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101451

LOS ALAMOS SCIENTIFIC LABORATORY
(CONTRACT W-7405-ENG-36)
P. O. Box 1663
LOS ALAMOS, NEW MEXICO

IN REPLY
REFER TO:

DIR

22 September 1953

US DOE ARCHIVES
326 US ATOMIC ENERGY
COMMISSION

Brig. General K. E. Fields
Director of Military Application
U. S. Atomic Energy Commission
Washington 25, D. C.

DIVISION OF MILITARY APPLICATIONS
Collection

Box 3772

Folder MRA 7 Castle, Vol. 2
June - sept. 1953

Dear General Fields:

As you are aware, extended discussions regarding the CASTLE operation took place at the Los Alamos Scientific Laboratory on 17 and 18 September between representatives of Holmes and Narver, the Eniwetok Field Office, the Santa Fe Operations Office, the San Francisco Operations Office, the Radiation Laboratory (Livermore), the Oak Ridge Operations Office, Carbide and Carbon Chemicals Company (ADP Plant), Joint Task Force 7, the Los Alamos Scientific Laboratory, and your office. As the result of these discussions, conclusions were reached regarding the proposed content and schedule of the CASTLE program which it is the purpose of this letter to report.

The LASL proposes to test at CASTLE four thermonuclear systems of which certain details are given in Appendix I. These systems are as follows:

A.

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Reviewed by Carl Wilson 10/30/84
DATE
Ray Bager 12/6/85

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C.

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It will be noted that the LASL program as presented here differs slightly from earlier prognostications which have generally anticipated the test of or unenriched LiD, thermonuclear system. A number of developments have led us to the conclusion that, within a framework of four experiments, the experiment provides more important and useful information than experiment. Our reasons for this opinion are summarized below.

a.

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The Radiation Laboratory (Livermore) proposes to test at CASTLE the two radiation implosion devices, namely [redacted] and the [redacted], which they have described elsewhere. The total CASTLE program thus remains at six shots. The schedule of these six shots was established, after a thorough review of the status of construction at Eniwetok-Bikini, the rate of availability of Li⁶, the design and fabrication status of the test shots, and the logistic problems of the Task Force, as follows:

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March 1, 1954 -

March 11 -

March 22 -

March 29 -

April 7 -

April 14 -

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Pre-eminent among the factors which have led to the adoption of this schedule are the following:

1. The construction program at Eniwetok would require joint occupancy of test structures by the contractor and by scientific personnel for at least two weeks before shot date if an earlier schedule were to be attempted. Such joint occupancy (e.g. wiring going in by the contractor at the same time electronic equipment is being tested by scientific personnel) is believed to be completely impractical. From a security point of view, it is most undesirable to have construction workmen present during weapon assembly and placement operations. The proposed schedule eliminates (or minimizes) such joint occupancy.
2. The supply of Li⁶ for the proposed experiments should be complete (according to present predictions) for the proposed schedule at least 50 days in advance of actual shot date. Approximately 40 days is regarded as minimal time for shipment, fabrication, local assembly and test, overseas shipment by air, and assembly and test overseas. The proposed schedule allows a slight degree of freedom in this respect.
3. The proposed schedule will permit the Task Force to send the major portion of its personnel overseas immediately after Christmas rather than sometime before. This is a matter of some concern to the Task Force Commander for obvious reasons of morale. It will also permit a considerable degree of logistic simplification, particularly with regard to the shipment of certain construction materials for the contractor.

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Airlift requirements in the weeks after 1 January 1954 are extremely heavy and it is not obvious that MATS can satisfy these requirements. The proposed schedule will ease this problem.

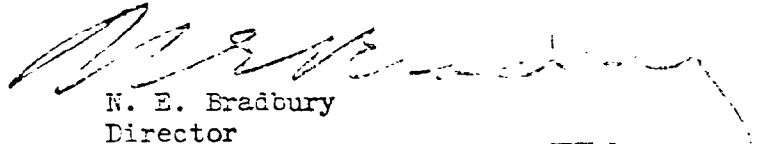
4. Design, fabrication, assembly, and local test of both the proposed IASL and Livermore devices can probably meet the above schedule unless presently unforeseen delays are encountered. Similarly, the diagnostic experimentation will probably be ready by these dates. Earlier dates would be extremely problematical in terms of actual accomplishment.
5. To attempt to meet earlier dates and then postpone at the last minute is wasteful of time, money, and logistic effort. The present schedule represents the best proposal which can be made at this time for the earliest practicable schedule which can be met if no unforeseen difficulties are encountered.

We have attached to this letter as appendices (1) a table of the general character and requirements of the proposed IASL devices, as well as some additional general information on other weapon systems which may be of interest for comparison; and (2) a somewhat revised production schedule for the emergency capability period based upon the inclusion of the ~~XXXXXXXXXXXX~~ only in the CASTLE test program. Although the active material requirements for these tests are fairly precise, it may be well to postpone the specific request to higher authority for permission to expend these materials until the exact amounts have been determined.

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Very truly yours,


N. E. Bradbury
Director

1A, 2A - Brig. Gen. K. E. Fields
3A - N. E. Bradbury File

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APPENDIX I

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APPENDIX (2)

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Omitting the [REDACTED] from the CASTLE series suggests a revision in the production schedules for the emergency capability program. In considering this change, it should be remembered that the major mechanical parts for the [REDACTED] are essentially identical and thus an enriched [REDACTED] could be introduced into the program after CASTLE with comparative ease.

The proposed production plan is based upon the following assumptions:

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4. Delivery of units (E.C., practice, flight and drop) to begin in January, 1954.
5. Delivery of the first set of field assembly equipment for assembly teams in January 1954, not later than delivery of the first E.C. unit.

Table I shows the monthly rate of deliveries to stockpile and development work as well as the cumulative numbers in stockpile. The numbers of units opposite each month are those delivered in that month.

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TABLE I

	Flight and Drop	Emergency Capability	Total Per Mo.	Cumulative Emergency Capability
JAN.				
FEB.				
MAR.				
APR.				
MAY				
JUNE				
JULY				
AUG.				
SEPT.				

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*Includes 2 practice units.

Such a table would be followed during this period if the results of CASTLE indicate a satisfactory behavior of both [redacted]. It gives an a priori preparedness for both a wet and a dry weapon, as well as capabilities for both a cheap and an expensive (in terms of scarce materials) system. Presumably, if successful and if wanted in larger numbers, [redacted] could be made in whatever greater numbers the fabrication facilities involved would permit.

There remains the possibility that the [redacted] shows unsatisfactory behavior and that it is not desired to put Li⁶ into this emergency capability system. On this basis, it could be recommended that the 95% Li⁶ produced up to that time be stockpiled for future use in [redacted] similar systems, and that the ADP plant immediately revert to the production of 40% material which could be used for [redacted] whose behavior is certain to be satisfactory if [redacted] satisfactory, and which in any case will give higher yields than similar systems of no enrichment. Table II shows the production schedule which would result if CASTLE should suggest by 1 May 1954 the advisability of making [redacted] rather than [redacted]. Alternatively, more [redacted] could be recommended for production and 95% Li⁶ continued in production and stockpiled for use in systems such as the [redacted].

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TABLE II

	<u>Flight and Drop</u>	<u>Emergency Capability</u>	<u>Total Per Mo.</u>	<u>Cumulative Emergency Capability</u>
MAY				
JUNE				
JULY				
AUG.				
SEPT				

It may finally be noted that if case difficulties interfere with the successful performance of both the [REDACTED] then the [REDACTED] would certainly not have worked and we would have to face the fact that there would be no emergency capability in this field because of the 50,000 lb. weight limitation.

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APPENDIX I

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