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AEC 952/28 411872

January 17, 1958

COPY NO. 28

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ATOMIC ENERGY COMMISSION

OPERATION HARDTACK TEST PROGRAM

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 January 20, 1958.

REPOSITORY NARA/College Park
COLLECTION RG 326 51-58 Secretary
BOX No. 182 (NN3-326-98-010)
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W. B. McCOOL
Secretary

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NAME: Arthur Harris
2ND REVIEW-DATE: 10/10/02
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DETERMINATION [CIRCLE NUMBER(S)]
1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED TO:
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E.O. 12958, Sec. 3.6
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NWD 972006A-844

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~~S E C R E T~~

ATOMIC ENERGY COMMISSION

TEST ACTIVITIES FOR CALENDAR YEAR 1958

Report to the General Manager by the
Director of Military Application

THE PROBLEM

1. To consider the test schedules for Calendar Year 1958 and the requirements for expenditure of special nuclear materials for the tests involved.

SUMMARY

2. At Meeting 1313 on November 6, 1957, the Commission considered AEC 952/19 (Test Activities for Calendar Year 1958) and

a. Approved conducting Operation HARDTACK, a series of nuclear tests at the Eniwetok Proving Ground, commencing on or about April 15, 1958;

b. Approved the proposed test program in Appendix "B" to AEC 952/19;

c. Noted that the proposed test program in Appendix "B" to AEC 952/19 included the firing of two or three low-yield underground tests at the Nevada Test Site in the fall of 1958 after the end of HARDTACK;

d. Noted that the test schedule for Operation HARDTACK would be given to the Commission as soon as it is firm, and that the Commission would be kept informed of changes to the schedule;

e. Noted that Department of Defense comments on and support of the test operation would be requested by letter to the Military Liaison Committee;

f. Noted that Presidential approval of the plans for Operation HARDTACK would be requested by letter after receiving the comments of the DOD;

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g. Noted that the requirements for expenditure of nuclear materials for the HARDTACK tests would be presented to the Commission as soon as possible; and that Presidential authorization for expenditure of the nuclear materials required would be requested after Commission approval of the amounts required;

h. Noted that the General Advisory Committee would be briefed on the HARDTACK program during their visit to Los Alamos on November 21-23, and their comments would be transmitted to the Commission.

3. On November 13,* the Military Liaison Committee was informed by letter of our plans for HARDTACK, and their comments on and assurance of DOD support for the operation were requested. The MLC reply of November 22 (AEC 952/22) assured appropriate support by the DOD and commented that such assurance was understood not to preclude further consideration and recommendations by the DOD as to the contents of the test program.

4. On November 23,* the President was informed by letter of our plans for HARDTACK, and was advised that a listing of the shots planned, their individual objectives, and the amounts of nuclear materials concerned would be submitted in January. He was also informed that there would be a continual and further review, particularly from the technical point of view, of the necessity for each shot, and that this review would include an examination by the General Advisory Committee of the scientific necessity for the laboratories' exploratory and developmental tests. On December 3, the President signed the letter of November 23, indicating approval of the plans for testing.

5. The schedule for tests during Calendar Year 1958 is contained in Appendix "A" and differs somewhat from the program given in Appendix "B" of AEC 952/19. Certain shots have been deleted and certain ones added, principally in connection with the acceleration of the POLARIS missile program, but also in

*Copy on file in Office of the Secretary.

[redacted]

846

[redacted]

connection with other programs. These changes are indicated in the "Remarks" column of the test schedule in Appendix "A" and will be described in detail below.

6. The test program for Operation HARDTACK approved in AEC 952/19 contained 22 firm shots (17 firm laboratory and 5 DOD effects shots), 3 contingent shots and 1 other possible shot (the U.N. demonstration shot). The HARDTACK test schedule given in Appendix "A" of this staff paper contains 24 firm shots (19 firm laboratory and 5 DOD effects shots) and 3 contingent shots.

7. [redacted] In addition, this letter requested that the device selected be weaponized as fully as possible for test in the HARDTACK series. In order to meet the new POLARIS warhead schedule it has been necessary to revise the test plans as follows:

DOE 6.1(a)

[redacted]

DOE 6.1(a)

[redacted]

[redacted]

[redacted]

DOE 6.1(a)

DOE 6.1(a)

8. In addition to the revisions required for the POLARIS program, one other shot has had to be added. [redacted]

DOE 6.1

[redacted]

DOE 6.1(a)

[redacted]

[redacted]

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10. The number of contingent shots in the test schedule in Appendix "A" remains the same (3) as in the test program in AEC 952/19. [redacted]

DOE 6.16

11. In addition to these full-scale tests we are planning to conduct some two to ten safety tests of certain designs as necessary to establish that, if detonated accidentally, no nuclear reaction would occur. Plans are to conduct the safety tests at NTS, three in spring 1958 and seven in fall 1958. [redacted] In Appendix "A" are listed designs being considered for the safety tests.

DOE 6.16

12. [redacted] It is planned that the MILLRACE devices will be fired underground in existing tunnels which will be modified to accommodate the shots. The detonations should be completely contained with no fallout resulting from the shots.

DOE 6.16

[redacted]

[redacted]

[redacted]

DOE 6.1(a)

DOE 6.1(a)

14. The requirements for special nuclear materials for these tests are listed in Appendix "B". Included in the totals are the amounts required for:

[redacted]

DOE 6.1(a)

[redacted]

850

[redacted]

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[redacted]

DOE 6.1(a)

15. In accordance with the Commission's desires as expressed at Meeting 1313 on November 6, the General Advisory Committee was briefed on the HARDTACK program. By letter to the Chairman, AEC, dated December 10, 1957, the Chairman of the GAC reported on the 56th meeting of the General Advisory Committee at Los Alamos, New Mexico, on November 21, 22 and 23. The following extract from that letter contains their comments on the HARDTACK program:

> "(1) PLUMBBOB and HARDTACK Series
>
> The Committee was presented with a thorough briefing of both the PLUMBBOB and HARDTACK Series by personnel from the Los Alamos and Livermore Laboratories. The Committee feels that both test series have been well planned, that they do not contain any significant duplication of effort, and that all planned tests in the HARDTACK Series should be carried out due to their importance. Also, the DOD shots are of importance and should be conducted in spite of the fact that they will contribute significantly to the release of fission products. However, due to the fact that they are to be tested at unusually high altitudes, fallout will probably not occur to an appreciable extent until the radioactivity has decreased, and then it will be at a low rate. The Committee does not feel that public reaction to the test series will be serious.
>
> The Committee has little to add to the briefings which have already been presented to the Commission, nor does the Committee feel itself qualified at this time to establish an order of priority of the HARDTACK Tests."

[redacted]

DOE 6.1(a)

[redacted]

[redacted]

16. The Chairman of the Military Liaison Committee has seen and informally concurs in the letter to the President given in Appendix "C".

STAFF JUDGMENTS

17. The Divisions of Biology and Medicine and Nuclear Materials Management and the Office of the General Counsel concur in the recommendation of this paper.

RECOMMENDATION

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

a. Approve the revised HARDTACK test program as contained in Appendix "A".

b. Approve conducting Operation MILLRACE, consisting of some 4 underground nuclear tests as indicated in Appendix "A", in fall 1958 at the Nevada Test Site.

c. Approve conducting some ten one-point safety tests at NTS in 1958.

d. Approve the expenditure of special nuclear materials up to the amounts given in Appendix "B", for the HARDTACK and MILLRACE tests and for the one-point safety tests at NTS.

e. Note that the list of shots and their objectives, for the HARDTACK and MILLRACE tests and for the one-point safety tests at NTS, will be submitted to the President by letter such as that in Appendix "C". This letter also requests authority to expend the special nuclear materials required for these tests.

f. Note that the Department of Defense will be informed of the approved test program by letter to the Military Liaison Committee such as that in Appendix "D".

g. Note that the Joint Committee on Atomic Energy will be informed of the approved test program by letter such as that in Appendix "E", after receiving Presidential authorization to expend the necessary special nuclear materials.

h. Note that the Department of State will be informed of the latest test plans by appropriate letter after receiving Presidential authorization to expend the necessary special nuclear materials.

[redacted]

[redacted]

~~S E C R E T~~

i. Note that the Federal Civil Defense Administration will be informed of the test plans by appropriate letter after receiving Presidential authorization to expend the necessary special nuclear materials.

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[redacted]

DOE 6.1(a)

APPENDIX "A"

SCHEDULE OF TESTS

[redacted]

Reference

[redacted]

Appendix "A"

Reference

[redacted]

DOE 6.1(a)

Reference

[redacted]

[redacted]

[redacted]

Appendix "A"

[redacted]

[redacted]

[redacted]

~~S E C R E T~~

APPENDIX "B"

REQUIREMENTS FOR SPECIAL NUCLEAR MATERIALS

[redacted]

DOE
6.1(a

[redacted]

[redacted]

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APPENDIX "C"

DRAFT LETTER TO THE PRESIDENT

1. On November 23, 1957, I wrote to you concerning our plans for testing in Operation HARDTACK, the spring 1958 test series at the Eniwetok Proving Ground. In this letter, I stated that in January I would submit to you a listing of the shots planned, their individual objectives and the amounts of special nuclear materials concerned.

[redacted]

DOE 6.1(a)

3. Since writing you, our plans for testing in HARDTACK have had to be revised somewhat. On December 12, 1957 we were informed by the Department of Defense that the development of the POLARIS missile system was being accelerated and were requested to accelerate the POLARIS warhead. In order to meet the new POLARIS schedule it has been necessary to revise the test program connected with development of this warhead. [redacted]

DOE 6.1(a)

[redacted]

[redacted]

scheduled shots do not give the necessary data to meet the early capability POLARIS requirement.

4. It has been necessary also to add to the program one other laboratory test. It was previously believed that the data required for the design of one warhead for the NIKE HERCULES could be obtained from the test of a basically similar device already included in the program. However, it is now felt necessary to test this second device in order to obtain the required data.

5. One other test of the original program has been deferred to the underground test series of very low-yield devices planned for the fall 1958 at the Nevada Test Site which I described in my November 23 letter, and which will be conducted as a separate test series to be known as Operation MILLRACE.

6. In summary, the over-all change to the HARDTACK program has been an increase of two scheduled shots, making a total of 19 scheduled laboratory and 5 scheduled DOD effects shots. In addition, there will be three contingent shots whose firing depends on the outcome of other shots in the series. Attached to this letter is a summarization of the scheduled and contingent nuclear shots in the HARDTACK and MILLRACE programs and their objectives.

7. In addition to these nuclear firings, we must fire some two to ten safety tests of certain designs to establish that, if detonated accidentally, no nuclear reaction would occur. These safety tests will be conducted at the Nevada Test Site, three in the spring 1958 and seven in the fall 1958. Earliest firing of two of the three is necessitated by the expedited POLARIS program.

[redacted]

[redacted]

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[redacted]

DoE 6.1(a)

We request your approval of the expenditure of the materials listed above.

[redacted]

DoE 6.1(a)

Dwight D. Eisenhower

Appendix "C"

[redacted]

[redacted]

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ANNEX TO APPENDIX "C"

HARDTACK TEST PROGRAM

DOD effects tests - The Department of Defense will fire five weapons effects shots. Three of these are high altitudes tests to determine detonation phenomena connected with missile and counter-missile design. Two of the three, each of 3.8 MT yield, will be carried to altitude by a Redstone missile, while the third of only 2 KT will be carried aloft by a balloon. The two other tests of the five are low-yield, underwater tests to determine essential information concerning the effects of atomic depth charges.

[redacted]

DOE 6.1a

[redacted]

DOE 6.1a

[redacted]

[redacted]

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[redacted]

DOE
6.1(b)

POLARIS warhead - Three shots will be necessary to meet the POLARIS requirement. [redacted]

DOE
6.1(a)

Annex to
Appendix "C"

[redacted]

[redacted]

[redacted] One is an exploratory shot of much smaller size to lead ultimately to moderate yield, small tactical weapons.

DOE 6.1(a)

[redacted]

DOE 6.1

New concepts in weapon design - One exploratory test of a new concept in weapon design possibly to lead to the development of very light-weight, medium-yield warheads will be fired.

MILLRACE TEST PROGRAM

[redacted]

DOE 6.1(a)

[redacted]

[redacted]

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APPENDIX "D"

DRAFT LETTER TO THE MLC

1. On November 13, 1957 I wrote to you concerning our plans for testing in Operation HARDTACK. Your reply of November 22, 1957 assured the Commission of appropriate Department of Defense support. On December 5, 1957 you furnished additional comments and recommendations concerning HARDTACK testing.

2. [redacted] DOE 6.1(a) By letter dated January 2, 1958 to Mr. Quarles, I outlined the revisions to the HARDTACK test program to meet the needs of the accelerated POLARIS warhead program. [redacted] DOE 6.1(a)

3. The President has been requested by letter, a copy of which is attached, to authorize the expenditure of the materials for the shot schedule now planned. This letter was coordinated with the Honorable Herbert B. Loper, Chairman of the MLC, prior to its dispatch to the President. I shall inform you when approval is received.

[redacted]

[redacted]

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APPENDIX "E"

DRAFT LETTER TO THE JCAE

1. On September 17, 1957 I wrote to you concerning our plans for testing in Operation HARDTACK, the spring 1958 test series at the Eniwetok Proving Ground, and noted that as our plans were further developed, I would keep the Committee informed.

2. We now have a reasonably firm program of tests in hand which has been approved by the Commission and concurred in by the Department of Defense. Operation HARDTACK will start on or about April 15, 1958 and will consist of about 24 firm laboratory and DOD effects shots. In addition, there are three contingent shots whose firing depends on the outcome of their counterparts among the firm shots.

3. We are planning to conduct a small series of nuclear tests underground at the Nevada Test Site in the fall 1958, to be known as Operation MILLRACE. About four low-yield devices will be fired underground in existing tunnels. The detonations will be completely contained and no fallout will result.

4. Besides these tests, we plan to conduct up to ten safety tests in 1958 at the Nevada Test Site. The purpose of these tests is to determine that, if certain designs are detonated accidentally, no nuclear reaction would occur.

5. The President has authorized the expenditure of the required special nuclear materials for these tests. The detailed description of the tests, the devices involved and their objectives is attached.

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E.O. 12958, Sec. 3.6
NW: 972006A
By DM Date 7/27/05

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