDA USERS ARE SEEKING
ALTERNATIVE RESOURCES AT INCREASED
COST TO THE GOVERNMENT

Since the 1975 to 1976 time frame, some significant non-ERDA users have found or are taking actions to find alternative computer resources because of the access problems they are encountering. Descriptions of the problems some of them are having, or will have, follow.

Defense Nuclear Agency (DNA)

DNA and its contractors' use of the Berkeley facility has decreased from 7.5 percent of the Berkeley facility's capacity in fiscal year 1975 to 1.0 percent in fiscal year 1977. This decrease is attributable to problems of access that DNA was experiencing or expecting. DNA has shifted some of this workload from Berkeley to an Air Force laboratory.

The Air Force laboratory notified DNA that it could not receive computer services beyond fiscal year 1978 because of laboratory capacity problems. On December 22, 1976, DNA submitted a request to GSA stating that the best way to meet its computer requirements would be to obtain a company-owned, company-operated computer to be located in its Alexandria, Virginia, headquarters. Any company awarded this contract would set up a computer facility--hardware as well as personnel to run it--that would be dedicated to and controlled by DNA. DNA has proposed an initial contract period of 2 years, with the option to continue for three additional 1-year terms, at an estimated cost of \$3 million per annum.

We believe that obtaining its computer services from a commercial source would be more expensive than using Berkeley. (See app. I.)

Army Corps of Engineers

The Corps of Engineers' use of the Berkeley facility has increased since 1976, but recent access problems it has encountered has forced it to begin looking elsewhere for computer services. To meet a GSA-approved authorization, the Corps is now evaluating commercial contractor responses for a 3-year, \$7.5 million solicitation to provide scientific computer services. A Corps official said that they would consider placing

50 to 75 percent of this workload at Berkeley if the good service and access the Corps had enjoyed there in the past could be guaranteed. The official estimated that Berkeley services would be about one-half the cost of the cheapest available commercial services under the \$7.5-million scope of effort. Therefore, we calculate that if the Berkeley facility were available to the Corps for continued use, it could save between \$1.9 million and \$2.8 million over the next 3 years. Recently the Corps has awarded a contract for computer services not to exceed \$3.9 million with the balance of the \$7.5-million authorization to be awarded at a later time.

National Aeronautics and Space Administration--AMES Laboratory

The AMES Laboratory stopped using the Berkeley facility in 1975 because it acquired a large-scale computer equal to Berkeley's to supplement the two it already had. However, AMES Laboratory officials told us the laboratory is planning to replace one of the existing computers with a larger, faster system by the end of fiscal year 1979. They said, however, that if the Berkeley facility were available on a guaranteed access basis, they would consider it as an alternative to the new system and for future increased workloads.

Geological Survey

The Geological Survey's Menlo Park, California, facility has relied heavily on the Berkeley facility since 1973. However, it recently acquired its own computer, which is expected to handle 70 to 75 percent of its scientific workload. The other 25 to 30 percent will remain at Berkeley. This recently acquired system was justified largely on the fact that the Berkeley facility could not guarantee computer time.

Furthermore, Geological Survey scientists told us that their scientific computing needs should double in the next 4 to 5 years. These scientists expressed a preference for using Berkeley's facility over their own computer and claimed that the in-house computer costs much more than the Berkeley system to run equivalent programs.

Others

Physics International, R&D Associates, and Physical Dynamics are private contractors performing research for DNA. They generally use whatever computer facility DNA designates. Although their workload has shifted to the Air Force laboratory at DNA's request, these companies still have some workload at Berkeley, with Physical Dynamics still having most

of its workload there. These users expressed preference for using Berkeley over other facilities if good service and accessibility could be restored. However, because of recent deteriorated service at the Berkeley facility, two of them are looking for alternative commercial services.

Berkeley has hundreds of other users among universities, miscellaneous Federal agencies, and Government contractors. We could not contact all of these users, but we believe it is inevitable that the non-ERDA users among them will also commit themselves to alternate computer resources in the near future if current Berkeley trends continue.

CHAPTER 4

CONCLUSIONS, OBSERVATIONS,

RECOMMENDATIONS, AND AGENCY COMMENTS

Should the Lawrence Berkeley Laboratory computer facility be designated a Federal Center? Our December 1976 report demonstrated that such a designation would save millions of dollars of Federal funds and, consequently, recommended that it should.

ERDA's consultant did not agree with this recommendation. But a close look and analysis of this consultant's report --which underpins ERDA's decision against the Center concept --is very important. The consultant's report agreed with us that the Berkeley facility is efficient, economical, and responsive to customer needs or at least capable of being so, and a leader in the scientific data processing field. The report indicated that the Berkeley facility would be a very good candidate for a Center.

But the consultant reported, because there is no unsatisfied demand for the kind of computer services the Berkeley facility provides, there is no need to designate it a Center. The foundation for this statement is questionable for two reasons. First, the consultant used GSA regional offices as an information source although GSA admits that its regional offices do not readily collect this type of information, and failed to retain documents on its discussions with the GSA regions and how they were used to develop the final conclusion. Secondly, the consultant's subcontractor is now trying to establish a company in the Berkeley area to provide scientific data processing services, in part, to serve Federal users--an action that tends to contradict the report's conclusion.

In our view, all of the reasons and justifications that led us to our conclusion in the earlier report are still valid. The Berkeley facility user trends show that it is using increasingly larger percentages of its capacity to satisfy ERDA customers. Obviously, this will continue to force non-ERDA customers to look elsewhere for computing assistance. Given a choice, these non-ERDA customers would prefer to continue using the Berkeley facility because of its efficiency and low cost.

Since our earlier report, ERDA and GSA have met and discussed the Berkeley facility and the desirability of designating it a Center. But because of the recent creation of the Department of Energy--the new owner of the Berkeley facility--consideration of the issue has been deferred until

a later date. Also, the Office of Management and Budget has instructed GSA to further review and analyze the demand for Berkeley services.

We believe that further study is unnecessary. As time passes, it is inevitable that more Federal funds will be spent by non-Department of Energy users to acquire less efficient services, and that the Department will be able to point to diminishing and eventually nonexistent non-Department use to justify its opposition to the Center concept. Consequently, we believe that the meetings to be held between GSA and the Department of Energy should be aimed not at whether the Berkeley facility should be designated a Center, but how best that could be accomplished.

Because of the present saturated condition of the Berkeley facility, expansion is or will be necessary. Funds for expansion should be made available through the "Brooks Act," which authorized the revolving Automatic Data Processing Fund to provide adequate financial support for Centers, or through regular appropriated funds given to GSA. Therefore, with Berkeley being a Center, the Department of Energy could be provided funds for the expansion necessary to meet the total demand. Also, because the efficiency of the Berkeley system largely results from the excellence of noncomputer hardware factors, such as computer software, personnel, and operating policies, expansion should not decrease the efficiency or economy of the system. Expansion costs were considered in deriving our initial cost savings estimate. With an expanded workload, the Center would have a larger base on which to distribute fixed-costs, including expansion costs, thereby reducing the existing user rate.

It should be recognized that the Brooks Act limits GSA's authority on the issue of designating Centers. GSA is restricted from questioning an agency's computing requirements or its use of computer equipment. Consequently, GSA must depend on its ability to demonstrate the merits of the Center concept, as well as the receptiveness and good will of the Department, in working toward designating Berkeley as a Center.

Recommendation to the Secretary,
Department of Energy, and the
Administrator, General Services
Administration

We recommend the following actions be taken to designate the Berkeley facility as a Federal Scientific Data Processing Center:

--Establish an interagency agreement for the operation of the Center.

--Agree on the extent of expansion necessary to meet existing and future demand.

AGENCY COMMENTS

We asked the Department of Energy, GSA, and DNA to comment on our report. A discussion of DNA's comments is contained in appendix I.

In a meeting, GSA representatives agreed with our report and recommendation. They said their agency would work with the Department of Energy toward establishing Berkeley as a Center.

The Department of Energy's comments (see app. III) stated that it is willing to discuss with GSA the designation of Berkeley as a Center. It cautions, however, that several items would have to be resolved before it could agree with GSA on the Center issue. These items relate to the need for the Department to be able to have its own computing services done at Berkeley without any degradation of service or priority. We take no issue with this comment. In fact, we agree that the Department should not jeopardize the accomplishment of its mission and urge that GSA work toward the same end.

But we believe that our position--that meetings on the Center concept should be aimed at how best to implement the concept--should be emphasized. Neither the Department's comments on our report nor any conversations we had with Department officials indicated any positive commitment to, or sense of urgency about, the Center concept. And, as we pointed out earlier, further delays and passing of time are not an ally of the Center concept.

The Department, in its comments, also warns that its contractor at Berkeley--the University of California--is strongly opposed to designation as a Center and would not accept such a designation. In our view, once the Department and GSA agree on the concept, it should not be difficult for the Department to allay the University's concerns.

CHAPTER 5

SCOPE OF REVIEW

We made our review at ERDA, Germantown, Maryland; GSA, Washington, D.C. central office, and San Francisco, California (Region IX); the Lawrence Berkeley and Livermore Laboratories located in Berkeley and Livermore, California; DNA (headquarters), Washington, D.C.; and the ERDA consulting firm, Washington, D.C.

At these locations we interviewed agency officials, examined records, and compiled data. We also contacted and interviewed several former and current users of the Berkeley computer center. Our review did not include an audit of the financial statements of these organizations.

DNA--POSITION OF GAO ON DNA'S
JUSTIFICATION FOR ITS OWN COMPUTER

The Chairman, House Government Operations Committee, requested us to review DNA's request for a computer and the request's relationship to Lawrence Berkeley Laboratory's decision to limit non-ERDA user access to its computer.

DNA is responsible for the management of Department of Defense nuclear weapons testing, nuclear weapons effects research programs, and consolidated management of nuclear weapons stockpile. The testing and effects are done by contractors which require the use of scientific computers to complete their contractual requirements. DNA attempts to provide governmental sources that can be used to meet contractor needs. However, these computational requirements may also be done at a commercial facility or at their own, if available. DNA estimates that about 60 percent of the computations are done commercially and about 40 percent at Government facilities.

Various DNA contractors used Berkeley in the early to mid-1970s to meet their computational needs. As a result of increases in its ERDA workload, Berkeley limited non-ERDA users in 1975 to other than the prime-time shift. This limitation, along with a deterioration of services, caused some DNA contractors to look elsewhere for time sharing. DNA was able to obtain computer time at the Air Force Weapons Laboratory with a guarantee of service for a 2-year period. Near the end of this period, the Air Force Laboratory informed DNA it would not be able to continue its total time-sharing commitment. However, the agreement was extended through fiscal year 1978 to provide DNA computer services while GSA was processing a proposal to obtain a computer service facility.

REQUEST FOR AUTOMATIC
DATA PROCESSING SERVICES

On December 22, 1976, DNA submitted a request to GSA for authority to obtain a company-owned, company-operated computer to be located in its Alexandria, Virginia, headquarters. DNA's terms call for a 2-year contract with the option to continue for three additional 1-year terms. The annual cost has been estimated at \$3 million.

DNA cited several disadvantages 1/ in having to use multiple external sources to meet computer needs.

- Multiple external sources prohibit proper control in the development of computer programs which encourages the proliferation of multiple versions of major programs.
- Government facilities do not provide priority for DNA jobs which causes delays and continual searching for computer time sharing.
- Multiple external sources make it difficult to assure that all contractors have access to classified facilities.

DNA identifies Control Data Corporation hardware as the kind that is needed because this is what has been available to them and, consequently, the majority of their computer code programs are written for and run on such hardware. According to DNA, more than 94 percent of its programs are run on Control Data Corporation operating systems, and any attempt to convert to other hardware would be costly and time consuming. This is because extensive use was made of variations to the basic computer language.

There are some valid aspects of DNA's request for a centrally located computer facility. Having all computer time at one facility should enable DNA to better substantiate just what programs were developed under a DNA contract. However, because many scientists feel that their own program provides better end results, there will be a strong resistance to reducing the number of programs to eliminate duplication.

Assuring that classified facilities are available to all contractors is not a necessity. DNA has identified that only 5 percent of its workload is classified, but that increases are anticipated in the next couple of years to where about 50 percent of its workload will be classified. Consequently, even if the anticipated increase is realized, it will not be necessary to provide all contractors access to a classified facility. We were not able to obtain from DNA a firm figure on just what percentage of its computer workload is classified.

1/In commenting on this report, DNA said that the disadvantages listed are the basis for the DNA stated requirements.

It appears as though the large portion of DNA programs require Control Data Corporation hardware for computations, and conversion to another manufacturer would be costly and require a significant amount of time. We reviewed a program that was presented as an example in DNA's request for computer services. If this program is representative of the DNA inventory, then both the resources and the calendar delay to convert their inventory to run on another manufacturer's equipment would be significant. The approximate conversion cost of \$1.6 million presented by the agency is merely an estimate. To substantiate whether this cost is representative would require a considerable amount of time and effort that could not be accomplished within the time frame of this review.

According to DNA, its requirement is approximately one-third of the time available during a given month on the computer requested. The DNA requirement is productive time only and does not account for preventive and software maintenance and downtime. DNA officials stated that 1-1/2 to 2 shifts are being considered as the amount of time to be purchased. The time requirement is under one shift usage, but to have the computer available for West Coast contractors, 1-1/2 shifts is needed to account for the time zone difference between the East and West Coasts. Therefore, because the requirement as stated will not use even a full shift, the purchase of time in excess of one shift will mean using the available computer capacity to an even less extent.

OBTAINING COMPUTER TIME AT GOVERNMENT FACILITIES

Historically, DNA has not been able to arrange for a single Government facility to provide all the time necessary to meet its computer needs. According to DNA, its contractors used Federal facilities, including the Lawrence Berkeley Laboratory, Los Alamos Scientific Laboratory, Sandia Laboratories, Lawrence Livermore Laboratory, Oak Ridge National Laboratory, and the Air Force Weapons Laboratory, until about 1968. From 1968 to 1970, the Air Force laboratory was primarily used with the installation of a second computer. Then in the period 1970 to 1975, Berkeley was primarily used because of its remote user emphasis and acquisition of an additional larger computer. According to a DNA official, after 1968 the shifts from one facility to another were due to saturation on existing machines along with new and better computers becoming available.

Since submitting its request for automatic data processing services, DNA has attempted to obtain its total requirement

at one facility, limiting the facilities to only those with large Control Data Corporation computers and to obtain a guarantee of computer time for a period of 5 years. Given these criteria, which would be very difficult to obtain on a sharing basis at any one Government computer facility, DNA was not successful in locating a central computer facility.

CONCLUSIONS

The curtailment of computer services at Berkeley was just one more instance that caused DNA to look elsewhere for computer time because of increases in a facility's workload. The request for its own computer is based on this continual shifting from place to place and other disadvantages of having to use numerous facilities to fulfill computer requirements.

DNA has encountered disadvantages in having to rely on various computer facilities. However, its request to obtain a computer facility at its headquarters building does not present a convincing case as being the best available method of meeting its requirement:

- It is more expensive than using Berkeley or other Federal sources for computer services.
- It has been able to operate like any other customer for about 10 years, using other Federal sources. No significant events or actions have taken place which justify DNA's work getting a higher priority.
- Its stated requirement is insufficient to warrant a separate computer. DNA's requirement is less than one full shift usage and would create an underutilized facility.

Consequently, our position is that DNA's unclassified needs can best be met by designating Berkeley as a Federal Center.

AGENCY COMMENTS

DNA disagrees with our position that its computing needs can best be met by designating Berkeley as a Federal Center. Specific comments given are as follows:

- A computing facility is needed in fiscal year 1979 and Berkeley won't be ready in time.
- Making Berkeley a Center won't solve DNA's problems because Berkeley lacks a classified capability.

Regarding the first comment, if the conversion to the Berkeley Center is not made, DNA obviously would have to seek alternative means to obtain an adequate computing source.

The second comment hinges on the amount of DNA's workload that is and will be classified. This amount is very difficult to determine because of the complexities involved in such areas as using computer programs that may be unclassified but that must draw on data that is classified. When we asked various DNA officials for their estimate of the current workload that is classified, their responses ranged from 10 to 25 percent. In its comments, DNA projects that future classified workload will grow to 50 percent. This number is speculative.

The complexity of the classified computing workload issue is described in a June 1977 letter from one of DNA's contractors to DNA. This contractor, stating that it did not know the present or future DNA classified computing workload, concluded that if the classified workload proves to be less than 3 percent, DNA probably would be wiser to have all classified computing performed at another computer facility and to discard the notion of classifying its own facility. The letter goes on to say that if the classified workload proves to be greater than 30 percent, DNA probably would be wiser to use a totally classified facility to do its computing.

Because of the uncertainties surrounding the classified workload issue, we urge GSA to, as part of its review of the DNA request, take a very close look at DNA's projected classified workload to see if it is as large as DNA estimates. If it is, GSA should determine whether it would be beneficial for DNA to have any of its work done at Berkeley or to have its own computer.



DEFENSE NUCLEAR AGENCY
WASHINGTON, D.C. 20305

December 30, 1977

DDST

Mr. Monte Canfield, Jr.
Director Energy and Minerals Division
United States General Accounting Office
Washington, DC 20548

Dear Mr. Canfield:

This is in reply to your letter to the Secretary of Defense regarding your draft report dated 8 December 1977, on Failure to Make the Lawrence Berkeley Laboratory a Federal Computer Center Would be Costly, OSD Case #4775.

As requested personnel from the Defense Nuclear Agency met with representatives from your office and OSD, Data Automation on 15 December 1977 to provide informal comments to specific items in the draft report. Due to the expressed time constraints written comments are enclosed that indicate DNA's exception to the conclusion.

I trust the enclosure contains comments on a timely basis and that they will receive full consideration prior to submission of a final report. DNA's Request for ADP Services is a most important element in future Nuclear Weapons Effects code control and computing requirements.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Peter H. Haas".

PETER H. HAAS
Deputy Director
Science and Technology

Copy Furnished:
OSD, Data Automation

Defense Nuclear Agency Comments to the GAO
Draft Report dated 8 December 1977
"Failure to Make the Lawrence
Berkeley Laboratory a Federal
Computer Center Would be Costly"

Page III

"These users have expressed a willingness to consider using the Berkeley facility if past good service and access are guaranteed. GAO believes that if the Center were designated, these considerations would be restored."

COMMENT: The Berkeley facility will not provide the classified computing capability required by the Defense Nuclear Agency even if good service and access were guaranteed. As pointed out in later comments, it will also not provide for government control of contractor developed computer codes with highly desired integration and consolidation which could result in substantial advantages to the government including monetary savings.

Page 8

"Also, at the request of the Chairman of the House Government Operations Committee, we reviewed the request of a user of the facility to acquire its own computer facility."

COMMENT: The GAO indeed conducted a review of the DNA request to acquire its own computer resource by means of a three day visit to Headquarters, DNA, and subsequent discussions with contractors and military centers involved in DNA nuclear weapons effects computer calculations. The conclusions reached do not, however, portray a thorough understanding of that request since their recommendations pay little or no attention to the projected requirements for classified computing.

Page 10

"--Berkeley will not guarantee access to the system to non-ERDA users.

--Beginning in June 1977, non-ERDA users were banned from interactive 1/ use of the facility from the hours of 10 a.m. to 6 p.m., Monday through Friday - the "prime time" for interactive use from most customers."

COMMENT: These statements are indeed accurate and additionally represent the precise experience of the Defense Nuclear Agency with other previously similar non-DNA controlled/owned computer resources, e.g., Argonne National Laboratory, Oak Ridge National Laboratory, Los Alamos Scientific Laboratory and the Air Force Weapons Laboratory.

Page 12

"DNA has shifted some of this workload from Berkeley to an Air Force laboratory."

COMMENT: This shift was made as a direct result of the above (comment) situation, but not as a long range cure. The primary motivation was to acquire intermediate experience with remote computing operations and centralization of computing effort in anticipation of the (requested) DNA acquisition of its own facility (as per recommendation by the House Armed Services Committee).

Page 12

"The Air Force laboratory RECENTLY (June 1977) notified DNA that it could not receive computer services beyond fiscal year 1978 because of laboratory capacity problems. CONSEQUENTLY, on December 22, 1976, DNA submitted a request to GSA stating that the best way to meet its computer requirements would be to obtain a company-owned, company-operated computer to be located in its Alexandria, Virginia headquarters."

COMMENT: Obviously the DNA request preceeded the AFWL notification by six months! As pointed out earlier the DNA utilization of the AFWL computer facility has always been considered as an interim solution and we had always understood that AFWL could not continue to satisfy DNA needs. AFWL's (early) notification only exacerbated the DNA computing problem.

Page 12

"We believe the DNA request to acquire its own computer facility is not justified. Obtaining its computer services from a commercial source would be more expensive than using a Federal facility such as Berkeley."

COMMENT: The rationale for the above statement is insufficient as it does not address the DNA stated requirement for either the control of computer code proliferation or the need for classified computing. Even the cost comparison tends to be incomplete (as shown in comment below) and in view of previous experience with recently sharply increased Berkeley computer costs may in fact be highly premature.

Page 14

"Physics International, R & D Associates, and Physical Dynamics are private contractors who have a large share of their work under contract to DNA and who use whatever computer facility is designated by DNA. These companies still have some workload at Berkeley, with Physical Dynamics still having most of its workload there. These users expressed preference for using Berkeley over other facilities if good service and accessibility could be restored."

COMMENT: These three contractors constitute a relatively small portion of the DNA computing workload. Physical Dynamics may well prefer Berkeley because of close proximity. Physics International and R & D Associates have not properly assessed their needs for classified computing for DNA.

Page 17

"Given a choice, these non-ERDA customers would prefer to continue using the Berkeley facility because of its efficiency and low cost."

COMMENT: This does not include the Defense Nuclear Agency.

Page 20, Appendix I

"However, the agreement was extended through fiscal year 1978 to give DNA time to prepare a request to GSA for its own computer."

COMMENT: As stated in a previous comment the DNA request to GSA preceeded the computing notification from AFWL. The time extension agreement resulted from the long time taken in response to the DNA procurement of services request.

Page 21, Appendix I

"Several disadvantages are cited by DNA in having to use multiple external sources to meet computer needs."

COMMENT: The "disadvantages" listed in fact are the very basis for the DNA stated requirements. It should be clearly understood that these requirements have gone ignored by far too long. DNA's inability to satisfy them have resulted in an expensive and inefficient proliferation of computer codes and continues to be the source of a highly undesirable technology transfer to foreign nations. (As an example, DNA designed computer codes installed by DNA contractors at Berkeley have mysteriously found their way to a Moscow computing facility by way of Sweden!)

Page 22, Appendix I

"However, since many scientists feel that their own code provides better end results, there will be a strong resistance to reducing the number of codes to eliminate duplication."

COMMENT: The above statement is not only correct but moreover will be impossible to deal with by any means other than a DNA controlled facility. This was the precise basis for the House Armed Services Committee directed action for DNA to proceed promptly to put this problem to rest. It continues to plague the Nuclear Weapons Effects community which in fact includes many DoD organizations beyond DNA.

Page 22, Appendix I

"To assure that classified facilities are available to all contractors is not a necessity. DNA has identified that only 5 percent of their codes are classified but that increases are anticipated in the next couple of years to where about 50 percent of their workload will be classified. Consequently, even if the anticipated increase is realized, it will not be necessary to provide all contractors access to a classified facility. We were not able to obtain from DNA a firm figure on just what percentage of their computer workload is classified."

COMMENT: DNA strongly disagrees with the GAO assessment concerning a classified facility. In actuality, accessibility to classified computing is the key to DNA's security requirement, which is not and will not be available at LBL. Classified access is not necessary for all users at any given time, but may be for any user at a particular time. Over 99 percent of the R & D contracts negotiated by DNA require access to classified material. DNA contractors already have the requisite clearance and the addition of an efficient mode of executing classified computing would become a benefit to all.

The Deputy Director for Science and Technology foresees a significant growth in DNA's requirements to perform classified computing coincident with recent tasking and forecasts a growth to as great as 50 percent of the annual computing. This DNA requirement for increased classified computing is real. Because it has little historical precedence, it does not detract from the future need.

Pages 22 and 23, Appendix I

"According to DNA, their requirement is approximately one-third of the processing time available from the computer requested. The requirement is actual use time and does not account for preventive and software maintenance and downtime. DNA officials stated that 1-1/2 to

2 shifts are being considered as the amount of time to be purchased. If maintenance and downtime are excluded, the requirement would be well under one shift usage. In order to have the computer available for west coast contractors, it will be necessary to have a shift and a half available to account for the time difference. Therefore, since the requirement will not even use a full shift, the purchase of time in excess of one shift will mean using the available computer capacity to an even less extent."

COMMENT: DNA does not follow the reasoning presented concerning preventive maintenance and downtime. These factors have been considered as the services contractor's obligations as non-available time. In requesting 1-1/2 shifts of available service, DNA indeed was accounting for overhead costs for doing computing in addition to the time differential consideration for east and west coast contractors. If you assume a system efficiency of wall clock to CP hours of 65 percent, this implies a need for 206 real hours per month per 125 CP hours of computing on a CDC 7600/CYBER 176 configuration. Most CDC scientific computing facilities average between 55-70 percent. The highest experienced at AFWL has been 64 percent or 465 CP hours out of 720 available hours. To assure responsiveness in terms of turnaround and throughput for a varying job mix, DNA further estimates that the computer should not be loaded beyond the 80 percent level. Using this as a utilization factor, the requirement in actuality is 247 hours per month or approximately 12 hours per day, 5 days a week. Note that the above analysis does not include the overhead burden of classified computing. DNA experience at AFWL indicates at least 1-1/2 hours/day are lost to overhead in making any computing system ready for a classified session and then returning it to its unclassified normal state. This DNA computing load and overhead burden will be required at any computer installation that does mixed mode classified/unclassified computing. It is certainly not unique to the requested DNA facility.

Page 24, Appendix I

"Since submitting their request for ADP services, DNA has attempted to obtain their total requirement at one facility, limiting the facilities to only those with large CDC computers and to obtain a guarantee of computer time for a period of 5 years. Given these criteria, which would be very difficult to obtain on a sharing basis at any one Government computer facility, DNA was not successful in locating a central computer facility."

COMMENT: DNA has a long history of attempting to find existing computing resources within the government at the lowest total cost to the government. Changes in computer services have always been forced upon DNA by circumstances beyond DNA's control. Laboratories, which at one time could supply DNA's needs, curtailed their services as their in-house workload increased. This has resulted in a chronic uncertainty on the part of DNA regarding its ability to provide reasonable

computing to its contractors. DNA's stated requirement is certainly not diminished because it is difficult to obtain a centralized computational resource on a sharing basis at any one Government Computer Facility.

Page 24, Appendix I

"1. It is more expensive than using Berkeley or other Federal sources for computer services."

COMMENT: Before a final conclusion can be rendered that a DNA facility is more expensive than using Berkeley or other Federal sources for computer services, consideration should also be given to the total cost of computing. The most critical component of the total cost, which DNA project officer/managers can attest, is the impact to the scientific effort with its incremental cost increase created by a non-responsive computer resource. Such a non-responsive computer resource has been identified as the reason DNA has had to continually shift computer resources every 2 to 3 years over the past 10-15 years.

DNA recognizes that lease or purchase of the proposed computer capability would necessitate an under utilized facility with a long-term operating personnel commitment and, therefore, elected to request a Delegation of Procurement Authority (DPA) to solicit computer services to meet the stated time requirement. DNA estimates that the cost per CP hour for a DNA facility will exceed the LBL direct cost of \$1120/hr by not more than 15 percent. DNA has received an unsolicited proposal that offers 125 CP hours of CDC 7600 time at \$160,000 per month or equivalent time on a CYBER 175 system at \$150,000 per month. This proposal equates to an equivalent LBL hour at a cost from \$1200 to \$1300/hr. Relative to what DNA stands to gain in increased efficiency and responsiveness the 15 percent increase certainly does not appear excessive. It should be noted that an indirect cost to DNA when it utilized LBL was the 15 to 20 percent General and Administrative (G & A) cost for the DNA contractor to subcontract with LBL for computer time.

Page 24

"2. DNA has been able to operate as just another customer for about 10 years using other Federal sources. No significant events or actions have taken place which justify DNA's work getting a higher priority."

COMMENT: This statement neither reflects the changes in computing experienced during these years nor anticipates those likely in the next five years. DNA's computational efforts are changing in scope and time requirements have increased significantly. The current DNA workload at

the AFML facility is 2-1/2 times the FY 75 effort at LBL and is only about 60-70 percent of the total computing envisioned for FY 78. DNA agrees that there has been no significant change in priority of the DNA mission. Our concern, rather, is the "effective" priority has decreased because DNA takes a back seat to the in-house requirements of the computing center.

DNA has expressed the desire and need to exercise tighter control over the computer codes it pays to develop. It is realized that this will cause some impact to those contractors who develop similar codes, however, the economic benefits will exceed the effort required to ameliorate these potential problems. Furthermore, a concerted effort to restrict technology transfer to foreign nations dictates that DNA exercise a tighter code control program. DNA has long held the position that the U.S. does have a truly superior world position in terms of system predictive codes and computer applications, therefore, adequate program control is one of the strongest motives for a DNA-controlled facility. Considering the magnitude and sensitivity of DNA's Nuclear Weapons Effects R & D program, the management prerogatives inherent with a computer resource dedicated and controlled by DNA should receive primary recognition.

Page 25

"3. DNA's stated requirement is insufficient to warrant a separate computer. Their requirement is less than one full shift usage and would create an underutilized facility."

COMMENT: DNA has not requested a Delegation of Procurement Authority to purchase a computer. To the contrary, DNA does not want a computer. Having been unsuccessful in locating a reliable, long-term supplier, DNA had proposed to purchase the necessary computer services to meet FY 78 computer time projections of 125 CP hours. DNA considers that the services approach is superior to the alternative of purchasing a computer, primarily, because DNA cannot initially utilize the capacity of a total facility having the desired computational capability, i.e., CDC 7600/CYBER 176 configuration. If full utilization is the foremost consideration, then DNA can purchase services on the less capable CYBER 175 configuration. The cost for equivalent CP time as proposed is only slightly less. DNA estimates for its job mix, that due to efficiency and utilization factors, the 125 CP hours per month will require at least 2-1/2 shifts of available service on the CYBER 175.

Summary

The GAO review does recognize the reality of the DNA requirements and the difficulties of meeting these requirements. The GAO proposal to designate LBL as a Federal computer center does not solve DNA's problem. Without a significant increase in capacity at LBL it cannot provide the level of service that DNA demands and furthermore, no classified capability is planned. Designation terms of reference and sufficient computational expansion for LBL can probably not occur for at least two years once a decision is reached to make LBL a Federal computer center. As matters stand, DNA has no place to go in FY 79 that can offer a secure future. DNA does not foresee any reasonable alternative to that of initiating final action for procurement of computational services that would be dedicated and controlled by DNA. DNA's requirement still exists and becomes more critical with each passing month. DNA considers its Request for Services as the best method available for meeting the DNA requirement.

PRINCIPAL OFFICIALS
RESPONSIBLE FOR ADMINISTERING ACTIVITIES
DISCUSSED IN THIS REPORT

Tenure of Office

From

To

DEPARTMENT OF ENERGY

SECRETARY:

James R. Schlesinger	Oct. 1977	Present
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ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

ADMINISTRATOR:

Robert W. Fri (Acting)	Jan. 1977	Oct. 1977
Robert C. Seaman, Jr.	Dec. 1974	Jan. 1977

GENERAL SERVICES ADMINISTRATION

ADMINISTRATOR OF GENERAL SERVICES:

Joel W. Solomon	May 1977	Present
Robert T. Griffin (Acting)	Feb. 1977	May 1977
Jack Eckerd	Nov. 1975	Feb. 1977



Department of Energy
Washington, D.C. 20545

January 12, 1978

Mr. Monte Canfield, Jr., Director
Energy and Minerals Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Canfield:

Thank you for the opportunity to review and comment on the draft report, "Failure to Make the Lawrence Berkeley Laboratory a Federal Computer Center Would be Costly."

In the past, both the Energy Research and Development Administration (ERDA) and the Department of Energy (DOE) have met with the General Services Administration (GSA) to discuss designation of Lawrence Berkeley Laboratory (LBL) as a Federal Scientific Data Processing Center (FSDPC). At no time did DOE request postponement of discussions until 1978 as stated in the GAO draft (see Enclosure I - Greer letter to Carr, September 1977). At a September 1976 meeting, ERDA discussed with GSA the designation of LBL as an FSDPC and it was agreed that prior to proceeding with further discussions, an updated study was needed to verify the demand for computing services and provide a cost benefit analysis for the operation of LBL as an FSDPC. ERDA engaged an independent contractor, in consultation with GSA, to perform the study. The GAO draft report questions the validity of the contractor's findings because of inconsistent behavior on the part of one of the subcontractor's employees who participated in the study. (Enclosure II is a letter from the contractor pointing out what he believes to be factual inaccuracies in the GAO draft report regarding his study).

DOE again discussed the designation of LBL as an FSDPC with GSA in a September 1977 meeting and DOE has offered assistance to GSA in its review of the requirements for an FSDPC and the A-76 implications of such an action. We again reiterate our willingness to discuss this matter with GSA. However, we must also repeat the need for satisfactory resolution of the concerns we have previously expressed regarding DOE program priority. (Reference our letter, September 27, 1976, in response to the previous GAO report on this subject). DOE programs supported by computing services at LBL are critical to the accomplishment of the DOE missions and it is mandatory that these programs continue to be supported in a cost effective manner.

For example, new Energy Technology programs in geothermal development and nuclear waste disposal as well as continuing support to the Magnetic Fusion Energy program will require increasing support from the computing services

Mr. Monte Canfield, Jr.

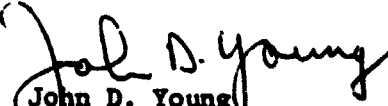
2

at LBL. Since the current demands for computing at LBL cause periods of saturation, as indicated in the GAO report, expansion of the LBL facility would be required to operate an effective FSDPC for the current users even without consideration of GAO projections for future years.

Accomplishment of the DOE missions has not been hindered to date by sharing at the LBL facility because DOE has maintained total management responsibility over the LBL facility and has not made long term commitments for its non-DOE use which could conflict with DOE mission needs at a later time. It is mandatory that DOE programs continue to be supported without any degradation of service or priority.

Furthermore, LBL is operated by the University of California, an independent contractor, and any change to the LBL contract, such as designation of the LBL computer facility as an FSDPC could only be accomplished with the agreement of the University of California. Enclosure III is an official written position by the University of California regarding designation of LBL as an FSDPC wherein they state that they are strongly opposed to designation as an FSDPC and they would not accept such a designation.

Sincerely,


John D. Young
Acting Controller

Enclosures:
As stated

September 19, 1977

(Enclosure I)

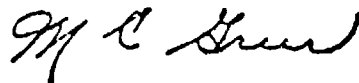
Commissioner Frank Carr
Automated Data and Telecommunications
Services
General Services Administration
Washington, D. C. 20405

Dear Commissioner Carr:

I enjoyed the meeting we had on September 16 regarding the designation of the Lawrence Berkeley Laboratory as a Federal Scientific Data Processing Center. I concur with your decision that before we proceed with discussions, GSA will first analyze the demand for such a center and then consider the A-76 implications of such a designation. I would like to repeat our offer of assistance and cooperation in performing these analyses.

If any questions arise in preparing the study plan, please let me know.

Sincerely,



M. C. Greer
Controller

QIS
INC.

(Enclosure II)

December 9, 1977

Mr. Ronald Schwartz
Director
Office of ADP Management
Department of Energy
Germantown, Maryland

Dear Mr. Schwartz:

In February, 1977, we conducted a study and prepared a report for ERDA entitled, "An Analysis of Important Factors in the Possible Designation of Lawrence Berkeley Laboratory (LBL) Computer Center as a Federal Scientific Data Processing Center (FSDPC)". GAO has recently conducted a follow-on analysis which has called into question the validity of our methods and findings. This letter is in response to the GAO report.

Our analysis had agreed with the findings of an earlier GAO study, that LBL was a cost-effective facility with outstanding technical competence. The question of potential demand for the services of such a facility can be stated in two fundamentally different ways:

1. Does any current or projected demand exist for large-scale scientific data processing, beyond the unused capacity of existing 7600-type computers operated by Federal agencies, which would be available for sharing?
2. If one data processing center, which is more cost-effective and technically competent than any other, has excess capacity available, is it likely that other Federal agencies would seek to use its services, in preference to sharing available time on other scientific data processing facilities?

In our original study, it was Question Number 1 which was addressed. We pointed out (in Chapter VII of that report) that sharing of excess time on existing government computers, such as that at Brookhaven National Laboratory was many times more economic to the government than the investment in added computing capacity, no matter how efficient.

(Enclosure II)

Ronald Schwartz - December 8, 1977

Two

GAO had two basic criticisms of our original study. First, that subcontractor, sometime after the completion of the study, participated in a business venture which aimed to establish a privately-operated facility in the Berkeley area, replicating the hardware and operating efficiency, to offer scientific data processing services to the Federal government. That is not, iori, a refutation of the findings of the report. It is merely possible to project sufficient demand to make such a business venture successful on the basis of Question Number 2 on the previous page. Even in an unsaturated market, the low-cost, quality producer can expect to draw substantial business away from his competitors.

The second criticism is summarized in the following part of GAO report:

"Rather than rely on the subcontractor's work, the consultant's project team contacted by telephone seven of the ten GSA regional offices to determine if there was a demand for Berkeley services. Based on these contacts, the consultant's project team reversed the position of its subcontractor and concluded that there was no unsatisfied demand for computer services. These telephone conversations were not documented or recorded. The GSA region where the Berkeley facility is located was not contacted because members of the project team believed this GSA regional office favored designating Berkeley as a Federal Center and, therefore, would not present a true picture of demand.

"We contacted GSA headquarters officials to find out if GSA regional offices are a good source of information on such a question. They said that the GSA regional personnel contacted would not know all or even most of the current or future data processing requirements in their region."

These points will be answered one by one:

"Rather than rely on the subcontractor's work..." and "Based on these contacts, the consultant's project team reversed the position of its subcontractor..."

Response. The subcontractor's work was not ignored, but was a significant part of the conclusions of the study. The study stated that there was no significant present demand (December 1976) for scientific data processing services which is not currently being met through sharing on other existing Federal installations. We said that the projected demand at LBL could

(Enclosure II)

Mr. Ronald Schwartz - December 9, 1977

Page Three

reach saturation any time from FY 1978 (Exhibit VI-2) to FY 1982 (Exhibit VI-1), depending upon which combination of all possible applications might actually be funded and utilize the LBL facility. The conclusion of the report was that the most probable time for saturation was around FY 1980. Those projections depended heavily on the findings of the subcontractor. It happened that he placed a higher probability on the early saturation alternative than others on the study team (who also visited the LBL Computer Center and talked with the members of its staff). Although the conclusion of the most probable point of saturation was stated to be FY 1980, the faster-saturation alternative was prominently displayed.

The next point made by GAO was, "...the consultant's project team contacted by telephone seven of the ten GSA regional offices to determine if there was a demand for Berkeley services... These telephone conversations were not documented or recorded. The GSA region where the Berkeley facility is located was not contacted because members of the project team believed that this GSA regional office favored designating Berkeley as a Federal Center and, therefore, would not present a true picture of the demand."

Response. These allegations are simply not factual. The telephone conversations were documented and were part of the working papers which were used to develop the final report. Not anticipating a detailed audit six months or more after the fact, we did not take sufficient care to preserve the working papers. Many, including those notes, were discarded along with earlier drafts of the report several weeks after the project was completed. The GSA San Francisco regional office was not included in the telephone contacts because the project team had an extended personal meeting with the members of that office while at the Berkeley site. Our project was discussed in detail, and the GSA officials made clear not only their support of the idea of an FSDPC at LBL, but also talked of their role in identifying Federal agencies who might desire to share time on the LBL computer. There was absolutely no thought or intent of bypassing that office for any reason. We stated in our report (p. II-2): "Under the current sharing mode, the utilization of the LBL facility is already high, due in part to the very effective job now being done by the San Francisco Regional ADTS Office in implementing the sharing program."

GAO Note: Reference that GSA San Francisco Regional Office was not contacted has been deleted.

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Finally, GAO stated, "(GSA officials) said that GSA regional personnel contacted would not know all or even most of the current or future data processing requirements in their region."

Response. We find this difficult to understand, in the light of GSA's own regulations, the Federal Property Management Regulations (FPMR). FPMR 101-32.203-1 states that,

"Federal agencies shall not initiate the process of selecting and acquiring ADP time or services from commercial sources unless it is first determined that the required ADP capability cannot be met satisfactorily by utilizing existing Federal ADP resources or established GSA mandatory contractual resources. Federal agencies shall first attempt to satisfy their ADP requirements by screening resources of other ADP units in their vicinity. If the result of the screening is unsuccessful, the requirement shall be referred to the appropriate ADP sharing exchange for assistance in locating suitable Federal ADP resources and in making the necessary arrangements for sharing." (underlining ours)

It was these ADP sharing exchanges that we contacted. Further, FPMR 101.32.4701-1 states,

"Reports (by Federal agencies) of sharing and of services obtained from a commercial source by ADP units shall be submitted on GSA Form 2068A to the appropriate ADP sharing exchange not later than the 15th of January, April, July and October of each year." (underlining ours)

Further, in submitting an Agency Procurement Request (APR) for new ADP equipment, each agency must include the statement:

"In accordance with the requirements of Subparts 101-32.2 and 101-32.3, Federal ADP resources have been screened and no ADP resources are available to satisfy the user's requirements." (FPMR 101-32.404)

If GSA is following the FPMR procedures, as we believe they are, then the ADP sharing exchange (in the regional offices) would be precisely the offices which would have the information on current unsatisfied demand which we were seeking. Moreover, the member of our project team who made those calls had, himself, formerly been on the staff of GSA in the data processing area. We believe he had the background and organizational understanding of GSA procedures to obtain the desired information in this manner.

GAO Note: Even though these regulations exist, GSA officials have stated that its regional offices would not readily know the demand for computer services.

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It should be pointed out here that the main thrust of our recommendations was not mentioned in the GAO review. Those recommendations are not dependant on which utilization pattern ultimately takes place at LBL and when the facility becomes saturated. They are critically important whenever the issue of an FSDPC is addressed, and should not be overlooked while projected utilization is debated. The report made these major points:

1. The establishment of an FSDPC, without the attendant expansion of the center, would produce no advantages which do not exist today. The disadvantages would be those of one more Federal agency (GSA) involved, no matter how remotely, in the operation of a center which performs superbly under its current single-agency management. Therefore, the designation of an FSDPC, if undertaken, should only be made contingent upon the delivery of the hardware necessary to accomplish the expansion. There is often a great lapse of time, and sometimes a total change in plans, between the initial intention to expand, and the ultimate commitment of budget dollars and the completed procurement.
2. If an FSDPC is established, coincident with the expansion of the present LBL Computer Center, the new capacity should be administratively separated from the original facilities (although they would operationally function as a single facility). The original facility and its existing client base, would remain the responsibility of DOE and LBL. The new capacity and its degree of utilization, would be the responsibility of GSA with DOE (LBL) providing the staff to operate the Center. This would accomplish the objectives of the FSDPC without interrupting DOE's use of the facility which it has developed.

We, obviously, cannot comment on the conclusions of GAO as to the current demand for services at the LBL Computer Center. However, we stand by our February, 1977, report as an accurate view of the situation at that time. We still believe that the recommendations discussed in the preceding paragraphs, and not the projected utilization levels, are the essence of how the future of the LBL Computer Center should be decided.

Sincerely,

McManis Associates, Inc.



Robert H. Marik
Principal Associate

(Enclosure III)

**Lawrence Berkeley Laboratory**

University of California
Berkeley, California 94720
Telephone 415/843-2740

January 3, 1978
DC 78-0001

Mr. John D. Young, Acting Controller
U.S. Department of Energy
Washington, DC 20545

Dear Mr. Young:

I am responding to your letter to me of December 17, 1977 in which you request that the University of California provide an official written position as to its willingness to have the Lawrence Berkeley Laboratory designated as a Federal Scientific Data Processing Center (FSDPC).

This proposal that the LBL Computer Center be designated a FSDPC has been reviewed by the managers of the Computer Center and upper management at LBL and we have a clear and definite position. The proposal is not, in our opinion, in the best interest of the Department of Energy nor of the Lawrence Berkeley Laboratory and we are strongly opposed to it. The Laboratory would not accept designation as a Federal Scientific Data Processing Center.

The reasons for the position are these:

- (1) The primary purpose of LBL is to do research and development activities for the Department of Energy as it has done for its 34 years of association with the Manhattan Engineering District, the Atomic Energy Commission, the Energy Research and Development Administration, and now the Department of Energy. More than 85% of its operating budget for FY-1978 comes from DOE to which it is committed heavily to execute programs in energy technologies, (fusion, geothermal, solar), in energy conservation, in energy policy, in environmental and biomedical research, in high energy physics, in nuclear physics, and in basic energy sciences.
- (2) The LBL Computer Center, originally organized to support high energy physics and nuclear physics, is an important support service to the whole range of DOE programs conducted by LBL. It is an absolutely essential part of LBL for the discharge of its research and development responsibilities to the DOE. The highest priority of the computer center is and must remain the provision of service to LBL programs for DOE which, in our view, can only be assured by LBL/DOE control of the Computer Center.

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- (3) The present work load of the Computer Center is approximately 80% for DOE programs and further needs for DOE are anticipated from new and expanded responsibilities. Among the most important of these are the heavy additional computing which will be associated with the Positron Electron Project (PEP) when experimental activities begin in 1980, and those associated with the National Resource for Computation in Chemistry (NRCC) which is just beginning operations at the LBL Computer Center under the sponsorship of DOE and the National Science Foundation.
- (4) The success of the LBL Computer Center is based on a secure base of support in DOE for hardware purchase and maintenance and the strong motivation of the staff, driven solely by the demands of the scientific users within LBL and free from obligations to serve others, to develop the capacity and service at the Computer to solve pressing scientific and engineering problems, and the preservation of this atmosphere in which creative work will occur. These factors have been crucial in achieving the high degree of successful operation which we now enjoy.

Thus in summary, we believe that the DOE must retain control of the LBL Computer Center in order to ensure the availability and maintenance of the quality of the Center for the needs of the DOE programs. All things considered, it is strongly in the national interest to leave it under its present management.

The above are sufficient reasons for the Laboratory's position.

There are additional reasons for our non-acceptance of the proposal to designate the LBL Computer Center as a FSDPC.

- (1) There are complex administrative and legal questions about the relationship of the FSDPC to LBL, the rest of the University and the DOE.
- (2) Loss of the staff morale and motivation because of diversion of purpose and relationships of the Center to the rest of LBL would probably destroy many of the features which make the LBL Computer Center so attractive today.
- (3) The uncertainties are great about support of the present hardware configuration and the purchase of extensive new computer equipment as well as provision of space within which to house an expanded facility.

(Enclosure III)

Mr. John D. Young

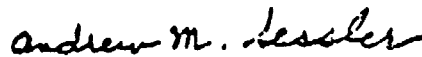
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I have expressed these views here in a short statement. It is a complex subject and I am available to provide more detailed justification of the conclusions, if that is necessary.

We at LBL are flattered by the strong statement of praise made by the GAO investigators about our Center and its service to many users in the 50 states of the Union. We plan to continue to supply some service to non-DOE users during the next year or two until the expanding DOE program computer requirements will saturate our capacity. DOE may wish, in light of the GAO Report, to encourage the Congress to establish a FSDPC at an institution or business firm whose main purpose is more in keeping with the aims of a FSDPC and whose staff would view it as a worthwhile challenge and hence be motivated to achieve a highly efficient computer service operation.

Yours sincerely,



Andrew M. Sessler
Director

AMS:mg

cc: President David Saxon (w/encls.)
Vice President C. O. McCorkle (w/encls.)