

HONOLULU AREA OFFICE

ROUTING SLIP

Action	Info	Initial & Date
<input checked="" type="checkbox"/>	MANAGER DEPUTY 8.5 Secretary	<i>WBS 5/27</i>
<input checked="" type="checkbox"/>	CHIEF, ADMIN & TECH BRANCH Dryden Streenan Ross Utsumi	<i>WBS 6/4</i>
<input checked="" type="checkbox"/>	Merrill Bruntlett Irene June	<i>June 3/28</i>
<input type="checkbox"/>	CHIEF, SECURITY BRANCH Kiyomura	
<input type="checkbox"/>	CHIEF, JOHNSTON APOLL BRANCH	
REMARKS	<p><i>This material on Bikini was handed me by Jimmy Mc Crow on 5/25/70. It should be placed in our Bikini file.</i></p> <p><i>WBS 5/27</i></p>	

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 BOX No. 1227, "ERDA #2"
BIKINI SURVEY
 FOLDER Jan Thru Dec / 1970

RADIATION SAFETY CONSIDERATIONS AT BIKINI ATOLL

MAY 1970

In response to an inquiry by the High Commissioner of the Trust Territory of the Pacific, the following general statement is provided regarding radiation safety of Bikini Atoll:

On Tuesday, August 27, 1968, the ship James M. Cook arrived at Kili Island bringing the High Commissioner, then Mr. William Norwood, representatives of the U. S. Department of Interior, Atomic Energy Commission, and Department of Defense, and members of the press. A primary purpose of the visit was to discuss with the Bikini people the recent decision that they could be returned to their Atoll and to answer questions regarding conditions in the Atoll. At that meeting there were questions on whether the islands were safe and whether food was safe to eat.

With Mr. Chutaro acting as interpreter, the AEC representative told the Bikinians that the question of safety of returning to the Atoll and using foods found there had been carefully studied. A committee of experts meeting in Washington, D. C. had concluded that returning the people to Bikini Atoll would not offer a significant threat to their health and safety but certain simple measures should be taken to further reduce the low level of radiation exposure that could be received. The recommendations of this committee of experts were summarized. The people were told that for the present, only the Bikini-Eneu complex is to be

rehabilitated. While they may go anywhere in the Atoll for purposes such as fishing and food collection, homes and community facilities are to be built only on Eneu and Bikini. In answer to a question, the Bikinians were told that food from the lagoon would be safe to eat. Certain precautions were to be taken in planting Pandanus, and radioactive scrap metal was to be removed from the islands.

Questions have since been asked about the conclusions of the committee of experts. As to whether certification can be given that Bikini is radiation free, the answer is that this cannot be done. Such a certification could not be given for any location in any country since there is both natural and man-made radioactivity everywhere. Levels of radioactivity vary from place to place. The levels of man-made radioactivity in Bikini Atoll are still elevated due to tests conducted in the Atoll. However, these levels have been greatly reduced over the years and will continue to decline. The radiation which comes from this radioactivity can be measured with instruments and the radioactivity in foods can be measured in the laboratory. Such measurements have been made for Bikini Atoll, the levels are known, and additional measurements will continue to be made in the future.

Since the levels of man-made radioactivity in Bikini Atoll as elsewhere are not zero, the question comes to how much radioactivity or radiation is acceptable from a health viewpoint and whether the levels expected for Bikini residents fall within an acceptable range. The answer from

the committee of experts is that exposures at Bikini Atoll will be acceptable. Predicted exposures are well within the human radiation protection guides recommended by national and international bodies of experts provided certain precautions are taken. The committee of experts recommended measures to reduce potential radiation exposures at Bikini and to insure that exposures remain acceptable for all future time.

One recommendation is that periodic resurveys of Bikini Atoll should be conducted that will provide a continual check on the radiation status of the people and the environment and that will help form the basis for decision as to the time of rehabilitation of islands outside of the Bikini-Eneu complex. This continuing monitoring of the environment at Bikini Atoll is the same as the monitoring conducted routinely throughout the United States wherein measurements of radiation and radioactivity in foods are made. It is appropriate to make such measurements for the Bikini people considering such measurements are made for the people in the U. S.

As to levels of radioactivity in foods at Bikini Atoll, two foods should be mentioned, namely, coconut crab and pandanus. The committee's recommendation that the population of coconut crabs be sharply reduced was directed to limiting the quantity of coconut crab in the diet. There was no intent that the crabs be entirely removed from the Atoll. Some

reduction occurred during cleanup operations on Bikini Island and coconut crabs are not now seen there in large numbers.

For pandanus, the committee recommended removal of two inches of topsoil over an area covered by the crown of mature trees for plantings on Bikini Island. If this is not done on Bikini, the fruit produced could not be eaten. Fruit produced by pandanus trees planted on Bikini will be analyzed to insure that it is acceptable for food.

The committee has recommended that no precautions are needed on Eneu and coconut crabs found there may be eaten in any quantity. Pandanus may be planted there without restrictions.

There is one very important recommendation of the committee which will require the direct cooperation and participation of the Bikini people. This concerns use of a dietary supplement of powdered milk to supply minimum daily requirements for certain minerals and consequently reduce possible uptake of radioactivity.

In addition to the general statement above, there has been a request for answers to specific questions which may be asked. A list of questions and answers is provided below:

1. Q. HOW DID THE COMMITTEE OF EXPERTS DECIDE BIKINI IS SAFE?

A. They reviewed measurements and data that had been accumulated during past surveys, then met with the 1967 survey team. Predictions were made of the total radiation exposure expected to occur from all possible sources if the natives were returned. In their opinion this exposure does not offer a significant threat to health and safety.

2. Q. DOES THE REPORT OF THE COMMITTEE OF EXPERTS MEAN THAT THERE IS NO RADIATION ON THE ISLANDS?

A. No. It means that in the opinion of the AEC and the committee of experts the type and level of radiation do not offer a significant threat to health and safety.

3. Q. HOW MUCH RADIATION WILL THE BIKINIANS BE EXPOSED TO?

A. That will depend on whether or not the recommendations from the committee of experts are followed. Under the worst conditions, with all of the recommendations ignored that are intended to minimize intake of radioactivity in food, the exposure in the first five years from internal and external radiation sources still would be within acceptable limits set by the Federal Radiation Council for individuals not engaged in atomic energy work. Beyond five years the recommended actions to minimize exposure from radionuclides in food will be needed to insure that the Pandanus may be eaten when it becomes available and that exposures over longer times such as 30 and 70 years remain within acceptable levels.

The accumulated whole body doses as calculated for the committee of experts are:

ADULTS		CHILDREN
5 years	- 1 rad	1 rad
30 years	- 6 rads	5 rads
70 years	- 10 rads	10 rads

The Federal Radiation Council's radiation protection guide for the whole body exposure of individuals amounts to:

Individuals in a Population

1 year	-	0.5 rad
5 years	-	2.5 rads
30 years	-	15 rads
70 years	-	35 rads

The general philosophy, based on both experience and research, is that 0.5 rad per year provides an acceptable level of whole body exposure for individuals. This value may be used where sufficient monitoring is performed so that radiation exposures are known.

4. Q. WHAT ABOUT THE RATE OF ACCUMULATION OF RADIATION EXPOSURE?

A. The rate for external radiation will be higher in the first few years but will decline steadily with time. Reduction to the U. S. average will occur in about 30 to 50 years. This reduction will continue after that time to levels lower than the U. S. average due to the lower natural background level in the Atoll environment. When the Bikini people first return, the doses to whole body from external and from internal radioactivity will be about equal. When more of the locally produced foods such as pandanus begin to become available, the contribution from internal radioactivity may increase. The recommendations of the committee of experts are intended to insure that such exposures in the future remain within an acceptable range.

5. Q. WHERE DOES THE RADIATION IN THE ATOLL COME FROM?
- A. Primarily from radionuclides in soil. The levels vary considerably from one island to another. It is for this reason that Eneu and Bikini were suggested as village sites since these two islands have lower levels.
6. Q. WHY ARE THE ISLANDS NOW CONSIDERED ACCEPTABLE FOR HABITATION WHEN THEY WEREN'T SOME YEARS AGO?
- A. Radioactivity decreases with the passage of time. Some radionuclides disappear faster than others. Altogether it is a combination of the passage of time and the work of nature in diffusing and dispersing the radionuclides. Readings taken in 1967, for instance, were lower than those of 1964.
7. Q. WHY MUST PRECAUTIONS BE TAKEN IN PLANTING PANDANUS TREES ON BIKINI?
- A. Pandanus fruit is a local diet staple, supplying certain needed vitamins. While there are no pandanus of edible variety now on Bikini Island, samples from a nonedible variety have been found to contain a higher level of both strontium-90 and cesium-137 than other plants grown in the same soil. The committee of experts has made a recommendation for reducing these levels in the fruit of trees to be planted on Bikini Island by removing the top two inches of soil which contains most of the radionuclides. On Eneu there is no need for such precautions since the soil there contains only a very small amount of radionuclides.

8. Q. WHY WAS IT SUGGESTED THAT THE COCONUT CRAB POPULATION SHOULD BE REDUCED IN NUMBER?
- A. The coconut crab is a local favorite. However, it is not desirable that this food be a major part of the diet since the levels of radioactivity in the crab are somewhat higher than some other food items. This consideration is the basis for the recommendation on crab population reduction.
9. Q. WHAT ABOUT COCONUTS? ARE THEY RADIOACTIVE?
- A. Coconuts have been observed to contain some amounts of radioactivity but much less than pandanus fruit. Suitable planting and fertilizing procedures are expected to reduce even these amounts. There are not many mature coconut trees on the atoll now. On some of the islands the tops of the coconut trees were snapped off by the force of the test blasts. On the islands most affected by the tests, the trees were burned or washed away. Many new coconut trees are being planted on the islands of Eneu and Bikini.
10. Q. WILL THE BIKINIANS BE ABLE TO FISH IN THE LAGOON?
- A. Yes. The survey team reports the lagoon contains a large quantity of fish. Marine life is low in radioactivity.
11. Q. IS THERE ANY RADIOACTIVITY IN THE BIRDS AND FISH?
- A. Some fish and birds contain measurable amounts of radionuclides which they have retained from what they've eaten, but the amount is not large enough to cause concern.