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REVIEW BOARD

Interdepartmental letterhead

Mail Station L- 383

Ext: 2-5181/2-5199

October 24, 1988

TO: Bart Gledhill, Chairman, Institutional Review Board
c/o Gerry Wyman

FROM: A. L. Anderson
Deborah Kruchten

SUBJECT: Whole Body Counting of Employee from AERE Harwell, U.K.

Approval is requested from the LLNL Institutional Review Board for LLNL to participate in radioactivity measurements on [redacted] of the Environmental and Medial Sciences Division at AERE Harwell, United Kingdom.

[redacted] received an administration of 76 Bq (2.05 nCi) of Ba-133 in March 1986 in a planned AERE experiment formally approved by their Tracer and Irradiation Studies Approval Committee. This committee is an ethics committee similar in human use oversight to our own (LLNL) Institutional Review Board.

The Ba-133 uptake (primarily now in bone) is known to within 5% and will provide useful additional data to that taken from [redacted] who was counted at LLNL in October 1987. An uneven distribution of activity was observed in the bones of [redacted]. This uneven distribution contributes error to activity calculations since it is standard practice to calibrate the counting equipment using phantoms with known even distributions of radionuclides. Dr. Morgan will provide additional data on the question of uneven radionuclide distributions in the body. This data is useful to LLNL and other DOE facilities as a means of better calibrating radiation detectors used in various in vivo monitoring programs which will ultimately provide more accurate dose estimates of individuals with radioactive uptakes.

Similar studies have been performed in the past with LLNL participation concerning subjects with Pd-103, Cr-51, Nb-92m, and various other radionuclides, including heavy elements such as Am-241 and Pu-239 that were taken up in the body as a result of accidental or occupational exposure. Usually, LLNL has been involved only in a passive sense, that is in performing measurements only on the subjects. However, approval was received from the LLNL Human Subjects Committee in 1981 and 1982 to allow participation of two LLNL employees in a program involving the direct inhalation of Nb-92m labeled particles at AERE Harwell. Both employees,

REPOSITORY LLNL B361 Rm 940A
COLLECTION Institutional Review Board
BOX No. IRB Protocol File
FOLDER Anderson 88-110 Whole Body Counter
Calibration with Ba-133

University of California



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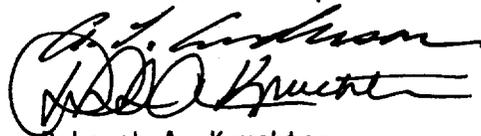
along with one other American and five British subjects were later counted at several British and American facilities, for the purpose of validating the LLNL plutonium lung counter calibration phantom which was developed at this Laboratory. In further work, 11 women (all British), were employed in another Nb-92m intercalibration program to determine the suitability of the phantom as calibration medium for females. Both of these programs produced valuable data, enabling us to perform our work more accurately and with more confidence.

The primary purpose of [REDACTED] visit to LLNL is to meet with Ron Jensen of the Biomedical Department to discuss the assessment of accumulated radiation dose on humans. Pending approval by the Institutional Review Board, we are proceeding to invite [REDACTED] to participate in measurements pertaining to his Ba-133 uptake while he is here at this Laboratory on November 17-19, 1988. Representatives from DOE-SAN have been informed of LLNL's intended measurements.

Attached for your review are the written communications with [REDACTED] to date.

With tougher standards such as ANSI N13.30 around the corner, better calibrations are needed to produce more accurate estimates of activity in the body. Taking advantage of the data provided by humans with radioactive uptakes is a means of better calibrating the radiation detectors used in various in vivo monitoring programs. If you have any questions regarding the above, please call Larry Anderson or Deborah Kruchten, on 2-5181 or 2-5199, respectively.

A. Larry Anderson
Whole Body Counting Laboratory
Hazards Control Department



Deborah A. Kruchten
Whole Body Counting Laboratory
Hazards Control Department

ALA/DAK:beb

Attachment

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