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MAR 30 1987

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HEALTH PHYSICS AND ENVIRONMENTAL DIVISION (HPE) RECOMMENDATIONS ON THE CONTINUATION OF CERTAIN MARSHALL ISLANDS PROGRAMS

At your request, the Marshall Islands Dosimetry Review Group (MIDRG) was established with Kenneth R. Heid, Philip R. Krey, McDonald E. Wrenn, and Bruce B. Boecker as special consultants to review the dosimetry programs of Lawrence Livermore National Laboratory (LLNL) and Brookhaven National Laboratory (BNL) and to make recommendations on the continuance of these programs. The MIDRG met September 30 and October 1, 1986, where William L. Robison and Edward T. Lessard provided information on their respective programs. Reports were received from the four consultants between October 15 and December 15, 1986 (Attachments A, B, C, and D). These comments and recommendations were summarized by David L. Wheeler of my staff in January 1987 and sent to the consultants for review (Attachment E). Two reviewers, Bruce Boecker and Kenneth Heid, have commented on the summary (Attachments F and G). Dr. Boecker's major comment was that the report could be revised slightly into a more coherent presentation. Both reviewers indicated that Mr. Wheeler properly represented the intent of the reviewers in his summary.

The HPE hereby makes the following recommendations concerning the continuation of Marshall Islands dosimetry programs based upon the summary of the comments and recommendations provided by the special consultants.

1. Recommendations regarding the LLNL dose commitment methodology.

There was agreement among the reviewers that the LLNL calculations were appropriate for estimating the environmental transport and uptake of radionuclides in the islands of interest. The LLNL dose estimates for cesium and plutonium should be accepted. The reviewers agreed that the contribution of plutonium toward total dose is insignificant when compared to that contributed by cesium-137.

HPE recommends that LLNL dosimetry calculations be used in regard to resettlement decisions in the Marshall Islands. Following resettlement, there should be a bioassay program that measures both cesium and plutonium to monitor the uptake of radionuclides into the body tissues of returnees. This should continue for a sufficient time to confirm that the actual uptakes are consistent with the LLNL predicted uptakes.

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2. Recommendations as to how much further to carry the BNL Pu-in-urine studies.

Dr. Heid recommended that because of the invasive nature of bioassay sampling into the privacy of individuals, the practice of bioassay be continued only until enough data have been collected to establish a baseline by which the environmental transport models can be tested.

Dr. Wrenn and Mr. Krey recognized this technique as a research tool that should be adequately tested against other techniques of comparable sensitivity.

Dr. Boecker agreed with the research utility of the BNL technique of measuring plutonium in urine and suggested that because of the sensitivity of the public toward plutonium in the environment, quantitative measurements of plutonium at environmental levels should seriously be considered by the U.S. Department of Energy.

HPE recommends that the BNL methodology of measuring plutonium in urine by Fission Track Etch be developed and validated against other techniques until it can reliably be used to measure plutonium in urine at environmental levels. This technique should be used for plutonium bioassays recommended in recommendation 1.

3. Is the continuation of the effort worthy of support as a contribution to the state of the art in radiation monitoring and protection?

Drs. Boecker and Wrenn agree that development of the BNL technique has merit for radiation monitoring of the public. Dr. Heid disagrees, stating that it is unlikely that the level of sensitivity offered by the Fission Track Etch procedure will ever be warranted or needed for radiological protection, and Mr. Krey did not express an opinion.

HPE recommends that development of the technique continue for the monitoring of Marshallese following resettlement. The technique is superior to alpha spectroscopy, and it does not make sense for BNL to change to one of the other techniques (still in the developmental stage) for measuring attocurie quantities of plutonium in urine samples. The technique should not be used to extrapolate measured concentrations to hypothesized exposures many years previously.

4. Suggestions for obtaining funding support.

Dr. Heid suggested that the Office of Health and Environmental Research might be willing to assist in support of research involving the collection of autopsy samples. Drs. Wrenn and Boecker suggested the possibility of

assistance from the Department of Defense because of the need for retrospective dose estimates for about 200,000 military personnel. Mr. Krey did not address funding.

HPE recommends that funding continue from Defense Programs until the technique is sufficiently developed and proven to be competitive with other techniques. When this occurs, it will be available for use by the Government of the Marshall Islands and other agencies on a buy-back basis.

5. Can the review group draft a statement as to the importance and relevance to the real Marshall's world of obtaining by autopsy organ and bone tissue representing certain of the unique Marshall Islands population groups?

Three of the consultants were in favor of collecting autopsy tissue and organ samples and measuring the plutonium to evaluate the effectiveness of the bioassay program and the accuracy of the transport and uptake models. Dr. Boecker cautioned against taking autopsy samples unless they are part of a total bioassay program in which organ burdens can be compared with the bioassay results taken from these individuals prior to death.

HPE agrees with Dr. Boecker in that autopsy samples should not be taken unless there are appropriate bioassay data that could be validated by autopsy samples. A long-term study involving bioassay and autopsy samples conducted on specific individuals that have exhibited high levels of plutonium uptake would be valuable. It is not certain that individuals participating in this type of study would benefit personally from the study or that the DOE is willing to make a commitment of this nature. We believe that the information gained from random samples from the population would not have significant merit.

In final response to your concerns about continued funding levels for LLNL and BNL dosimetry projects, we recommend that funding be continued to LLNL until the current programs reach a logical end, resettlement takes place, and the environmental transport of radionuclides to the population is established. Funding should continue to BNL until the fission track etch methodology has been validated by comparison with other techniques and receives credibility by those interested in the measurement of plutonium in urine at environmental levels. The recommendations of the consultants should be provided to the researchers as an aid in accomplishing the desired quality checks on their techniques.



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Enclosures:
Attachments A-G