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ATOMIC ENERGY COMMISSION

SPECIAL ATOMIC DETONATION FOR WEAPONS EFFECTS AND TRAINING

Note by the Secretary

The attached report by the Director of Military Application is circulated for consideration by the Commission during the week of October 22, 1951.

ROY B. SNAPP
Secretary

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ATOMIC ENERGY COMMISSION

SPECIAL ATOMIC DETONATION FOR WEAPONS EFFECTS
AND TRAINING

Report by the Director of Military Application

THE PROBLEM

1. To consider the advisability of one or more special atomic detonations designed primarily for obtaining effects data to satisfy civil defense requirements and permit military training and orientation.

BACKGROUND

2. Both the Department of Defense and the Federal Civil Defense Administration appear to have increasing need for furthering their knowledge of weapons effects. The pressure of international tension adds a critical time element to the desire for additional data on weapons effects engendered by the growing and more flexible atomic capabilities of the U.S. The probability of increased Soviet atomic capability also adds to the pressure.

3. The FCDA has already proposed training and orientation requirements (See AEC 432) considered impracticable under security and operational restrictions necessary to currently planned development tests. The AEC has indicated (See AEC 432/1) its technical capability to perform a separate test for this purpose should one be formally approved by the President. The Department of Defense, by separate action, has also expressed its willingness to furnish nominal logistic support for a separate test, if requested. From a purely military point of view, however, the

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By J K Hartsock
For the Director of Military Application
and Development
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Department of Defense has felt the expenditure of vital atomic weapons materials for this type of test, for the benefit of a single agency, is not justified. (See Status Report No. 4 to the AEC on DOD Atomic Energy Activities circulated for information in AEC 415/2).

4. However, no inquiry has been made into the Department of Defense's attitude toward a separate test designed to provide effects data for the FCDA, the Department of Defense, and AEC. Under these circumstances, their attitude might be favorable should a combined effects program appear important enough to justify a special shot.

5. Press attendance at a future shot is also a probable requirement. This can most easily and advantageously be arranged in conjunction with a nominal shot whose security requirements are minimal.

DISCUSSION

6. There can be no question that the AEC and the Department of Defense are jointly interested in both weapons development data and weapons effects data, while FCDA also has an important, but somewhat different interest in effects alone. Nevertheless, it would appear that the primary interest and responsibility of the Commission lies in the development field, while the Department of Defense would seem to be more interested in the effects and uses of the weapon as delivered in response to the announced military requirements. Both the AEC and the DOD have strong secondary interests in effects and development, respectively, so that there can probably never be complete separation of the two interests.

7. Economy of fissionable material dictates the most effective over-all use of each atomic detonation to obtain the maximum data

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in all areas. Thus, experimental test programs in the past have included projects designed to expand knowledge in both the developmental and effects fields. Operational and scientific compromises have been necessary in planning the test operations so that both missions could be accomplished. As in any compromise, each interest has suffered in some degree, due largely to the co-equal status of interest in each test.

[REDACTED] Inasmuch as its yield was thought to be most accurately predictable and most nearly in the order of magnitude desired for a large weapons effects program, most of the military structures and materials tests were designed around this shot. The joint bio-medical program was also largely tied to this shot.

[REDACTED] The changes were costly in time, manpower, and money and at the same time prevented a full realization of the laboratory objective for proof-testing.

[REDACTED] Some of the Department of Defense structures were purposely placed on the main radial blast line from the ground zero to obtain certain data. It also became necessary to locate some of the laboratory instrument

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shelters on the same line, but closer to the zero point. There was some feeling that the presence of the closer AEC installations might have disturbed the data recorded further away, at the Department of Defense structures.

10. While neither of the two examples of interference given above, nor in fact any others which occurred, proved serious or highly significant, it is true that they were disturbing. It is also true that on the basis of non-interference only, it might be advantageous to have separate shots, each designed for the objective of major interest. This is not to say that the secondary interest would be barred; instead, the secondary interest would be satisfied only to the extent possible under a policy of non-interference with the major interest. Thus, the degree of developmental experimentation included in a special shot for effects purposes would depend entirely on opportunities remaining after effects needs were satisfied. In other words, pre-planning policy would announce the agency having major interest in each shot and that agency would be given recognized authority and responsibility for the program content for the shot.

11. Security of Restricted Data also offers a problem in joint tests. A major requirement in the original FCDA proposal was the attendance of large numbers of uncleared personnel from the country-wide civil defense organizations as well as state and local officials for orientation and education in connection with atomic explosions. A similar problem is presented in the proposal of the Department of Defense for the participation of a 5000-man Regimental Combat Team, together with an additional 3500 military observers at BUSTER-JANGLE. It is neither feasible nor desirable to give these people "Q" clearances. Yet their control in such numbers in the test area to prevent the loss of classified data

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presents a difficult, if not insurmountable problem. Conversely, effective security control may be expected to so limit their participation and observation as to nullify in large part the purposes of their presence.

12. On the other hand, there is complete agreement that participation as may be required in atomic tests by both FCDA and military personnel on relatively large scales is desirable.

13. A corollary problem is the attendance of press and other news media representatives. If large numbers of uncleared people are present at a test, exclusion of the press is not feasible. Press attendance under strict censorship is certainly undesirable in the view of the news media, yet Commission interests may require either some degree of censorship or control of releases or a very definite restriction on movements of news representatives.

14. AEC 446/10 presented for information a memorandum from Mr. Carroll L. Tyler, Manager, SFO, who is responsible to the Commission for the BUSTER-JANGLE operation this fall. Mr. Tyler strongly recommends a re-examination of the whole philosophy of conducting tests not primarily connected with the weapons development program, but whose primary objective is rather connected with effects, civildefense, military maneuvers, etc. He recommends that the Commission discuss with the Department of Defense, FCDA, and internally with the Division of Biology and Medicine, the advisability of setting up special tests designed to serve the purposes mentioned above.

15. It does not appear to the Division of Military Application that the effects mission can or should be completely divorced either operationally or scientifically from the development mission. In the first place, it would appear desirable to have combined

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operational planning and execution of all shots in a series under one head. Thus, a policy under which planning for a series of developmental test shots could include provision for one additional shot, specifically designed as to yield and spatial positioning (tower or air burst) for obtaining maximum effects data as a primary objective, appears eminently sound.

16. Under this concept, a test might include several developmental shots plus one added shot primarily for effects. Under AEC authority and responsibility, effects experiments would be held to a minimum on the development shots and included only on a non-interfering basis. On the other hand, the effects shot would include a minimum of non-interfering development experiments. Economies in time, money, manpower, and improved data values appear to make this an attractive arrangement, which has the important added advantage of clear-cut designations of authority and responsibility.

17. There is and will continue to be a community of interest of varying degree on the part of both the AEC and the Department of Defense in effects and development. Further, there is a functional connection between the two objectives; they are not entirely separable as to resulting data nor as to interdependence for planning of future programs. Finally, it is desirable to fix the areas of paramount interest and authority in atomic tests, as between the AEC and the DOD.

CONCLUSIONS

18. It is concluded that:

a. There is a growing interest in and need for data concerning weapons effects, especially on the part of the Department of Defense and the FCDA;

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b. Both the AEC and the DOD have interests in both the effects and the development of atomic weapons; neither interest entirely excludes the other;

c. While it is not desirable to separate entirely the development and effects tests as to planning and execution, it is desirable to plan special effects shots for the primary purpose of gaining effects information, thus minimizing the necessity for adding effects programs to test shots designed primarily for development purposes. Both types of shots may include experiments for the secondary type on a non-interfering basis. While separate effects shots might be uneconomical from the standpoint of expenditure of fissionable material, the results obtained together with the savings in time, money, and effort may render them economical from the over-all point of view;

d. Assuming a policy approving in principle special shots primarily for effects purposes, those agencies jointly desiring such a test should be responsible for adducing and supporting test programs whose importance and need justify the expenditure of the necessary fissionable material.

STAFF JUDGMENTS

19. The Division of Biology and Medicine has no objection to the recommendation of this paper. The Office of the General Counsel has indicated no legal objection to the action recommended.

RECOMMENDATION

20. That the Atomic Energy Commission:

a. Note the conclusions above;

b. Agree that it is desirable to plan special effects shots for the primary purpose of gaining effects information;

c. Note that some precedent has been set by the Commission in its letter of May 11, 1951, to the FCDA by indicating AEC willingness to conduct a test primarily designed for effects, if feasible and if approved;

d. Note that JANGLE is, in principle, an example of a test designed entirely around military requirements for effects data and in which the AEC development interest is very limited and its effects interests are served largely by the military program;

e. Agree that those agencies jointly desiring such a test should be responsible for adducing and supporting test programs whose importance and need justify the expenditure of the necessary fissionable material;

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f. Approve the transmittal of a letter, such as that in the Appendix, to the MLC suggesting separate atomic detonations primarily for effects purposes and inviting the views of the MLC.

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APPENDIX

DRAFT MEMORANDUM TO THE CHAIRMAN, MILITARY LIAISON COMMITTEE,
REGARDING SPECIAL ATOMIC DETONATION FOR WEAPONS
EFFECTS AND TRAINING

1. The Atomic Energy Commission has reviewed the advantages and disadvantages to be realized from a special atomic detonation to study weapons effects in connection with one of its regular development tests at the Nevada Test Site.

2. It appears that such a shot would be valuable to the Department of Defense, the Federal Civil Defense Administration, and the Atomic Energy Commission, provided sufficient requirements could be generated by these agencies to justify the expenditure of fissionable material for the shot. These requirements might consist of a need for further weapons effects information, troop training, and orientation of military and civilian personnel.

3. As you know, the Nevada Test Site was obtained by the Commission for development tests as requirements dictate. Because the yield of experimental devices is not known accurately prior to detonation, planning and design of efficient effects programs in combination with development functions are difficult. The administrative problems of security and logistics inherent in a joint effects and development program also force compromises which limit the effectiveness of each program.

4. We believe that the Department of Defense and the Commission have a joint interest in both development and effects of atomic weapons. We further believe these two interests can best be served by formulation of a policy assigning primary and secondary responsibilities for given areas of operations.

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5. The basic objectives of such a policy would appear to be:

- a. Maximum efficiency in obtaining needed development data
- b. Maximum extension of existing data on effects.
- c. Minimum interference or compromise between development and effects objectives.
- d. Preservation of necessary security.
- e. Maximum training and orientation of personnel in connection with atomic explosions.
- f. Early establishment of yield, spatial positioning (air, tower, underground, etc.) and character of shot (s) against which effects programs can be carefully and logically designed without continuing change.

6. While it is not desirable to separate entirely the development and effects tests as to planning and execution, the Commission believes it desirable to plan a special effects shot as may be required. Such a shot will serve to minimize interference with tests primarily designed for development purposes. Both types of shots may include experiments of the secondary type on a non-interfering basis. While separate effects shots might be uneconomical from the standpoint of expenditure of fissionable material, the results obtained together with the savings in time, money, and effort may render them economical from the over-all point of view.

7. Your comments are invited.

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Appendix