

6-30-2005

Development of Dose Conversion Coefficients for Radionuclides Produced in Spallation Neutron Sources Quarterly Progress Report 4/01/05 – 6/30/05

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Patton, P. W., Rudin, M. (2005). Development of Dose Conversion Coefficients for Radionuclides Produced in Spallation Neutron Sources Quarterly Progress Report 4/01/05 – 6/30/05. 1-2.

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

Quarterly Progress Report 4/01/05 – 6/30/05

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. These dose coefficients fill data gaps exist in Federal Guide Report No. 11 and in Publications 68 and 72 of the International Commission on Radiological Protection (ICRP), and two articles containing the data have been accepted for publication in the Journal of Health Physics. Currently, more nuclear data is needed for the rare radionuclides produced from a mercury target. While attempting to develop a workable plan to acquire this missing data, Q-value discrepancies are being investigated.

Personnel

Principal Investigators:

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

Graduate Assistants

- Sung Yop Kim (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
- Oak Ridge National Laboratory
- Francis Marion University

Management Issues

Personnel Issues:

Currently, only one graduate student is working on this project primarily due to the lack of radionuclide data needed to perform the calculations.

Budget Issues:

Even though the funds allocated for this year are from a no cost extension, there is sufficient funds to cover the cost of the project mainly due to the fact that the only expenses are the assistantship for Sung and travel to meetings to discuss acquiring missing data.

Technical Issues

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

Submitted the Data from this Work to National Journals

Two papers were accepted by the Journal of Health Physics. A copy of each has been forwarded to your department.

Calculated the Magnitude of Q-value Discrepancies

Eighty-three radionuclides have a Q-value discrepancy between the two data sets. This equates to 54 decay chains. The Q-value using both data bases have been recalculated and compared to determine the magnitude of the difference. Previous work relied on the Q-value obtained from ENSDF.