

Date 1/7/88

ROUTING AND TRANSMITTAL SLIP

TO:		Initials	Date
1.	<u>Bill Jackson, PASO</u>		
2.			
3.			
4.			
5.			

Action	File	Note and Return
Approval	For Clearance	Per Conversation
As Requested	For Correction	Prepare Reply
Circulate	For Your Information	See Me
Comment	Investigate	Signature
Coordination	Justify	

REMARKS

Copy of Caspers Report:

1. There has got to be an approach to clear sampling other than bringing people on board for several days
2. Casper should not be in charge of getting samples back & following. We need a junkie & a man (RMI HS?) to make the door to door sounds all day - every day. A "foreigner" can't do this

FROM: Affectively. Need your help to manage this for BVI

Mail Stop
Phone No.

John Planning & Execution
Kennel Harry B.

Ronzelay 1988 File 2 89

HARRY BROWN'S Files, NV



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FTS 666

Department of Nuclear Energy
Radiological Sciences Division

October 31, 1988

Mr. Harry Brown
Department of Energy
Office of Emergency Response and
Program Analysis
Nevada Operation Office
P.O. Box 98518
Las Vegas, NV 89193-8518

Dear Harry:

At your suggestion, I have contacted Bill Jackson and discussed with him who could be the health service person for our bioassay collection mission during future field trips. Bill thinks that Ms. Jenuk Kabua is our best choice. We know she is a very respected individual among the Marshallese, she is a registered nurse who worked for Dr. Adams and understands the bioassay application. If you agree, and, she wishes, I will begin planning for her to join my whole-body counting and bioassay sampling field trip in July 1989.

Enclosed is a copy of my September 1988 trip report. I have indicated a few observations and wish lists in the conclusion section. I would like you to support or correct these ideas. Any comments, suggestions and/or questions concerning this report from yourself or other members, please let me know. Best regards.

Sincerely yours,

Casper Sun, Ph.D.

LCS/df

Attachment

cc: C. Meinhold, (w/o attachment)
J. Baum "
S. Banerjee "
A. Moorthy "

Marshall Island Bioassay Mission Report

September 1-26, 1988

SUMMARY

A sampling bioassay mission for the population of Rongelap and Utirik was conducted. The four objectives of this trip were: (1) Collect urine and fecal samples from the people now living in Majatto (dri-Rongelap) and Utirik, especially for those who were found to have an elevated plutonium in the urine from previous analysis. (2) Update personnel records. (3) Find a solution for obtaining contamination free urine and feces samples. (4) Participate in the RMI/DOE Meeting on September 23, 1988, at the PASO, Hickam AFB, Honolulu, Hawaii.

Because this sampling collection mission was part of Dr. Adam's Medical program, I would like to thank Dr. Adam, and his team members for all their support and assistance. Without their support and assistance, my work would have been far more difficult.

Since the plutonium intake estimated from our reported urine data are questionable, activities related to the plutonium issues were a central topic between RMI and DOE. Dr. Kohn's Rongelap Resettlement Project final report highlighted two unresolved issues: (1) What is the true plutonium intake rate? and (2) Is it safe for infants to live on Rongelap? A few ideas with regard to solving these two questions are summarized briefly at the end of this report.

Majatto Island: (September 7-10, 1988)

Majatto is located at the northwestern part of the Kwajalein Atoll. Before 1985, Majatto had been uninhabited because it had no fruit or vegetable crops. However, because the island is uncontaminated, Rongelap people chose this place as a temporary home. Owing to the size of the island land and the limited food and water supplies, many of the people have subsequently moved and the exodus is continuing. The current population on the island is about 200, a large fraction of which is children.

It should be noted that because the island is uncontaminated, this was the first visit to Majatto and the first collection of dri-Rongelap urinary samples in an environment free from a contamination. This will then alleviate the concern about plutonium in soil contaminating the urine samples.

In recent years, the Rongelap people have been infuriated about their radiation "stories" and tired of being moved around. The hospitality of the people has changed toward us, (DOE and its' contractor scientists) and will get worse. They need radiological education. This education program should address their environmental activities in terms of their potential risk. In order to benefit our bioassay program, this education should cover why we are collecting urine and how they can help. In this trip, I found the most difficult task on urine collection is getting their cooperation. I distributed approximately 140 urine collection bottles (two bottles for each person) and 50 fecal sample kits. After three days, a total of 34 urine

collection bottles (from 34 persons) and 15 fecal specimens were returned.

Because of our visit, another two important tasks accomplished on the island were (1) The Islanders who had been feeling hopeless, forgotten, and fearful that they might become sick and die by the radiation poison, now feel much better. In fact, they are looking forward to our whole-body count visit in July 1989. (2) Our WBC records were updated. Many old pictures are replaced and many new individuals were added to our database. We also updated their current location.

Utirik Island: (September 12-16, 1988)

This was my first visit to the Utirik island. As a result of an experience on Majatto a couple days earlier, in which 75% of the distributed bottles were lost, my urine collecting technique was quickly modified. Based on the radiological conditions on this island, I was more interested in re-sampling the people who had previously participated in our urine program rather than sample new volunteers. I personally delivered urine bottles, at which time I told each individual that the bottles will be collected by myself the next day. I gave two bottles to each adult male and one to each of the teenagers and adult females. I learned that the "face to face" communication method has made it difficult for the islanders to refuse and/or neglect their urine contribution. The outcome in terms of urine sample returned were marvelous. Almost all of the bottles are recovered. Only two individuals returned with empty bottles and two persons lost their bottles. However, only a few fecal samples are returned.

There are two individuals on Utirik whose urine contained more than 400 aCi. New urine samples are needed to confirm the data from their previous samples. Unfortunately, one of the individuals has moved to the other island. The second one, however, was located. She is 12 years old, born with polio, and has never been able to walk. Her condition suggested to me that the urine collected all these years from her might very well be contaminated. In order to verify this and collect soil free urine and fecal samples from her, I decided to bring her to the ship.

Her father agreed to bring her to the ship for four days for repeated 24-hour specimens. The father also brought his 5 year old daughter for which he is the sole care giver. These three people, the 5 and 12 year old girls and their father, were therefore involved with a special bioassay collection program on the ship. This was particularly helpful since the father was one of the thyroid nodule patients. This set of urine samples is the most complete and verifiable 24-hour urine samples we have ever obtained in the field.

Majuro Island: (September 17-22, 1988)

Majuro is the capital of the Republic of the Marshall Islands. People on this island live a completely different life style than the people in Majatto and Utirik. Unlike Majotto and Utirik, the people in Majuro have stores, hotels, restaurants, schools, hospitals, transportation, a radio station and night-time entertainment. Majuro, the city, has many attractions

which entice outer-islanders to move and settle there. The urine collection method used in Utirik is not practical in Majuro, because of the complexity of life on this island.

In Majuro, I collected samples from 30 of the 40 persons who participated in the medical program and from 5 of the 12 Rongelap people who now live on Majuro. I considered these 35 bottles valuable for our plutonium evaluation since Majuro island is faraway from the contaminated islands and personal hygiene is much better. Furthermore, the 30 people in the BNL Medicare program were among the exposed population in Rongelap and Utirik.

RMI/DOE Meeting: (September 23, 1988)

This meeting between personnel from RMI and DOE was planned and managed by Mr. Harry Brown. The complete attendee list is given in Attachment 1.

In the morning session, Mr. Brown discussed the DOE's objectives in the Marshall Islands program and talked more specifically on LLNL's environmental habitation and BNL's whole-body counting programs. Then, he summarized the current status of the plutonium issue and let LLNL and BNL answer some of RMI's questions. In the afternoon session, Mr. Brown proposed a cost sharing concept to the RMI. (see Attachment 2.)

During the luncheon, Dr. Kato, Senator DeBrum (RMI), Mr. Peter Oliver (Special Assistant for compact Affairs, RMI) and I had a friendly chat and exchanged more information. Senator DeBrum has expressed his personal gratitude to BNL whole-body counting and our plutonium chemistry programs. When the low percentage of urine bottles recovered at Majatto was reported to the Senator he expressed his concern. Senator DeBrum indicates that a cooperative message will be delivered from the RMI government to the dri-Rongelap and to all the other outer islands as well in which he will ask for full cooperation.

Conclusion for Plutonium Issues:

In the Rongelap Reassessment Project Report, July 22, 1988, Dr. Kohn's indicated that the plutonium studies should be focused on what creates such large variation and how to reconcile this problem.

Dr. Kohn believes current urine results are questionable. He justifiably has a hard time accepting that the calculated intakes based on what was found in the urine are higher than what would be projected from the measured plutonium activity in the environment. He suggests that additional sets of data should be obtained for these individuals. He wants us to collect many repeated 24-hour urinary samples in seven day intervals. He said, "It would be ideal, this way, we may reduce the biological variation of the body and close-up the statistical variation."

Mr. Dave Wheeler, DOE dosimetrist, looks at the urine data from a different angle. He pointed out to Dr. Kato and I on September 22, "based on the data he received, he has not found any correlation between the plutonium activities and Marshallese's age, sex, where and how long these people lived."

What he said is "could it be possible for one who had high levels of plutonium in urine one year and much less in other years." The urinalysis data we have now has indeed shown an inconsistency on two data points for the same individuals. The root causes of the inconsistency on urine data must be identified.

However, Dr. Kohn and Mr. Wheeler are addressing the same question we have discussed in our MIRS-1989 plan. I suggested that we first look into the contamination possibility in our previously collected urine. During this, September 1988, field trip, a total of 100 urinary samples were collected. Some of these samples were obtained from the same person who had a positive indication on previous surveys. These samples are scheduled for analysis immediately upon their receipt at BNL.

It was not until 1986, when the FTA method gave consistent results, that we discovered that the urine may have contamination and other problems. Now these problems are being investigated. It is clear that for the future urine collection missions, a contamination free sampling protocol will be developed. To accomplish this and solve other plutonium related issues, I proposed to Mr. Brown the following:

Provide sleeping facilities on-board the ship. It could be like the Medical program's. There are six beds in their trailer. With four such trailers, a maximum of 24 people can participate in the collection program each day. The people on-board would be fed, cared for, and monitored by our registered nurse. We would provide shower and toilet facilities and simple entertainment for them. The participants would not be discharged until the sampling collection is completed.

I would like to comment on Dr. Kohn's recommendation on the reliability and availability of our plutonium data. Our current plutonium data for the Rongelap population are being evaluated by Mr. Dave Wheeler and I, independently. The findings will be reported to Mr. Brown. The data of the urine samples just collected this fall are important for this evaluation. Without this data, this phase of the study can not be considered complete. Because there are too many rumors about the plutonium, Dr. Kohn would like us to evaluate our previously released data and publish our findings.

Although the calculations are straightforward, the actual relation between the plutonium found in urine and how much of plutonium still remains in the body is not simple. Choosing a representable plutonium metabolic model for Marshallese is an important decision for a dosimetrist. Due to my role and duties in the MIRS program, I must determine and apply the most appropriate model for Marshallese. Mr. Dave Wheeler has been invited to join in this work with me and present a study on the evaluation of plutonium metabolic presented at the 34th Health Physics Annual Meeting, June 25-29, 1989, Albuquerque, NM.

As mentioned earlier in this report, I distributed and collected the urine bottles personally at Utirik. The power of person to person interaction can not be denied. Using this method, I successfully recovered almost all the urine samples. Moreover, I saw the volume of urine from person to person vary

from 250 to 2000 ml/day. I realized that the solution to estimating the volume of urine per day, whether from children or adults may be resolved. The reasons behind this ten fold variation in a daily volume appear to depend solely on the water he/she drinks. If this is true, I can determine which people have what daily volume of urine from their economic and social status since in the Marshall Islands these factors determine water availability.

Based on FTA available data, a total of 45 individuals have reported plutonium excretion in urine which is higher than 400 aCi/day; two are dri-Utirik and 43 are dri-Rongelap. However, 24 of the total 43 Rongelap individuals on my list have moved to the other islands. I believe that since Majatto is a terrible place to live, the islanders may move to other islands. We will have a very difficult time keeping track of them. In the field, most of my time was used in searching for identification numbers from the WBC records. This record was developed in 1980 or earlier. For children and teenagers, I had trouble in identifying them from their old pictures. New records and a computerized database should be developed to maintain personal demographic information and fast identification for the next field services.

I noticed that the fecal samples collected during this trip were unsuccessful. However, lessons were learned from this failure. (1) a freeze-dry method should be used instead of drying specimen by using a microwave oven. The microwave oven burned and overcooked the samples. (2) The Marshallese version of our "1-2-3" fecal sampling instructions should be available. From each volume of stool specimen returned, there was less than one half of a teaspoon. The islanders are use to giving a small fraction of stool for medical examination. They were confused by our bioassay program from that of the Medical Department's. However, a one page Marshallese instruction procedure should take care of this problem.

Attachment 1

REPMAR/DOE MEETING - 23 SEPTEMBER 1988
HICKAM AFB, HAWAII

Name	Organization
Kohn, Henry	BARC
Kato, Walt	BNL
Sun, Casper	BNL
Brown, Harry	DOE/NV
Dryden, Joseph	DOE/FASO
Jackson, William	DOE/FASO
Wheeler, David	DOE/NV
Hahn, Dick	DOE/DC
Rudolph, John	DOE/DC
Morgan, Larry	DOI/DC
Campbell, Arnold	DOS
Debrum, Reynold	H&N
Hiner, Kent	H&N
Robison, William	LLNL
Briscoe, Wayne	NCT
Antak, Nichtimos	REPMAR <i>Rony</i>
Balos, Henchi	REPMAR <i>B. K. K.</i>
DeBrum, Oscar	REPMAR <i>-</i>
Hernest, Johnson	REPMAR <i>Euen</i>
Jarpi, Jabwe	REPMAR <i>Rony</i>
John, Yomae	REPMAR <i>Guent</i>
Lokebel, Ello	REPMAR <i>Rony</i>
Niedenthal, John	REPMAR <i>B. K. K.</i>
Oliver, Feter	REPMAR <i>-</i>
Fevec, Davor	REPMAR <i>Guent</i>
Yamamura, Hiroshi	REPMAR <i>Went</i>
Yoshitaro, Samson	REPMAR <i>Euen</i>
Sunyh, Narayarwp	University of Washington

9/23/88

Meeting of RMI and USDOE
RADIOLOGICAL RELATED PROGRAM REQUIREMENTS IN THE
MARSHALL ISLANDS, FY 1989 AND BEYOND

AGENDA

0830-0850	I.	Introductory remarks and introduction of US delegation	Harry Brown	DOE
		Introduction of RMI delegation and remarks	Oscar deBrum	RMI
		Administrative	Kent Hiner	H&N
	II.	DOE Program Overview		
0850-0930		Environmental investigations including limited questions and answers	W. Robison	LLNL
0930-1000		Plutonium dose issue	D. Wheeler Casper Sun	DOE BNL
1000-1015		Break		
1015-1045		Whole Body Counting and bioassay including limited questions and answers	Casper Sun	BNL
1045-1130	III.	Technical discussions and general question and answer period	All	
1130-1300		Lunch (No Host)		
1300-1400	IV.	Program Cost Presentation	Harry Brown John Rudolph	DOE
		Proposed funding source for FY 1990 and beyond		
		Funding Discussion		
1400-1500	V.	Period of separate discussions - each delegation		
1500	VI.	Joint Discussion		
		Identify areas of agreement in principal		
		Need for further meetings on individual topics		
		Conclusions		

DOE PROGRAM COSTS (ESTIMATED)

FY 1989

(\$000)

*MEDICAL PROGRAM (BNL)	\$ 950
*PLUTONIUM DOSE REVIEW (BNL)	
BNL	400 ✓
UNIVERSITY OF UTAH (QA)	100
*WHOLE BODY COUNTING (BNL)	
PROGRAM	575 ✓
CAPITAL EQUIPMENT	300 ✓
*ENVIRONMENTAL ASSESSMENTS (LLNL)	1,300
CAPITAL	100
*LOGISTICAL SUPPORT (DOE-H&N)	1,500
SHIP	
FIELD STATION BIKINI	
MEDICAL REFERRALS	
PROGRAM	
CAPITAL	

\$5,225

4.8

400
575
300

1275

PROPOSED PROGRAM FUNDING (ESTIMATED).

FY 1990 -- 1991

(\$000)---

	U. S.	RMI
MEDICAL / <i>addition to 177-</i>	1,200	
WHOLE BODY COUNTING - BIOASSAY	500 50%	500
ENVIRONMENTAL ASSESSMENTS	750	750
LOGISTICAL SUPPORT / <i>No Medical</i>	700	700
RADIOLOGICAL EDUCATION	<u>25</u>	<u>25</u>
<i>Scholarship for 119 Education</i>	3,175	1,975

(161) *total*

PLUTONIUM DOSE

1. RE-EXAMINE ALL RAW DATA AND RECALCULATE COMMITTED EFFECTIVE DOSE EQUIVALENT.
2. CONDUCT WHOLE-BODY PROGRAM; AND BIOASSAY BEFORE AND AFTER - ENEWETAK, MEJATTO, KILI, UTRIK.
3. ESTABLISH NON-EXPOSED PU BACKGROUND; INVESTIGATE SAMPLE CONTAMINATION.
4. NEW DETECTORS AND WBC EQUIPMENT PURCHASED.
5. ESTABLISH A PROTOCOL TO COLLECT SAMPLES.
6. FURTHER ANALYZE SOIL AND WATER FOR PU.
7. DEVELOP FECAL EXCRETION MODEL.
8. INSTITUTE A PU ANALYSIS PROGRAM WITH ANOTHER LAB.
9. ESTABLISH ADVISORY COMMITTEE OF NATIONALLY RESPECTED SCIENTISTS AND PHYSICIANS FOR OVERVIEW.