



Dr. J. R. ... Inceptor
Division of ... Medicine

... , 1954

... , Ionophysics

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As reported in a previous memorandum, the best estimates of gamma doses received are as follows:

Principal natives	100 r
Illininae natives	75 r
(Transient from OngeLab)	
tirik	15 r
Air weather personnel on	10 - 0 (except 3 rwy
Miwetak Island of	personnel with 98 r)
Mongerik, toll	

All available data were used in arriving at these estimates. These data are reported in an annex to this memorandum. Not included in the above estimates are the contributions of soft gammas (below 20 keV) nor betas. These undoubtedly contributed biologically significant doses.

Known uncertainties in arriving at an estimate are roughly well known, they will bear repeating here to indicate the difficulty of computing the whole body gamma dose.

1. Decay exponents have been reported ranging from -0.9 to -1.5+. What is desired here is the decay exponent for the time from fallout to the time of evacuation. This is not known with certainty and therefore -1.2 has been assumed.

2. Np^{239} contamination. If a single dose rate reading is made at the peak of the relative Np^{239} activity and then an integration made according to -1.2, a serious miscalculation might be introduced. Likewise, ignoring the radiation dose from Np^{239} would not be desirable. The above whole body estimates are made taking the Np^{239} contamination into account, since the amount produced has been estimated for this device.

3. Location of personnel. Dose rate readings vary by almost a factor of two for different localities where the natives might have been. Here they were and how long they remained was not been determined with certainty. The dose rate reading in the sleeping barracks of the Air weather personnel was only about 1/3 of that outside; the dose rate inside of the native huts was almost as high as outside. The natives slept on the ground or on mats that were almost as hot as outside the huts. ...

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John W. Bugher

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June , 1954

4. Sky shine. The phenomena of sky shine with the passage of the cloud was documented at St. George, Utah in the spring of 1953. The gamma dose from the sky shine might have been appreciable when one considers the relatively heavy fallout. This factor is extremely difficult to assess.

5. Dose rate readings were made by different individuals, at different times, at different locations, and by different types of instruments some of which were calibrated and some were not.

6. The exact time of initial fallout is not known. An hour or even half-hour difference in estimating initial time of fallout will make a difference in estimating doses in the early times after detonation.

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Distribution:

- Orig. - Dr. Bugher
- Green, pink & yellow - B&M files
- 1 cc - Lt. Robt Sharpe, NMRI, NMC, Bethesda, Md.
- 4 cc's - Bioph. Br.

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- 1. Estimated time of fallout: 5-6 hours.
- 2. Time of evacuation and number of evacuees: H # 31 (16 by air; 18 by ship)
- 3. Radiation levels.
 - 1. (Evacuation Team)

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Decontamination Readings - 3 March 1954

Time (H#2)	Place	Geiger Muller Reading (R/50hrs)
0855	Ent at landing	1.0 R
0900	Ent 100 yards from landing	1. R
0903	120 yards from landing	1.5 R
0904	Ent 50 yards over + 50 yds. from landing	1.2 R
0905	Ent 25 yds. over + 50 yds. from landing	1.2 R
0906	20 yds. in 50 yds. from landing	1.4 R
0907	at landing	
0915	200 yards from beach on ground	1.3 R
"	" " " " 3' level	1.3 R
0917	250 yards from beach on ground	1.6 R
"	" " " " trees	1.3 R
0920	150 yards from beach on ground	1.9 R
"	" " " " 3' level	1.5 R
0922	100 yards in at school house	1.3 R
0925	50 yards from beach	1.5 R
1020	100 yards in from landing on ground	1.6 R
"	" " " " " 3' level	1.2 R
1023	300 yards in on ground	1.5 R
"	" " " " 3' level	1.2 R
1025	400 yards in on ground	1.8 R
"	" " " " 3' level	1.3 R
1030	450 yards in + 200 yds. over on ground	1.6 R
"	" " " " " 3' level	1.3 R
1035	200 yards in + 400 over on ground	2.1 R
"	" " " " " 3' level	1.5 R
1037	200 yards in + 500 over on ground	2.3 R
"	" " " " " 3' level	1.6 R
1045	" " " " 550 " on ground	1.3 R
"	" " " " " 3' level	1.4 R

- 2. 1.4 r/hr at H # 31
- 2. 7 r/hr at H # 55
- (NYCO aerial survey)
- 3. 1.4 r/hr at H # 36 (Lt. Larson of Task Force)

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Rongelap (cont'd.)

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4.

Typical Readings in Rongelap Village & Marsh

<u>Location</u>	<u>Dose Rate (mr/hr)</u>
Rongelap Island (average)	375
Center of village	300
Near central cistern	300
Near southern cistern	220
Near northern cistern	350

(Scoville using TIB)

5. 40 mr/hr at D + 25 (Schlavone using PDR-39)

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This material contains information concerning the national defense of the United States, the security of the United States, and the national defense of the United States. It is intended for the use of authorized personnel only. It is to be controlled by law.

- A. Estimated time of fallout: 7.5 hours.
- B. Time of evacuation and number of evacuees: 3 air weather personnel at H + 28 hours; 20 air weather personnel at H + 34 hours.
- C. Radiation levels.

1. Film badge readings:

- 98 roentgens (representing 3 Army personnel at one end of island. Was hung about 4 feet high on the tent pole)
- 82 roentgens (hung between and against one wall of metal barracks)
- 44 roentgens
- 40 roentgens
- 40 roentgens (representing 8 people)
- 38.5 roentgens (in an icebox)
- 38 roentgens (" " ")
- 37.5 roentgens (" " ")

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EX EMP. POLITICAL DATA

- 2. NYOO automatic recorder went off-scale (100 mr/hr) at H + 7.3 hours.
- 3. 1.8 r/hr at H + 28 hours (evacuation team)
- 4. (Seville using TIB)

TYPICAL READINGS IN CAMP ON ENIWETOK IS. - 10 MARCH

<u>Location</u>	<u>Outside Dose Rate (mr/hr)</u>	<u>Inside Dose Rate (mr/hr)</u>
Eniwetok Island (average)	280	--
Mess hall	220	110
Tent, edge of main camp	270	175
Latrine	260	160
Sleeping quarters	260	90
Dispensary	220	110
Radio Station	290	160
Weather Station (N end of island)	250	110
Proj. 6.6 Station (S end of ")	240	--

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Longerik (cont'd.)

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17 March, 1200 HIKS

Living Area Readings:

Mess hall interior	40 - 100	HF/HR
Hospital interior	50 - 75	HF/HR
Walk from hospital to mess	100 - 110	HF/HR
Store room (behind mess)	50 - 55	HF/HR
Exterior store room tent	100 - 150	HF/HR
General Area exterior	100 - 150	HF/HR

Weather Station Site Readings:

Exterior areas local	125 - 150 - 160	HF/HR
Interior all tents	50 - 75	HF/HR
Interior building	50 - 60	HF/HR

Army Site Readings:

General area	140 - 190	HF/HR
Interior tents	70 - 80	HF/HR
Adjacent to trailer	160 - 180	HF/HR

19 March, 1100 - 1220 HIKS

Landing on beach	42	HF/HR
Living area	60	HF/HR
Inside mess hall	22	HF/HR
Inside dispensary	26	HF/HR
Inside barracks	23	HF/HR
SSE end of island (Ravinsende)	47	HF/HR
Along road to Ravinsende area 40-42 -	40	HF/HR
Inside weather building	23	HF/HR
Work area outside building	60	HF/HR
Army area (around trailer)	40	HF/HR
Inside foliage area	40	HF/HR
Inside tent	19	HF/HR

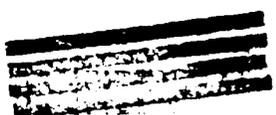
19 March, 1400 HIKS

Inside weather building	21	HF/HR
Living area Still	60	HF/HR
Inside barracks	23	HF/HR
Inside dispensary	25	HF/HR

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(JTF 7.4)

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Wongerik (cont'd.),

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~~5. R. A. Schiavone using RDS-39 recently calibrated)~~

6. 1.7 r/hr at H / 31 hrs.
1.0 r/hr at H / 30 hrs.
(NYOO aerial survey)

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- A. Estimated time of fallout: 16-18 hours.
- B. Time of evacuation: H + 78 hours.
- C. Number of evacuees: 154 natives.
- D. Radiation levels.

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- 1. 160 mr/hr at H + 55 (survey team from Task Force using TIB)
- 2. 120 and 150 mr/hr at H + 77 (Goodwin)
- 3. 100 mr/hr at H + 77 (evacuation team)
- 4. 40 mr/hr at D + 8 (Seville using TIB)
- 5. 3.3 mr/hr at D + 54 (highest reading)
- 6. 2.0 mr/hr at D + 54 (lowest reading)
- 7. 1.0 - 1.2 mr/hr at D + 54 (on sleeping mats)
- 8. 240 mr/hr at H + 34
160 mr/hr at H + 80
(NYOO aerial survey)

Distribution:

- Orig. - Dr. Bugher
- 1 cc - Lt. Sharpe, NMRI, NMC, Bethesda, Md.
- 2 cc's - B&M files (attached to yellow and pink copies of memo
fm. Dunning to Bugher dated June 8, 1954)
- 2 cc's - Bioph. Br.

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