

Development of Dose Conversion Coefficients for Radionuclides Produced in Spallation Neutron Sources

Quarterly Progress Report 8/20/03 – 12/01/03

UNLV/AAA University Participation Program

Phillip Patton and Mark Rudin
Principal Investigators

Project Summary

A research consortium comprised of representatives from several universities and national laboratories has been established as part of this project to generate internal and external dose conversion coefficients for radionuclides produced in spallation neutron sources. Information obtained from this multi-year study will be used to support the siting and licensing of future accelerator-driven nuclear initiatives within the U.S. Department of Energy complex, including the Spallation Neutron Source (SNS) and Accelerator Production of Tritium (APT) Projects. Determination of these coefficients will also fill data gaps for several hundred radionuclides that exist in Federal Guide Report No. 11 and in Publications 68 and 72 of the International Commission on Radiological Protection (ICRP).

Personnel

Principal Investigators:

- Dr. Phillip Patton (Health Physics)
- Dr. Mark Rudin (Health Physics)

Graduate Assistants

- Yayun Song (Health Physics)

National Laboratory Contacts

- Brent Boyack, AAA Project Leader for NEPA/Safety at Los Alamos National Laboratory
- Tony Andrade, Los Alamos National Laboratory

University and National Laboratory Participants

- Idaho State University
- Georgia Institute of Technology
- University of Florida
- University of Tennessee
- Oak Ridge National Laboratory
- Francis Marion University

Management Issues

Personnel Issues:

John Shanahan graduated in July 2003 leaving Yayun Song as the only graduate student assigned to the project.

Budget Issues:

All expenditures appear to be on target and consistent with the budget set forth in the project proposal. However, due to the fact that one graduate student transferred to another school, we may have additional funds available from the graduate student area.

Technical Issues

The following technical work has been performed to date on the DCC project:

Increased Participation in the DCC Working Group

In addition of the initial participants in the DCC working group, three new members attended our meeting in November. These members are Dr. Wesley Bolch (University of Florida), Dr. Derek Jokisch (Francis Marion University) and Dr. David Peterson (Francis Marion University).

Development of a Methodology to Calculate the Radionuclides in Category 2

After reviewing the two main nuclear databases, a method was developed to calculate the radionuclides that fell into category two. The method required DCs be calculated using both databases. If a difference resulted that was greater than 5%, both values were to be reported. If the difference was less than 5%, the most conservative DC will be reported.

Presentation of Project at National and Local Meetings

The scope of work of the UNLV/AAA DCC project was presented at the following two national or local meetings:

An Interdatabase Comparison of Nuclear Structure Data Utilized in the Calculation of Dose Coefficients for Radionuclides Produced in a Spallation Neutron Source. J Shanahan, M Rudin, and P Patton, ANS GSRF, (2003).

Evaluation of Nuclear Databases and the Calculation of Dose Coefficients for Radionuclides Produced in a Spallation Neutron Source. Y Song, J Shanahan, K Eckerman, M Rudin, and P Patton, Lake Mead Chapter of the Health Physics Society Oct 2, 2003.