

[REDACTED]

[REDACTED] - a device similar to, though smaller than, [REDACTED] and making use of liquid deuterium.

[REDACTED] - a thermonuclear device making use of a [REDACTED]

[REDACTED] - an experiment to investigate the behavior [REDACTED]

The first four devices are being developed at Los Alamos and the latter two at Berkeley.

In response to questions from the Commission on the relative importance of the various devices to be tested, Mr. Graves said that there was a strong technical necessity for the testing of each of the six devices, but that the Commission must make the determination whether this technical necessity justifies the expense of an Eniwetok test. He pointed out that the IVY Mike yield was greater than predicted by almost a factor of two and that the behavior of thermonuclear systems is not well understood. If the CASTLE program had to be reduced to four shots, he would recommend testing the [REDACTED]

[REDACTED] should be eliminated with the least harm to the program as it is a device which is almost certain to work. The other devices involve many unknowns which cannot be determined by calculation but only by actual full-scale test. He pointed out that he was not qualified to comment on the necessity of the two Livermore devices [REDACTED]

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With regard to emergency capability, Mr. Graves said that additional cases and components are being made for the [REDACTED] and ballistic drop tests are under way. In the event any of these prove to be successful, it will be possible to have a deliverable thermonuclear weapon soon after the conclusion of the test. If, however, the [REDACTED] turns out to be the only successful weapon for emergency capability, the military requirements for thermonuclear weapons will not be fulfilled because of a shortage of Li-6. The [REDACTED] appears now to offer the best long-range possibility but it would not be feasible to develop it into a deliverable weapon for about one to two years after the test. He added that [REDACTED] if it works, could be the

[REDACTED]

most desirable of the three weapons for which there will be an emergency capability as it is the cheapest of the three and involves no cryogenic problems.

Mr. Strauss asked what will be the latest date by which the Commission must approve the CASTLE program in order to conduct it as planned beginning February 1954. Mr. Graves replied that by the middle to the end of September, developmental work on the six devices should have reached a point sufficiently advanced to permit the Commission to decide on the CASTLE program. General Fields added that other factors which will determine the time of an eventual Commission decision and the time of the start of the test are: the progress of construction at the Eniwetok-Bikini test site and Li-6 production.

Mr. Graves then briefly described the [REDACTED] a boosted fission weapon with yield in the range of the [REDACTED] but with several advantages over that weapon. The [REDACTED] would be of smaller size than the [REDACTED] and would be considerably safer, permitting conventional in-flight insertion. It has not been recommended for test during the CASTLE series as its characteristics are the most calculable of the devices in question and the required information can probably be obtained without a test.

Mr. Graves described the proposed location of the various shots on both Eniwetok and Bikini Atoll and said that if a six-shot program is carried out the base camp and the air strip at Bikini may be destroyed by one of the shots.

The proposed schedule would begin with the first shot on the 15th of February and the last on the 3rd of April if weather conditions permit. On the most pessimistic assumption, that each shot would be delayed one week due to the weather, the last shot would then occur on the 15th of May. The series would then require 90 days and would come close to the period of undesirable weather which begins usually around the first of June.

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In response to a question from Mr. Strauss, General Fields said that a supporting task force of approximately 10,000 people would be required, approximately the same number as for GREENHOUSE and SANDSTONE, but for a considerably longer time. Mr. Zuckert said that with a task force of this magnitude held over a length of time such as is contemplated, it would be impossible to keep the operation secret. The

[REDACTED]

Commission then discussed with Mr. Boyer the problems of public reaction that would result from carrying out such a series of tests over such an extended period.

Mr. Strauss inquired how much money would be committed to the CASTLE test program prior to September. General Fields replied that extensive development had been in progress at both Los Alamos and Livermore for some time and a great deal of hardware has been procured and fabricated in the past six months. The Commission is obligated under contracts with American Car and Foundry and the Cambridge Corporation and, although considerable funds might be saved by eliminating the actual Pacific tests, the greater part of the development funds have already been expended or obligated.

In response to questions from the Commissioners, Mr. Graves said that in his judgment, it would be possible to begin the test around the 15th of February. However, Li-6 production may well hold up the second shot, [REDACTED] or necessitate rearrangement of the proposed shot schedule. The Los Alamos and Livermore scientific personnel, as well as Holmes and Narver, feel that it will be possible to carry out the test as planned.

General Fields inquired whether the test organization should plan on a documentary film on Operation CASTLE. Mr. Strauss replied that a film would be desirable but that it should be simple with technical information and Hollywood trimmings kept to a minimum. Mr. Strauss and the other Commissioners thanked Mr. Graves for his presentation. After further discussion, the Commission:

a. REQUESTED a report on funds that will be committed to Operation CASTLE prior to approval of the final program by the Commission in September; and

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b. NOTED that a simple documentary film would be prepared following Operation CASTLE.

2. Film on Blast and Thermal Measurements

Mr. Graves showed a film to the Commission depicting blast and thermal measurement techniques used in Operation TUMBLER-SNAPPER.

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Roy B. Snapp
Secretary

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