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November 12, 1980

Dr. Janakiram R. Naidu
Ecologist
Brookhaven National Laboratory
Safety & Environmental Protection
Division
Upton, NY 11973

Dear Jan:

Thank you very much for your letter with suggestions for the radiation education program plan we are preparing at the request of the Department of Energy. Your comments and suggestions are in general agreement with those we've received from several other sources. Your letter increases our confidence that we are on the right track.

At this time we have no assurance the program will be funded by Congress nor do we know whether we would be asked to implement the program. If we are, we will consider your offer to participate.

Enclosed is a copy of the Bikini booklet which you may not have seen yet.

With best regards,

Bill

W. J. Bair, Ph.D.
Manager
Environment, Health and
Safety Research Program

WJB:1m

Enclosure

DOCUMENT DOES NOT CONTAIN ECI

Reviewed by *DJ Kricker* Date *5/1/97*

REPOSITORY *P.N.N.L.*
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Safety & Environmental Protection Division

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cc: C M W...
R W Baulman
10/18/80

September 30, 1980

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OCT 7 1980

W. J. BAIR

Mr. W. J. Bair
Manager
Environment, Health & Safety Research Program
Batelle Pacific Northwest Laboratories
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Richland, Washington 99352

Dear Bill,

I sincerely apologize for taking such a long time in replying to your letter.

An educational program must first establish what the goal will be. In the case of the program that will be developed for the Marshallese under PL:96-205, I presume, the goal will be to:

- a. develop an understanding for radiation and its effect
- b. relate this understanding to their environment and therefore the effect of such radiation on their continuing to live on islands/atolls which have above then normal radiation
- c. indicate that such radiation exposure as they would receive can be kept to a minimum, that they could avoid undue exposures, that they will be in a position to make value judgements on their desire to return to some of their islands/atolls inspite of the fact that there is residual radiation on their islands from the nuclear test in the past.

The above may not necessarily be the goal(s) in your program but that was and is my perception based on my experience with the Marshallese while staying with them in their homes during 1977 and 1978. (See Enclosure). This opportunity of living with them for extended periods permitted me to develop an educational program precisely tailored to:

- a. develop an atmosphere of trust
- b. correcting the misconception of radiation and its effects especially as they saw it in reference to their own experience
- c. their mode of learning which is primarily through story-telling rather than text-book learning

The outline of the program that follows is therefore based on the above experience and goals.

It is essential that the program be channelled through a primary instructor. This person should be totally familiar with the cultural framework of the Marshallese - this I consider of paramount importance as my experience has led me to believe. There is no similarity between the culture of the West and the Marshallese and with due respect to the Western culture, I feel that an understanding of the Marshallese culture requires that one be either born there or in a culture very similar to theirs. It is recognized that the West has studied their culture, but there is a significant difference in studying a culture and in blending with that culture.

The need to understand, speak and think in Marshallese is critical for crossing language barriers. This combination of cultural and language fluency permits the development of an understanding for a complex subject such as radiation and its effects.

The primary instructor then develops a group of Marshallese, who have also had the opportunity to study in the United States, in the understanding of radiation and its effects. This program should consist of:

- a. an examination of the Marshallese language and through the help of the Marshallese develop an effective means of communicating the difficult and controversial subject of nuclear radiation and its effects.
- b. educating the Marshallese instructors in the U.S. especially in the laboratories where work on the Marshall Islands is being performed.
- c. visit to the various islands and demonstrate the educational program based on verbal rather than that of text-book communications.

The above is but a synopsis of what an educational program should be based on. I have discussed your request with Mr. Charles Meinhold. He concurs with me in that this Division would be willing to help develop an educational program based on the concepts identified above. The feasibility of allocating 3 - 4 weeks per year of my time to assist you in developing the program and later to supervise the field educational part of the program would be provided on a contractual basis.

Thanking you for the opportunity to contribute towards this unique educational program.

Yours sincerely,



Janakiram R. Naidu, Ph.D.,
Ecologist

cc: B. Wachholz, DOE/EV
C. Meinhold
A. Hull
E. Lessard

Enc.: H.P. Society Paper, December, 1979

of the exposed inhabitants and environmental monitoring of their atolls were instituted. The inhabitants were taken to other islands, while environmental monitoring programs began to assess the radiological impact of the fallout so as to determine the time frame in which the inhabitants could be returned safely to their respective islands.

*Medical Department, BNL

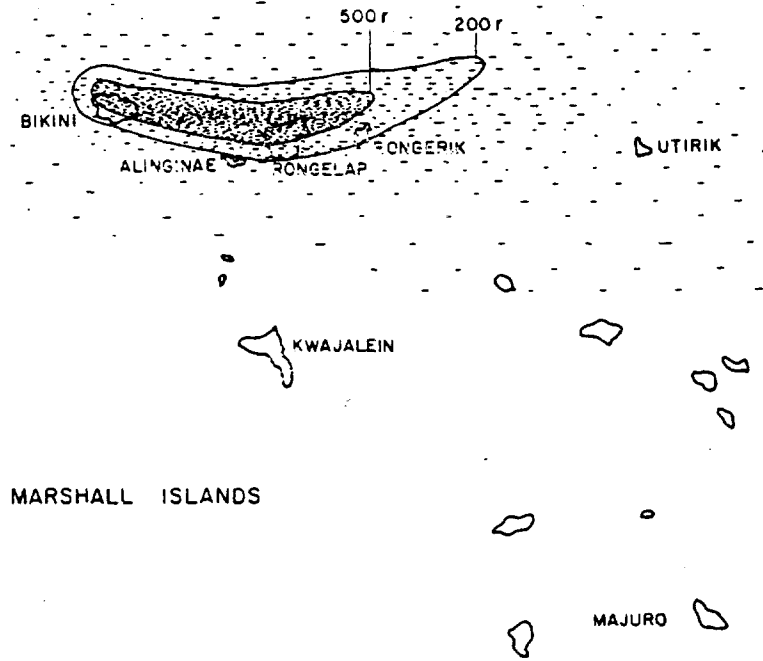


Figure 1

Distribution of Fallout from the BRAVO Test, March 1954 (Cr 56)

these to feel that the United States (U. S.) had deliberately exposed them, so that it could conduct research on the effects of radiation exposure on human beings, and therefore they were indeed 'guinea pig'.

b. their involuntary residence on islands where radiation is higher than natural background, since the decision to leave or return was not theirs,

c. their naive interpretation of radiation as the cause of diverse problems, such as,

i. arrowroot plant blight, which is presently found throughout the Marshalls,

ii. increase in breadfruit tree parasite infestation, and

iii. body pain or any other symptom that could not be explained.

The result has been that our efforts and services to the Marshallese have been misunderstood, our best explanations have not been believed, in large part due to education and language barriers only vaguely comprehended. After 24 years, the people still believe that their individual islands or atolls contain dangerous levels of radioactivity (which they for lack of an adequate word in Marshallese, refer to as "poison") and despite explanations to the contrary, they are still concerned about eating island produce. This situation has been further complicated because the islanders are culturally hesitant to speak of unpleasant thoughts, they do not respond to questions readily upon interrogation, and they do not often reveal their fears and inner thoughts at public meetings.

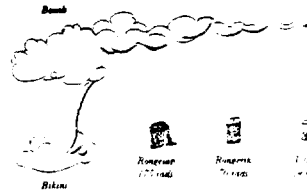
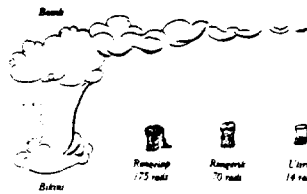
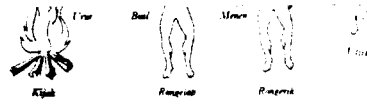
Early Educational Efforts

Recognizing the urgent need for an effort to mitigate the growing concern of the Marshallese over what has happened since 1954, the predecessor agencies of the Department of Energy (DOE), the Energy Research Development Administration (ERDA), and Atomic Energy Commission (AEC), began developing methods of communicating the medical and environmental findings to the inhabitants of Rongelap and Utirik. The most direct method used was the village meetings held prior to and after a survey, when through an interpreter, its objectives and the preliminary results were presented. A "Question and Answer Booklet on Effects of Fallout on Rongelap and Utirik" (TTPI74) was developed by the Trust Territory of the Pacific Islands and the Brookhaven National Laboratory's Medical Division and circulated in July 1974. This booklet presented answers

to the most frequently asked questions on radiation, radiation effects, radiation in the environment and the medical examinations, in English and Marshallese, along with pictures depicting the topic or activity being addressed (Figure 2). A similar booklet entitled "Radiological Conditions at Enewetak Atoll and Protection of Future Residents" (USERDA75), was produced in March 1975 by ERDA. This booklet also presented information on radiation in the environment in English and Marshallese, with appropriate illustrations in color (Figure 3). Though these methods were well received, the Marshallese felt, as indicated in the village meetings, that we had over-simplified the information which seemed to indicate to them that we had treated them as child-like individuals, incapable of understanding what we were saying unless we reduced the technical explanations to a minimum. Furthermore, these booklets appeared to the Marshallese as "impersonal", since their information gathering has traditionally been through "the spoken word" in an atmosphere of face-to-face meetings, such as the village meetings and group conversations. It was suggested by the Marshallese that the most effective way of informing them would be for a knowledgeable scientist to live with them on their island and talk to them about radiation. By doing so, this scientist, in our opinion, would be able to:

- a. partake in their activities, especially in eating their food, thereby proving to them through example that their food is safe to eat,
- b. take part in discussions and answer questions on the spot, and thereby develop an atmosphere of trust,
- c. develop and present an educational program on radiation in Marshallese, including what radiation is, what radiation can do, and finally, how it might affect them as they continue to live on an island which has residual radioactivity.

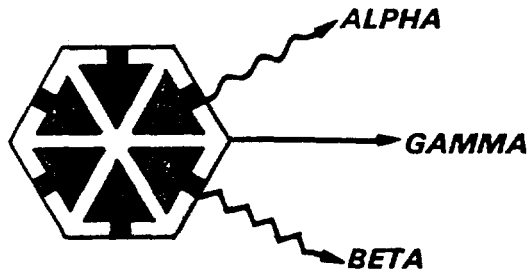
This preliminary "in residence" education program was basically



At distance 1 feet is 175 radi from Batu. At distance 7 feet is 70 radi from Batu. At distance 14 feet is 14 radi from Batu. Heat is measured in degree. Radiation is measured in radi.

At distance 1 feet is 175 radi from Batu. At distance 7 feet is 70 radi from Batu. At distance 14 feet is 14 radi from Batu. Heat is measured in degree. Radiation is measured in radi.

WHAT IS NUCLEAR RADIATION?



You cannot see, hear, feel, taste, or smell nuclear radiation. It can only be seen by instruments. We cannot stop radioactive materials from sending out radiation. It cannot be turned off.

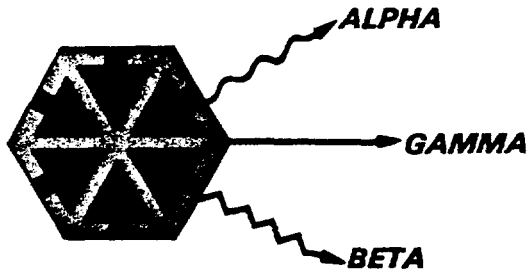
- *Gamma* radiation can go through thick layers of heavy materials.
Radiation like this is used to make x-rays.
- *Beta* radiation can go through only a few feet of air.
- *Alpha* radiation cannot go through even one inch of air.
- *Beta* and *Alpha* radiation cannot go through even a thin sheet of paper.

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Figure 3

Example of Information Presented in the Publication: (USERDA 75)
United States Energy Research and Development Administration, March 1975
Radiological Conditions at Enewetak Atoll and Protection of Future Residents

TA IN NUCLEAR RADIATION?



Nuclear radiation kwo ban loe, enjake, nemake, ak at bwin. Jemaron lo wot kin kein jerbak. Jejeb maron kabwijrak an jabdrewot men eo e radioactive kettelok baijin in radiation kein ie. Ejaje kwini.

- *Gamma* radiation emaron in kabejlok jabdrewot maal ak jimien jekdron ne emejel. Radiation jab in rej kerjerkal ilo x-ray.
- Kajur in an tellok *Beta* radiation jet wot ne.
- *Alpha* radiation eban le jen juon inch ilo mejatoto.
- Eban bijlok juon peba kin *Alpha* im *Beta* radiation.

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without touching or tasting it; and that unlike poison, it decreased with time. This latter concept was demonstrated by using a square paper and by repeatedly tearing that paper in half. The difference in size between the

explanations of the role of these programs in relation to their continued stay on the islands. The first was accomplished by detailed descriptions of the various activities of the scientists who came to their islands

on the island and live with them. In this way, the overall program would

help the Marshallese to understand the relative risk of exposure to radioactive material in perspective to their overall health status.

Both programs would be carried out initially by Brookhaven National Laboratory personnel, the effects of radiation program being taught by a member of the health physics team while the medical program being carried out by a RN in conjunction with a MD. To be successful, however, the program should involve Marshallese as much as possible from the beginning. The program should eventually be run entirely by Marshallese with U. S. scientific and/or medical personnel serving only in an advisory capacity.

In essence, it should be a synthesis of two worlds and two frames of understanding. To bridge this cross cultural gap, Marshallese with the required qualifications, such as a degree of science for the environmental aspect and for the medical programs local residents should be hired. In the latter case, the BNL Marshallese nurse practitioner will be available to avoid any cultural bias. The key liaison on each island could be provided through the president of the women's club, the queen, the health aide, the minister and the schoolteacher. As the medical program progresses, a health educator/RN or Medex (trained either in the U. S. or Fiji) could be recruited for each island, to work with the local resident to maintain the continuity of the program.

Both programs would have to be constantly evaluated to ensure that they are culturally sound and realistic. Ultimately, the goal would be to have a Marshallese working full-time on each island who would be responsible for the medical program and who would also be familiar with the environmental program. The importance of the health education program is realistic because medical problems are usually the first ones to be recognized with environmental problems being less clearly defined. Therefore, the environmental monitoring

(EM) educator could restrict his/her presence to the field visits, while the health educator could cover for the environmental monitoring educator during the interim.

The thrust of the EM program would be to present to the Marshallese the concepts of radiation, such as the radioactive element, the way radiation interacts with living things, what the program is doing on the island, the type of analysis made on the island, and in the U. S., what the results are and what the results indicate. It would also explain why scientists change their statements with time, the importance of Federal standards on radiation, and how they come about using them in reference to their living on the island.

Eventually, such a program should be able to establish a two-way dialogue that will lead to an informed educational perspective on the nature of the radiation problem as well as the endeavors of the U. S. Government in the interest of the Marshallese.

Summary

A preliminary 'in residence' educational program indicates that a combined presentation of the environmental (radiological) and medical educational programs to the Marshallese should:

- a. clear the misunderstandings that radiation is not a poison, that it is easy to recognize and to measure with the instruments used by scientists,
- b. serve to minimize groundless fears and to assure the people that through discussions they can learn to express their concerns and to expect to receive meaningful answers,
- c. prepare them to help make a decision, based on "informed consent", about living on an island where radioactivity will continue to exist far beyond their life expectancy,
- d. give them an identifiable forum for interacting with the various

ongoing programs in the environmental and medical areas,

e. meet the needs for medical programs which have already been requested by the residents of Rongelap and Utirik, and which may presumably be anticipated by the future residents on Enewetak and Bikini, and

f. put into perspective for all Marshallese their responsibility for maintenance of health, since they will be active participants.

The unique initial experience has revealed the machinations of the unusual drama between the forces of ignorance and fear on the one hand and knowledge and trust through education on the other. All of you gathered here attest to the role that education has played in your lives. This same experience has also revealed a facet of their nature that was impressive, for the Marshallese throughout the program always conducted themselves with complete dignity. There is a wisdom born of many sorrows and hardships. They were responsible and objective in their statements apologizing for being emotional when their conduct was the essence of composure and restraint. They are a proud and sensitive people, with good reason for being so. At each lecture meeting, three flags always flew in the stiff wind--the UN, the TT, and the United States--the latter flag honoring a nation known for its sincerity in keeping to its commitments and its humanitarian beliefs.

Acknowledgements

Our sincere thanks to Drs. V. Bond, R. Conard, E. Cronkite, K. Knudsen, Mr. C. Meinhold and Mr. A. Hull for giving us this most unique opportunity in the realm of education. To Dr. W. Weyzen (DOE), our gratitude for recognizing the urgent need and funding us to carry out the initial task. Our sincere thanks to Mr. A. Hull (BNL) and Dr. W. Bair (PNWL) for reviewing this paper and offering their valuable comments. And finally, to the Health Physics Society and you ladies and gentlemen our thanks for sharing this experience of ours.

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- CO 67 Conard, R. A. et.al., "Medical Survey of the People of Rongelap and Utirik Islands Eleven and Twelve Years after Exposure to Fallout Radiation (March 1965 and March 1966)", BNL 50029 (T-446), April 1967.
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