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IN REPLY
REFER TO:

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20 February 1953

Brig. General K. E. Fields
Director of Military Applications
U. S. Atomic Energy Commission
Washington 25, D. C.

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW	
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	6. CLASSIFIED INFO BRACKETED
	7. OTHER (SPECIFY):

Via: C. L. Tyler, Manager, Santa Fe Operations Office

Sanitized by NN-523
on 2/5/98

Dear General Fields:

1. Reference is made to FAX S-125 dated 17 February from Huston to Tyler quoting Bethe on the question of the advisability of substituting an air drop for a surface shot of Runt or Jughead in Operation CASTLE. We find ourselves in strong disagreement with this suggestion for Operation CASTLE although we have, of course, no objection to a DOD effects program at a later date under appropriate circumstances if this seems necessary to them. Our reasons for preferring the present operational plan follow.

2. In spite of the fact that the devices to be tested in Operation CASTLE are being designed with "emergency capability" in mind, the operation is primarily an experimental test program in the field of weapon development. Accordingly, the diagnostic experiments are still of the highest importance for it is not expected that the design of radiation implosion weapons or their further improvement will stop with this test program. Therefore, we strongly believe that no step should be taken which diminishes the amount of appropriate and relevant experimental information which can be obtained. Every effort is being made to simplify the experimental program and to include only those experiments which are essential and have a proper balance between their cost and the information which they give. However, all shots presently are expected to carry as a minimum some experimental observations including the behavior of the primary bomb (alpha), the radiation transit time to the secondary bomb, and the photographic behavior of the case.

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3. The Jughead is presently planned not as a large shot but as an island shot and it is likely that the most extensive instrumental observations will be carried out on this experiment. The remainder of the Los Alamos shots are planned as large shots located near atoll islands so that photographic and other observations can be made on them. We would regard it as absolutely impossible, were it otherwise desirable, to drop the Jughead

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Brig. General K. E. Fields

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at the time of the presently planned test shot inasmuch as the associated cryogenic logistics and test drops are actually coming to completion at or shortly after the test date.

4. The dropping of the Bunt or the Alarm Clock would, presumably, be a task within Air Force capabilities. However, the Bunt is the last of the devices scheduled for final design freezing and will be the last to be constructed. This is necessarily so in view of the state of knowledge of systems of this nature. Accordingly, only the Alarm Clock is actually available as a device for consideration for a drop test. ~~DELETED~~

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Actually, emergency capability is far more easily, cheaply, and effectively demonstrated by methods other than using a live bomb.

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Such a priori ignorance would seem to be extremely unfortunate for any effects instrumentation and might seriously jeopardize its effectiveness.

5. It should be recalled that the developmental status of the X-14, 16, and 17 in emergency capability closely parallel the status of the Nagasaki and Hiroshima bombs in the sense that the actual reliability of any of the components will be far from exactly known. Thus, there will exist the possibility of failure or malfunction due to completely minor and extraneous reasons. These reasons will not be known, but an unnecessary stigma will be attached to the device which may be impossible to remove and which would not have occurred had a proper experiment been made. It must be recalled that the definition of "emergency capability" is that only non-known characteristics of the device will prevent its delivery by existing aircraft in time of war. Models of these devices that have the same reliability now expected of conventional weapons will require long and arduous further study, development, and field testing of the Sandia Corporation type.

6. The certainty of any air drop cannot be guaranteed at this time. Thus it would be necessary for J-Division to plan on both an air drop and a barge capability for a given test if this philosophy were agreed upon. Accordingly, for this reason alone, the introduction of an air drop does not simplify the test program but rather complicates it. Even were it certain that an air drop were possible, the resulting operation is not necessarily less complicated except for the fact that few observations are made. Not to do a test at all, of course, is a simplification of the same sort. That air drops themselves present

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