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AEC 483/15

September 12, 1952

COPY NO. 1

ATOMIC ENERGY COMMISSION

DETECTION AND IDENTIFICATION OF WEAPONS TEST

Note by the Secretary

The attached memorandum from the Air Force has been submitted by the Division of Military Application for the information of the Commission.

ROY B. SNAPP

Secretary

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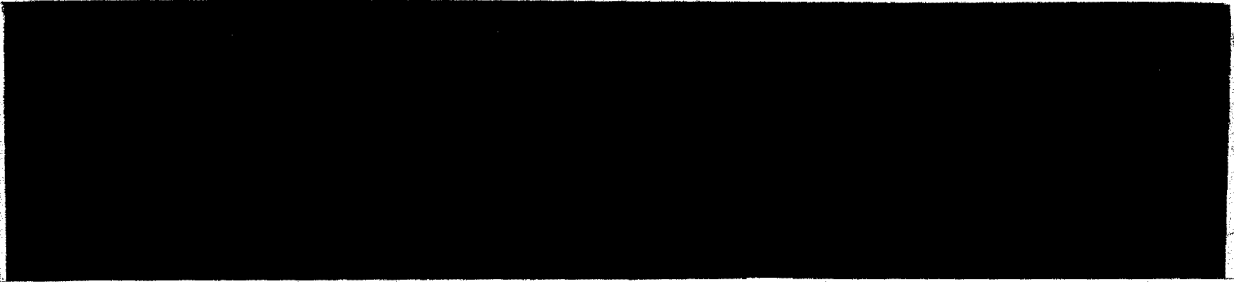
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ABSTRACT

DETECTION AND IDENTIFICATION OF WEAPONS TEST



*DoE
Gola*

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D. C.

4 August 1952

AFOAT-1/TECH DIR

MEMORANDUM FOR MAJOR GENERAL JOHN A. SAMFORD

SUBJECT: Detection and Identification of IVY (Mike)

1. PROBLEM: To study the possibility of detection and positive identification of the thermonuclear weapon, IVY (Mike), by analysis of bomb debris collected at distant points.

2. DISCUSSION: The following discussion does not treat thermonuclear weapons in general but is specifically directed toward the IVY (Mike) weapon. Three cases are chosen, indicating the extent to which the nuclear reaction may proceed. Significant criteria are considered for identifying the nature of the reaction.



DoE
b(3)

b. The capture-to-fission ratio for a weapon of this type is expected to exceed by several times the theoretical maximum for a fission type weapon.



DoE
b. (1a)

e. The relative amounts of the Plutonium isotopes 238, 239, 240 and 241 will differ greatly from that produced by a fission type weapon.

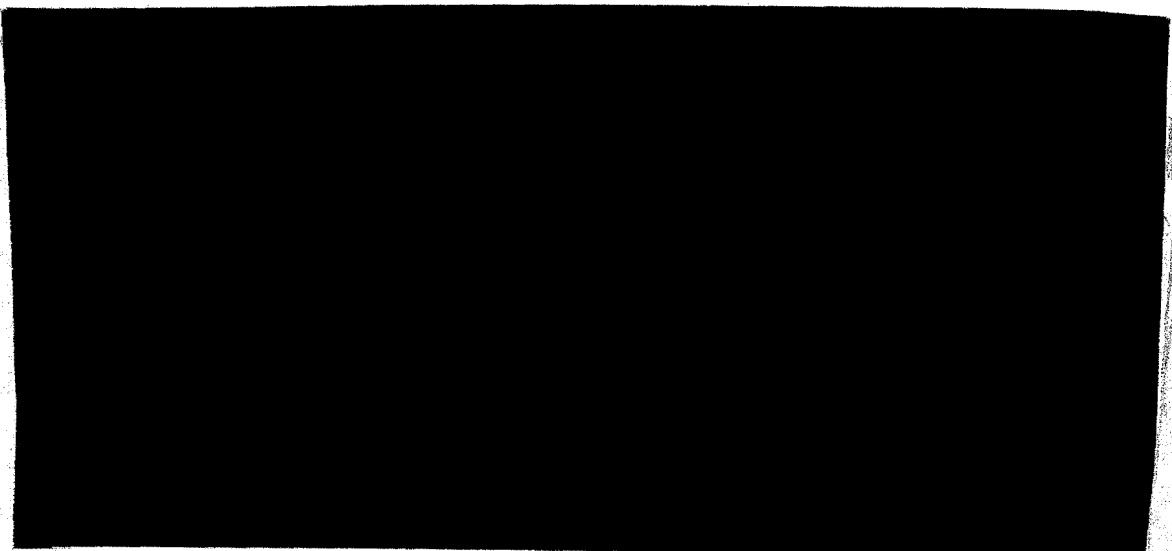
f. Tritium will be present in detectable amounts and will indicate that it was either an original constituent of the bomb or was generated in the explosion.

g. Carbon 14 and Argon 37 will be formed in detectable quantities in both Mike and King shots. The interpretation of any differences between the two bombs, based on these measurements, is questionable at this time.

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DOE
6.1

e. The relative amounts of the Plutonium isotopes 238, 239, 240 and 241 will differ significantly from that produced by a fission type weapon.

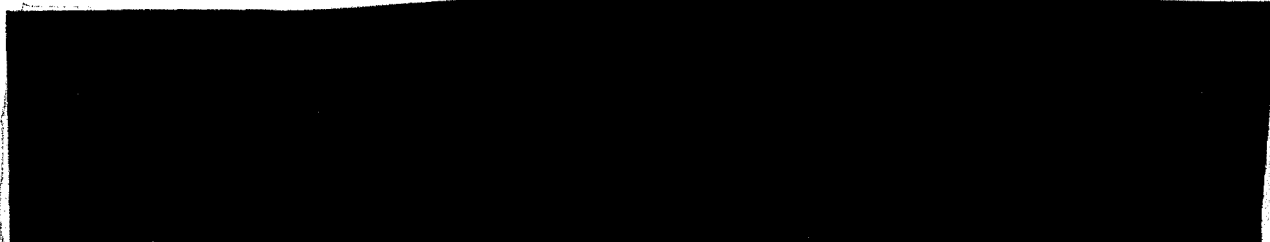
f. Tritium will be present in detectable amounts and will indicate that it was either an original constituent of the bomb or was generated in the explosion.

g. Carbon 14 and Argon 37 will be formed in detectable quantities in both Mike and King shots. The interpretation of any differences between the two bombs, based on these measurements, is questionable at this time.

Case III. -  DOE
6.1(a)

In this case all results will indicate a composite fission type weapon with certain exceptions of which the following two are expected to be most significant:

- a. Detectable amounts of tritium.
- b. Abnormal amounts of natural uranium.



DOE
6.1

Los Alamos personnel indicated that the probability of the Uranium 239 fissioning to any appreciable extent is low, and in any event doubted that this reaction would proceed to an extent sufficient to materially alter the criteria cited in Case I and Case II.



DOE
6.1(a)

[Redacted]

W

[Redacted]

DOE
6.1(a)

/s/

D. L. NORTHRUP
Technical Director, AFOAT-1
Office for Atomic Energy, DCS/O

/s/

D. J. KEIRN
Brigadier General, USAF
Chief, AFOAT-1
Office for Atomic Energy, DCS/O

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WWD 972006
Date 6/17/05

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