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Classification cancelled (or changed) (insert appropriate classification)

by authority W. B. Reynolds, DC 55-105

September 10, 1955

~~RESTRICTED DATA~~

THIS DOCUMENT CONTAINS 3 PAGES.  
THIS IS COPY 6 OF 6 SERIES A.

DOCUMENT NUMBER DC 55-1044

Mr. H. A. Fidler, Manager  
San Francisco Operations Office  
U. S. Atomic Energy Commission  
518 - 17th Street  
Oakland 12, California

Subject: Livermore Metallurgical Laboratory

Dear Mr. Fidler:

Although your request indicated that Washington was concerned about the economics of building such a laboratory we feel that there is much more than economics that recommend this project.

One of the most serious problems is the serious lack of fundamental metallurgical information on Plutonium. There are only a handful of people at LASL, Hanford, and Argonne working on basic research and much of this is directed toward reactor problems. Compared to the number working on say the metallurgy of copper, a very old element in terms of usage, they are insignificant. The critical importance of this material to our defense program means that we must increase this effort markedly. Especially for weapons. The following are some of the items which although very basic are unexplored.

- (a) Alloying of plutonium. Very little has been done in this field except at the low Pu concentration systems of interest to Reactor people. Practically nothing has been done at the high concentration end of interest to weapons.
- (b) Practically nothing is known as to how impurities or surface conditions affect the mechanical properties.
- (c) We have found a complete dearth of information on alpha phase Pu, which we need badly. Even such simple data as tensile strength is incomplete.
- (d) Data on chemical compounds of interest to the weapons program is very sketchy.
- (e) Studies of corrosion inhibiting compounds are unavailable.
- (f) A great deal must be learned about fabrication techniques such as bonding, making of thin shells, etc.

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BY AUTH. TCG-WM-1

DATE 10-10-91

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Mr. H. A. Fidler

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The above statements are meant to indicate that such facilities are in serious demand and that Livermore will not be a duplication. The Livermore Laboratory is not intended to be a competitive facility but rather a laboratory closely integrated with the Livermore weapons program to do the kind of work that cannot be successfully done elsewhere because of distance and other interests. The following are some of the main points in this regard.

- (a) To effectively maximize the use of plutonium in weapons (efficiency, etc.) the group must be a part of the laboratory. In this way only can they on their own initiative see problems, investigate them and make suggestions in weapons design.
- (b) Only by being a part of the laboratory can they have enough detailed knowledge of Livermore weapons design to know what compromises can be made in last minute changes, or what the effects of a partly damaged or undersize part might be. These are critical items in a very tight schedule as between shot changes. Where perhaps two weeks is all that is available for fabricating or developing new parts.
- (c) Only by being part of the laboratory can a real push be put on to make a between shot change. Getting another laboratory to go on a twenty four hour seven day per week schedule just takes too long because of divided loyalty and reporting responsibility.
- (d) Only by being a part of a weapons laboratory can you successfully test integral weapon parts for a weaponizing program. An extreme example would be environmental testing of combination assemblies of high explosives and plutonium parts.
- (e) Only by being a part of a weapons laboratory could you repair a torn can or trim an oversize piece or make a cut in a piece as a last minute change.

The above items deal only with the more nebulous matter of getting an effective job done on schedule. Getting down to the core of your question, there are some very pressing hard dollar and cents reasons for such a laboratory.

- (a) Probably the most emphatic is the additional amount of money it would cost when the inability to do the above work forces reopening of NTS for a special repeat shot. This would cost from 3 to 6 million dollars.
- (b) More intangible but nevertheless real is the stretching out of a development program for a year or more to wait for the next test operations. This could cost several million dollars.
- (c) Another important economical consideration is the potential saving in plutonium by increases in efficiency. A ten per cent increase in efficiency in a weapon could save tremendous amount of money in production costs.

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Mr. H. A. Fidler

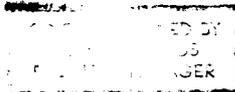
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It will be noted that at least part of the dollar savings is in the ability to wait before freezing design on critical parts. We have found through long experience that no matter how much effort goes into trying to rush something through there is nevertheless a certain period of time consumed in convincing people that it is important; hence delays in the schedule.

A by-product saving is the ability to process our own reclaimed material. This will reduce the required inventory by 30% to 50% or conversely allow reuse of material so the program is not suffering from shortages. This is a real dollar saving.

We feel strongly that this building is essential to our weapons program. It is the more important if the weaponizing will be done locally. Dr. Kenneth Street will be in Washington starting Monday and will discuss this with DMA (Starbird and Anthony).

Very truly yours



W. B. Reynolds  
Business Manager

WBR:mas

cc: York/Sewell  
L. O. Viales  
DC File ✓

Distribution:

- c 1 & 2 H. A. Fidler
- 3 York/Sewell
- 4 L. O. Viales
- 5 ~~K. Street~~ Col. A. D. Starbird
- 6 DC File

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October 6, 1955

Colonel A. D. Starbird, Director  
Division of Military Application  
U. S. Atomic Energy Commission  
1901 Constitution Avenue  
Washington 25, D.C.

Dear Colonel Starbird:

This will be your authorization to upgrade the classification of our document DC55-1044, dated September 10, 1955, addressed to H. A. Fidler from W. B. Reynolds, from Confidential to Secret Restricted Data.

The documentation should be noted as follows:

c 1 of 6/A H. A. Fidler  
c 2 of 6/A H. A. Fidler  
c 3 of 6/A York/Sewell  
c 4 of 6/A L. O. Viales  
c 5 of 6/A A. D. Starbird  
c 6 of 6/A DC File

Enclosed is a set of receipts for this document which will serve as your certification of the upgrading.

Copy 5 was originally issued to Kenneth Street, but it is our understanding that he delivered it to you personally.

Very truly yours,

W. B. Reynolds  
Business Manager

WBR:MHA  
Enc

bc: Kenneth Street

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