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D R A F T

PROPOSAL FOR THE DESIGNATION OF THE LAWRENCE BERKELEY LABORATORY AS A FEDERAL SCIENTIFIC DATA PROCESSING CENTER

I. Introduction

It is proposed that the LBL Computer Center be designated a Federal Scientific Data Processing Center (FSDPC) to provide general purpose computing services to federally supported scientific and engineering users. The FSDPC would be operated by the Laboratory within the framework of its existing AEC contract (W-7405-ENG-48), and under the auspices of an interagency agreement between the Atomic Energy Commission and the General Services Administration. (A draft of such an agreement is included with this proposal.) The Center would operate in accordance with the appended operating plan.

In the following paragraphs we consider the reasons for the establishment of such a center, for placing it within the AEC family, and for locating it at LBL. An informal paper urging the speedy designation of LBL as an FSDPC is included as part of this proposal.

II. Advantages of the FSDPC

The FSDPC will provide its customer agencies and contractors with the economies of scale that a large-scale computing facility provides to a single installation. These benefits take two forms: reduced costs for "traditional" computing, and the economical availability of new capabilities. The first of these, being easier to measure, is more

widely understood. It results from the fact that a more powerful computer requires less operational and programming support than an "equivalent" number of smaller computers. Furthermore, these economies are supplemented by Grosch's Law, which states that the increase in power (of a computer) is roughly proportional to the square of the increase in hardware cost. Thus even an installation with no new requirements, but simply a need to do more of the same, can benefit immensely from the availability of a large general purpose facility which provides inexpensive computing. The FSDPC will allow many small contractors to enjoy these economies of operation which are normally accessible only to very large installations.

Equally important is the more subtle advantage of the possibility of new or expanded capabilities. In the absence of a national utility like the FSDPC, those installations requiring a special service (extremely high-quality graphics, for instance) only occasionally or in small quantity can justify neither the independent acquisition of the necessary hardware nor the required software support. They must either pay high commercial rates to satisfy the requirement, or reduce the scope of the project, sometimes abandoning it altogether. The FSDPC will provide a mechanism through which several such small requests can be combined to provide a facility which all need but none can acquire individually.

As the government becomes more energy conscious, the pressure for resource sharing of this sort will continue to increase. An established FSDPC is the obvious channel through which to implement such sharing programs.

III. The AEC as Sponsoring Agency

The successful implementation of the FSDPC requires a sponsoring agency which understands large-scale computers and scientific computing, and with experience in the administration of national scientific facilities. The AEC is uniquely qualified on both counts. It was a pioneer in the application of large-scale computers to the problems of science and engineering, and remains a dominant force in the development of scientific computation. The AEC's experience in the procurement of large-scale computing systems, and in the administration of the installations which use them, is unparalleled.

The AEC is also no stranger to the administration of large-scale scientific facilities on a national scale: AEC accelerators have long been considered as national resources, and have been operated for the benefit of the whole of the scientific community. This experience, combined with the AEC's large-computer expertise, makes the AEC the most reasonable choice as sponsoring agency.

IV. The Location of the FSDPC at LBL

The FSDPC will be based upon a complex of large-scale computers, accepting much (if not most) of its workload from remote locations, either via remote batch submissions or through an interactive network. To be successful, it must be strongly user-oriented, treating its customers with respect, frankness, courtesy, and consideration, as well as being technically competent. The LBL Computer Center satisfies all of these criteria: it already supports one of the nation's largest remote batch

operations, providing access to both a 6600 and a 7600; it possesses a unique complement of peripheral equipment (including the photodigital store); it provides interactive access, both for file editing and program interaction; and it is widely known for the variety and quality of the service it provides to its users, both local and remote. Furthermore, LBL has already demonstrated that it can operate as a FSDPC in an effective manner: the current sharing program on the 7600 at LBL has already resulted in more than $10 million of savings to the Government.

V. Conclusion

One result of the increasing federal concern with energy and the environment will be increasing emphasis on programs to provide effective pooling of expensive resources. Large scale computing is such a resource, and federal data centers will be the pooling mechanisms. The establishment of a Federal Scientific Data Processing Center, under the auspices of the AEC, at the Lawrence Berkeley Laboratory will ensure that this important enterprise receives the experienced and competent guidance necessary to its success.