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AEC 926/8

September 25, 1957

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ATOMIC ENERGY COMMISSION

NOTES FOR THE 113th AEC-MLC CONFERENCE

Note by the Secretary

The attached report by the Director of Military Application is circulated to the Commission to provide background information for the topics scheduled for discussion at the 113th AEC-MLC Conference on Thursday, September 26, 1957.

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NOTES FOR THE 113th AEC-MLC CONFERENCE

Report by the Director of Military Application

There are two listed items on the Agenda for the AEC-MLC Conference on Thursday, September 26, 1957. The following brief notes are furnished for the information of the Commission as background for the conference. The background notes on the Food Irradiation Reactor were prepared by the Division of Reactor Development.

I. Approval of the Minutes of the 112th AEC-MLC Conference

The minutes of the 112th AEC-MLC Conference were approved by the Commission at Meeting 1295 on July 24, 1957.

II. Food Irradiation Reactor (Suggested by MLC)

Brief Statement of Problem

1. To clarify the status of the FIR project, and to agree with the DOD on a single course of action to be taken to meet the DOD requirement for a source of gamma radiation for use in the U. S. Army Ionizing Radiation Center.

Background

2. Following a DOD request on November 22, 1955, for a gamma facility for incorporation in a radiation processing plant, the AEC included in its FY 1957 budget a request for \$3 million for construction of the FIR. Expected completion date: October 1958 (later reported as September 1959 at joint meeting of May 2, 1957).

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3. Apportionment of funds for the FIR was delayed initially because a site for the radiation facility has not been selected. After the selection of Sharpe General Depot, Stockton, California, as the site, apportionment was denied pending conclusive establishment of the fact that private industry could not be persuaded to fund for the project. (Ref. AEC 719/12)

4. A subsequent request for apportionment of funds was denied by the BOB on the grounds that: (a) it would not be consistent with the Administration policy to limit construction to essential projects; and (b) the appropriateness of a full-scale plant was questionable. The MLC was so advised, and the AEC requested additional information from DOD to support a request for a reconsideration of the BOB determination of May 14, 1957. (Ref. AEC 719/14)

Present Status

5. AEC has received from BOB a report on the conclusions of the DOD's Technical Advisory Panel on Atomic Energy, substantially as follows:

- a. Radiation processing of food offers great military promises.
- b. A full-scale pilot industrial plant is consistent with the Army's food testing program.
- c. The gamma radiation facility need not, initially, have the full processing capability of 1000 tons per month.
- d. A cobalt-60 facility appears to offer a more practical source of gamma radiation than the FIR.

In addition, the DOD:

- a. Asked whether or not the AEC would furnish some two megacuries of cobalt-60 for use in a cobalt facility (assuming no unacceptable effect on production for weapons programs).
- b. Suggested that a cobalt facility might be financed with funds appropriated for FIR construction.

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c. Proposed a meeting between representatives of AEC, MLC, DOD and Army.

6. In its memorandum accompanying the DOD letter, the MLC asked what would be the impact on weapons material production if AEC production facilities were diverted to producing cobalt for a cobalt facility.

7. A reply to the DOD is being staffed through the AEC, and will embody the following points:

a. Cobalt could be furnished at a unit price of \$0.625 per curie (AEC out-of-pocket costs) while the radiation program is developmental; thereafter, at a rate of \$2.80 per curie.

b. Funds appropriated for the FIR cannot be used to provide any gamma source other than a reactor.

c. AEC is willing to participate in a meeting with MLC, DOD, and Army representatives.

8. A separate reply to the MLC is being staffed through the AEC and will advise the MLC that the cost of cobalt, in terms of weapons materials, would be 10 kg of plutonium or 120 gm of tritium initially, with annual replenishment costing 2.5 kg of plutonium or 30 gm of tritium.

9. Meanwhile, AEC is continuing limited R&D toward the refinement of a conceptual design of the FIR into a preliminary design.

Discussion

10. From time to time since the initiation of the FIR project suggestions have been made -- some within AEC, some within DOD -- concerning the possibility of a gamma source other than a reactor. The suitability of spent fuel elements, gross fission products, and long-lived isotopes has been examined repeatedly (Ref. AEC 719/13). It has been determined that neither spent fuel

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elements nor gross fission products will meet all the specifications established for the gamma radiation facility. Of the long-lived isotopes, cobalt-60 and cesium-137 are the only sources with a good probability of meeting the specifications. Cobalt offers the advantages of relative safety and ease of handling, and lends itself to use in a compact radiation facility. However, the only present source of suitable cobalt for this purpose is to be found in AEC production facilities, at some expense to the production of weapons materials. An advantage to the use of cesium is that it would be available from waste fission products at no expense of fissionable material. At the present time, however, the capacity of existing separation facilities is inadequate to provide the required quantity (now estimated to be approximately 30 megacuries).

11. As long as no positive steps are taken toward the procurement of a specific gamma source for food irradiation, there will continue to be new suggestions offered and new data developed. The inevitable result will be continued postponement of a firm choice, with a consequent delay in the achievement of a useful gamma source for this application. Accordingly, there should be agreement on a single course of joint action. Because a shift from the FIR to another and undefined concept could be expected to involve a considerable delay and possibly increased costs, it appears expedient to proceed with the original plan calling for a reactor gamma source.

Recommended AEC Position

12. Recognizing that it is essential to pursue diligently a single course of action, it is recommended that the AEC either:

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a. Secure from DOD a reaffirmation of its requirements for the FIR, with assurance of support to the AEC vis-a-vis the BOB, Both AEC and DOD may continue investigations of alternative sources, as desired, but not to the detriment of the FIR project; or,

b. Alternatively, secure from DOD a release from the AEC commitment to provide a reactor gamma source, with AEC agreeing to assist the DOD in exploring the possibility of obtaining a gamma source other than a reactor.

III. OPERATION HARDTACK (Suggested by AEC)

1. By letter of August 13, 1957 (AEC 952/13), the Commission advised the Secretary of Defense that the President had approved commencing Operation HARDTACK on April 1, 1958. This letter also pointed out that the President expressed doubt as to the necessity for the number of shots, approximately 25, we had indicated as probably necessary, and directed that planned firings be screened and held to the smallest number practicable without losing essential defense objectives.

2. The directors of the weapons laboratories are scheduled to brief the Commission on their HARDTACK shot proposals on October 22. Subsequently, it is suggested that the HARDTACK program be considered further at the AEC-MLC meeting on October 24. In addition to the necessity for holding the number of shots to a minimum, continued effort is being given to reducing the resulting world-wide fallout.

3. Also of immediate interest is the possibility of Foreign Observers. The President, in his press conference of July 3, 1957, while discussing clean weapons, stated that if another test is made, he would invite other countries to observe such tests and to determine the resulting fallout. On September 19, Secretary Dulles, in his speech before the United Nations General Assembly stated, "We shall invite the United Nations to send observers to one of our next tests so that they can see how these tests are conducted." We are currently considering what proposed shots

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would be appropriate for such observation and what phenomena foreign observers could be given access to in order to determine the relative cleanliness of the device. This also should be discussed at the next AEC-MLC Conference.

IV. EXCHANGE OF REACTOR INFORMATION WITH CANADA

It is understood that during the general discussion period, the MLC will briefly explain the status of progress in implementing the amendment to the Agreement for Cooperation on Civil Uses of Atomic Energy between the U. S. and Canada. This amendment (AEC 781/37) approved by the Commission at Meeting 1202 on May 24, 1956, permits exchange of information on military propulsion reactors.

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