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LOS ALAMOS LABORATORY PROPOSED THERMONUCLEAR PROGRAM (u)

471.6

The considerable success of the thermonuclear shots at Eniwetok and the rapid theoretical development of new thermonuclear devices create a rapidly changing situation. It is, in this situation, impossible to propose a realistic program extending over several years. It is, however, desirable to summarize the status and the immediate plans [redacted]

DOE b3

DOE b3

Consideration of booster weapons is omitted. It is expected booster weapons will be useful. It is clear, however, that sound theoretical calculations are needed before effective weapons can be developed and it is furthermore clear that both the effort and the result to be expected from these developments are significant but moderate.

[redacted]

DOE b3

DOE b3

No really significant progress in this matter can be expected prior to a full-scale Maniac calculation. This calculation is being prepared by J. von Neumann and some staff of T-Division. No significant expansion of this group is necessary except possibly for the period of the actual run on the Maniac.

In preparation for the work on the Maniac, some theoretical calculations are needed which are carried out by Breit and collaborators. It is recommended that these calculations be continued.

LOS ALAMOS
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Eugene M. Sandoval
OS-6 Deputy Group Leader

In order to clarify the behavior of the inverse Compton effect, calculations have been proceeding at Rand, under the direction of de Hoffmann, from the Los Alamos Laboratory, with the help of Stein. These calculations have proved to be useful as preparation and orientation for the proposed Maniac calculations, and it is recommended that these calculations be continued as long as the Maniac group considers them valuable.

Further calculations by analytical methods have been carried out by Bethe and collaborators. It is considered that these calculations have served their valuable purpose and that this most efficient group should be employed on more urgent problems.

Under these conditions, it may be expected that results will be available early in 1952. It is not recommended that any further experimental or developmental programs be carried out for the exclusive purpose of the super calculations. Measurements of DD and DT cross-sections are continuing. These are relevant for all thermonuclear work. The same holds for the opacity work in Chicago.

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[redacted] It is probable that such a test will be proposed for a later date or else that no such test will be proposed.

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[redacted]

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Reasonably complete and conclusive calculations seem to be simpler. Such calculations are now scheduled to start on June 15 and will probably start somewhat later than that date.

An active group consisting of Nordheim, Peck, Richtmyer and collaborators is now working on this problem. This group might be strengthened by the part-time work of Goertzel and possibly by Scalletar in the fall.

[redacted]

DOE b3

The first reasonably complete calculations on an idealized spherical model are hoped to be completed during the fall of 1951. [redacted]

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Marshall Rosenbluth and others have made recently considerable progress in discussing this topic. It will not require great effort to follow up these developments in case they should turn out to justify the promise which they seem to show at present.

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[redacted]

This implosion work would necessitate a program in GMX Division. It is not proposed that such a program be initiated prior to the fall of 1951. It may be initiated then, depending on the evaluation of the situation at that time. [redacted]

[redacted]

DOE b3

The necessary high compressions can not be obtained by means of high explosive implosion. It is planned to achieve these high compressions with the help of radiation implosion originating in a primary fission bomb.

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The potential promise of this device seems at present the highest of any device as yet proposed. On the other hand, least consideration has been given to this device and the possibility exists that a decisive flaw will be found.

Some work has been done on this device by de Hoffmann, Hoyt, Bethe, Ulam, von Neumann, Teller, Wheeler and others. In addition, it is recommended that a considerable fraction of T Division at Los Alamos, a considerable fraction of the summer visitors at Los Alamos, and practically all of the Princeton group concentrate on

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No discussion of the test date is justified prior to the presentation of a reasonably detailed theoretical design which can be considered final at least in its main features. Every effort will be made to make the design as simple as possible. In particular, it will be attempted to limit the observational program connected with the tests to essentials. One may hope to obtain in this way a proposal which can be carried out in a period less than a year after presentation of the preliminary model.

[redacted] It seems therefore advisable to proceed without delay with the necessary jobs of maintenance and expansion of cryogenic equipment on Eniwetok. This last recommendation need not, of course, be followed if an alternative method of liquid deuterium delivery and handling is found.

DOE b3

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