

NW 972006A
By DM/LR Date 7/18/05

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CLASSIFICATION: ~~TOP SECRET~~
BY AUTHORITY OF: Marshals (C) Class. 2-14-74
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SECURITY INFORMATION

AEC 597/23

October 1, 1953

COPY NO. 1

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ATOMIC ENERGY COMMISSION

CASTLE PROGRAM

Note by the Secretary

1. The attached report by the Director of Military Application is circulated for consideration by the Commission at an early date.

2. The CASTLE program will be discussed at the AEC-MLC conference scheduled for 2:00 p.m., Thursday, October 1, 1953.

AEC 597/23

ROY B. SNAPP

Secretary

REPOSITORY: NARA - College Park
RG 326 AEC SECRETARY
COLLECTION: 1951-58

208 Classified
MRA 7 CASTLE

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1ST REVIEW DATE: <u>01/10/02</u>
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AUTHORITY: <u>28 CFR 1.55</u>
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WITH ATTACHMENT(S)	
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NW 972006A
By DM/LR Date 7/18/05

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This document consists of 26 Pages

Copy No. 1 of 20 Series A

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By authority of U.S. Atomic Energy Commission

Per Sup. Gen. K. E. Fields R.B. Cook Date 10-1-53

Document Number LXI-2413-1A

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SECURITY INFORMATION

ATOMIC ENERGY COMMISSION

CASTLE PROGRAM

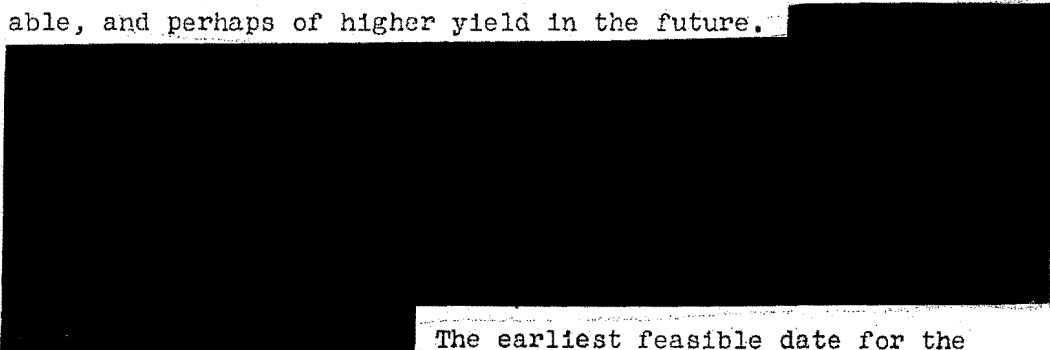
Report by the Director of Military Application

THE PROBLEM

1. To determine the scope and timing of Operation CASTLE.

SUMMARY

2. Operation CASTLE embraces both short-term and long-term goals for the thermonuclear program. The short-term goal is to prove in an emergency capability with one or more thermonuclear weapons currently being engineered for production and delivery. The long-term goal is to test new designs which should lead to thermonuclear weapons that are smaller, lighter, more deliverable, and perhaps of higher yield in the future.



DOE
6.1(a)

The earliest feasible date for the start of the CASTLE tests is March 1, 1954. The CASTLE program recommended is believed to be the maximum practicable program.

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RECOMMENDATION



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6.1 (a)

b. Approve the scheduling of the first CASTLE test for March 1, 1954, the sequence, exact dates, and locations of the various tests to be determined by the Commander of the Joint Task Force Seven in conjunction with the Los Alamos and UCRL-Livermore Laboratories.

c. Note that copies of this staff paper will be forwarded with a memorandum such as that in Enclosure "D" to the Chairman of the Military Liaison Committee, requesting concurrence by the Department of Defense in the scope and timing of the CASTLE program.

d. Note that the Joint Committee on Atomic Energy and the General Advisory Committee will be advised of this action by appropriate letters.

LIST OF ENCLOSURES

ENCLOSURE "A"

Background, discussion, and conclusions

ENCLOSURE "B"

Letter of September 22, 1953, from Los Alamos

ENCLOSURE "C"

Letter of September 21, 1953, from UCRL-Livermore

ENCLOSURE "D"

Draft Memorandum to the Chairman, MLC

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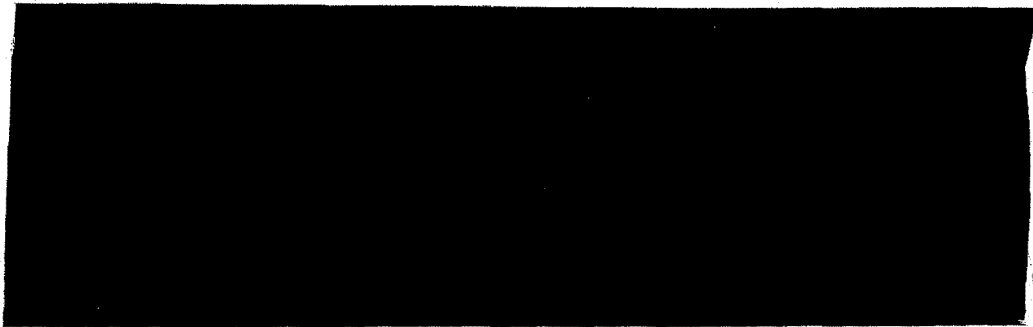
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ENCLOSURE "A"

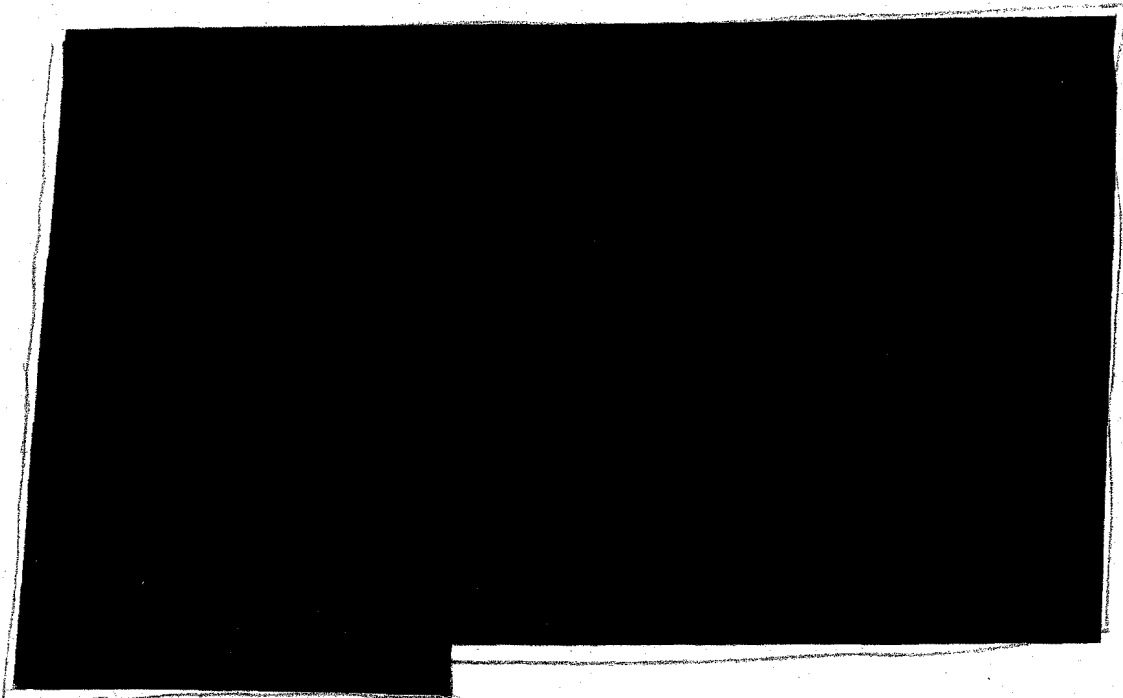
BACKGROUND, DISCUSSION, AND CONCLUSIONS

BACKGROUND



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6.1(a)

The MLC advised of concurrence by the Department of Defense in a letter of July 3, 1952 (AEC 493/8). The possibility was envisaged at that time that other radiation-implosion devices might be included in the test operation.



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6.1(a)



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6.1(a)

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[REDACTED]

DOE
6.1(a)

In order to accomplish this program, Los Alamos recommended that CASTLE be held in the Spring of 1954.

[REDACTED]

DOE
6.1(a)

By letter of January 2, 1953 (AEC 597/7) the Commission proposed to the MLC that CASTLE be held as early in 1954 as technical progress permitted, and by letter dated January 19, 1953 (AEC 597/11) the MLC advised of Department of Defense concurrence.

[REDACTED]

DOE
6.1(a)

The latter would have a better chance of success and would give a higher yield, but would be dependent on lithium-6 production. Meanwhile, in the Spring and Summer of 1953, the Air Force indicated the importance of reducing the weight of thermonuclear weapons for delivery by the B-47, a medium bomber being produced in large numbers, and for delivery by the Hustler, a new medium bomber under development.

[REDACTED]

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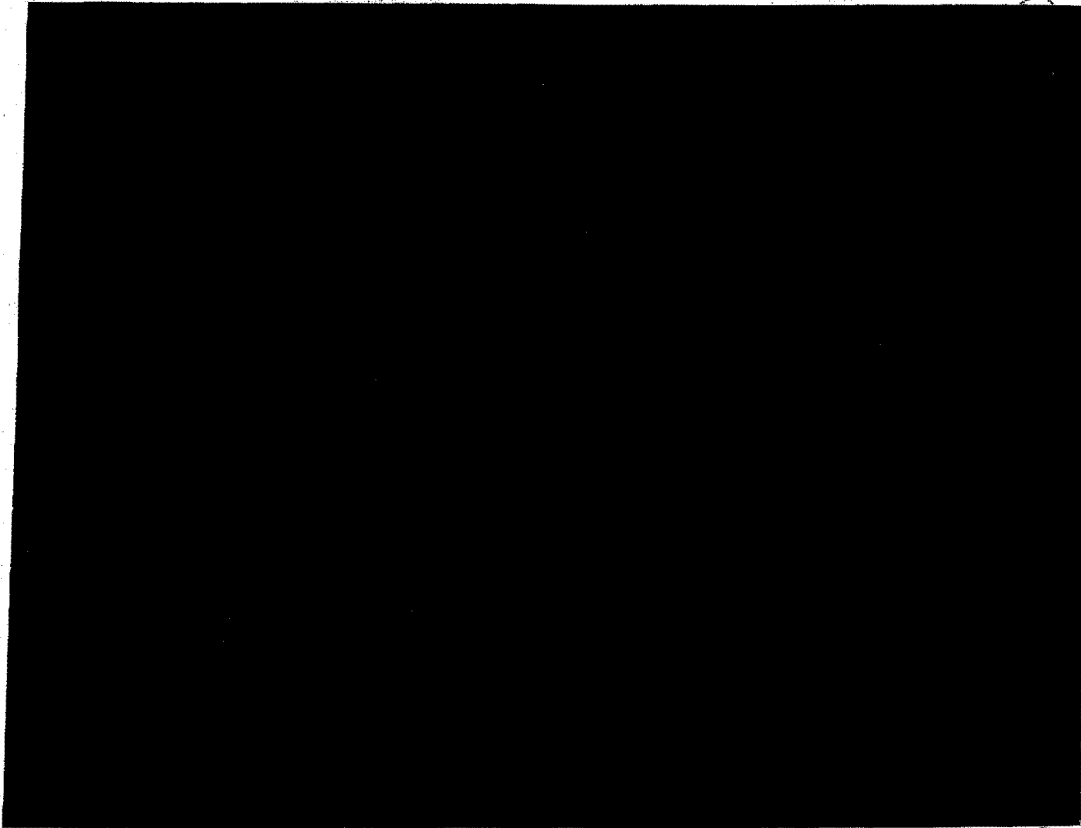
5. The program for thermonuclear development, testing, and emergency capability have been going forward with great emphasis and speed. The importance of these programs is increased by the fact that the Soviet Union conducted an atomic test on August 12, 1953, that involved both fission and thermonuclear reaction.

DISCUSSION

6. Following a meeting on September 17, 1953, at Los Alamos among representatives of the Atomic Energy Commission, Los Alamos, UCRL-Livermore, Oak Ridge, and Joint Task Force Seven, proposals for the CASTLE tests were formally submitted by Los Alamos and UCRL-Livermore and are attached as Enclosures "B" and "C".




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6.1(a)



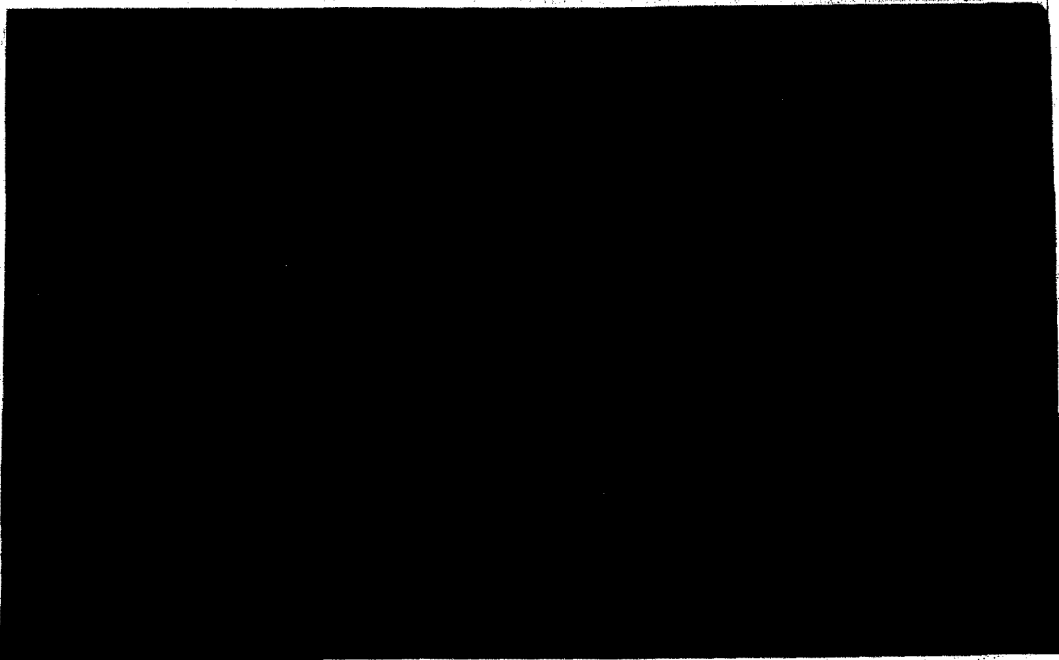
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 This is particularly important since the present situation indicates a large military requirement for emergency capability weapons soon after CASTLE.

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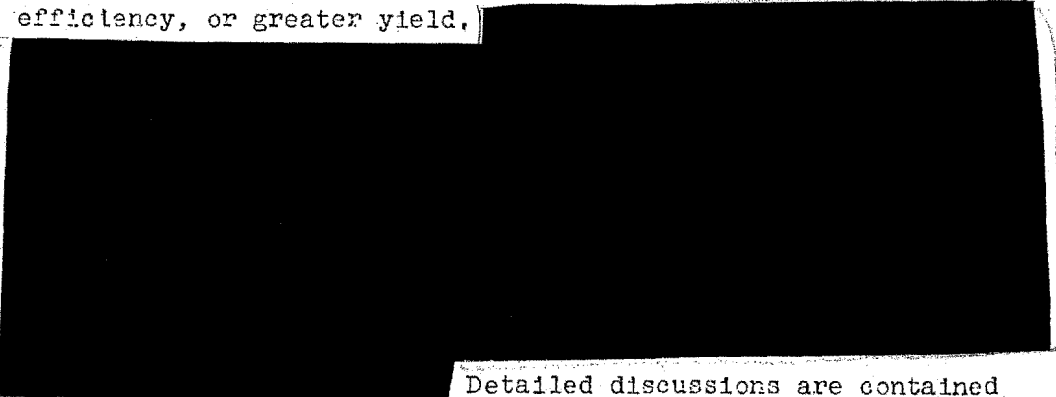


DOE
6.1(a)



DOE
6.1(a)

The goal is to obtain data which will enable the next generation of thermonuclear weapons to be of smaller size, lighter weight, higher efficiency, or greater yield.



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Detailed discussions are contained in Enclosures "B" and "C".

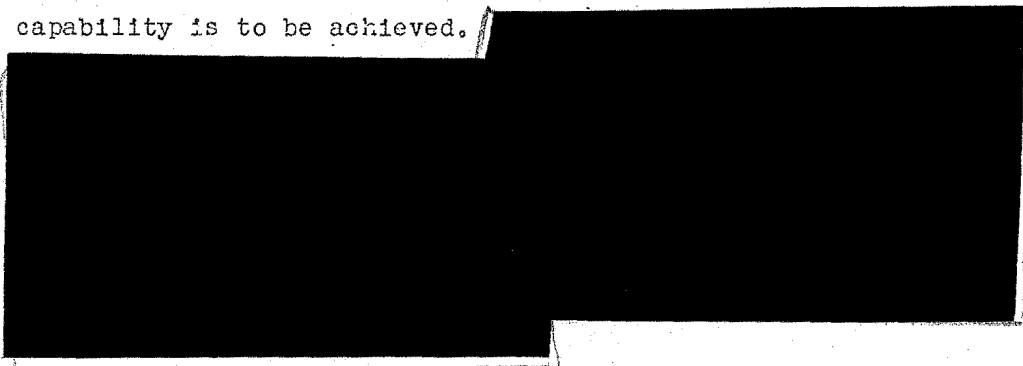
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10. In regard to the timing of the CASTLE Operation, Los Alamos proposes in Enclosure "B" that March 1, 1954, be set as the target date for the first test. This is based on the rate of supply of lithium-6, the time required for fabrication, shipment, and assembly of weapon components, and the schedules for construction of test sites and installation of equipment at Bikini and Eniwetok. Although there is no one phase of the preparations which prohibits the start of CASTLE a little earlier, every phase is so tight that March 1 seems the best target date to set for the initial detonation. Tentatively establishing a less realistic date would lead to confusion in planning and conducting the operation and would probably not result in an earlier successful completion of the operation.

11. Scheduling the date of the first CASTLE test for March 1 does not adversely affect the time when the first emergency capability is to be achieved.



DOE
6.1(a)

12. Consideration was given to limiting the CASTLE program to a maximum of four shots and deferring the remaining tests to a later operation. While this would be favorable from the point of view of simplifying and shortening the CASTLE Operation, it would not be consistent with the maximum effort toward thermonuclear progress. It would also involve greater expense inherent in two separate operations.

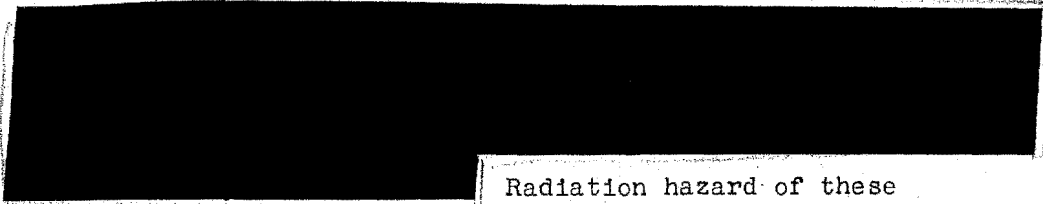


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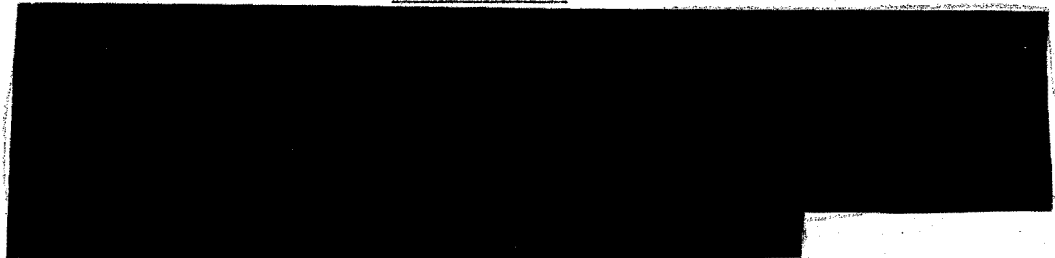


DOE
6/10/54

Radiation hazard of these over-water shots appears sufficiently low to permit firing at the close time intervals anticipated. The instrumentation mounted on the islands could, if not damaged, service three shots probably as well as two.

13. The CASTLE program recommended in this paper is believed to be the maximum practicable program. It covers all available possibilities for providing an emergency capability and should furnish an excellent basis for the future development of thermonuclear weapons.

CONCLUSIONS



DOE
6/10/54

15. Any alternative plan such as postponing a portion of the shots until the Fall of 1954 would be wasteful, costly, and harmful to either the immediate "emergency capability" program or future progress in the field of thermonuclear weapons.

16. The magnitude and complexity of a seven shot program is not to be underestimated, but must be reconed with in view of the importance of thermonuclear weapon progress. It therefore appears ill-advised to consider anything short of a maximum effort for the CASTLE program.

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17. For the above reasons the Division of Military Application concludes that the CASTLE Operation should be planned to include seven test shots rather than six as proposed by the Laboratories in Enclosures "B" and "C".

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Enclosure "A"

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ENCLOSURE "B"

UNIVERSITY OF CALIFORNIA
Los Alamos Scientific Laboratory
P.O. Box 1663
Los Alamos, New Mexico

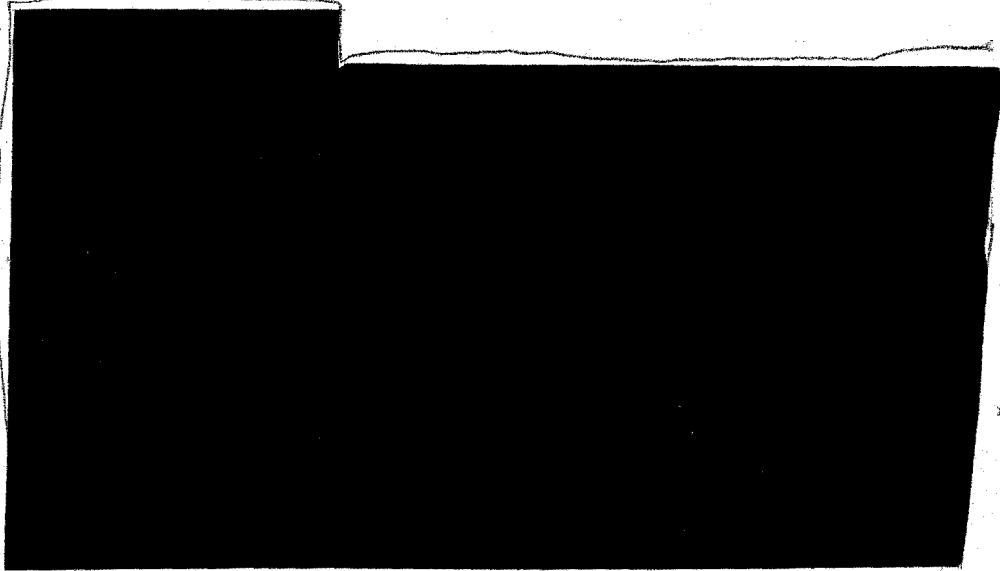
22 September 1953

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

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:



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[REDACTED]

DOE
6.1 (a)

C.

[REDACTED]

DOE
6.1 (a)

Particular attention has been devoted to radical weight reductions in the case and the test will throw light on the validity of these modifications.

D.

[REDACTED]

DOE
6.1 (a)

[REDACTED]

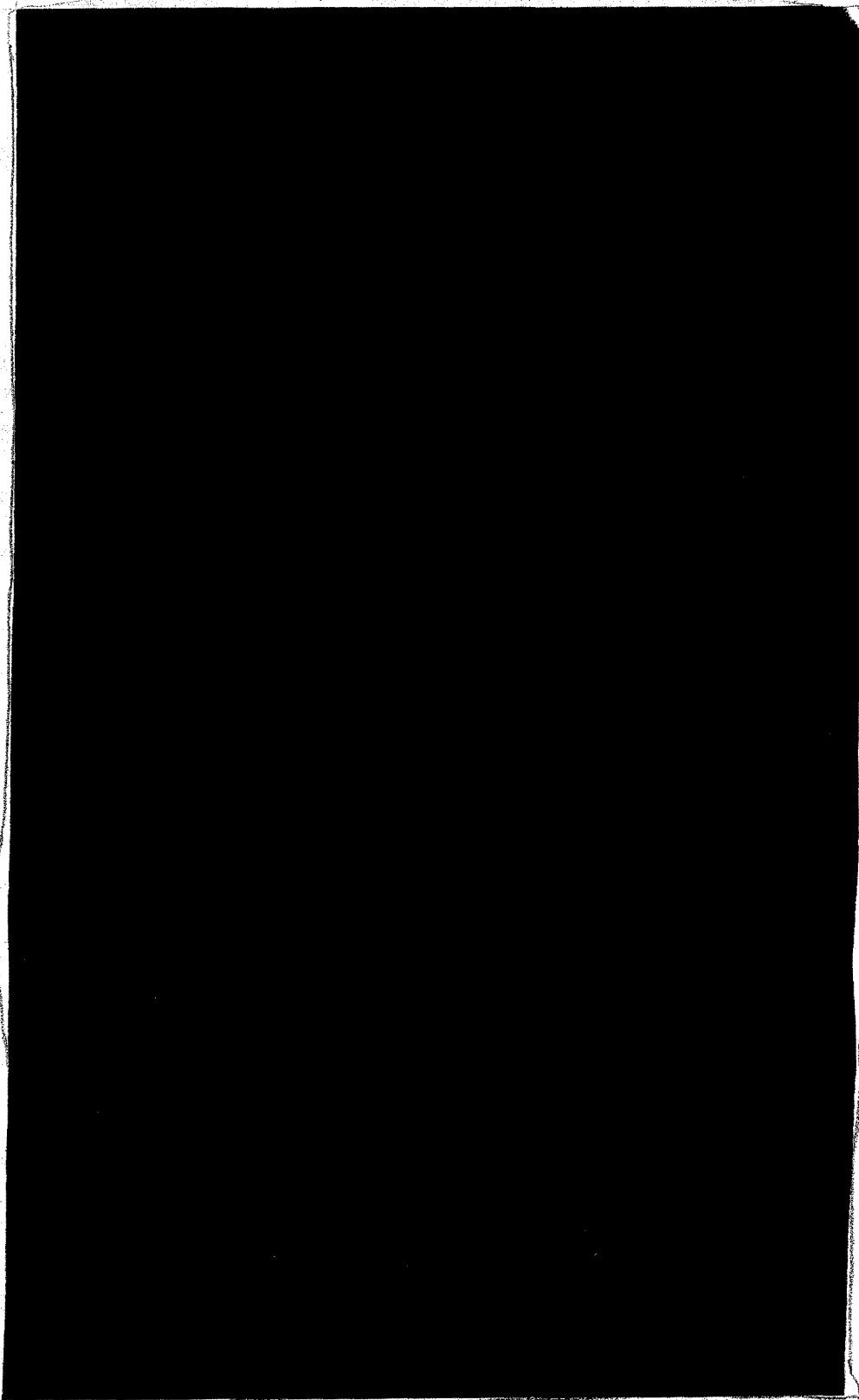
Our reasons for this opinion are summarized below.

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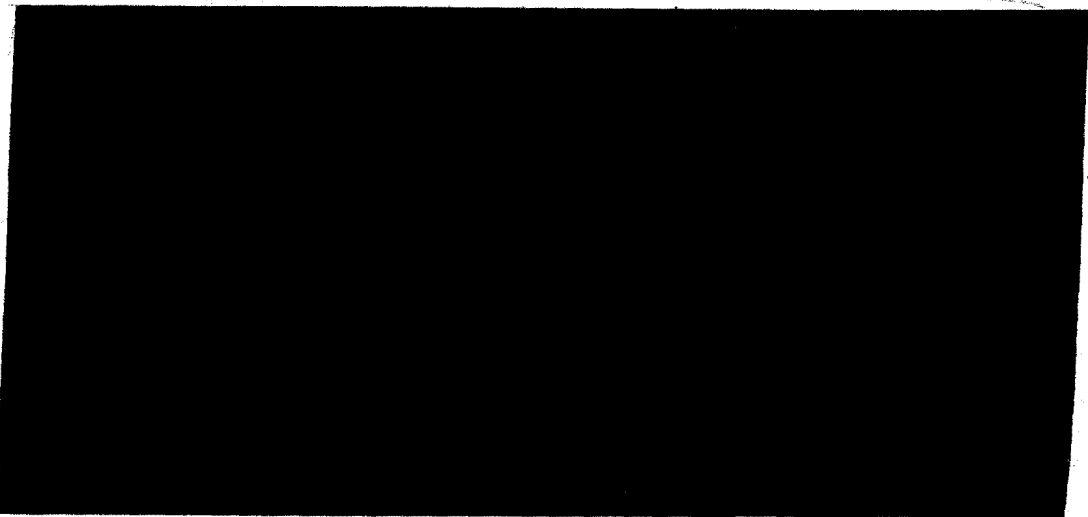
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DOE
6.11(a)

To provide the latter alternative, the emergency capability program will be given sufficient flexibility to permit such a choice after CASTLE.



DOE
6.11(a)

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

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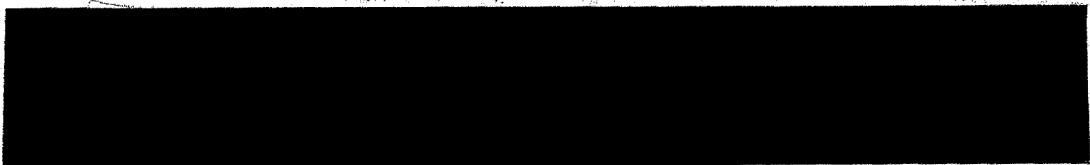
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to the shipment of certain construction materials for the contractor. Airlift requirements in the weeks after 1 January 1954 are extremely heavy and it is not obvious that MATS can satisfy these requirements. The proposed schedule will ease this problem.

4. Design, fabrication, assembly, and local test of both the proposed LASL 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.



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6. (a)

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.

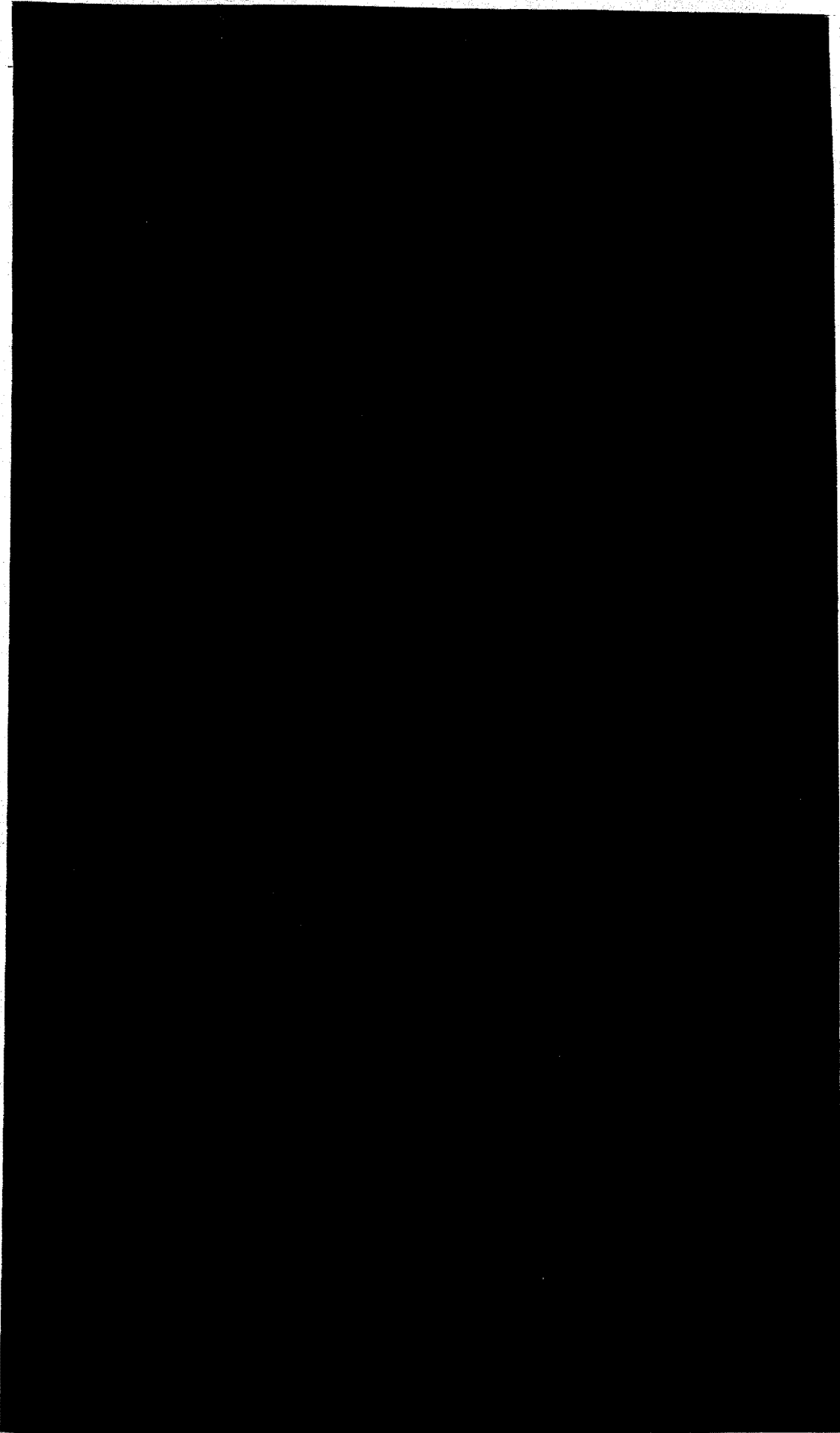
Very truly yours,

/s/

N.E. Bradbury
Director

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Dec 6/1979

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APPENDIX (2)


The proposed production plan is based upon the following assumptions:

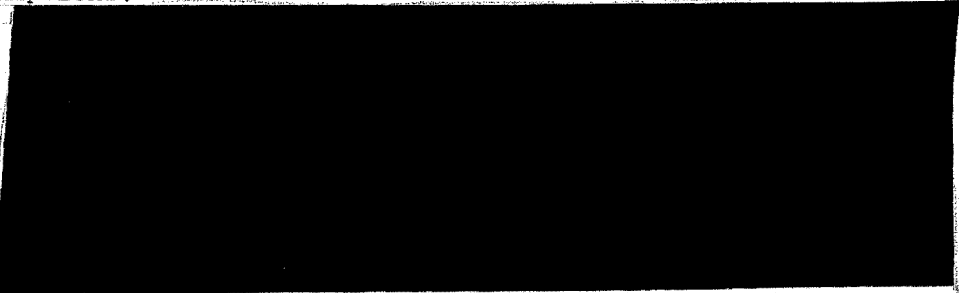

5. Delivery of the first set of field assembly equipment for assembly teams in January 1954, not later than delivery of the first E.C. unit.

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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6.1a

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TABLE I



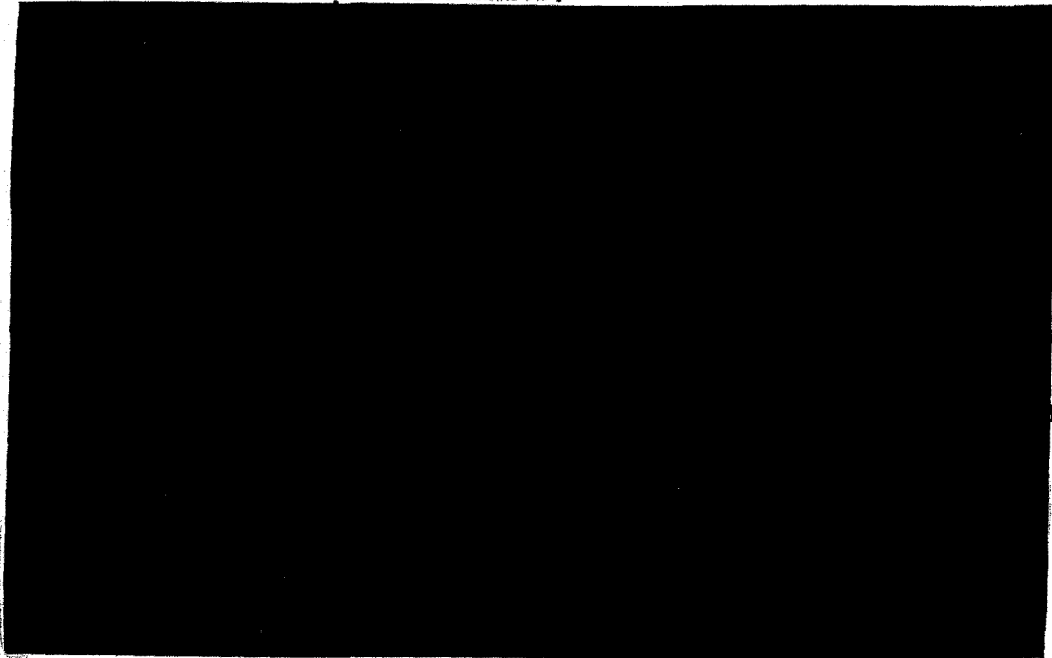
DOE
6.1(a)

- JAN.
- FEB.
- MAR.
- APR.
- MAY
- JUNE
- JULY
- AUG.
- SEPT.

Note:

The key to this table is filed in the "Weapons Requirements" folder, under date of October 1, 1953, in the SPECIAL safe.

*Includes 2 practice units.



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6.1(a)

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TABLE II



DOE
6.1(a)

MAY

JUNE

JULY

AUG.

SEPT.



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ENCLOSURE "C"

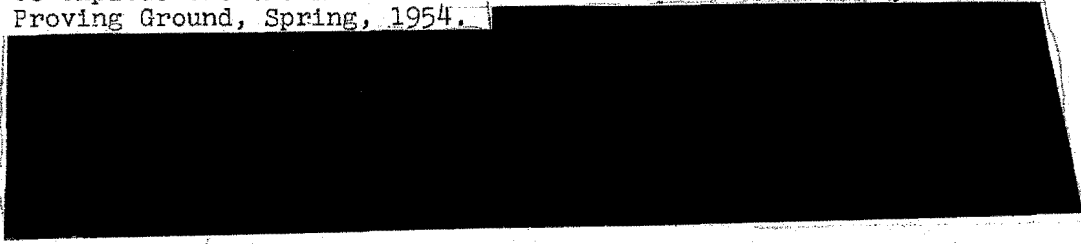
UCRL-LIVERMORE LABORATORIES

September 21, 1953

General Kenneth E. Fields, Director
Division of Military Application
U. S. Atomic Energy Commission
Washington, D. C.

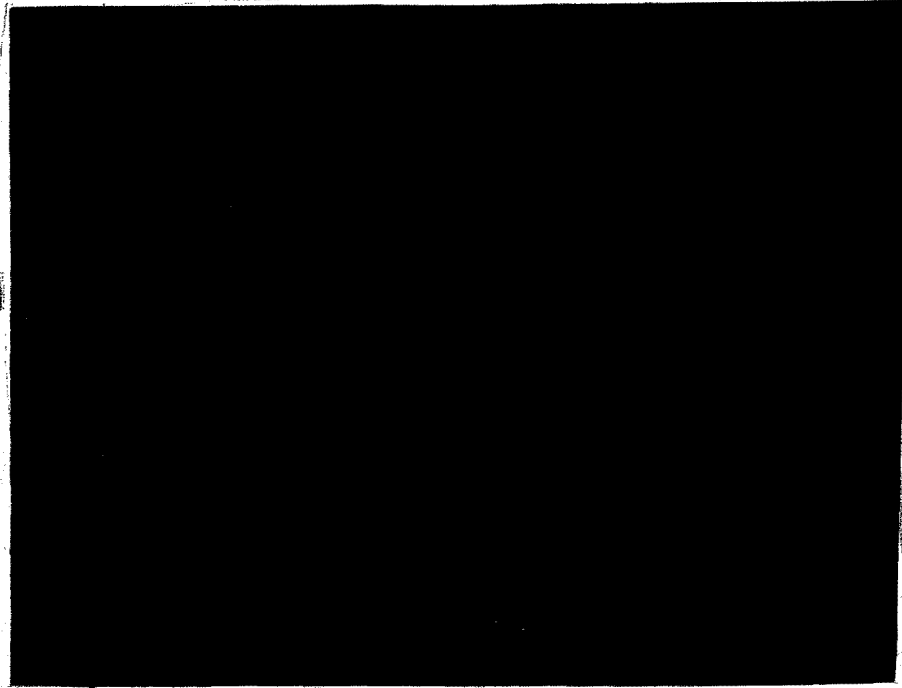
Dear General Fields:

The University of California Radiation Laboratory proposes to explode two thermonuclear devices at Operation Castle, Pacific Proving Ground, Spring, 1954.



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I. Design



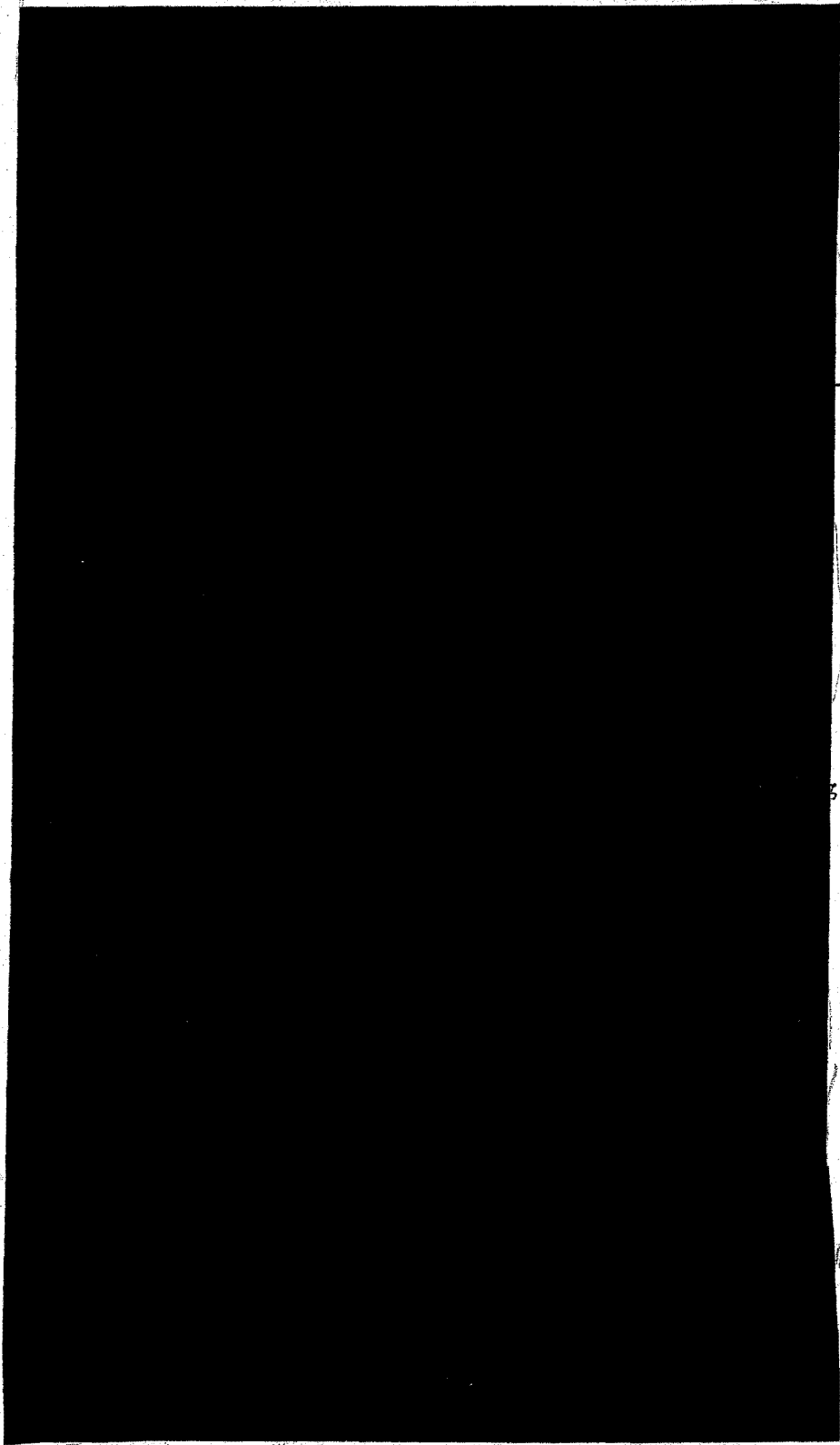
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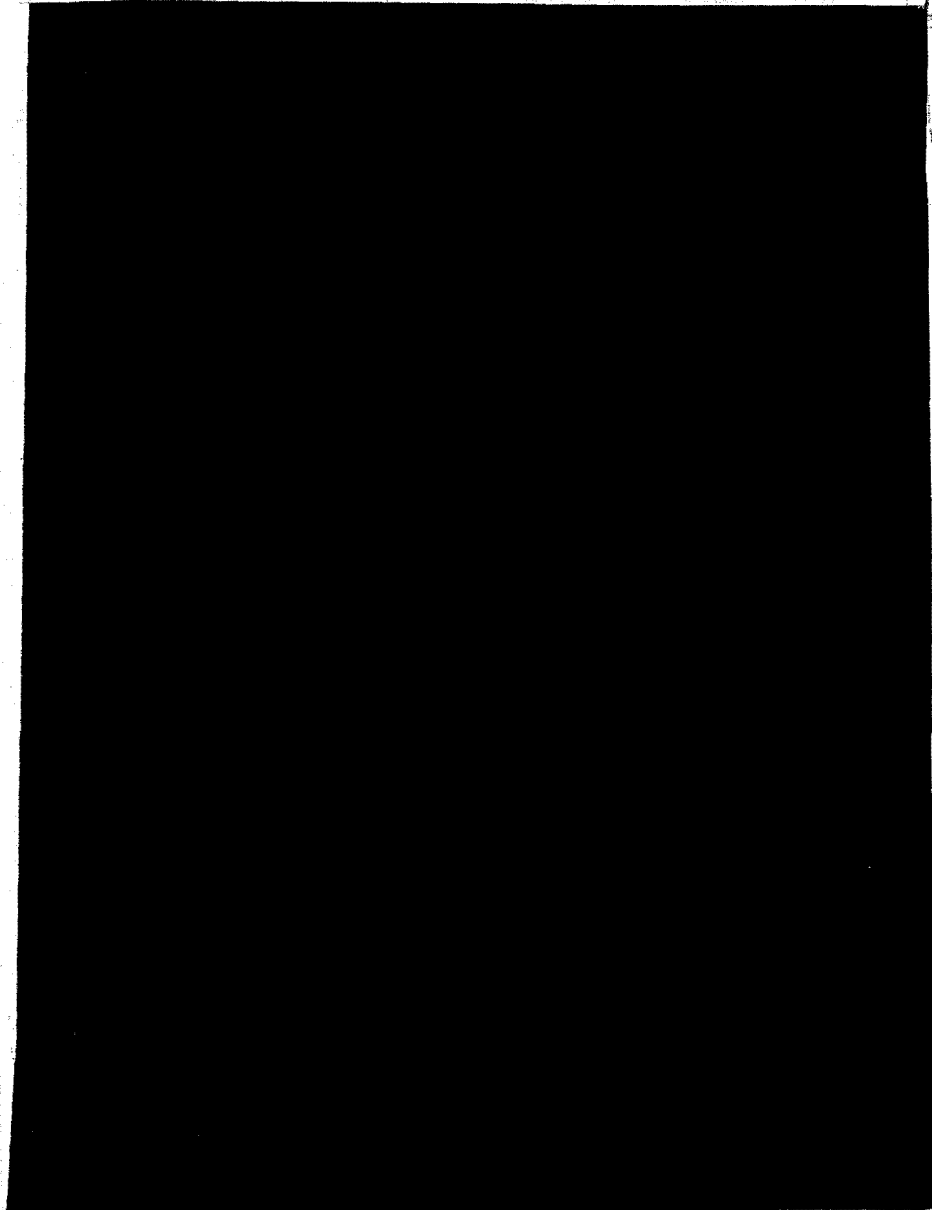
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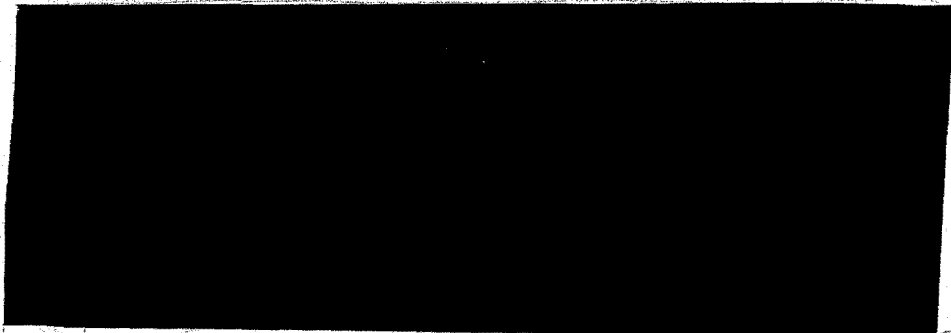
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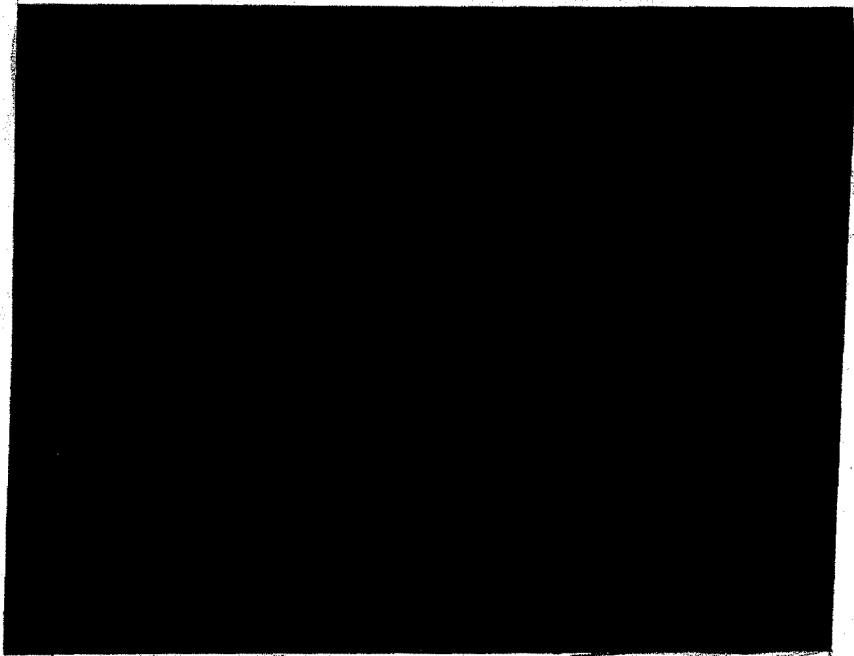
II. Purpose and Hoped for Results



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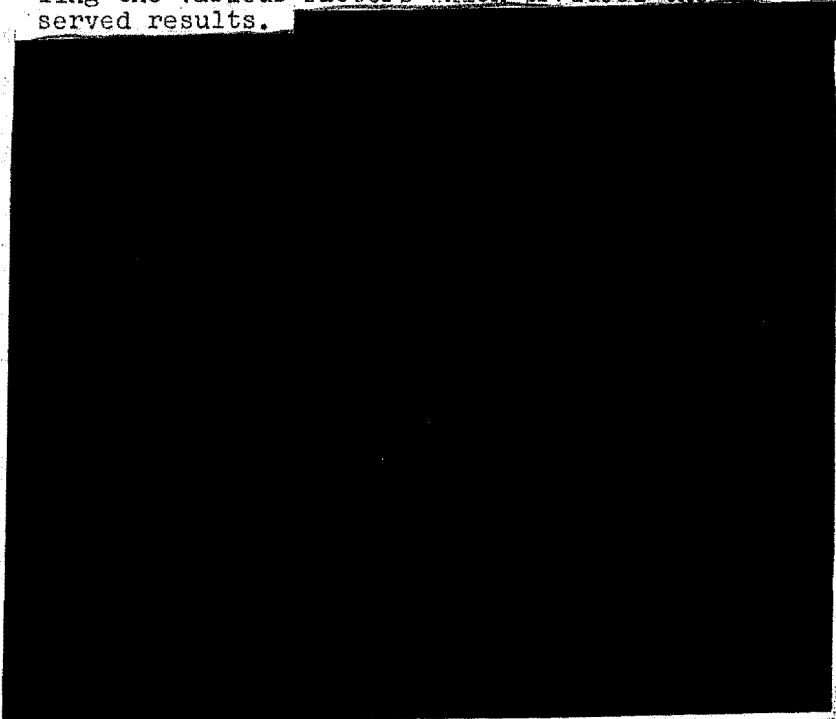
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6.1(a)

If each of these factors were known, the yield could be calculated quite accurately; however, only the first two can be predicted with even a modest degree of confidence. In addition to the total yield, the rate of reaction and several of the partial contributions to the yield will be measured by appropriate diagnostic experiments. These measurements will allow us to make a beginning at untangling the various factors which produced the observed results.

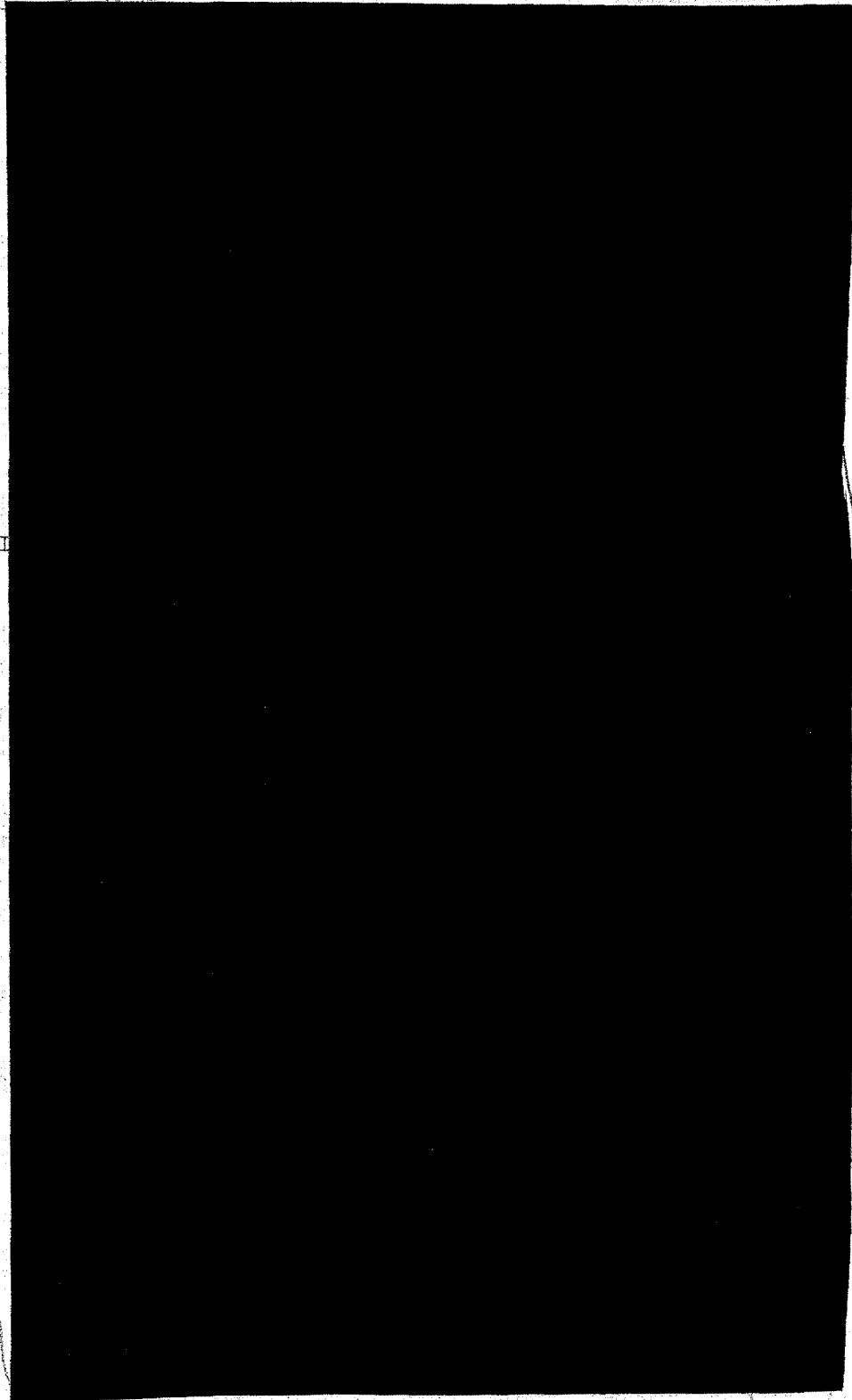
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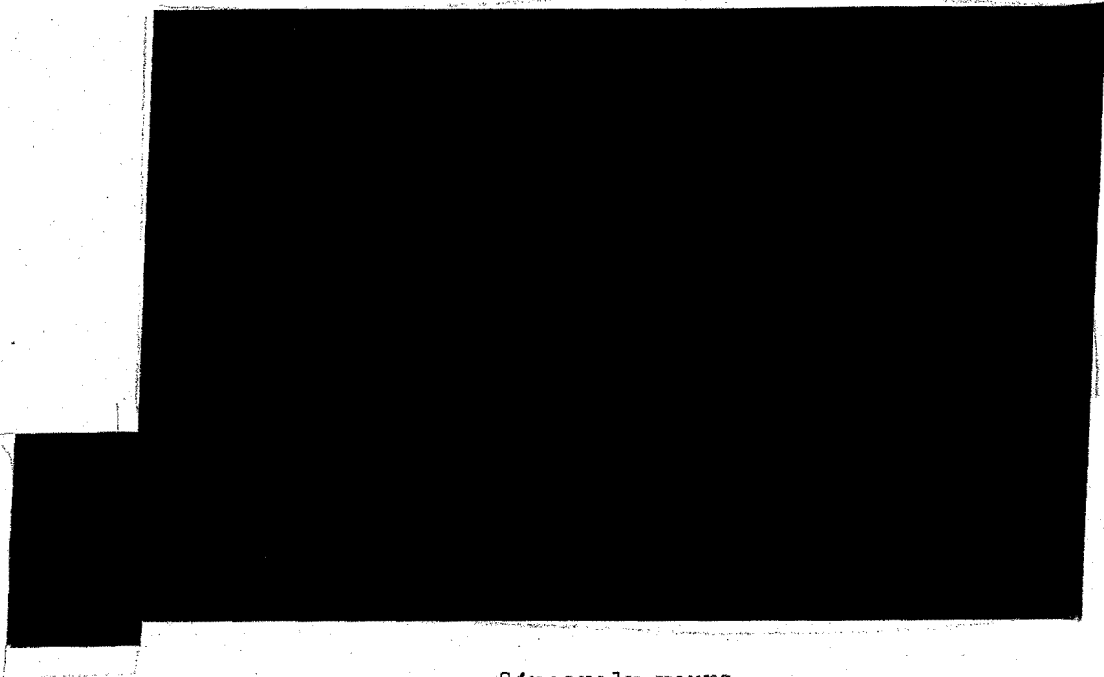


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IV. Material Requirements Summary (Expended Material Only)

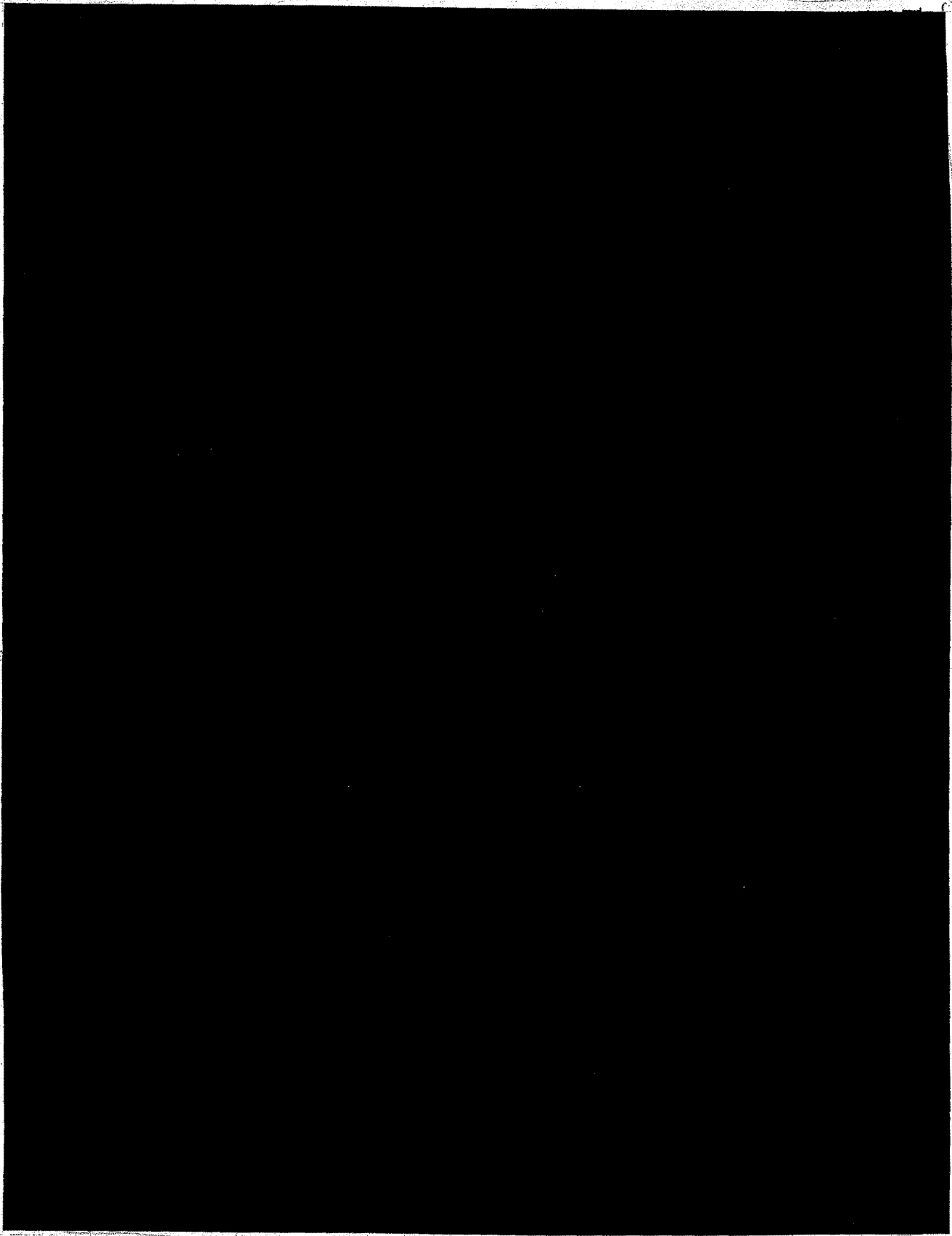


DOE
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Sincerely yours,

HERBERT F. YORK



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ENCLOSURE "D"

DRAFT MEMORANDUM TO THE CHAIRMAN, MLC

Forwarded herewith are copies of a staff paper, the recommendation of which has been approved by the Commission after consultation with the Military Liaison Committee on October 1, 1953. The formal concurrence of the Department of Defense in regard to the recommended scope and timing of the CASTLE Operation is requested.

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SECURITY INFORMATION

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November 6, 1953

ATOMIC ENERGY COMMISSION

DECISION ON AEC 597/23

CASTLE PROGRAM

Note by the Secretary

At Meeting 925 on October 7, 1953, the Commission:



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b. APPROVED the scheduling of the first CASTLE test for March 1, 1954, the sequence, exact dates, and locations of the various tests to be determined by the Commander of the Joint Task Force Seven in conjunction with the Los Alamos and UCRL-Livermore Laboratories.

c. NOTED that the Joint Committee on Atomic Energy, the Military Liaison Committee, and the General Advisory Committee will be advised of this action by appropriate letters.

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ROY B. SNAPP

Secretary

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