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Location LANL
Records Center - Trinity
Collection MED Box 27
Folder 230.6 (Trinity) Hazards

SPECIAL RE-REVIEW FINAL DETERMINATION UNCLASSIFIED, DATE: 2/21/80

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FR-7 Med.

UM

DATE June 22, 1945

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230.6 Trinity Hazards MED TR1 Bx. 27

TO: K. T. Bainbridge

FROM L. H. Hempelmann & James F. Nolan

SUBJECT: Danger to Personnel in Nearby Towns Exposed to Active Material Falling from Cloud

In a memo. to you (16 June 1945), Hirschfelder and Magee discuss the possibility of active material and fission products falling from the cloud. Assuming that these calculations are correct, the following is a consideration of the actual danger to personnel in the contaminated area.

I. Danger from 49: This would seem to be nil in any reaction which has enough energy to carry the cloud over the escarpment because

A. Particles of 100 microns and over (which would fall in the first few hours) are filtered out completely by the nose and upper respiratory tract and are not retained by the lung. This means that there is no danger from inhalation of 49 until the particles of small size (5 - 10 microns and under) reach the earth; this is a matter of days according to Hirschfelder's calculations.

B. The absorption of 49 from the intestinal tract is so poor (0.1 percent or less) that it would be necessary for an individual to ingest at least one milligram of material to absorb a *tolerance amount. This would correspond to the amount of material distributed over 5000 sq. feet of surface.

II. The danger from fission products: This presents a more real hazard than 49; nevertheless, in the situation described by Hirschfelder and Magee, it would seem extremely improbable that injury would result in the case of people not previously exposed to radiation.

A. External radiation: The integrated amount of radiation in the first 14 days is 68 r. This would certainly not result in permanent injury to a person with no previous exposure to radiation. It would probably not even cause radiation sickness. A normal person could probably stand two or three times this amount without sustaining permanent bodily damage. Fatalities probably would not result unless ten or more times this dose were delivered.

B. Ingestion: The danger from ingestion can be stated with less certainty than the above. Experiments have been done (Chicago Handbook, Chapter XII) to determine the tolerance dose for ingestion of mixed fission products (after thirty days cooling.) This corresponds to 16.4 millicuries which in the case described by Hirschfelder and Magee would be distributed over a surface area of approximately 500 square centimeters. Since a great portion of the activity in the contaminated area comes from short-lived products which can be tolerated in much larger amounts, it is probable that ten to thirty times the above amount (16.4 mc.) could be safely ingested.

C. Inhalation: Since the large particles which would reach the

*(1 - 5 microgram)

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CLASSIFICATION CANCELLED

INTER-OFFICE MEMORANDUM

SECRET

DATE June 22, 1945

TO: K. T. Bainbridge

FROM L. H. Hempelmann & James F. Nolan

SUBJECT: Danger to Personnel in Nearby Towns Exposed to Active Material Falling from Cloud

earth during the first few hours probably would be completely filtered out by the upper respiratory tract, this hazard is not great.

It is felt that the above discussion indicates that even if dust falls from the cloud in the manner described by Hirschfelder and Magee, there is little likelihood of serious damage to individuals in neighboring towns unless the contamination is 2 - 3 times that which is described. This should not be taken to mean that the hazards described by Hirschfelder and Magee are not serious and to be avoided if possible. All precautions should be taken for evacuation of the countryside should the contamination be worse than that described.

L. H. Hempelmann, M. D.

J. F. Nolan, Capt., M. C.

cc: Hirschfelder
Penny
Capt. T. O. Jones
file

SECRET

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