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MARSHALL ISLAND WORKSHOP
LAWRENCE LIVERMORE LABORATORY, JUNE 27-29, 1977
TRIP REPORT BY WILLIAM L. TEMPLETON, PNL

SUMMARY

At the invitation of Roger Ray, NVOO; Bill Forster, BER; and Bill Robison, LLL, I attended and participated in the Marshall Islands Workshop, June 27-29, 1977. I agreed to submit my perceptions of the program in writing and have restricted these to four main areas. I identified the following major areas of concern for attention by AES: 1) The lack of a coherent program plan defining short- and long-term objectives and priorities. It is suggested that the appointment of a scientific director for program management supported by a small steering committee is a priority requirement. 2) The rationale for the Enewetak soil cleanup and disposal operation is based on assumptions regarding resuspension of plutonium that have not been validated by empirical data. The proposed soil guidelines for the removal of soil do not appear to be technically supportable. It is recommended that the basis for the proposed soil cleanup and disposition, including ocean dumping, should be reevaluated. The present terrestrial inventory available for resuspension and the resultant dose commitment cannot be altered by the proposed course of action. 3) Resuspension research studies are required to be intensified to define the inhalation and ingestion pathways for plutonium. 4) With the present Bikini inhabitants at some radiological risk, alternative resettlement proposals need to be considered in greater depth, and scientific and technical bases need to be examined along with the social and economic impacts.

INTRODUCTION

At the invitation of Roger Ray, NVOO; Bill Forster, BER; and Bill Robison, LLL, I attended the Marshall Islands Workshop at Lawrence Livermore Laboratory to take part in the research discussions. One the first day and part of the second each principal investigator presented an abstract of his study. This was followed by extensive in-depth discussions of selected segments of the overall program.

It is pertinent to note that this was the first time that all concerned with this program, i.e., the technical representatives from AES, BER, and OES; NVOO; SAN; and principal investigators from BNL, LLL, University of Washington, University of Hawaii, Bowling Green State University had met.

Since I was the only technical person present who was not closely associated with the program, it was agreed by Bill Burr, Bill Forster, and Roger Ray that my written perceptions of this workshop would be useful. I agreed to do this, but it should be borne in mind that I may have missed some of the finer points in the technical and political discussions. In no way was I acting as a rapporteur for the workshop. While many project details were presented, I will restrict my comments to four major areas that I feel need ERDA senior management attention.

PROGRAM ORGANIZATION AND STRUCTURE

It was apparent that there was an overall lack of direction in this program with the result that AES has a number of projects that do not necessarily share the same philosophy or objectives. From the discussions the problem appears to exist mainly at HQ, particularly between OES and BER, and, to a lesser degree, with BER. The issues and program objectives are not clear with the result that there is no coherent program in place, nor have the priorities been identified.

It was very apparent to me, and also expressed by some of the principal investigators, that there is an immediate need for strong program management embracing all the existing AES programs. It is my recommendation that a program manager or scientific/technical director and a small steering committee be appointed from a list of persons not presently responsible for the conduct of the program. The program manager should be given some executive responsibility and should be responsible directly to the AES.

PROPOSED ENEWETAK CLEANUP

The one project that received the most attention from the workshop was the proposed cleanup of the Enewetak Lagoon Islands. Initially, concern was expressed regarding the placement of contaminated materials and soil on Runit. In particular the rationale for using Cactus Crater for the contaminated concrete slurry was not obvious. This particular operation appeared to have many disadvantages in that it does not remove the material from environmental interaction since there are data that indicate ocean water connections do exist and that erosion, etc., will ultimately result in the material being returned to the uncontrolled situation. As a repository for relatively short-lived radioactive materials this concept could be useful, but the consensus of the meeting was that the crater was not an acceptable solution for plutonium contaminated wastes.

The discussion then moved to alternatives. The most obvious one discussed was ocean disposal outside the lagoon. It was reported that this was not acceptable to E.P.A. This is difficult to accept from a technical standpoint. The United States is a signatory to the London Convention on the Dumping of Wastes at Sea. The Technical Memorandum and Resolution was signed by E.P.A. on behalf of the United States Government and includes the definition and recommendations for radioactive materials, providing the basis for ocean

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dumping. The Enewetak material is well within the guidelines proposed, and ocean dumping would result in no significant radiological hazard to man or marine organisms. (I should point out that I was chairman and United States representative on a recent I.A.E.A. panel (June 13-17, 1977) to redefine the radiological basis of the London Convention for the United Nations Intergovernmental Maritime Consultative Organization). The discussion then moved to the rationale for the cleanup. The participants could see the necessity to remove contaminated concrete, metal, ground disposal sites from the Islands and to place this in some form of controlled state on Runit. However, they were not convinced that the rationale for removing soil from the islands was based on acceptable assumptions, i.e., a resuspension problem, nor had any attempt been made to validate those assumptions. The need for a resuspension research program rather than an inadequate monitoring program was called for. Additionally, the guidelines proposed for levels of plutonium in soil appeared to conflict with recently proposed federal guidelines and the basis for a double standard was not made clear. While it was accepted that the decisions to conduct this operation were complicated and had been made over the last two years, the consensus was that the soil removal aspect and the attendant disposal should be immediately re-evaluated. A number of participants were sufficiently concerned that they prepared a draft memorandum, which Bill Burr agreed to bring to the attention of the AES (copy attached).

BIKINI AND ENEU

A considerable time was spent discussing the Bikini Island problem. While it is obvious that there have been, are, and always will be considerable political, economic and social pressures to resettle the islanders, I was not convinced that sufficient technical and scientific discussions had been conducted to come to a decision acceptable to or for the islanders. The indications are that the present inhabitants

of Bikini are at some radiological risk as a result of their consumption of subsistence and garden crops from Bikini. It appears to me rather naive to expect them not to consume subsistence crops growing on their doorstep. Even if the present islanders are moved to Eneu, from the little I learned about their way of life, they will still cross to Bikini to harvest the available food. If the remainder of the islanders are resettled there as well, it is doubtful that Eneu can support them, exacerbating the problem.

Relative to the economic base for Bikini and Eneu Islands, the consensus was that the copra meal would not be acceptable on the open market (e.g., Japan) because of the ^{137}Cs content, although the oil might be. While the interdependence of the economics of these two products might suggest some form of subsidy for the meal, the disposition of that material only raises another disposal problem.

I found it disturbing that, while ERDA is very concerned with the social and economic impacts of the developing energy technologies, there appears to be no one specifically addressing the social and economic implications of governmental actions in the Marshall Islands as a part of present operations. Without this input the scientific and technical decisions may not serve the best interests of the islanders.

With reference to the radiological aspect, the immediate need is to reassess the dose commitment and measure the body burdens. My impression was that the food consumption studies need to be intensified to refine the actual intake of radionuclides and that increased efforts are required on the whole body counting and the urine analysis. The workshop discussed the problems of analysis of urine for plutonium at low levels. Our attention was drawn to the recent HASL Report 319 which would indicate that the number of laboratories able to conduct these Pu analyses (and even γ scans) with a high degree of confidence in their data is surprisingly small.

The letter report from the Chairman of the Transuranium Technical Group to AES dated January 12, 1977, was circulated. My impression from the workshop was that the questions asked then were not being addressed with sufficient urgency.

RESUSPENSION STUDIES

Among the major areas that need immediate resolution are the plutonium pathways. Some of these have been elucidated, i.e., the marine pathway on Bikini. However, insufficient data are available on drinking water from roof catchment, foliar retention of resuspended material and inhalation. It was clear from the discussion that the proposed BNL high-volume sampling program (supported by OES) will be insufficient to define the problem. The need was identified for a well-conceived resuspension research program to determine the degree of resuspension of respirable particles for various activities, i.e., in the villages, garden tilling, etc., the role of foliar uptake by garden crops, and the role of marine aerosols. The need for supporting meterological data is essential if any meaningful data are to be gained. It was suggested that this program be conducted by the resuspension group at LLL who have had experience at NTS.

CONCLUSIONS

Many of the areas of concern expressed at the workshop were perceived by me to stem from a lack of communication, on the one hand, within and between division staffs in Headquarters; and on the other, with the contractors. It was very apparent that the only way this program can have pricritized objectives and conduct the surveillance and research projects in a coherent manner is with the appointment of a scientific director with program management responsibilities. The identification and selection of such a person will not be a simple task since, while it is essential that he have objective scientific prowess, he will also need considerable management

skills and expertise. He will require executive responsibilities and should report directly to AES.

While it is appreciated that the DOD operation at Enewetak has begun, I concur with the suggestion that the soil cleanup and disposal operations be reevaluted by AES immediately. The consensus was that it was not too late to redirect and restrict these efforts to the cleanup of contaminated materials only, while this reevaluation is made.

While it may be beyond the scope of my commitment at the workshop, I would like to say that many of the participants felt that there were some compelling moral and ethical aspects of this Marshall Islands situation that need to be addressed by the government as soon as possible.

ATTACHMENT

DRAFT MEMORANDUM PREPARED 6/28/77

FOR THE ATTENTION OF AES

We, as concerned citizens and scientists participating in the ERDA-Marshall Islands Workshop on June 27-29, 1977, have reviewed the imminent decontamination program for Enewetak Atoll. We call your attention the following matters, since we feel that many aspects of the proposed program are economically and environmentally unacceptable.

The rationale for removing plutonium-contaminated soil is based on assumptions regarding resuspension of Pu that are not validated by empirical data. Additionally, we question whether the guidelines which have been established for soil removed are supportable.

However, we accept that certain contaminted material does have to be removed and agree that this can be placed under control on Runit islet.

The present total inventory of plutonium in the terrestrial environment at Enewetak available for resuspension and resultant dose commitment cannot be significantly altered by the proposed course of action.

The removal of soil from Engebi and other islets would cause a serious loss of the atoll's most valuable terrestrial resource (humus layer), which cannot readily be replaced.

The placement of contaminated concrete slurry into actus rater does not remove this material from environmental interaction, since direct ocean water connections into the crater exist; and present knowledge indicated breakdown and remobilization of Pu will occur.

We therefore recommend that the projected soil removal aspect of the Enewetak cleanup should immediately be reevaluated. We recommend that you reevaluate specifically the basis for soil removal and the disposition of that which is removed.

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