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DM 1-74 Date 6/27/05

AEC 129/55

November 27, 1953

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ATOMIC ENERGY COMMISSION

PART III - WEAPONS -
PROGRESS REPORT TO THE JOINT COMMITTEE
JUNE THROUGH NOVEMBER 1953

Note by the Secretary

Attached for the consideration of the Commission during the week of November 30, 1953, is Part III, Weapons, of the Progress Report to the Joint Committee. As indicated in AEC 129/54, Part III, Weapons, will be transmitted to the Joint Committee as a separate document.

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PART III

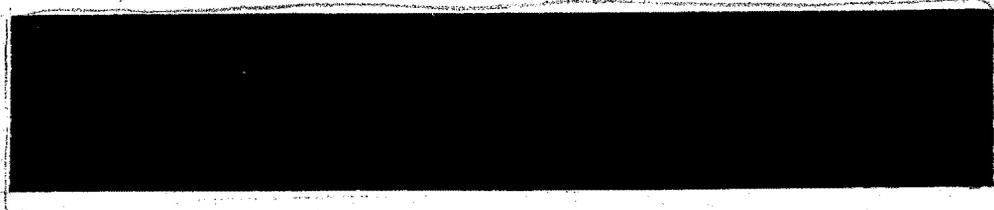
WEAPONS

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1. The highlights of the thermonuclear and fission weapon programs during the last six months are these:

- a, Design release of three deliverable thermonuclear weapon prototypes, to be tested in the Pacific, March-April 1954, and to enter stockpile during January-June 1954;



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Thermonuclear Weapons Program

2. The two-fold objectives of the thermonuclear weapons program as stated in the preceding Progress Report continue to be: First, achieving as quickly as possible an emergency capability to deliver early-design thermonuclear weapons; and, second, creating over a longer term improved-design thermonuclear weapons which are smaller, lighter, and more easily delivered, or possibly of higher yield, than the emergency capability prototypes.

3. The immediate focal point of the thermonuclear program has been the preparation for Operation CASTLE, scheduled to begin

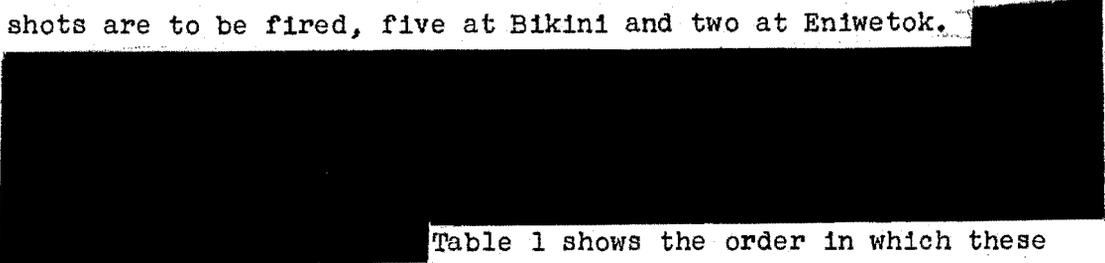
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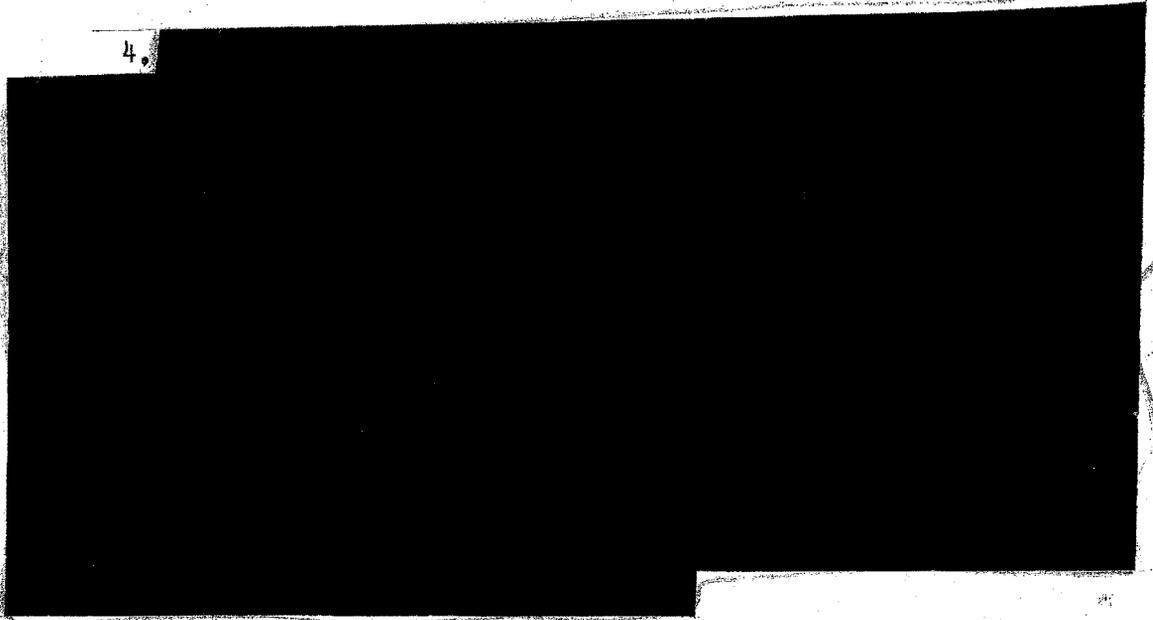
6401/4932/12/3

in the Pacific in March 1954, at which tests seven thermonuclear shots are to be fired, five at Bikini and two at Eniwetok.



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Table 1 shows the order in which these weapon prototypes and devices are scheduled to be fired and the kinds of fusionable material to be employed.



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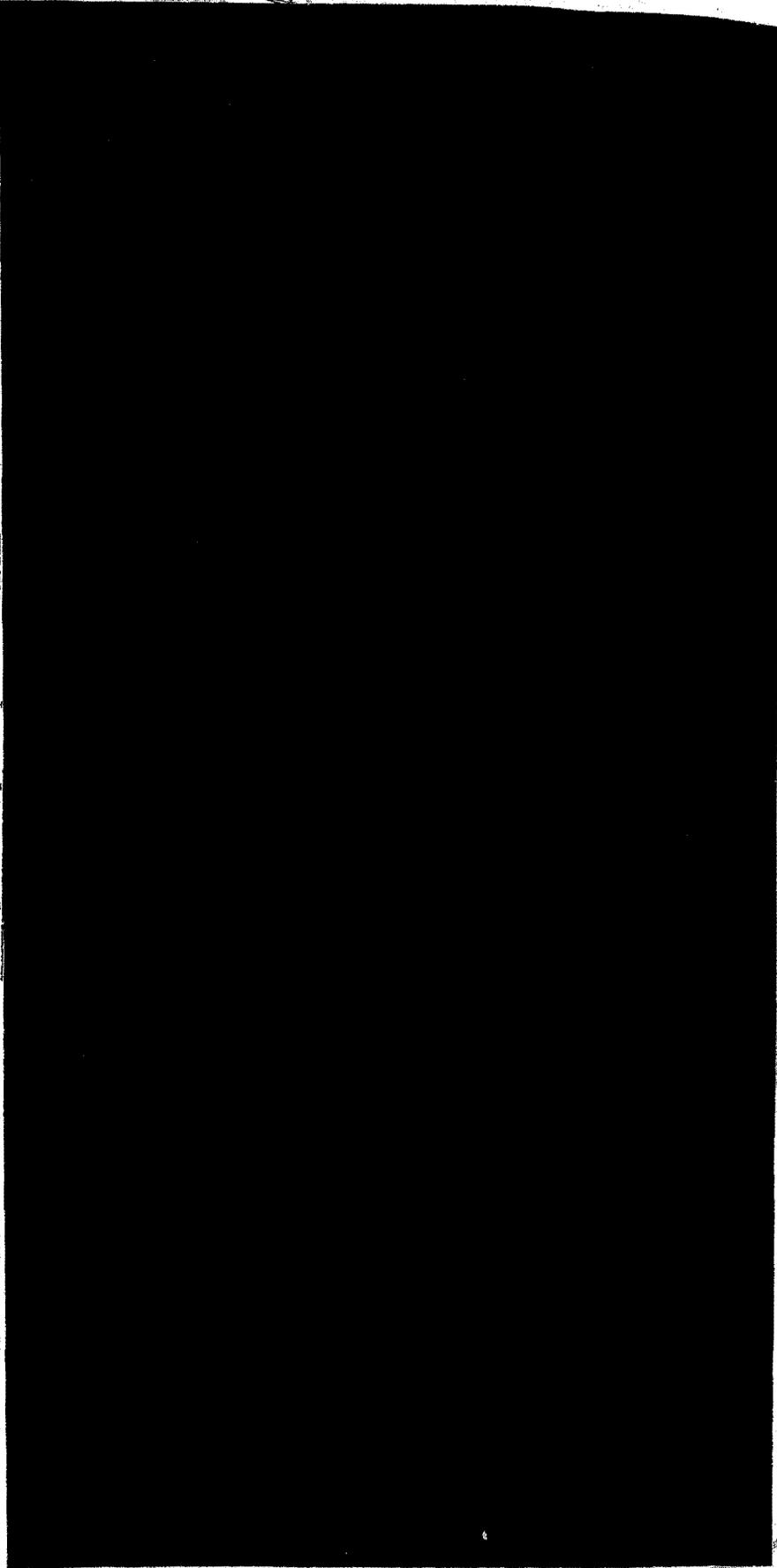
4.
5. As indicated in Table 1, the thermonuclear weapons program is dependent upon the work of both Los Alamos Scientific Laboratory and University of California Radiation Laboratory (Livermore); Los Alamos Scientific Laboratory will be responsible for five shots, and University of California Radiation Laboratory for two.

6. Plans for the thermonuclear production program are proceeding on the basis of guidance furnished by the DOD, September 28, 1953. While production of thermonuclear weapon materials and components based on earlier DOD requirements has been underway for some time, quantity production plans are being kept flexible

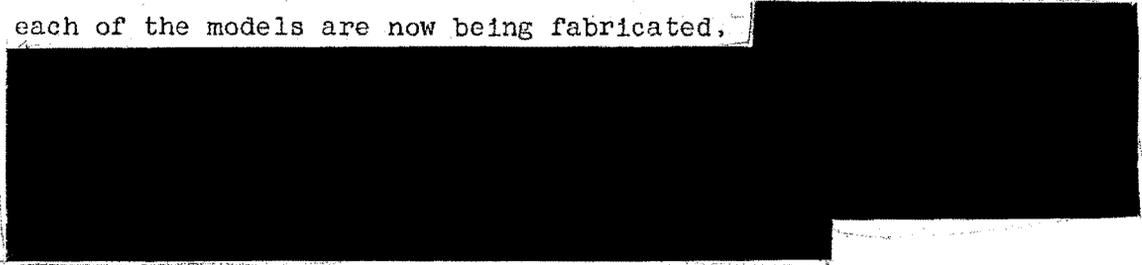
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TABLE 1.

Contemplated Scope of Operation CASTLE



to facilitate the adaption of CASTLE results. The design of each of the three emergency capability weapon prototypes was released for procurement during the third quarter 1953, and components for each of the models are now being fabricated.



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Future Weapon Tests

7. The proposed schedule of full-scale weapon tests after Operation CASTLE is substantially as outlined in the preceding Progress Report (see Part III, page 11, Table 2). Operation TEAPOT, the next continental test series, is now scheduled for the spring of 1955.

Fission Weapon Research and Development

8. New bombs and projectiles. The development status of each of the new bombs and the new artillery projectile shown on Chart III-A is summarized below:



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Under the authority granted by the President in February 1953, the development and production responsibilities for the non-nuclear portions of this weapon have been transferred to the Department of Defense.

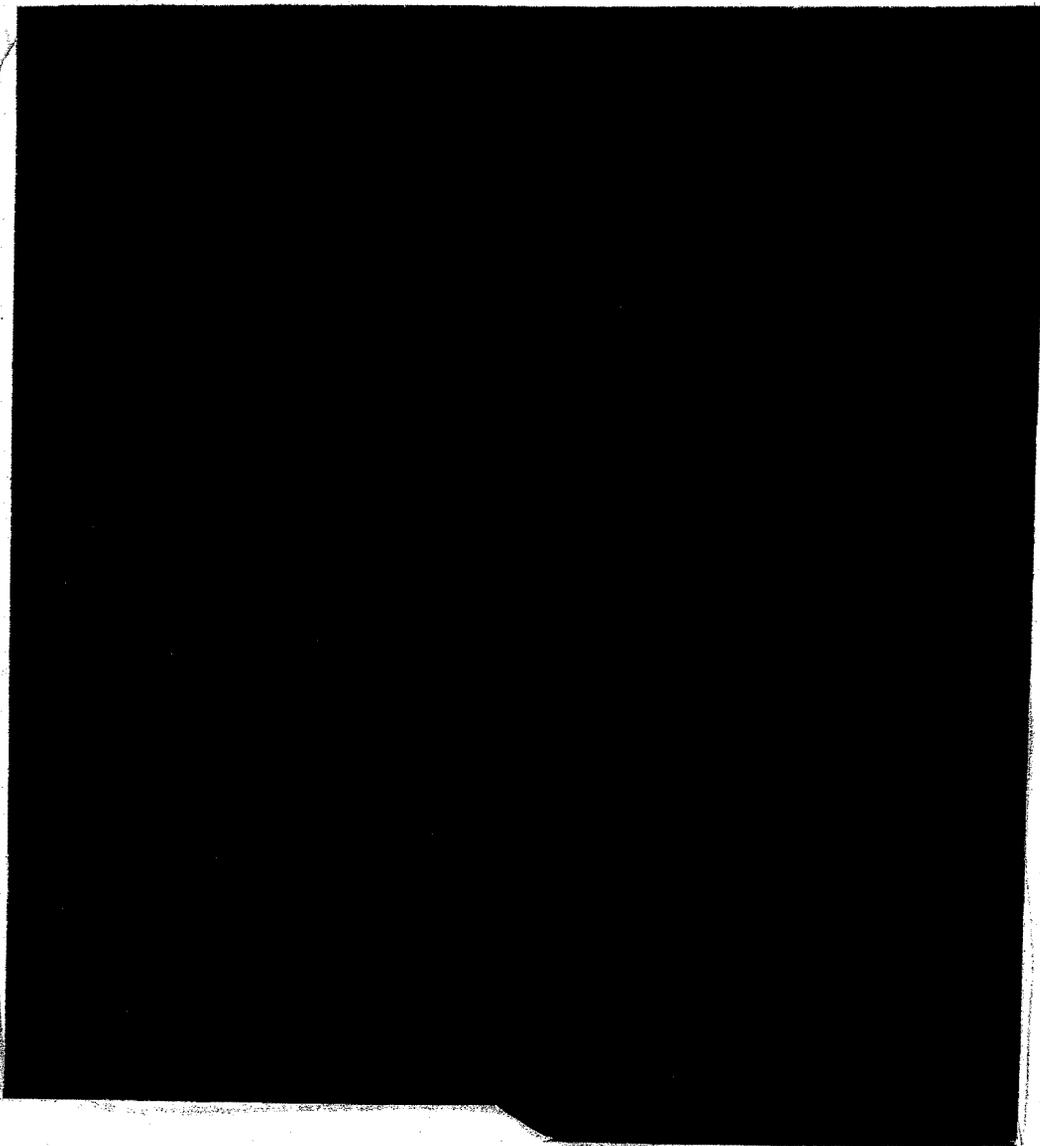


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WEAPONS

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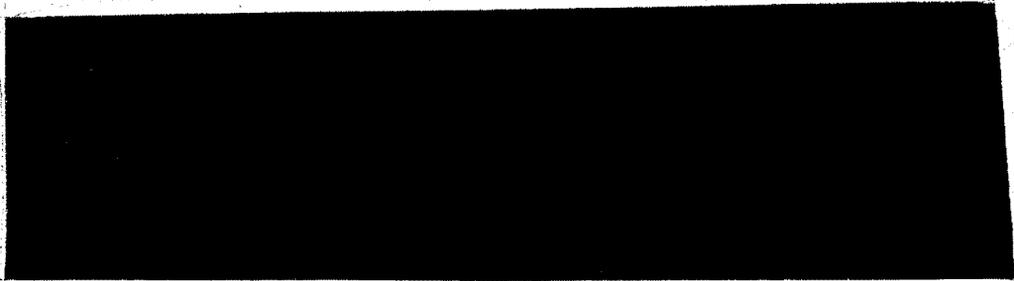
WEAPON DEVELOPMENT SCHEDULE



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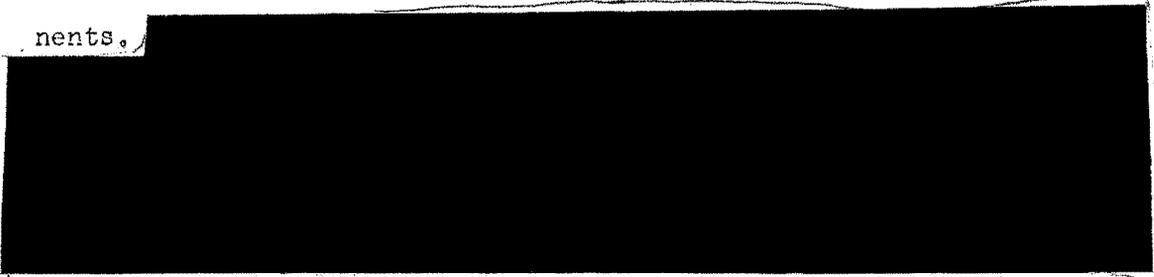
CHART III - A

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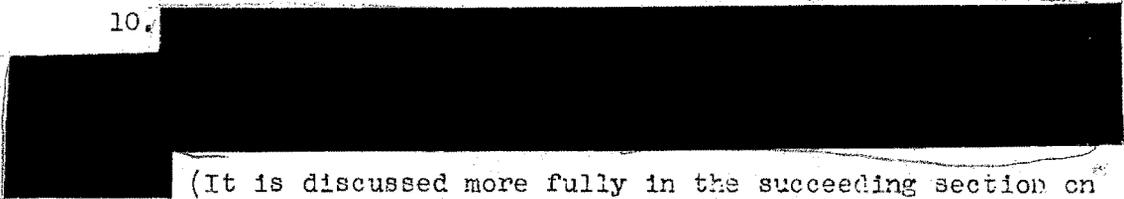
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9. Warhead Installations for Guided Missiles. The develop-
ment status of atomic warhead installations for guided missile
combinations is shown on Chart III-A. Warhead installations are
accomplished by converting bombs from stockpile. The stockpile
entry date shown refers to the adaption kits and conversion compo-
nents.



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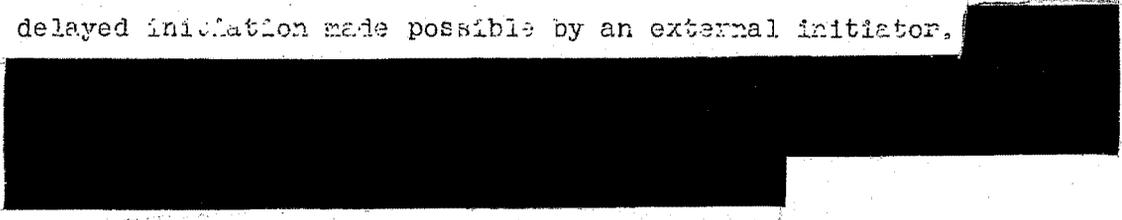
10.



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(It is discussed more fully in the succeeding section on
Weapon Production and Stockpiling.)

11. Continental weapon tests in 1952 and 1953 involving exter-
nal initiation demonstrated that gains in yield can be achieved by
delayed initiation made possible by an external initiator.



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12. Radiological warfare. The Army Chemical Corps has dras-
tically reduced its effort devoted to radiological warfare agents,
and the Commission in March 1954 will terminate the work of the

Knolls Atomic Power Laboratory aimed at developing a process for extracting essentially pure fission products from reactor waste materials. There are no present military requirements for radiological warfare agents, and no production facilities are planned.

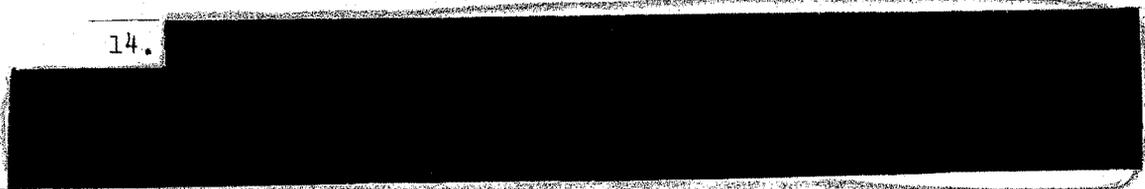
Fission Weapon Production and Stockpiling

13. Nuclear Assemblies. Chart III-B, Nuclear Assemblies, shows the growth of the stockpile since 1949, measured in terms of indexes of the actual number in the stockpile (December 31, 1949 100). As mentioned in the preceding Progress Report, the number of nuclear assemblies added to the stockpile in a particular period is influenced not only by the current quantity of plutonium and uranium 235 being produced but also by changes in the kinds of nuclear assemblies being produced, by changes in the quantity of fissionable material in the production and fabrication pipeline, by diversions of material for weapon tests, and by diversions required to enrich the Hanford reactors and for reactor research and development. During the latter part of 1952 and the early part of 1953 the diversion of fissionable materials for these purposes was appreciable compared with total output during that period. Thus, during the first half of 1953 the number of nuclear assemblies added to the stockpile was less than one-half the number added during 1952.



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14.

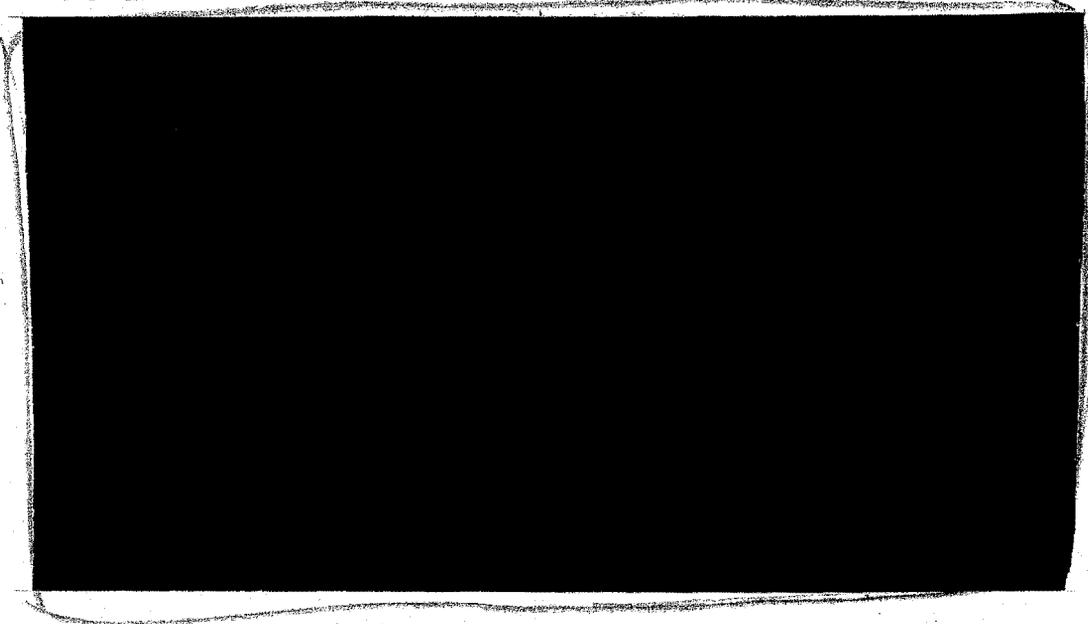


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WEAPONS

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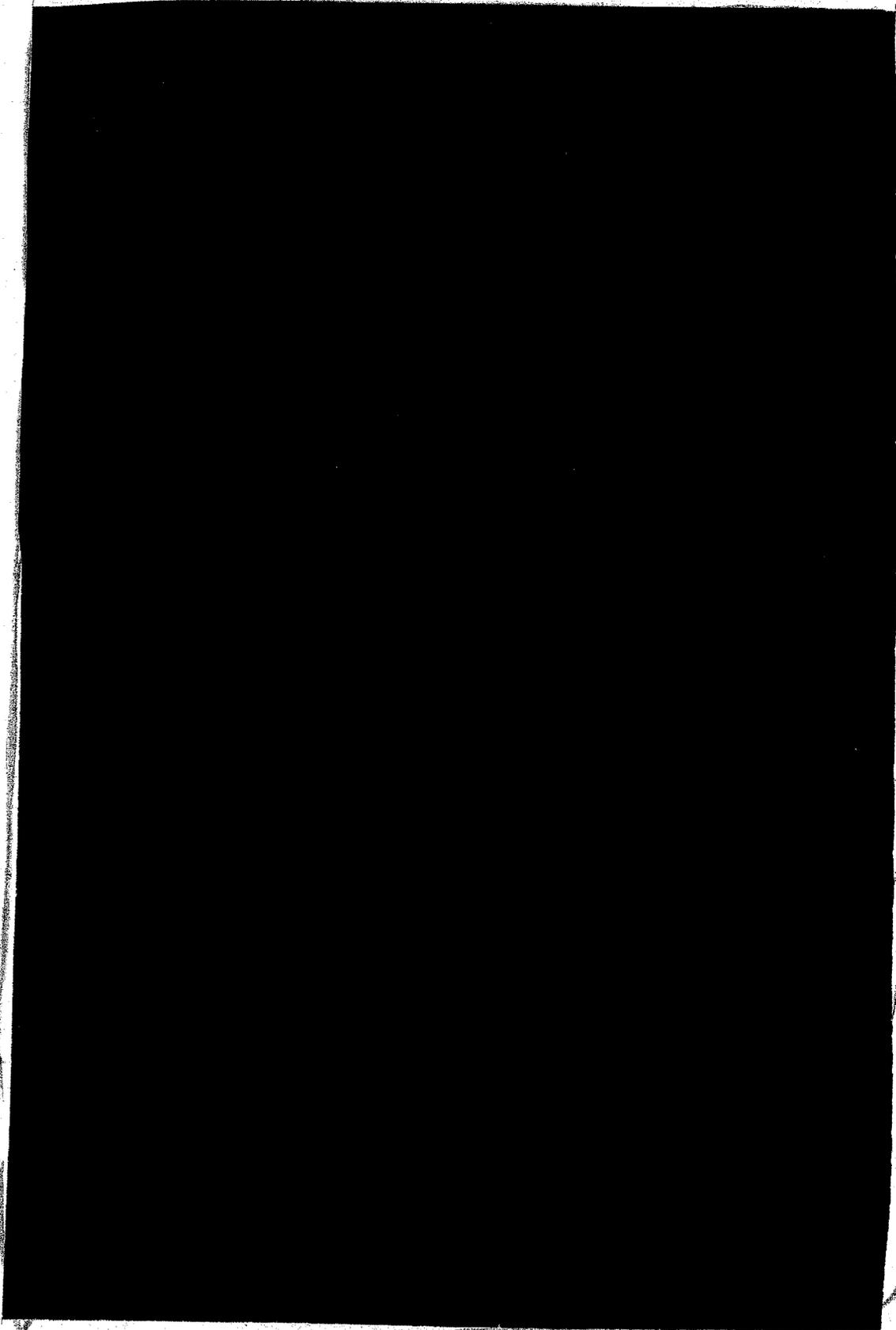
NUCLEAR ASSEMBLIES



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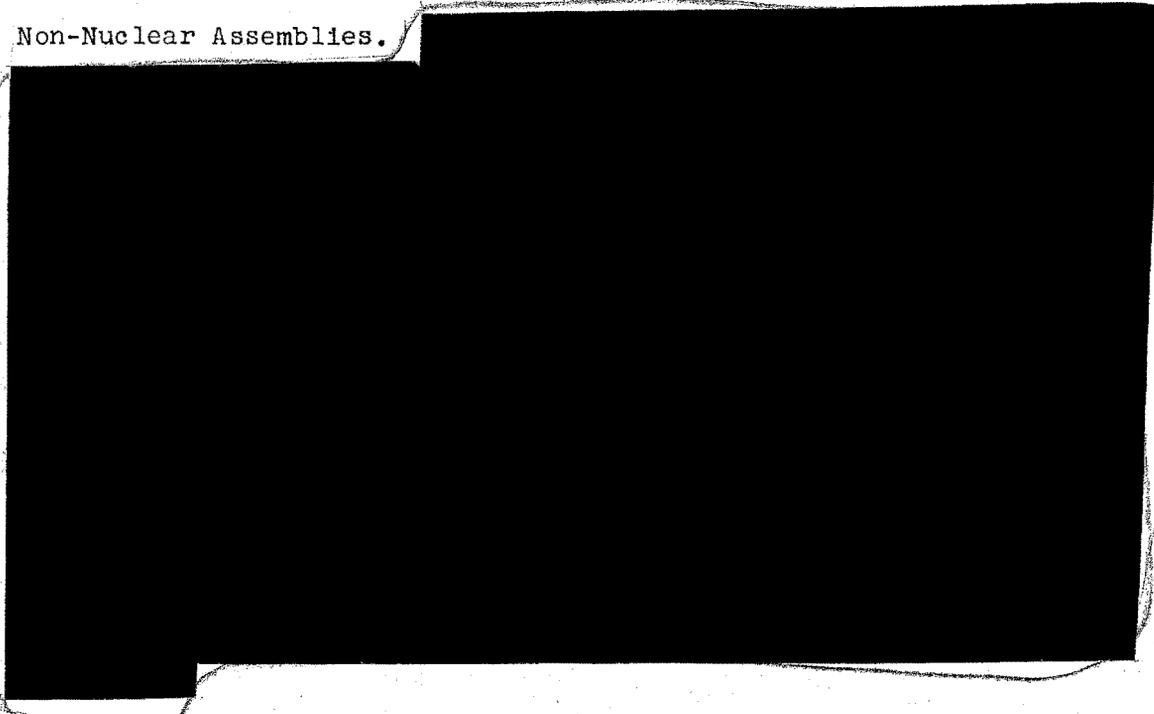
CHART III-B

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SECURITY INFORMATION



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17. Non-nuclear Assemblies. The composition of the stockpile of non-nuclear assemblies on September 30, 1953, and the composition of quarterly production during 1953 are shown in Chart III-C, Non-Nuclear Assemblies.



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18. The production of three non-nuclear assemblies was terminated during the third quarter of 1953. The Mark 5 output was stopped because military requirements for this type bomb were reduced; production of the Mark 8 gun-type bomb for subsurface detonation was ended because the stockpile goal by July 1955 had been met; and the output of the Mark 9 (280-mm. artillery-fired projectile) was transferred to the Department of Defense in accordance with the President's action in February 1953. (See page 15 of Part III, preceding Progress Report.)

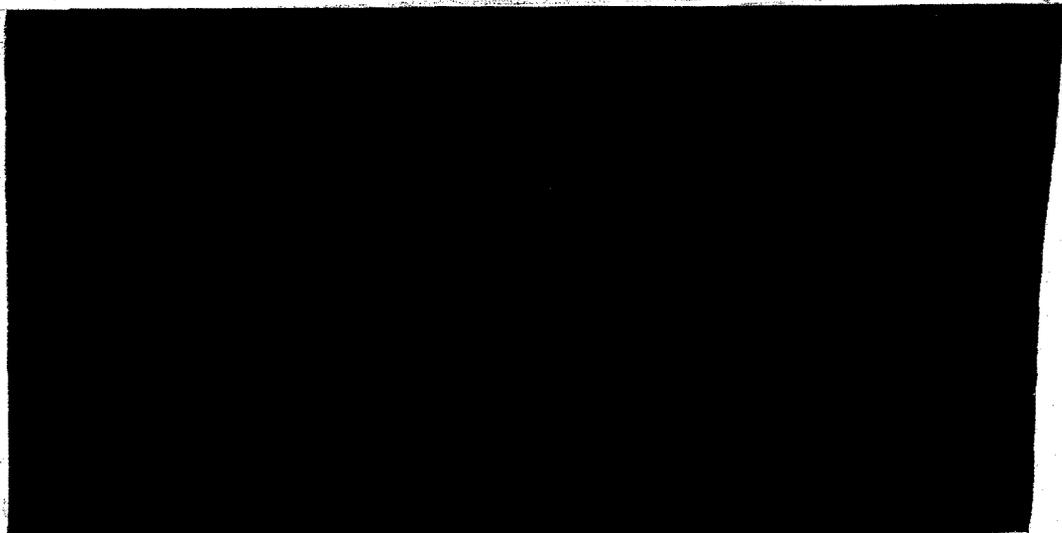
19. Comments on the status of the three non-nuclear assemblies now being produced for stockpile follow:

a. Mark 6 (Implosion-type weapon, outside diameter 61 in., approximate weight 8,500 lbs.) The design of a new model having improved fuzing is about to be completed and will shortly be released for production.

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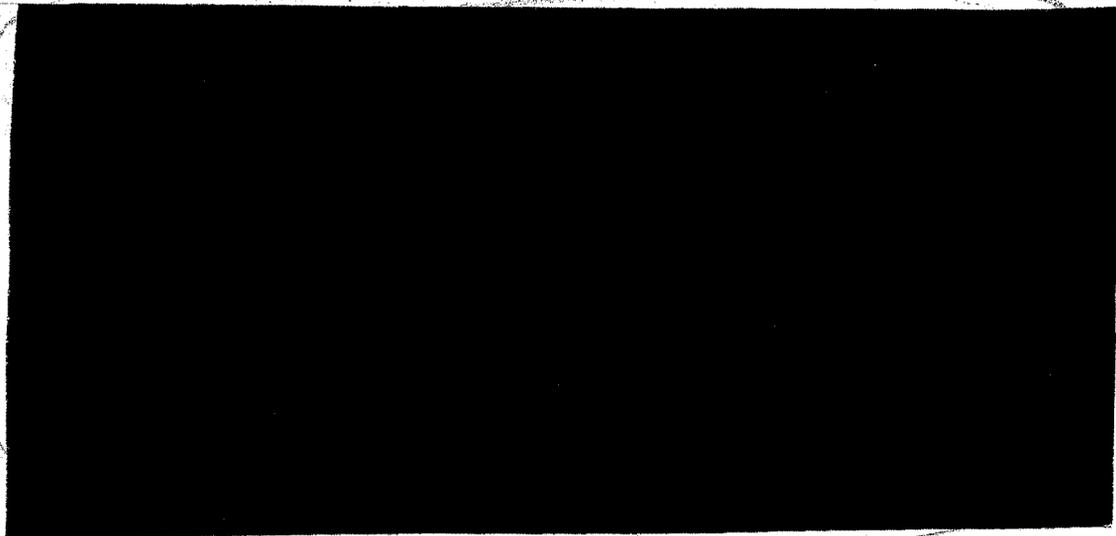
WEAPONS

NONNUCLEAR ASSEMBLIES
COMPOSITION OF STOCKPILE - SEPT. 30, 1953 *



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COMPOSITION OF CURRENT PRODUCTION



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CHART III-C

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SECURITY INFORMATION

b. Mark 7 (Implosion-type weapon, approximate outside diameter 30 in., approximate weight 1,600 lbs.) A new model having improved fuzing is now being stockpiled.

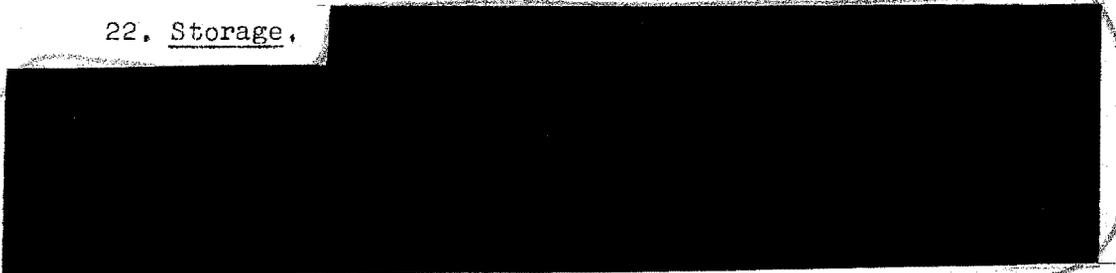
c. Mark 18 (Implosion-type bomb, outside diameter 61 in., approximate weight 8,500 lbs.) This weapon, described above, is essentially the Mark 6 but incorporates changes required by the special nuclear component and its nuclear safing.

20. DOD participation in non-nuclear weapon production. The preceding Progress Report described the President's action in February 1953 which directed the Commission to authorize the DOD to assume primary responsibility for the production of non-nuclear components of gun-assembly-type weapons as mutually agreed upon. More recently, the AEC and the DOD jointly recommended to the President that he direct the Commission to authorize the DOD to assume responsibility for (1) the manufacture, production, or acquisition of such non-nuclear components of weapons utilizing implosion-type nuclear systems as may be mutually agreed upon and (2) the custody of such non-nuclear components of the types for which they assume production responsibility, as may be mutually agreed upon.

New Weapon Facilities

21. Production. The Rocky Flats Plant near Denver, Colorado, for core fabrication, inspection, and assembly has been completed and is now in full operation. A special review of present and projected HE plant capacity has been completed; based on this study the Commission has cancelled the construction of the Spoon River plant, near Macomb, Ill., described in the preceding Progress Report.

22. Storage.





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23. After 1955 the weapon storage requirement becomes so great that the cost of constructing present types of structures would be prohibitive. AEC and the DOD have agreed that future fission weapon storage will consist of "satellite" facilities. These storage sites will be adjacent to or near national storage sites; stockpile weapons will be stored in warehouses in a standby or depot-type condition, instead of being stored in operational or ready condition as is done with stockpile weapons at the present sites.

24. New thermonuclear weapon requirements and the projected production of such weapons have also prompted additional construction and partial modification of storage vaults, warehouses, and plants. The modification of existing storage sites has begun in order to provide storage facilities for such high-yield weapons needed up to July 1956. (End of TOP SECRET section.)

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