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November 6, 1958

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ATOMIC ENERGY COMMISSION

PART III - WEAPONS

QUARTERLY PROGRESS REPORT
TO THE JOINT COMMITTEE ON ATOMIC ENERGY
JULY-SEPTEMBER 1958

Note by the Secretary

Attached for consideration by the Commission in connection with AEC 129/94 is Part III - Weapons of the July-September 1958 Quarterly Progress Report to the Joint Committee.

W. B. McCool

Secretary

[redacted]

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TOP SECRET
By authority of U.S. Atomic Energy Commission
Per Don S. Burrows/lwb/lwb Date 11-6-58
Document No. LXXXI-5872 /A

[redacted]

PART III

WEAPONS

WEAPONS PRODUCTION

1. The production of nuclear weapons in the July-September quarter was 22 percent below forecast. Among the individual programs, the Mark 25 warhead for the Genie missile and the Mark 28 Class D thermonuclear bomb were furthest behind schedule. The lag in these programs resulted from difficulties encountered with the newly designed DELETED However, production during September improved generally, and at the end of the month it appeared that the production lag for all programs would be overcome by January 1959, and that the previously reported forecast of the number of nuclear weapons in stockpile by June 30, 1959, would be met.

2. New weapons first produced for stockpile during the quarter were:

a. The Class D thermonuclear bomb, Mark 28 Y1, with a yield of [redacted] and a weight of 2,000 pounds,

b. The Mark 49 Y1 thermonuclear warhead for the Intermediate Range Ballistic Missiles, Jupiter and Thor, with a yield of [redacted] and a weight of 1,600 pounds, and

c. The Class D thermonuclear warhead, Mark 27, for the Regulus and Rascal missiles with a yield of [redacted] and a weight of 2,800 pounds.

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[redacted]

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WEAPONS DEVELOPMENT

3. A feasibility study was completed and the Department of Defense requested a development program for a warhead for the Falcon missile and the Davy Crockett recoilless rifle and other weapons in the Battle Group Atomic Weapon System.

4. A development program was established at the request of the Department of Defense for a laydown version of the Class C thermonuclear bomb, TX-46.

5. As a result of Operation HARDTACK tests, the AEC determined that the [DELETED] device will be weaponized for the Class B thermonuclear bomb, TX-41, with yields of [redacted] for the conventional version and [DELETED] for the "clean" version.

6. The [DELETED] test of the XW-35 warhead for Intermediate Range and Intercontinental Ballistic Missiles resulted in a yield of [DELETED] Inasmuch as a slightly better yield can be obtained in the same weight class using the Mark 49 warhead with [redacted] the XW-35 program was canceled.

7. The weapons laboratories, Los Alamos Scientific Laboratory, Sandia Laboratory, and University of California Radiation Laboratory at Livermore, were informed that the President directed that every effort should be made to maintain the vigor of the laboratories and weapons development progress during the period of the nuclear weapons tests suspension.

8. New light weight weapons, now in research or development, require detonators which will meet severe weight and space limitations.

[redacted]

(See also Part II of

[redacted]

[redacted]

WEAPONS TESTING

9. The completion of tests for Phase I of Operation HARDTACK at Eniwetok Proving Ground and the disestablishment of the danger areas in the Pacific were announced on September 8. Thirty-four nuclear tests and one safety test were conducted. Results of the Phase I nuclear tests are shown in Table 1. The one-point safety test was a DELETED DELETED Results indicated that the weapon is one-point safe and production will continue with the present design.

10. Results of the nuclear tests conducted at Nevada Test Site during September and October, Operation HARDTACK, Phase II, are also shown in Table 1.

11. After the President's announcement concerning test suspension on August 22, AEC weapon programs were reviewed and Presidential approval was requested for additional nuclear test shots for Phase II. Fifteen nuclear test shots, one contingent shot, and 10 to 12 safety tests were approved.

Operation HARDTACK

Table 1.

Phase I - Eniwetok Proving Ground

Tests Sponsored by the Los Alamos Scientific Laboratory

Name, date, and device	Objective	Actual yield	Results
CACTUS May 5		18.0 KT	
DELETED			
BUTTERNUT May 11		DELETED	
DELETED			
KOA May 12	[redacted]	1.31 MT	
DELETED			DELETED
HOLLY May 20		DELETED	
DELETED			

Tests Sponsored by the Los Alamos Scientific Laboratory (continued)

Name, date, and device	Objective	Actual yield	Results
YELLOWWOOD May 25 DELETED			
MAGNOLIA May 26 DELETED			
TOBACCO May 29 DELETED	DELETED	DELETED	DELETED
ROSE June 2 DELETED			
WALNUT June 14 DELETED			
LINDEN June 17 DELETED			

Tests Sponsored by the Los Alamos Scientific Laboratory (continued)

Name, date, and device	Objective	Actual yield	Results
ELDER June 27 DELETED			
OAK June 28 DELETED			
SEQUOIA July 1 DELETED	DELETED	DELETED	DELETED
PISONIA July 17 DELETED			

Tests Sponsored by the University of California Radiation Laboratory

FIR May 11 DELETED			
NUTMEG May 21 DELETED	DELETED	DELETED	DELETED

Tests Sponsored by the University of California Radiation Laboratory (continued)

Name, date, and device	Objective	Actual yield	Results
SYCAMORE May 30 DELETED			
MAPLE June 10 DELETED			
ASPEN June 14 DELETED	DELETED	DELETED	DELETED
REDWOOD June 27 DELETED			
HICKORY June 28 DELETED			

Tests Sponsored by the University of California Radiation Laboratory (continued)

Name, date, and device	Objective	Actual yield	Results
CEDAR July 2	[redacted]		
DOGWOOD July 5	[redacted]		
POPLAR July 11	[redacted]	[redacted]	[redacted]
OLIVE July 22	[redacted]		
JUNIPER July 22	[redacted]		

Tests Sponsored by the University of California Radiation Laboratory (continued)

Name, date, and device	Objective	Actual yield	Results
PINE July 26 DELETED			
QUINCE August 5 DELETED	DELETED	DELETED	DELETED
FIG August 17 DELETED			

Effects Tests Sponsored by the Department of Defense

Name, date, and device	Objective	Actual yield
YUCCA April 27 DELETED	High altitude (90,000 feet) effects test to extend knowledge of effects at altitudes above 40,000 feet. (Warhead was carried by a balloon.)	DELETED
WAHOO May 15 DELETED	Underwater effects test, 500 feet deep in 3,000 feet of water, to determine effects under given conditions.	DELETED
UMBRELLA June 8 DELETED	Underwater effects test, 150 feet deep on bottom of lagoon, to determine effects under given conditions.	DELETED

Effects Tests Sponsored by the Department of Defense (continued)

Name, date, and device	Objective	Actual yield
TEAK August 1 [redacted]	High altitude (250,000 feet) effects test to determine [redacted] (carried by Redstone missile.)	[redacted]
ORANGE August 12 [redacted]	High altitude (125,000 feet) effects test to determine [redacted] carried by Redstone missile.)	[redacted]

Tests Sponsored by the Los Alamos Scientific Laboratory

Name, date, and device	Objective	Actual yield	Results
EDDY September 19			
[redacted]			
MORA September 29			
[redacted]			
SIERRA			
[redacted]			
QUAY October 10		[redacted]	[redacted]
[redacted]			
LEA October 10			
[redacted]			
RIO ARRIBA October 18			
[redacted]			
DONA ANA October 23			
[redacted]			

Tests Sponsored by the University of California Radiation Laboratory

Name, date, and device	Objective	Actual yield	Results
TAMALPAIS October 8			
[redacted]			
WRANGEL October 10			
[redacted]			
HAMILTON October 12			
[redacted]			
RUSHMORE October 15			
[redacted]			
LOGAN October 15			
[redacted]			
MAZAMA October 22			
[redacted]			
EVANS October 24			
[redacted]			
BLANCA October 25			
[redacted]			

[redacted]

WEAPONS FACILITIES

Ballistics Test Range

12. The proposal to lease 40,000 acres of desert land on the Navajo reservation near Winslow, Arizona, for use as a ballistics test range was withdrawn. During the discussions with representatives of the Navajo Tribal Council it was found that the local Navajos were nearly unanimous in opposing this project. Alternate sites for a proposed range are under AEC review.

Construction

13. Expansion of weapon research and development facilities at the University of California Radiation Laboratory at Livermore was 61 percent complete and about on schedule on September 30. Construction of the Sigma Building at Los Alamos was 64 percent complete and slightly behind schedule.

14. The 1958 expansion of ACF Industries plant at Albuquerque was 60 percent complete.

15. The design of the building and supporting facilities for a 5-megawatt reactor for testing weapon components by Sandia Corporation in Albuquerque was 92 percent complete and on schedule. Completion of design, scheduled for the end of October, would permit taking bids for construction in November.

EXCHANGE OF WEAPONS INFORMATION WITH THE UNITED KINGDOM

16. Two exchange-of-information meetings with the United Kingdom were held in the July-September quarter. These meetings were held pursuant to section 144c(1) of the Atomic Energy Act and the new bilateral agreement with the United Kingdom. Highlights of the first meeting, held in Washington, D.C., August 25-27, are set forth in the following paragraphs.

17. Our transmission to the United Kingdom consisted of a written report and more detailed oral statements concerning weapons we now have and will shortly have in production. Included were details of size, weight, shape, yield, amount of special nuclear material, method of nuclear safing, mechanical and electrical design, and vulnerability.

18. The United Kingdom representatives presented parallel information together with an indication of weapons they intend to develop. Following completion of all items in the agenda, the United Kingdom representatives gave an oral presentation of their state of achievement in the nuclear weapons field, in which they described two rather sophisticated, DELETED small, fission devices, one of which had been tested and the other of which was to be tested.

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19. During the first meeting it became obvious that the United Kingdom has achieved an advanced state of weapon research and development in both the fission and thermonuclear fields. Moreover, it appeared likely that certain advances made by the United Kingdom would be of benefit to the United States.

20. Highlights of the second meeting, held in Albuquerque, September 15-17, are set forth below:

21. We provided the British with blueprints, material specifications, and relevant theoretical and experimental information related to our XW-47 warhead; Mark 28, 44, 45 and 48 warheads; and the DELETED for our TX-41 and TX-46 weapons now under development.

22. The British provided similar information on their high-yield fission bomb, now in stockpile; 2,200-pound thermonuclear bomb; small DELETED device; two boosted fission designs; planned 1,500-pound thermonuclear weapon; and proposed 6-inch gun device.

23. Both parties discussed in detail neutron sources for initiators, high explosive specifications, yields and designs, and mechanical and electrical components.

24. We have several observations resulting from these meetings. The British have performed experiments in DELETED and their program in this regard approximates our own experiments of 1954-55. They have tested radiation-implosion, two-stage devices corresponding to our state of knowledge of about 1954-55. They fully understand the advantage of the DELETED and their state of knowledge is about the same or somewhat better than ours of 1956. In regard to initiators, they do not have the DELETED initiator, but have proceeded toward development of an external neutron source of initiation. These sources, DELETED DELETED In high explosive development, they have devised DELETED

DELETED

25. While it does not appear that we are interested in taking any one United Kingdom weapon or device and weaponizing it for our use, there are specific developments which the United Kingdom scientists have made which hold a great deal of interest for us and which might offer advantages in our weapons systems.

26. When the information which has been transmitted to both parties has been fully analyzed, the United States and United Kingdom representatives will determine desired areas of cooperation for further exchanges.

27. Following the initial exchange meeting, the United Kingdom invited the AEC to send representatives to Christmas Island to observe their test operation during September. Two representatives from LASL witnessed one large-yield shot and received detailed information on their diagnostic instrumentation. During the second meeting, the AEC extended a reciprocal invitation for the United Kingdom to send observers to Phase II of Operation HARDTACK during the week of October 5-11. The Commission, with the concurrence of the Department of Defense, recommended to the President that certain information concerning diagnostic techniques and instrumentation be approved for release to the United Kingdom at that time.1/

1/The third exchange-of-information meeting was held in early October and featured discussions on the instrumentation used in weapons testing. In anticipation of the disarmament meetings with the Soviets beginning October 31 in Geneva, a fourth exchange-of-information meeting was held in late October. In this meeting, which was sponsored by the Department of Defense and the Central Intelligence Agency, there was an exchange of intelligence information on Soviet nuclear weapons development.

[redacted]

PROPOSED DELIVERY OF WEAPONS TO NATO

28. Instead of completely retiring certain weapon components as originally planned, consideration is being given to reconditioning and setting aside a portion of the nonnuclear components of the [redacted] for possible North Atlantic Treaty Organization stockpile use.

INFORMATION BULLETIN ON ACCIDENTS

29. A joint AEC-DOD Technical Information Bulletin on Atomic Weapon Accident Hazards, Precautions and Procedures was published on September 30, 1958. This bulletin was coordinated with the Department of State and interested British agencies. The bulletin has been furnished to Federal, State, and local government agencies.