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June 6, 1952

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ATOMIC ENERGY COMMISSION

PART III - WEAPONS
PROGRESS REPORT TO THE JOINT COMMITTEE
DECEMBER 1951 - MAY 1952

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Note by the General Manager

Attached for the consideration of the Commission during the week of June 9, 1952, is Part III - Weapons of the Progress Report to the Joint Committee. The charts referred to will be transmitted separately to the Commission in advance of the meeting to consider the draft of the Report. As stated in AEC 129/41, this section will be transmitted to the Joint Committee as a separate document.

M. W. BOYER
General Manager

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DEPARTMENT OF ENERGY	DETERMINATION (CIRCLE NUMBER)
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This document consists of 14 pages

Copy No. 1 of 14 Series A

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By Authority of U. S. Atomic Energy
Commission

Per Francis D. McEntley, CRG Date 6/6/52
Document No. LXXXI-151-7A

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PART III

WEAPONS

Summary

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1. Stockpiling of the following new fission weapons began during the period of this report:

Mark 5 - 45-inch diameter implosion bomb

Mark 6 - Improved 60-inch diameter implosion bomb

Mark 8 - Penetrating bomb

Prototype Mark 7 - 30-inch diameter implosion bomb

Prototype Mark 9 - Artillery-fired atomic projectile.

Stockpiling of regular Mark 7 and Mark 9 production models is scheduled to begin during the next two or three months. Production of these new weapons will continue until stockpile requirements are met.

2. Good progress was made in the construction of the large yield thermonuclear device to be tested at Eniwetok early in November, 1952. The entire thermonuclear program is being pressed vigorously and plans are being made to test a second large yield thermonuclear device of different design in the fall of 1953.

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3. A series of eight nuclear test detonations was started in April and will be concluded in June 1952, at the Nevada Proving Ground - Operation TUMBLER to obtain additional information on blast phenomena, and Operation SNAPPER to study new weapon developments. The next series of tests at Nevada is scheduled to be held early in 1953.

4. Construction of new weapons production and storage facilities has continued.

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Weapon Production

Mark 4 (Implosion-type bomb, outside diameter 60 inches; approximate weight 10,800 pounds)

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A number of Mark 4 non-nuclear assemblies at each storage site is now maintained in a "ready" condition, fully assembled so they can be loaded in planes without delay.

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Mark 6 (Implosion-type bomb; outside diameter 60 inches; approximate weight 8,500 pounds)

6. Production of the Mark 6 is continuing.

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Mark 5 (Implosion-type bomb; outside diameter 45 inches; approximate weight 3,100 pounds)

7. This weapon is currently being stockpiled.

Mark 7 (Implosion-type bomb; approximate outside diameter 30 inches; approximate weight 1,600 pounds)

8. A number of prototype units, which could be used in an emergency, are now in the stockpile. Initial delivery of the approved production model has been delayed owing to over-all delays in construction of additional facilities and deliveries of equipment to the Iowa Ordnance Plant, Burlington, Iowa. Stockpiling of the regular Mark 7 production units is now scheduled to begin in June 1952.

9. Special fuzing is being developed for incorporation at a later date.

Mark 8 (Gun-type bomb for subsurface detonation; approximate diameter 14-1/2 inches; approximate weight 3,250 pounds)

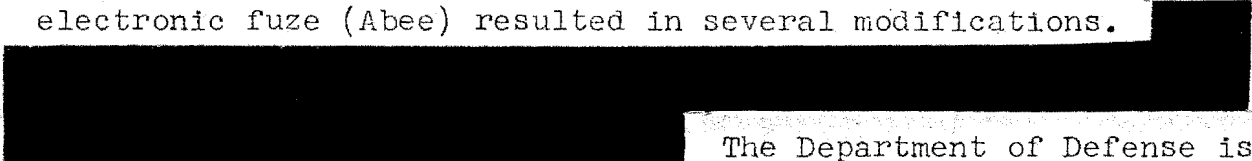
10. Stockpiling of the Mark 8 bomb began in February 1952 and the weapon is now operational.

Mark 9 (280 mm. Artillery-fired atomic projectile)

11. Stockpiling of prototype projectiles began in April 1952, and first deliveries of regular production units are scheduled to be made in July 1952. The associated artillery piece, which was developed by the Army Ordnance Corps, has been extensively tested using projectiles which did not contain fissionable material.

Weapon Components Production

12. Abee and Albert Fuzes. A thorough study of the new electronic fuze (Abee) resulted in several modifications.

 The Department of Defense is

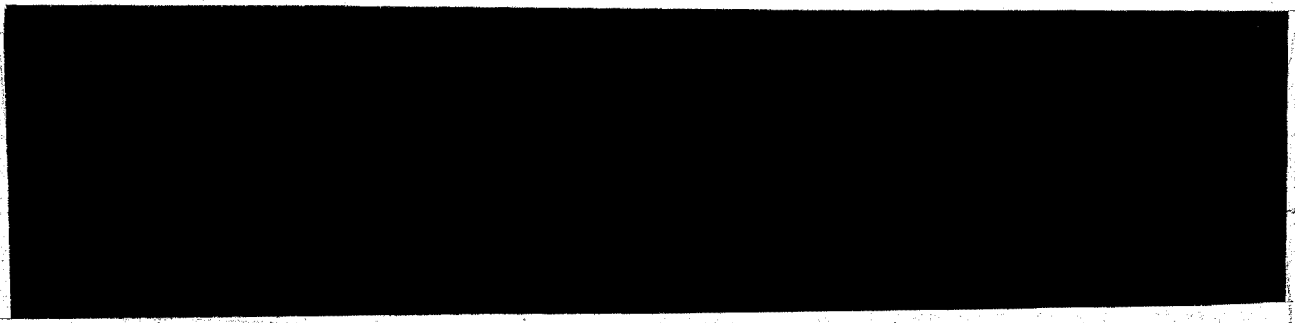
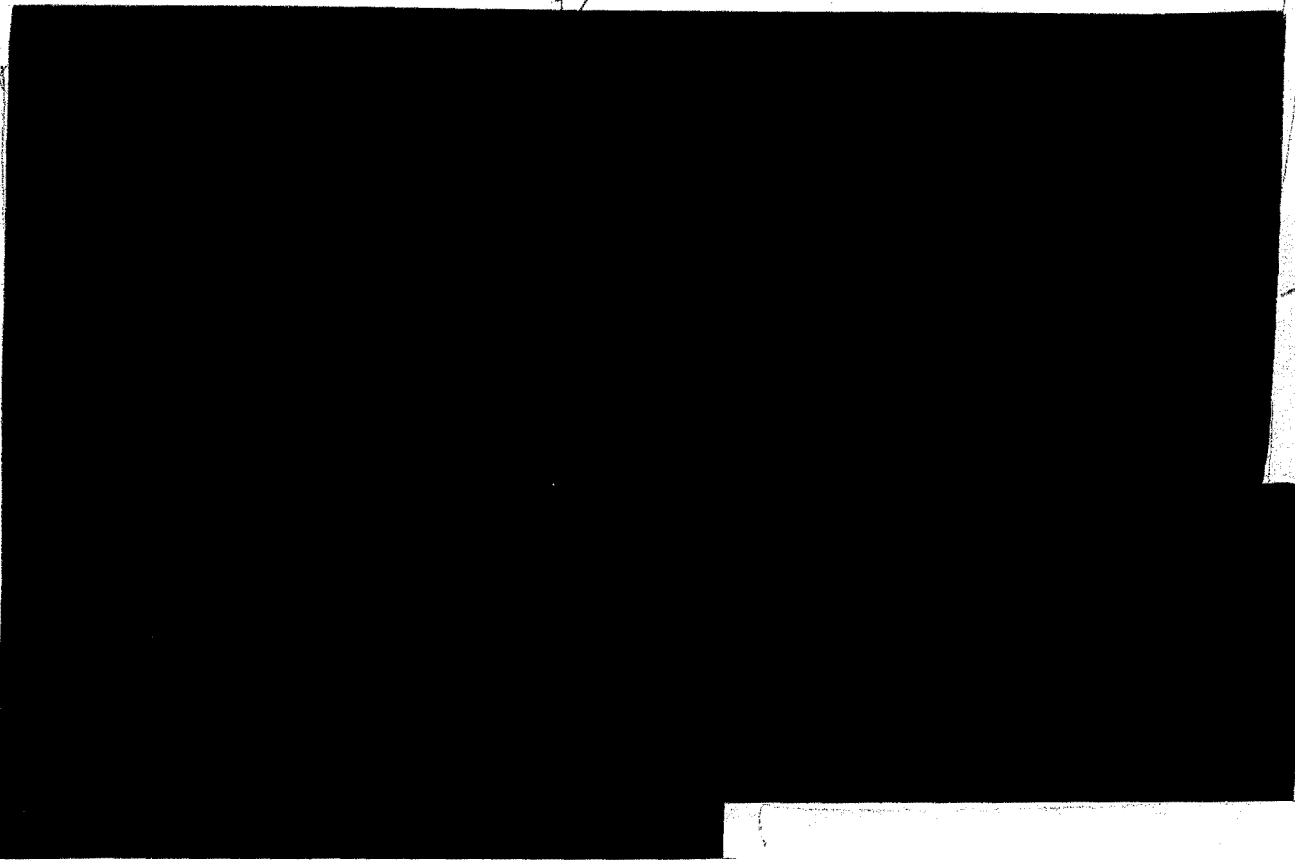
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conducting operational evaluation of its characteristics and functioning.



16. Stockpiling of the nuclear components for the gun-type weapons (Mark 8 and Mark 9) is continuing.

17. Initiator Production. Production of initiators for implosion weapons has proceeded on schedule. Production of initiators for the gun-type weapons was initiated and is progressing satisfactorily.

1/ The composition of the several nuclear cores was given in the Progress Report, June through November 1951, Part III, page 8, Table I.

2/ The reason for stockpiling the "160" core was explained in the Progress Report, June through November 1951, Part III, page 8.

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Weapons Production Facilities^{1/}

18. The Pantex Ordnance Plant, Amarillo, Texas, has been producing cored H.E. charges for the Mark 6 Mod 2 weapons since December 1951. Casting of high explosive charges for the Mark 5 and Mark 7 weapons is scheduled to begin at Pantex in June 1952.

19. A number of factors combined to delay the operational date of additional facilities at the Iowa Ordnance Plant at Burlington. However, production of H.E. for the Mark 5 weapons and weapon assembly work have been started there, and H.E. production and assembly of the Mark 7 is now expected to start in June 1952.

20. Inspection and assembly of nuclear cores has started at the Rocky Flats Plant near Denver, Colorado. Full production capability for fabricating plutonium and uranium 235 weapon components is scheduled to be attained by April 1953.

Fission Weapon Development

21. Chart No. 1 shows present development schedules for the principal new non-nuclear assemblies.

Mark 10 (Gun-type bomb desired for airburst only)

22. The Department of Defense has postponed indefinitely the requirement for this weapon, and its development has been suspended.

Mark 11

23. Seventeen aircraft are being studied as possible carriers for this weapon. Ballistic dummies are being used for aircraft compatibility tests and air flow studies. Impact tests of scale models indicate that the Mark 11 warhead will have significantly

^{1/} Construction schedules are given in Appendix "B" of the body of the report.

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greater ability to withstand impact than the warhead of the
Mark 8.

Mark 12 (Implosion-type bomb; outside diameter approximately
22 inches; weight about 1,200 pounds)

24. The first full scale test of the H.E. and nuclear system
for this bomb has just been conducted (see "Full Scale Tests").
A final full scale proof-test of the completed weapon, including
bomb case, fuzing system, etc., may be required at a later date.

Mark 13 (Implosion-type bomb; outside diameter 60 inches; weight
and length undetermined)

25. The previous design cut-off date (complete design
release date) of June 30, 1953 will not be met because the Armed
Forces are still establishing desired ordnance characteristics
and need to make further studies regarding the over-all length of
the bomb. As many of the most recent advancements in fission
weapon design as possible are being incorporated in this weapon.

Studies of nuclear systems are underway at Los Alamos, and, it is
planned to test a suitable design at Eniwetok in the Fall of 1952.

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Atomic Depth Bomb

27. A military requirement for the development of an atomic depth bomb was received in February 1952 and initial studies are underway. It will be an implosion type weapon, and will probably have a parachute attachment to reduce its impact with the water and allow more time for escape of the delivering aircraft.

Warheads for Guided Missiles

28. For some time the Commission has been working with the Department of Defense on a program for adapting atomic warheads for use in guided missiles; this work involves close coordination in the development of both the warheads and the missiles. The Department of Defense has stated requirements for the development of atomic warheads of several sizes for use with a number of missiles of the Army, Navy and Air Force.

29. Chart No. 2 shows the development schedules for the warheads of all atomic warhead-guided missile combinations for which development requirements currently exist. A number of other possible warhead-missile combinations are under study.

30. The Los Alamos Scientific Laboratory has been given primary responsibility for the development of the H.E. and nuclear systems which will withstand the high accelerations, and other conditions encountered in missiles, while the Sandia Corporation has charge of developing the installation arrangements in the allotted warhead space in the various missiles. Development of the missiles proper is under the Department of Defense.

Uranium 233

31. Production of uranium 233 in sufficient quantity for a full scale test is continuing. The Department of Defense and the

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Commission are currently studying further the potential military applications of U-233 and means for its production.

Initiator Development

32. An external initiator is scheduled to be tested at the Nevada Proving Ground in June, 1952. Laboratory investigations of alternate radioactive materials having longer half lives has continued, but polonium-210 is still the only active material being used in production of initiators for stockpile.

Thermonuclear Program

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Shipment of parts to Eniwetok is scheduled for early August with some parts to leave as late as early September. Assembly of the device at Eniwetok should begin about the middle of September.^{1/}

34. The cryogenics facilities at the Boulder (Colorado) Laboratory are nearly completed. The equipment is running well and liquefaction of gases in large quantity has been accomplished.

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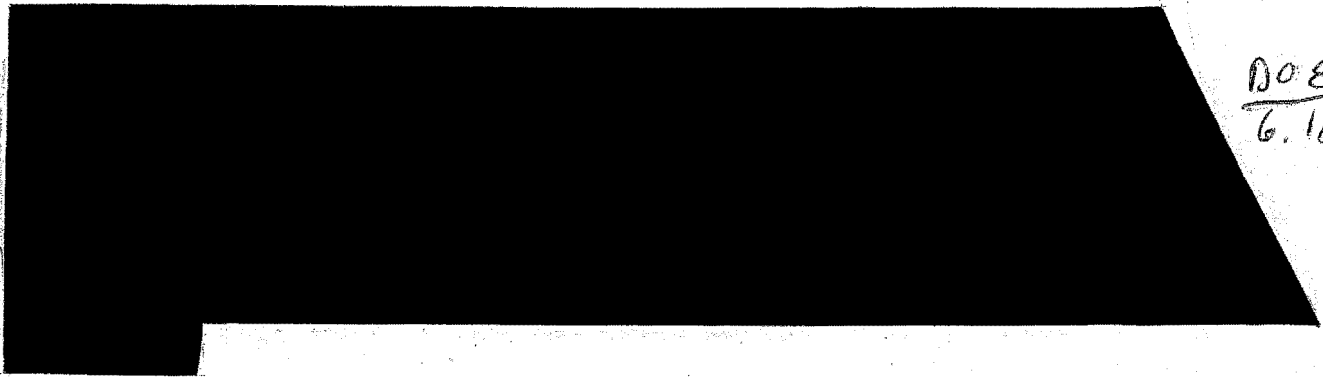
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^{1/} See Full Scale Tests, Operation IVY, page 10 .

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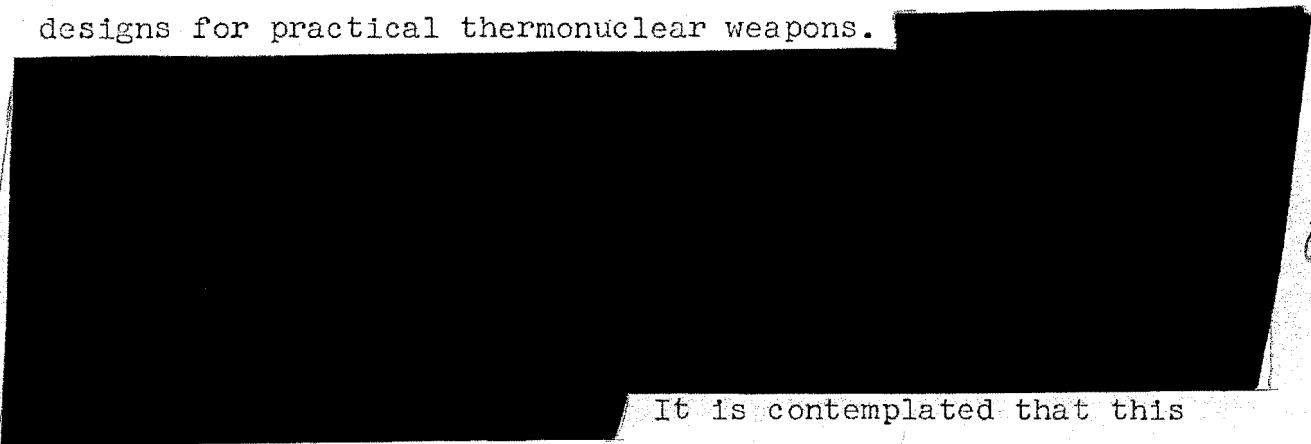
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37. Detailed consideration continues to be given to possible designs for practical thermonuclear weapons.



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It is contemplated that this design will be suitable for delivery by presently available bombers. A test of such a device in the Fall of 1953 is now thought possible and is planned. The plant to produce the necessary lithium-6, located at Oak Ridge, is under construction, and pilot plant operation and studies are continuing.

Tritium Production

38. Tritium requirements for the thermonuclear program do not now appear to be as large as was originally thought might be necessary.



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The question of tritium production in its relation to uranium-233 production is currently being reviewed.

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Full Scale Tests

Operation TUMBLER (Nevada, April-May 1952)

39.




Operation SNAPPER (Nevada, May-June 1952)

40. A number of new weapon features, principles, and designs are being tested in this series, as indicated in Table II. Results of these shots are still largely in the evaluation stage and will be reported at a later date.

Projected Tests

41. Operation IVY (Eniwetok, November 1952). Planning for Operation IVY is proceeding satisfactorily. The thermonuclear shot has been designated as "Mike" shot, and the present target date is early in November. The plan is to evacuate all personnel from Eniwetok Atoll for this detonation.



42. Operation UPSHOT (Nevada, Spring of 1953). This series of tests, reported previously as scheduled for the Fall of 1952, has been postponed until early 1953.

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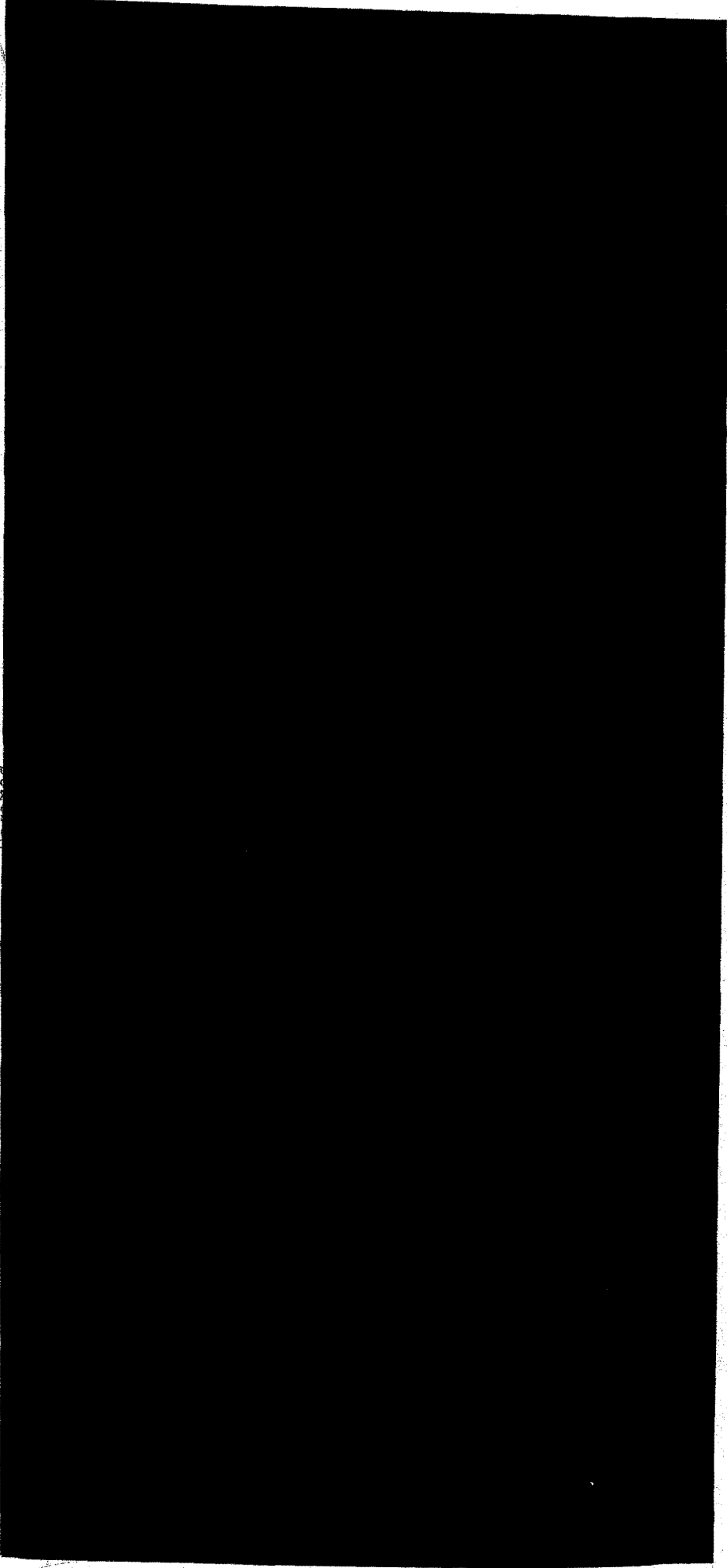


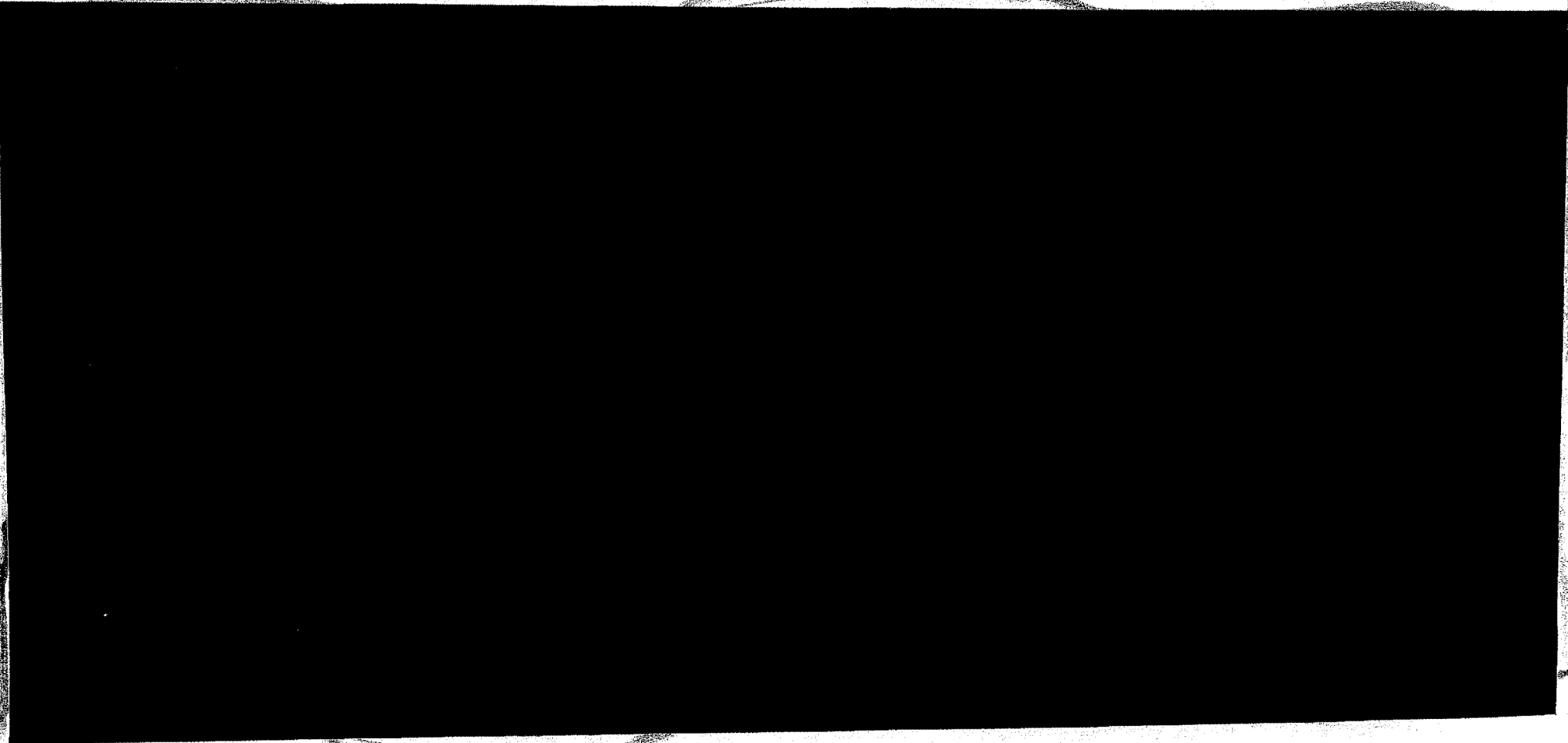
Table I - Operation TUMBLER - Nevada Proving Ground, April-May 1952

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Table II - Operation SNAPPER - Nevada Proving Ground, ^{1/} May-June 1952



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1/ All of these shots are being detonated at Yucca Flat, and all are being carried out on 300-foot towers except No. 1 which was an air drop.

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43. Operation KNOTHOLE (Nevada, Spring of 1953). The Department of Defense is considering holding some military effects tests in the Spring of 1953 at the Nevada Proving Ground and have assigned the code name KNOTHOLE to this possible operation.

44. Operation CASTLE (Eniwetok, Fall of 1953).  

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Weapons for Military Maneuver Training

45. Provision of atomic bombs to the Department of Defense for operational maneuver training has heretofore been effected through the establishment of a pool of eighty non-nuclear weapon assemblies in the custody of the Department of Defense for this purpose. The atomic weapon delivery capability of the Department of Defense has since expanded to such an extent that the limited number of weapons in the maneuver pool was inadequate to provide the training required. The Department of Defense recently proposed, and the Atomic Energy Commission has approved, the use of non-nuclear weapon assemblies in the stockpile for operational maneuver training purposes, with the provisions that (a) any individual weapon assembly will be used for no more than one maneuver assembly during its stockpile life, and (b) the responsibility for security and safeguarding of the weapons in the temporary custody of the Department of Defense will be assumed by the Department.

Radiological Warfare

46. The Department of Defense is currently evaluating the military worth of radiological warfare in the light of present knowledge and with consideration for the expanding potential capacity to produce radiological warfare agents. It is hoped that some reasonably firm conclusions regarding the feasibility of radiological warfare may be reached without the necessity for conducting

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field tests involving large amounts of R.W. agents, which would require the construction of additional facilities for separating and handling the material in large quantities.

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