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SWPIS 400,112

SUBJECT: Weapons Effects Program for Operation IVI.

TO: Chief of Staff, U. S. Army, Washington 25, D. C.

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1. By a letter dated 15 August 1951, the Atomic Energy Commission informed the Department of Defense that the overseas test of thermonuclear devices previously scheduled for the spring of 1952 would be postponed until the winter of 1952-53. Recent informal but reliable information is to the effect that the Los Alamos Scientific Laboratory will probably be prepared to conduct the next thermonuclear test during the period July-September 1952. A nucleus of a task force capable of accomplishing such a test exists as Joint Task Force 132.

2. Details of the device to be tested are not yet known and probably will not be available until shortly before the test is conducted. However it is understood that the expected yield of the thermonuclear device will be between 1 and 50 megatons, with the most probable value about 10 megatons. It is understood that the test will be conducted on one of the western islands of Eniwetok Atoll, the thermonuclear device being mounted on a low platform. In effect, this will be a surface type detonation. In addition, a test of a nuclear device yielding about 500 kilotons may be conducted.

3. In order that the military may be prepared to take full advantage of this opportunity to gain most valuable weapons effects information, it is necessary that early planning for this phase of the operation be instituted. With this end in view, an informal conference was held in the Headquarters, AFSWP on 10 October 1951 attended by representatives of the Los Alamos Scientific Laboratory, certain service laboratories, AFSWP consultants and members of the AFSWP staff. At the conference, a tentative program of weapons effects measurements was formulated and is forwarded herewith as Inclosure 1.

4. In view of the difficult logistics involved, the very restricted land area available at the test site, safety considerations, and particularly in consideration of the very great range of uncertainty as to the yield of the thermonuclear device, certain projects which previously have been associated with weapons effects tests are considered to be completely inappropriate for conduct of this particular test. This is particularly so of biological tests, structures tests, and tests of military equipment. In lieu of such experiments, basic measurements should be made of blast and radiation at Operation IVI, while the objects themselves are more conveniently and economically exposed and tested at lower yield tests

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WITH 19CL  
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1954.

WITH ATTACHMENT

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW	
REVIEWER-DATE: <u>LL/199</u>	DETERMINATION (CIRCLE NUMBER(S))
THORITY: <u>DAOS (EAD) (EADD)</u>	1. CLASSIFICATION RETAINED
ME: <u>M.L. K...</u>	2. CLASSIFICATION CHANGED TO: <u>FRD</u>
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within the continental limits of the United States. The programs outlined in Inclosure 1 are of great importance to the military because the measurements are to be made on a nuclear device of yield far beyond any which has ever before been tested. Phenomena in this area are predicted now by extrapolation from data taken at tests of much smaller yield. Verification of scaling laws employed is of utmost importance.

5. A few structures remain on Engebi Island which were not destroyed at Operation GREENHOUSE. Considering the uncertainty of the yield at the proposed test, the repair and instrumentation of these structures is not warranted. However, engineering studies of the structures before and after the test may be productive of some additional engineering information in regard to structures. It is recognized that, in addition to the proposed program outlined in Inclosure 1, the Los Alamos Scientific Laboratory will carry out scientific measurements designed to determine the yield and functioning of the device. Also, the Air Force will be expected to conduct the usual LRD program.

6. It is recommended that the tentative Weapons Effects Program outlined in Inclosure 1 be approved with the understanding that it involves no biological projects, no structures projects and omits the exposure of military equipment.

7. Your concurrence or comments on the foregoing are requested by 24 November 1951 in order to permit early initiation of more detailed plans for the military participation in the test.

8. A similar letter has been sent to the Chief of Naval Operations and the Chief of Staff, U.S. Air Force.

1 Incl:  
1. Measurements Program

HERBERT B. LOPER  
Brigadier General, USA  
Chief, AFSWP

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THIS DOCUMENT CONSISTS OF 2 PAGES

PROPOSED WEAPONS EFFECTS TEST PROGRAMS FOR  
OPERATION IVY  
COPY NO. 10 OF 25 SERIES A

In the event of a test of a weapon of over 1 megaton the following measurements in approximate order of priority are required for essential weapons effects information.

A. Air Blast.

1. Photographic documentation to establish growth of the fireball and position at breakway of the shock front.
2. Measurements of Pressure vs Time on the ground and, if possible, in free air at altitudes significant to delivery aircraft.
3. Ambient atmospheric conditions with good altitude resolution.

B. Thermal Radiation.

1. Measurements of total energy and energy vs time at appropriate distances.
2. Measurements to show resolution of spectra.
3. Determination of total thermal energy at altitudes significant to delivery aircraft.

C. Radioactive Contamination.

1. Determination of fall-out pattern.
2. Radiochemical analyses for important isotopes.
3. Measurement of spread by base surge.

D. Afterwinds.

1. Measurement of the magnitude and duration of afterwinds.
2. Observation of cloud rise.

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*Robert A. [Signature]*

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ENCLOSURE NO. 1

**E. Earth Shock.**

1. A seismic survey of the test area augmented by borings to approximately 5,000 feet to study the structure and material of the Atoll.
2. Measurement of crater size.
3. Measurement of accelerations vs time.
4. Seismic measurements (to be coordinated with long range detection program).

**F. Neutron Flux.**

1. Measured under field conditions.

**G. Water Effects.**

1. Measurement of underwater shock.
2. Measurement to determine wave heights.

**H. Gamma Radiation.**

1. Measured under field conditions.

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