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OUTLINE OF RAD-SAFE OPERATIONS AT ENGBI BETWEEN THE SANDSTONE AND GREENHOUSE TESTS, WITH SPECIAL REFERENCE TO CONDITIONS ON ENGBI H-6

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1. In the Sandstone Operation a nuclear device was detonated on the Island of Engbi on 15 April 1948. The Greenhouse ~~CONFIDENTIAL~~ Spring of 1951.

Classification changed to _____ by authority of the U.S. Atomic Energy Commission,

2. First Survey

Per W. R. Pelman 22 Aug 53
(Person authorizing change in classification) (Date)

Started 5 October 1948

Personnel Dr. Simon Chiles, H-Division, LASL By Leanne Johnson 11-2-55
(Person making change, and date)

Reference Report LAB-H-1-1

Conclusions Gamma ray intensities in the neighborhood of ground zero on Engbi were considerably in excess of ^{permissible} personnel levels for continuous work.

3. Second Survey

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Started During January 1949

Personnel Brig. Gen. James P. Conney, USAMC, DMA of AEC
Dr. Harry O. Whipple, H-Division, LASL
Mr. Gordon Pettengill, H-Division, LASL
Dr. K. Z. Morgan, ORNL
Dr. Carl C. Gamertsfelder, Hanford Works

Reference & Conclusions No formal report on survey was made so far as is known. The survey was preliminary to a conference at Holmes & Narver offices in Los Angeles on ways and means for decontaminating the Shot Islands. Following this conference, it was decided that decontamination should be done by

(1) First, removing and dumping into the sea all of the radioactive scrap, (e.g. radioactive steel debris) that could be located.

(2) Second, wetting the soil to alloy dust, and bulldozing the top layer to bury the generally dispersed radioactive contamination.

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COLLECTION 64-11331-1

PER DRIS H. DIXON (Person authorizing change in classification and date)

BY Leanne Johnson (Signature of person making the change and date)

FOLDER Greenhouse

Ernie Folk Personnel

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Note Since it might appear that burying the contamination would not entirely solve the problem in an area where subsequent excavation work would be necessary, a digression is made here to set forth the reasoning upon which this method of disposal was based.

On account of the great penetrating power of gamma rays in air, much of the radiation exposure of a man standing in a contaminated area is due to distant radioactive material. For the kind of gamma radiation existing on the Shot Islands, 80 or 90% of the exposure is due to radiation coming from distances greater than 10 feet. Suppose then that all of the radioactive material is adequately covered, and that subsequently a 20 foot diameter hole is dug. Suppose that the hole is dug in such a way as to expose the previously covered radioactivity without removing any of it (which is a practical impossibility). Then the man could at most receive 10 to 20% of the radiation exposure which he would have received if the decontamination by burial had not been done. This theoretical calculation is conservative. Under practical conditions experience has shown that this method of decontamination is even more effective than the calculation indicates.

4. Mr. Charles Blackwell, Health Division, IASL, was on duty as Rad-Safe Officer during the period approximately 13 February to 15 March 1949 to supervise the removal of the radioactive scrap from Engebi Island. He left when it was decided that no further work would be done in contaminated areas until some months later, when systematic decontamination would be undertaken.

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5. During the period 6 May through 15 August 1949, Dr. Wm. H. Ray, Health Physicist, ORNL, served as Rad-Safety Officer at Eniwatok. He conducted a scientific investigation of the situation with special emphasis on the radioactive content of dust on the Shot Islands. He was unable to detect any significant quantity of radioactivity in dust kicked up by any ordinary activities on the islands. By stirring up dust into the air by artificial means, he was able to obtain some radioactivity. He concluded that there was not enough radioactivity in the dust to be a health problem, and that the proposal to wet the soil during decontamination by earth-moving was unnecessary. (It was later decided to wet the earth anyway, to be absolutely safe). In addition, Dr. Ray supervised the removal of radioactive scrap from the Shot Islands Aomori and Runit, and prepared three recorded lectures for the instruction of contractor personnel in radiological safety precautions. Dr. Ray's work is covered in the following "Radiological Safety Reports" (Confidential): SD-225 (20 May 1949), SD-226 (3 June 1949), SD-358 (17 June 1949), SD-359 (8 July 1949), SD-947 (31 July 1949), SD-948 (19 Aug. 1949).
6. Systematic decontamination by earth-moving was started, on Engebi, about 1 November 1949, with Mr. Wm. Rhodes, H-Division, LASL, on duty. During February 1950, with the decontamination work on Engebi completed, and the work on other islands nearing completion, Mr. Rhodes was relieved as Rad-Safety Officer by Mr. Jack Aebly, H-Division, LASL.
7. Third Survey
Started 25 February 1950

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Personnel Dr. Simon Shlaer
Mr. Wm. Rhodes

Reference Report Shlaer to W. A. Curtis, AEC Engineer, dated 1 March 1950.

Conclusion Radiation level on Engebi was less than the maximum permissible for continuous exposure during the 5 1/2 hour work week. None of the metal scrap still remaining on Engebi was found to have radioactivity in excess of the level permissible for 5 1/2 hour per week exposure.

8. Fourth Survey

Started March, 1950

Personnel James P. Cooney
Jack Aeby

Reference Report Cooney and Aeby to Curtis dated 22 March 1950.

Conclusion Same as third survey except that all of the radioactive scrap mentioned in the preceding report had apparently been removed. It was recommended that the issuing of film badges be discontinued after the decontamination of the other islands which was then scheduled for early completion.

9. Fifth and Final Survey

Started 5 - 11 May 1950

Personnel Dr. T. H. White, Health Division, Los Alamos
Mr. Jack Aeby

Reference Report Aeby and White to C. T. Cooper, AEC Resident Engineer, dated 11 May 1950.

Conclusions This final survey covered not only those islands in the Atoll where further work was contemplated but every island where there was any possibility of work being required. Nowhere in the Atoll was there found any radiation intensity in excess of the maximum permissible level for

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54 hour per week exposure. In a few places (not on Engebi) where excavation was being done in the neighborhood of previous shot tower footings there was found some radioactive metal scrap which had apparently been concealed by the grading operations. None of this metal scrap gave intensities in excess of the permissible level for 54 hour per week exposure. It was concluded that there was no need for further rad-safety operations on Eniwetok Atoll and that the issuing of film badges could be safely discontinued. (Action was taken on these conclusions shortly thereafter).

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