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Development of Dose Conversion Coefficients for Radionuclides Produced in Spallation Neutron Sources Quarterly Progress Report 1/1/05 – 3/31/05

Phillip W. Patton
University of Nevada, Las Vegas

Mark Rudin
University of Nevada, Las Vegas

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

Quarterly Progress Report 1/1/05 – 3/31/05

UNLV/AAA University Participation Program

Phillip Patton and Mark Rudin
Principal Investigators

Project Summary

The research consortium comprised of representatives from several universities and national laboratories has successfully generated internal and external dose conversion coefficients for twenty radionuclides produced in spallation neutron sources. In addition, the group has identified twenty radionuclide that are missing electron capture files and eighteen additional radionuclides missing substantial physical data. The goal for the current year is to develop a methodology that will allow for producing the dose coefficients for these radionuclides with missing data. Methods to obtain these data are being investigated.

Personnel

Principal Investigators:

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

Graduate Assistants

- Sung-Yop Kim

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
- University of Tennessee
- Oak Ridge National Laboratory

Management Issues

Personnel Issues:

One new graduate student, Sung Yop Kim was added to the project.

Budget Issues:

All expenditures appear to be on target and consistent with the budget set forth in the project proposal considering the extension.

Technical Issues

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

Submitted the Data from this Work to National Journals

One paper is in press in the Journal of Health Physics and another is accepted.

Investigated the Requirements to Produce Data for Radionuclides in Category 3

Several of the radionuclides first investigated lack the required nuclear data to calculate dose coefficients. The extension of the project has targeted investigating the feasibility of producing these rare radionuclides using the linear accelerator located on Idaho State University's campus. A meeting with Derek Jokisch, David Peterson, and Rich Brey was conducted in January to discuss the possibility of producing the missing radionuclide data. Much concern was noted on the feasibility of this, therefore an approach that investigates the possible error associated with calculating dose coefficients without the missing electron capture files is being developed.

Additional Training for New Graduate Students

Sung Kim traveled to Idaho State University and learned the dose coefficient software. Furthermore, it was decided that both universities will calculate dose coefficients for radionuclides lacking electron capture data.