

Center for Radiation Protection Knowledge Update

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**ISCORS Meeting
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Center for Radiation Protection Knowledge

- Established at ORNL per MOU 2010
 - DOE, DoD, EPA, NRC, and OSHA
- Objectives
 - Maintain state-of-the-art biokinetic and dosimetric methodologies
 - Make methodologies available to Federal agencies and to the scientific community
 - Provide technical assistance to Federal agencies
 - Provide technical analyses and documentation to support Federal Guidance Technical Reports
 - Provide training material and courses for Federal agencies

Center Team

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M. B. Bellamy

K. F. Eckerman^{*}

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Professional Activities

- ICRP Committee 2, DOCAL Task Group, and INDOS Task Group
 - OIR parts 1-5: Calculation of occupational effective internal dose coefficients
 - Revision of biokinetic models: Systemic kinetics
 - Revision of dosimetric models and data
 - Publication 116: External dose conversion coefficients
 - ICRP Task Group 90: Age-dependent Dose Coefficients for External Exposures to Environmental Sources
- NCRP SC 6-9: Dose reconstruction for million worker study
- ICRU Committee 26: Operational Dosimetry Quantities
- ANSI/ANS 6.1.1: Neutron and Gamma-Ray Dose Coefficients
- Scientific Review Group, DOE Russian Health Studies Program

International Program Recognition

- Royal Swedish Academy of Sciences: Gold Medal for Radiation Protection
 - 1966 K.Z. Morgan, Director Health Physics Division
 - 2012 K.F. Eckerman, Dosimetry Team Leader
- ICRP Emeritus Member
 - 2012 K.F. Eckerman
 - First Committee member



Center Activities

- Completed FGR 15 Draft (revision of FGR 12 on external dose)
- Update of FGR 13 in progress
 - Risk coefficients for internal and external exposures
 - Letter report on significance of updated risk coefficients
- Interaction with NCRP, ICRP and ICRU
- Maintenance tasks
 - DCFPAK (*Dose and risk coefficient library*)
 - DCAL (*Dose and risk coefficient software*)
 - Rad Toolbox (*PC-based suite of reference radiological data*)
- Developing advanced radiation protection training modules
- Conducted training sessions: DCAL & PIMAL (ORNL software)
- Technical support for the radiation protection community

FGR 15 Method

- Draft submitted August 2013
- Final due February 2014
- Contents:
 - Age/gender specific external dose coefficients
 - Air submersion, water immersion, soil contamination
 - Coefficients for 1252 radionuclides

FGR 15



FGR 15 Results

DRAFT FRG15Viewer - Display dose coefficients of FGR 15 DRAFT

Xe-133m External Exposure Pathway: Submersion

Organ	Dose Coefficient ($Sv\ m^3/Bq\ s$)					
	Newborn	1-y-old	5-y-old	10-y-old	15-y-old	Adult
Brain	3.78E-15	3.31E-15	1.77E-15	1.77E-15	1.69E-15	1.69E-15
O-mucosa	2.88E-15	2.24E-15	1.26E-15	1.25E-15	1.20E-15	1.19E-15
S-glands	3.15E-15	2.61E-15	1.29E-15	1.28E-15	1.25E-15	1.20E-15
Esophagu	2.91E-15	2.62E-15	1.21E-15	1.21E-15	8.38E-16	7.99E-16
ET-regio	3.63E-15	3.21E-15	1.49E-15	1.49E-15	1.27E-15	1.30E-15
Lung	3.63E-15	3.21E-15	1.49E-15	1.49E-15	1.27E-15	1.30E-15
Breast	3.13E-15	3.92E-15	1.80E-15	1.80E-15	1.62E-15	1.64E-15
Thymus	3.47E-15	3.16E-15	1.40E-15	1.38E-15	1.24E-15	1.26E-15
St-wall	3.35E-15	2.88E-15	1.30E-15	1.30E-15	1.02E-15	9.58E-16
SI-wall	3.18E-15	2.68E-15	1.10E-15	1.10E-15	9.30E-16	9.25E-16
Colon	3.20E-15	2.63E-15	1.11E-15	1.12E-15	9.40E-16	9.25E-16
Thyroid	3.53E-15	2.93E-15	1.53E-15	1.50E-15	1.55E-15	1.55E-15
Ht-wall	3.52E-15	2.97E-15	1.32E-15	1.29E-15	1.06E-15	1.08E-15
Liver	3.40E-15	2.89E-15	1.29E-15	1.28E-15	1.12E-15	1.10E-15
Spleen	3.45E-15	2.98E-15	1.33E-15	1.32E-15	1.09E-15	1.10E-15
Kidneys	3.59E-15	2.98E-15	1.32E-15	1.32E-15	1.21E-15	1.19E-15
Adrenals	3.14E-15	2.72E-15	1.19E-15	1.16E-15	9.69E-16	9.63E-16
Pancreas	3.10E-15	2.56E-15	1.10E-15	1.09E-15	8.90E-16	8.84E-16
GB-wall	2.94E-15	2.55E-15	1.07E-15	1.07E-15	9.30E-16	9.09E-16
B-Surfac	1.20E-14	9.47E-15	3.62E-15	3.60E-15	3.01E-15	2.94E-15
R-Marrow	3.41E-15	2.95E-15	1.37E-15	1.38E-15	1.22E-15	1.21E-15
Muscle	3.63E-15	3.31E-15	1.50E-15	1.50E-15	1.33E-15	1.32E-15
Lymph	3.65E-15	3.27E-15	1.51E-15	1.51E-15	1.35E-15	1.34E-15
Testes	3.49E-15	3.53E-15	1.26E-15	1.24E-15	1.29E-15	1.27E-15
Ovaries	2.86E-15	2.53E-15	1.15E-15	1.12E-15	7.60E-16	7.81E-16
Prostate	3.52E-15	2.59E-15	1.09E-15	1.12E-15	7.61E-16	7.80E-16
Uterus	3.06E-15	2.39E-15	9.84E-16	9.60E-16	8.06E-16	8.11E-16
UB-wall	3.62E-15	3.03E-15	1.27E-15	1.28E-15	1.08E-15	1.06E-15
Skin	1.32E-14	1.28E-14	1.06E-14	1.06E-14	1.05E-14	1.05E-14
Effective	3.52E-15	3.20E-15	1.48E-15	1.48E-15	1.29E-15	1.28E-15

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Program Plans

- Hire additional expert(s) in radiation protection
 - Expand postdoc/intern program
 - Add new sponsors
 - Increase university collaborations
 - Host visiting professors with students
 - Joint lab/university appointments
 - Continue to expand ongoing relationships with:
 - University of Tennessee
 - University of Florida
 - Georgia Institute of Technology
 - Engage HPS partner universities
 - Overhaul the Center website
- Oak Ridge National Laboratory
U.S. Department of Energy



Conclusions

- ISCORS support critical to
 - Acquiring new staff
 - Advancing professional activities
 - Ensuring program continuation
 - Maintaining U.S. radiation protection expertise
- ORNL management supportive of MOU
- Program growth will support ISCORS needs

Your efforts are appreciated