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June 24, 1954

AEC 141/25

COPY NO. 19

ATOMIC ENERGY COMMISSION

USE OF THE NEVADA PROVING GROUNDS

Note by the Secretary

The General Manager has requested that the attached report by the Director of Military Application be circulated for consideration by the Commission during the week of June 28.

ROY B. SNAPP

Secretary

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ATOMIC ENERGY COMMISSION

USE OF THE NEVADA PROVING GROUNDS

Report to the General Manager by the  
Director of Military Application

THE PROBLEM

1. To consider continued use of the Nevada Proving Grounds for atomic testing activities in the light of comments from the General Advisory Committee and the Advisory Committee on Biology and Medicine.

SUMMARY

2. The operating criteria for the Nevada Proving Grounds considered by the Commission at Meeting 962 on February 17, 1954 (AEC 141/22), has been revised in light of comments from the General Advisory Committee and the Advisory Committee on Biology and Medicine. The recommended criteria are similar to those previously considered in AEC 141/22 except that the new criteria (1) include a statement to the effect that prior to detonating a 50 KT weapon from a 500 foot tower the safety factor calculated for such a shot should be confirmed by detonating a shot of lesser magnitude from a 500 foot tower, (2) exclude the statement that the number of apparently marginal shots per year should be limited to a minimum, and (3) do not place any arbitrary limit to the number of shots that may be fired in a given year.

STAFF JUDGMENTS

3. The Division of Biology and Medicine and the Division of Information Services concur in the recommendation of this paper

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RECOMMENDATION

4. The General Manager recommends that the Atomic Energy Commission:

a. Note comments of the General Advisory Committee (Appendix "B");

b. Note comments of the Advisory Committee on Biology and Medicine (Appendix "C");

c. Approve the continued use of the Nevada Proving Grounds for atomic test activities, subject to conduct of test activities in accordance with the criteria set forth in paragraph 6 of Appendix "A";

d. Note that the Joint Committee on Atomic Energy and the Military Liaison Committee will be notified of this action by appropriate letter.

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LIST OF ENCLOSURES

APPENDIX "A"

Background and Discussion

APPENDIX "B"

Letter from Dr. I. I. Rabi,  
to Mr. Lewis L. Strauss

APPENDIX "C"

Letter from E. C. Stakman,  
to Mr. Thomas E. Murray

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APPENDIX "A"

BACKGROUND AND DISCUSSION

1. At Meeting 962 on February 17, 1954, the Commission considered "The Report of the Committee to Study the Nevada Proving Grounds" and (a) approved planning and general test preparations for conduct of tests at the Nevada Proving Grounds in 1954-1955, (b) approved release of \$460,000 for capital construction items, and (c) requested that the General Advisory Committee and the Advisory Committee on Biology and Medicine be asked to report their views on the proposed policy for the use of the Nevada Proving Grounds as set forth in AEC 141/22. Specific approval for continued use of the Nevada Proving Grounds was withheld pending consideration of the General Advisory Committee and the Advisory Committee on Biology and Medicine comments. Based on the Commission request, the Advisory Committee on Biology and Medicine met on March 13, 1954 and the General Advisory Committee met on April 1, 1954 to consider this matter.

2. The viewpoints of the Advisory Committee on Biology and Medicine are contained in their letter dated March 25, 1954 (Appendix "C"). Those of the General Advisory Committee are contained in letter dated April 9, 1954 (Appendix "B"). Briefly stated both committees recognized the paramount importance of the continued use of the Nevada Proving Grounds and agreed, except for minor exceptions, with the operating criteria enumerated in paragraph 4 of AEC 141/22, previously considered by the Commission. The General Advisory Committee strongly endorsed the recommendations of AEC 141/22 and went beyond those recommendations in regard to the number of shots to be fired at the Nevada Proving Grounds in any given year. They recommended that the number of shots be

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limited only by requirements as determined by the laboratories and the Division of Military Application. The Advisory Committee on Biology and Medicine felt that the number of shots should be limited to ten per year with no more than three high yield detonations included in that number.

3. In agreement with the General Advisory Committee, the Advisory Committee on Biology and Medicine stressed the necessity for measures to minimize, on a local and on a national scale, the risks involved in testing at the Nevada Proving Grounds. The Advisory Committee on Biology and Medicine also recommended that prior to detonation of a 50 KT weapon the safety factor calculated for detonations of 50 KT weapons from 500 foot towers should be verified by detonation of a smaller yield weapon from that height.

4. The Advisory Committee on Biology and Medicine recommended deletion as meaningless the criterion of subparagraph 4(f) of AEC 141/22, namely, "The number of apparently marginal shots in any year should be limited to a minimum." The Advisory Committee on Biology and Medicine recommendation has been incorporated in Paragraph 6, Appendix "A" of this paper since the sense of the deleted statement is contained in other criteria particularly subparagraphs 6 (c), (d) and (e).

5. In view of the importance of the weapons development program to the national defense it is considered that the weapons test program should be maintained as flexible as possible to assure accomplishment of military requirements. It would be unwise, therefore, to place an arbitrary limitation on the number of shots to be fired in a given period at the Nevada Proving Grounds. However, the importance of evaluating each shot and ascertaining that acceptable weather conditions exist prior to detonation cannot be over-emphasized.

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6. Based on the comments received from the General Advisory Committee and those from the Advisory Committee on Biology and Medicine the original operating criteria submitted by the Committee to Study the Nevada Proving Grounds have been revised slightly as follows:

a. The number of nuclear shots at the Nevada Proving Grounds in one year should be determined by laboratory requirements as reviewed by the Division of Military Application in the light of other pertinent considerations and approved by the Commission.

b. Each nuclear shot programmed whether AEC, military or civil defense should be justified individually and the number involved should be held to the minimum consistent with technical requirements.

c. Each potentially hazardous shot should be separately identified and justification for such a shot should include plans for controlling or reducing fall-out from it.

d. Shots should be scheduled with more elasticity, so that non-critical shots may be fired when conditions are not right for more critical or marginal shots. Such elasticity will benefit from addition of new firing areas.

e. Marginal shots should be fired only under satisfactory weather conditions that have a high degree of predictable stability. The possibility of continuing postponements and of resulting extension of series duration should be accepted. Participating organizations and units should be advised that they must accept the possibility of postponements on such shots.

f. Any air drop of more than 1 KT projected yield should be scheduled only after thorough evaluation of the reliability of its fuzing system.

g. Shots should be limited as follows with regard to yield and burst altitude, with maximum yield to incorporate a reasonable allowance for error:

Surface and subsurface, 1 KT  
300 foot tower, 25 KT  
500 foot tower, 50 KT  
Air drop, 80 KT (Fireball not to touch ground).

Prior to detonating a 50 KT weapon from a 500 foot tower the safety factor calculated for such a shot should be confirmed by detonating a shot of lesser magnitude from a 500 foot tower.

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APPENDIX "B"

GENERAL ADVISORY COMMITTEE  
to the  
U. S. ATOMIC ENERGY COMMISSION  
Washington 25, D. C.

April 9, 1954

Mr. Lewis L. Strauss, Chairman  
U. S. Atomic Energy Commission  
Washington 25, D. C.

Dear Mr. Strauss:

This letter is the first section of the usual report of the Chairman of the General Advisory Committee to the Chairman of the Atomic Energy Commission which follows a meeting of the GAC. This letter covers the discussion of the GAC at its meetings on March 31, April 1 and 2, 1954, of the staff papers and recommendations with respect to the Nevada Proving Grounds (AEC 141/22 and 141/23; Report of the Committee to Study the NPG, dated Feb. 1, 1954; Report of the Advisory Committee for Biology and Medicine).

The General Advisory Committee has already made its views on the subject of weapon testing known to the AEC in the report of the Chairman of the GAC dated February 10, 1953. The relevant paragraph reads as follows:

"The level of effort in test programs has been increased greatly in recent years; this has undoubtedly been a very significant factor in the weapon progress which has been achieved. We feel that the test programs are technically very desirable and are extremely useful in the Commission's program of weapon development. There are indications that, even in its present advanced status, our actual test capability may not be adequate for all of the experiments which it would be valuable to carry out; and, hence, we have considered whether this capability should be increased. Since the results of the test programs are certain to affect the optimum composition of the stockpile with respect to weapon types, and since the information will be most useful before the stockpile increases to the point that weapon refabrication becomes an unmanageable task, we are led to favor an increase in the weapon testing capabilities in the near future."

The GAC wishes to reaffirm the views previously expressed with respect to the importance of tests of nuclear weapon design as a necessary means of progress. The GAC further strongly endorses the recommendations in the staff papers with respect to the NPG.

However, the GAC does not believe that the number of tests should be limited to 10 per year as suggested, but that the number

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should be determined by the needs of the weapon laboratories and the Division of Military Application.

The GAC fully endorses the recommendation that each proposal for a test should be scrutinized with the utmost care as to need, and that no effort should be spared to exercise the greatest precautions to safeguard the surrounding communities and the test personnel with respect to fall-out, blast, and blast damage. With the increased understanding of these proposals, precautionary measures become more effective.

The GAC knows of no substitute for tests on the continental site to maintain our lead in the field of atomic weapons. We have seen no suggestion for another site which has the advantages of the NPG.

The GAC therefore recommends that the use of the NPG be continued, and that no arbitrary limitation should be imposed on the number of tests in any given period. At the same time the GAC recognizes that unless the greatest precautions are taken, a certain element of danger will always attend tests of nuclear weapons.

Sincerely yours,

I. I. Rabi  
Chairman



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APPENDIX "C"

UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON 25, D. C.

March 26, 1954

Mr. Thomas E. Murray, Acting Chairman  
United States Atomic Energy Commission  
Washington 25, D. C.

Dear Mr. Murray:

Transmitted herewith are the comments and recommendations of the Advisory Committee for Biology and Medicine on the "Report of the Committee to Study the Nevada Proving Ground" as requested by the Commission in a memorandum dated February 19, 1954 to Dr. John C. Bugher, Director, Division of Biology and Medicine, from the Division of Military Application.

The Advisory Committee held a special meeting to consider this report at the Atomic Energy Commission in Washington, D. C., on Saturday, March 13, 1954.

Paraphrasing General Forrest's famous saying, "Victory goes to the nation that gets there fustest with the mostest and bestest weapons". This is no less true in the atomic age.

It is therefor essential to continue the Nevada Proving Grounds in order to achieve maximum speed in the development of weapons. Speed is essential to national survival.

In emergencies such as this some risks, immediate and long term, must be accepted. These risks should be frankly and publicly acknowledged. However, the policy of minimizing these risks must be continued in both the local and national interest.

Our recommendations relative to the criteria beginning on Page 2 of AEC 141/22 are as follows:

- a. The number of nuclear shots at the Nevada Proving Grounds in one year should be held to a planned maximum of ten. The number of three high yield tower shots should not normally be exceeded.
- b. & c. Each nuclear shot programmed, whether for AEC, military or civil defense, should be justified individually evaluated as to probable off-site hazard, and should include plans for controlling or reducing its fall-out.

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- d. No change
- e. Marginal shots should be fired only under satisfactory weather conditions that have a high degree of predictable stability. The possibility of continuing postponements and perhaps of resulting extension of series duration should be accepted. Participating organizations and units should be advised that they must accept the possibility of postponements on such shots.
- f. Deleted as meaningless
- g. No change
- h. Shots should be limited as follows with regard to yield and burst altitude, with maximum yield to incorporate a reasonable allowance for error:

Surface and sub-surface, 1 KT  
300-foot tower, 25 KT  
500-foot tower, 50 KT  
Air drop, 80 KT (fireball not to touch ground)

We suggest that approval of the 50KT yield for a 500-foot tower be withheld until experimental detonation at a lower KT level has proved that the safety factor indicated here actually exists.

In addition to the recommendation on the criteria given above, there are certain other general comments which we desire to make:

- (1) We commend the use by the Test Director of an advisory panel which has been customary at NPG and recommend that this practice be extended to the operations in the Pacific.
- (2) The Committee noted that the first announcement of the recent incident in the Pacific came as a result of the letter a Marine wrote to his mother. The Committee considers it highly desirable that there should be an early official release of authentic information to avoid permitting unreliable and inaccurate reports to become controlling by default.
- (3) The Advisory Committee for Biology and Medicine notes with approval the studies now being carried out. It further urges that: (a) all feasible emphasis be placed on the extension and acceleration of the studies on the distribution and effects of radioactive material from tests; (b) the Gabriel and Sunshine studies be expanded to include other elements than those now regarded as being controlling (Ru, I, Pu, for example).
- (4) The experimental evidence obtained by the staff of the Division of Biology and Medicine indicates that the biological food chains must be considered broadly and not only along conventional agricultural lines. The Committee considers of utmost importance the provision of adequate support for extensive and intensive studies on these phases of the problem.

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As of possible interest to the Commission we are sending you a complete transcript, classified SECRET, of the discussions at the recent meeting of the Committee.

Respectfully submitted,

/s/

E. C. Stakman, Chairman  
Advisory Committee for Biology  
and Medicine