



**ORAU TEAM  
Dose Reconstruction  
Project for NIOSH**

Oak Ridge Associated Universities | Dade Moeller | MJW Technical Services

**Probability of Causation Evaluation of  
ICRP 116 Anterior-Posterior, Isotropic, and  
Rotational Geometries**

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11/06/2017	00	New document initiated for probability of causation evaluation of International Commission on Radiological Protection Publication 116 anterior-posterior, isotropic, and rotational geometries. Incorporates formal internal and NIOSH review comments. Attachment C tables were refreshed. Training required: As determined by the Objective Manager. Initiated by Keith A. McCartney.

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**ACRONYMS AND ABBREVIATIONS**

ALL	acute lymphocytic leukemia
AML	acute myeloid leukemia
AP	anterior-posterior
CML	chronic myeloid leukemia
DCC	dose conversion coefficient
GSD	geometric standard deviation
<i>Hp(10)</i>	personal deep dose equivalent
ICRP	International Commission on Radiological Protection
IGF	irradiation geometry factor
IREP	Interactive RadioEpidemiological Program
ISO	isotropic
keV	kiloelectron-volt, 1,000 electron-volts
L	leukemia, excluding chronic lymphocytic leukemia
MeV	megaelectron-volt, 1 million electron-volts
mrem	millirem
NIOSH	National Institute for Occupational Safety and Health
ORAU	Oak Ridge Associated Universities
POC	probability of causation
ROT	rotational
SRDB Ref ID	Site Research Database Reference Identification (number)
yr	year

## 1.0 INTRODUCTION

In a review to address a comment from the Advisory Board on Radiation and Worker Health (SC&A 2005), the National Institute for Occupational Safety and Health (NIOSH) determined that the rotational (ROT) and isotropic (ISO) dose conversion coefficients (DCCs) as applied in OCAS-IG-001, *External Dose Reconstruction Implementation Guideline* (NIOSH 2007), could lead to an underestimate of the external dose. The ISO geometry is of minor concern in dose reconstruction because it typically applies to onsite ambient dose in which a person was not present during the measurement to effectively shield the dosimeter from low- and intermediate- energy photons (<30 keV and 30 to 250 keV, respectively). However, if the ISO DCCs are applied to personal dosimeter measurements, they could result in an underestimate of the organ dose. Correction factors for ROT and ISO DCCs [applicable to the bone (red marrow and surface), esophagus, and lung] were published in Table 4.1.a of OCAS-IG-001, *External Dose Reconstruction Implementation Guideline* (NIOSH 2007), based on information in *Study of a Selection of 10 Historical Types of Dosimeter: Variation of the Response to Hp(10) with Photon Energy and Geometry of Exposure* (Thierry-Chef et al. 2002).

The purpose of this report is to provide guidance on the application of the organ DCCs from International Commission on Radiological Protection (ICRP) Publication 116, *Conversion Coefficients for Radiological Protection Quantities for External Radiation Exposures* (ICRP 2010). The DCCs in Publication 116 assume that the radiation beam is perpendicular (incident angle = 0) in relation to the personal deep dose equivalent [*Hp*(10)] and that exposure measurements were from either film badge or thermoluminescent dosimetry. While these assumptions are reasonable and appropriate for the anterior-posterior (AP) exposure geometry, they could lead to an underestimate of the organ dose if appropriate irradiation geometry factors (IGFs) are not applied.

The analysis examined AP, ROT, and ISO exposures to evaluate when an exposure geometry other than AP should be considered when evaluating a claim. The analysis determined both probability of causation (POC) percentages and dose results in millirem for each combination of organ, gender, dosimeter location, exposure type, and energy range. The results of this report will be used to update Table 4.1a of OCAS-IG-001 when Publication 116 DCCs are implemented.

Attachment A provides the full results of the POC analysis, and Attachment B details the *Hp*(10) results for 30- to 250-keV photons and 100-keV to 2-MeV neutrons, which are the most consequential to POC determination. Attachment C contains the results of the dose analysis. Attachment D is a sample Interactive RadioEpidemiological Program (IREP) sheet for 30- to 250-keV photon exposure of the male lung under ISO geometry with the dosimeter on the center chest. In Attachments A, B, and C, a green checkmark indicates the highest result.

## 2.0 METHODS AND APPROACH

To determine the geometry most favorable to the claimant for calculating the POC, Monte Carlo methods were used to generate IREP sheets for every combination of the following:

- Organ (all Publication 116 organs, see Table 2-1),
- Gender,
- Radiation type (neutron or photon),
- Geometry (AP, ROT, and ISO)
- IREP radiation category (e.g., 100-keV to 2-MeV neutrons),
- Dose type (*Hp*(10) and *Exposure*), and
- Dosimeter location.

Table 2-1. IREP models.

Publication 116 Organs <sup>a</sup>	Publication 116 Organ <sup>b</sup>	IREP model
Adrenals	Adrenals	Other endocrine glands
Endost-BS	Bone surface	Bone
Brain	Brain	Nervous system
Breast	Breast	Breast
Colon	Colon	Colon
Colon	Colon	Rectum
Oesophagus	Esophagus	Esophagus
ET	Extrathoracic (ET) region	Other respiratory
Eye lens	Eye lens	Eye
GB-wall	Gall bladder	Gallbladder
Testes	Gonads (male – testes)	All male genitalia
Ovaries	Gonads (female – ovaries)	Ovary
Kidneys	Kidneys	Urinary organs (less bladder)
Liver	Liver	Liver
Lungs	Lungs	Lung
Lymph	Lymphatic nodes	Lymphoma and multiple myeloma
Muscle	Muscle	Connective tissue
O-mucosa	Oral mucosa	Oral cavity and pharynx
Pancreas	Pancreas	Pancreas
Prostate	Prostate (male)	All male genitalia
R-marrow	Red bone marrow	Leukemia, excluding chronic lymphocytic leukemia
R-marrow	Red bone marrow	Acute lymphocytic leukemia
R-marrow	Red bone marrow	Acute myeloid leukemia
R-marrow	Red bone marrow	Chronic myeloid leukemia
Remainder	Remainder tissues	Other and ill-defined sites
S-glands	Salivary glands	Oral cavity and pharynx
SI-wall	Small intestine	All digestive
Spleen	Spleen	All digestive
St-wall	Stomach	Stomach
Thymus	Thymus	Other respiratory
Thyroid	Thyroid	Thyroid
UB-wall	Urinary bladder	Bladder
Uterus	Uterus (female)	Female genitalia less ovary

a. Organ names as listed in Publication 116.

b. Clarification added to some organ names.

All exposures were calculated using Monte Carlo simulations with custom software from Vose. The Vose software consists of a dynamic link library (DLL) containing analysis routines from Vose's commercial software ModelRisk. The DLL is a general purpose Monte Carlo code that allows automated combining of dissimilar distributions within a programming framework.

## 2.1 DOSIMETER LOCATIONS

Four dosimeter locations were implemented for the calculations: Center chest, left collar, center waist, and left chest pocket (Table 2-2). These locations are assumed to approximate the standard locations of the dosimeters on a worker.

## 2.2 IRRADIATION GEOMETRY FACTORS

ORAUT-RPRT-0068, *Correction Factors for Use with ICRP Publication 116 Isotropic and Rotational Dose Conversion Coefficients*, determined IGFs for ISO and ROT geometries (ORAUT 2016a). The IGFs apply to *Hp(10)* and *Exposure* measurements. All AP IGFs are 1 because that is the geometry of the ICRP DCCs. Tables 2-3 through 2-6 list the ISO and ROT IGFs.



Table 2-2. Dosimeter locations.

Dosimeter location	Description
Center chest	The lower edge of the dosimeter location approximates the bottom of the sternum.
Left collar	The upper edge of the dosimeter location approximates the top of the left clavicle.
Center waist	The dosimeter location is centered at the approximate location of the belt buckle.
Left chest pocket	The upper edge of the dosimeter approximates the location of the top edge of the left chest pocket of a laboratory coat.

Table 2-3. ROT neutron IGFs by dosimeter location.

Energy (MeV)	Female				Male			
	Center chest	Center waist	Left chest pocket	Left collar	Center chest	Center waist	Left chest pocket	Left collar
0.000000001	2.0863	1.8373	1.5902	2.0297	2.0308	1.8778	1.6780	1.8931
0.00000001	2.2019	1.9249	1.6635	2.1350	2.1368	1.9778	1.7522	2.0121
0.0000002	2.1678	1.8971	1.6234	2.0793	2.0969	1.9458	1.7319	1.9842
0.000002	2.0632	1.7935	1.5799	1.9847	1.9962	1.8310	1.6468	1.8461
0.00002	2.0677	1.7999	1.5754	1.9824	2.0146	1.8361	1.6559	1.8545
0.00005	2.0460	1.7996	1.5651	1.9389	2.0090	1.8219	1.6537	1.8396
0.0002	2.0512	1.8129	1.5717	1.9604	2.0162	1.8385	1.6582	1.8535
0.0005	2.0799	1.7757	1.5591	1.9443	1.9609	1.7777	1.6377	1.7977
0.005	2.0363	1.7768	1.5689	1.9765	2.0029	1.8271	1.6498	1.8418
0.01	2.0821	1.7909	1.5715	1.9489	1.9704	1.7926	1.6412	1.8071
0.02	2.0437	1.7927	1.5770	1.9883	2.0152	1.8371	1.6545	1.8568
0.03	2.0509	1.7998	1.5803	1.9978	2.0227	1.8408	1.6592	1.8721
0.05	2.0432	1.7932	1.5789	1.9944	2.0152	1.8367	1.6590	1.8665
0.07	2.0443	1.7942	1.5807	1.9974	2.0181	1.8396	1.6581	1.8731
0.1	2.0460	1.7881	1.5813	1.9957	2.0185	1.8401	1.6581	1.8780
0.15	2.0384	1.7957	1.5786	1.9927	2.0213	1.8417	1.6586	1.8787
0.3	2.0372	1.7851	1.5749	1.9857	2.0184	1.8420	1.6604	1.8808
0.7	1.9917	1.7595	1.5626	1.9505	1.9845	1.8043	1.6408	1.8439
1	1.9626	1.7400	1.5403	1.9239	1.9567	1.7815	1.6169	1.8179
1.2	1.9192	1.7216	1.5295	1.9067	1.9395	1.7652	1.6022	1.8138
2	1.8466	1.7030	1.5124	1.8361	1.8925	1.7413	1.5977	1.7766
3	1.7519	1.6371	1.4684	1.7488	1.8108	1.7021	1.5575	1.7040
4	1.7396	1.6388	1.4644	1.7259	1.7988	1.7036	1.5465	1.6915
5	1.6474	1.5712	1.4230	1.6635	1.7202	1.6419	1.5067	1.6287
6	1.6082	1.5452	1.4064	1.6319	1.7058	1.6040	1.4863	1.6014
8	1.5536	1.5045	1.3737	1.5683	1.6342	1.5611	1.4536	1.5492
10	1.5310	1.4744	1.3661	1.5061	1.5825	1.5123	1.4376	1.4934
12	1.4826	1.4303	1.3337	1.4670	1.5419	1.4579	1.4164	1.4653
14	1.4368	1.3969	1.3084	1.4246	1.4892	1.4264	1.3749	1.4330
16	1.4483	1.4097	1.3148	1.4321	1.4932	1.4360	1.3812	1.4259
18	1.3832	1.3512	1.2711	1.3721	1.4234	1.3857	1.3313	1.3635
20	1.3546	1.3431	1.2586	1.3803	1.4259	1.3940	1.3296	1.3735

Table 2-4. ISO neutron IGFs by dosimeter location.

Energy (MeV)	Female				Male			
	Center chest	Center waist	Left chest pocket	Left collar	Center chest	Center waist	Left chest pocket	Left collar
0.000000001	2.0336	1.8912	1.5980	2.3066	2.0655	1.9418	1.6653	2.1621
0.00000001	2.1848	2.0044	1.6860	2.4258	2.1882	2.0764	1.7644	2.2982
0.0000002	2.1490	1.9637	1.6399	2.3651	2.1451	2.0208	1.7308	2.2520
0.000002	1.9728	1.8090	1.5613	2.2003	2.0029	1.8712	1.6162	2.0739
0.00002	1.9758	1.8135	1.5691	2.2072	2.0144	1.8810	1.6274	2.0674
0.00005	1.9605	1.7979	1.5588	2.1881	1.9977	1.8615	1.6211	2.0481
0.0002	1.9778	1.8150	1.5694	2.2050	2.0105	1.8839	1.6294	2.0689
0.0005	1.9590	1.7813	1.5644	2.2234	1.9962	1.8472	1.6141	2.0699
0.005	1.9686	1.8023	1.5595	2.1884	1.9940	1.8668	1.6189	2.0539
0.01	1.9716	1.8006	1.5728	2.2362	2.0120	1.8676	1.6215	2.0892
0.02	1.9780	1.8230	1.5706	2.2085	2.0147	1.8861	1.6288	2.0743
0.03	1.9881	1.8361	1.5763	2.2244	2.0279	1.8968	1.6358	2.0889
0.05	1.9802	1.8248	1.5742	2.2150	2.0206	1.8914	1.6327	2.0784
0.07	1.9807	1.8288	1.5772	2.2202	2.0277	1.8965	1.6332	2.0872
0.1	1.9819	1.8231	1.5764	2.2181	2.0251	1.8986	1.6346	2.0889
0.15	1.9794	1.8277	1.5735	2.2091	2.0298	1.8959	1.6360	2.0827
0.3	1.9735	1.8196	1.5697	2.1946	2.0338	1.8965	1.6411	2.0840
0.7	1.9370	1.7919	1.5569	2.1411	1.9955	1.8666	1.6202	2.0266
1	1.8927	1.7639	1.5296	2.1046	1.9557	1.8318	1.5855	1.9944
1.2	1.8662	1.7507	1.5184	2.0767	1.9503	1.8223	1.5779	1.9863
2	1.8258	1.7473	1.5030	1.9817	1.9131	1.8164	1.5795	1.9346
3	1.7613	1.7032	1.4658	1.8838	1.8417	1.7844	1.5485	1.8417
4	1.7494	1.7086	1.4608	1.8494	1.8282	1.7879	1.5356	1.8238
5	1.6776	1.6447	1.4243	1.7728	1.7562	1.7297	1.5029	1.7467
6	1.6388	1.6211	1.4056	1.7343	1.7354	1.6939	1.4833	1.7195
8	1.5865	1.5811	1.3795	1.6655	1.6690	1.6497	1.4534	1.6610
10	1.5648	1.5440	1.3714	1.6390	1.6557	1.6176	1.4366	1.6417
12	1.5206	1.5049	1.3422	1.5918	1.6262	1.5773	1.4080	1.6070
14	1.4862	1.4752	1.3222	1.5486	1.5774	1.5365	1.3884	1.5559
16	1.4870	1.4785	1.3261	1.5534	1.5851	1.5454	1.3964	1.5550
18	1.4272	1.4247	1.2894	1.4810	1.5099	1.4859	1.3496	1.4889
20	1.4105	1.4281	1.2761	1.4464	1.4702	1.4861	1.3432	1.4551

Table 2-5. ROT photon IGFs by dosimeter location.

Energy (MeV)	Female				Male			
	Center chest	Center waist	Left chest pocket	Left collar	Center chest	Center waist	Left chest pocket	Left collar
0.01	2.0656	1.8206	1.5811	2.0087	2.0196	1.8577	1.6675	1.8772
0.015	2.0733	1.8150	1.5863	2.0075	2.0276	1.8550	1.6689	1.8810
0.02	2.0392	1.7788	1.5645	1.9878	2.0177	1.8295	1.6460	1.8599
0.03	1.9119	1.7060	1.5263	1.8851	1.9277	1.7553	1.6006	1.8177
0.04	1.8478	1.6842	1.5089	1.8473	1.8969	1.7370	1.5882	1.7915
0.05	1.8120	1.6721	1.5000	1.8244	1.8701	1.7278	1.5809	1.7756
0.06	1.7978	1.6666	1.4953	1.8089	1.8616	1.7217	1.5769	1.7637
0.08	1.7775	1.6578	1.4890	1.7913	1.8446	1.7111	1.5710	1.7500
0.1	1.7634	1.6495	1.4827	1.7786	1.8346	1.7045	1.5669	1.7392
0.15	1.7279	1.6324	1.4684	1.7508	1.8054	1.6858	1.5540	1.7159
0.2	1.6983	1.6129	1.4543	1.7225	1.7811	1.6675	1.5404	1.6943
0.3	1.6485	1.5759	1.4298	1.6745	1.7348	1.6341	1.5147	1.6515
0.4	1.6052	1.5450	1.4072	1.6361	1.6940	1.6049	1.4940	1.6171
0.5	1.5685	1.5176	1.3897	1.6015	1.6579	1.5791	1.4740	1.5873
0.6	1.5388	1.4954	1.3735	1.5735	1.6280	1.5556	1.4565	1.5595
0.8	1.4885	1.4564	1.3477	1.5259	1.5778	1.5167	1.4259	1.5146
1	1.4491	1.4233	1.3246	1.4839	1.5362	1.4831	1.4010	1.4768
1.5	1.3792	1.3633	1.2806	1.4104	1.4587	1.4199	1.3489	1.4081
2	1.3318	1.3220	1.2514	1.3609	1.4057	1.3748	1.3130	1.3609
3	1.2723	1.2674	1.2102	1.3028	1.3350	1.3159	1.2647	1.2985

Table 2-6. ISO photon IGFs by dosimeter location.

Energy (MeV)	Female				Male			
	Center chest	Center waist	Left chest pocket	Left collar	Center chest	Center waist	Left chest pocket	Left collar
0.01	1.9963	1.8706	1.5949	2.2631	2.0366	1.9153	1.6608	2.1293
0.015	2.0045	1.8621	1.5975	2.2403	2.0414	1.9151	1.6601	2.1075
0.02	1.9677	1.8204	1.5669	2.1952	2.0180	1.8829	1.6316	2.0650
0.03	1.8519	1.7346	1.5174	2.0367	1.9183	1.7961	1.5771	1.9704
0.04	1.8051	1.7203	1.5007	1.9777	1.8922	1.7864	1.5696	1.9223
0.05	1.7873	1.7171	1.4944	1.9484	1.8757	1.7817	1.5642	1.9048
0.06	1.7781	1.7138	1.4910	1.9324	1.8670	1.7786	1.5607	1.8915
0.08	1.7674	1.7110	1.4855	1.9139	1.8559	1.7756	1.5573	1.8777
0.1	1.7592	1.7068	1.4808	1.8963	1.8456	1.7705	1.5536	1.8657
0.15	1.7347	1.6932	1.4680	1.8592	1.8234	1.7567	1.5429	1.8372
0.2	1.7118	1.6801	1.4564	1.8268	1.8006	1.7410	1.5322	1.8116
0.3	1.6701	1.6519	1.4341	1.7681	1.7578	1.7123	1.5109	1.7640
0.4	1.6368	1.6271	1.4148	1.7219	1.7219	1.6867	1.4923	1.7237
0.5	1.6074	1.6047	1.3979	1.6825	1.6916	1.6632	1.4762	1.6883
0.6	1.5811	1.5842	1.3834	1.6479	1.6644	1.6419	1.4606	1.6577
0.8	1.5373	1.5476	1.3589	1.5933	1.6154	1.6035	1.4337	1.6071
1	1.5015	1.5165	1.3379	1.5495	1.5763	1.5707	1.4113	1.5650
1.5	1.4340	1.4541	1.2971	1.4711	1.5005	1.5057	1.3648	1.4870
2	1.3879	1.4082	1.2679	1.4192	1.4469	1.4572	1.3316	1.4327
3	1.3257	1.3451	1.2285	1.3517	1.3768	1.3888	1.2844	1.3624

**Note: Photon IGF Values are only provided up through 3 MeV since, as noted in ICRU 47 Table A.1, “exposure is not accurately determined at energies above 3 MeV since there is significant departure from electronic equilibrium” (ICRU 1992). Please note, however, that the data and references given in ICRP 116 do allow for the derivation of Hp(10) and H\*(10) DCF values at energies above 3 MeV (ICRP 2010).**

## 2.3 PROBABILITY OF CAUSATION ANALYSIS

IREP calculations were performed assuming a 5-year work period starting at age 35 with an assumed latency period of 3 years for leukemia, 7 for thyroid, and 10 for all other cancers. A dose of 2,000 mrem/yr was applied as a normal distribution with a 30% error.

The enterprise edition of IREP version 5.8 was used to calculate the POC values. The enterprise edition performed the POC calculation 30 times, each time using a different seed value, and each exposure was sampled 10,000 times. The average of the resultant POC values were used for the comparisons.

Table 2-1 lists the assumed IREP model for each the organs listed in Publication 116.

### Monte Carlo Calculation for POC Analysis

The Monte Carlo simulation combined the following elements:

$$IREP\ Exposure = Dose \times DCC \times IGF \quad (2-1)$$

where

*Dose* = 2,000 mrem/yr applied as a normal distribution with a 30% error.

*DCC* = based on the method in ORAUT-RPRT-0069, *Updated ICRP 116 Dose Conversion Factors and Comparison to ICRP 74 Dose Conversion Factors* (ORAUT 2016b). The DCC is treated as a continuous distribution. A four-point Lagrange interpolation, as recommended by ICRP Publication 116 (ICRP 2010), is used to determine DCC values between discrete points.

*IGF* = 1 for AP, values in Table 2-3 through 2-6 for ISO and ROT geometries. The IGF was treated as a continuous distribution using a four-point Lagrange interpolation.

## 2.4 DOSE ONLY ANALYSIS

In addition to the POC analysis, a separate analysis was performed comparing only the calculated dose value. In this analysis, 500 mrem of measured dose and 500 mrem of missed dose were combined with the Publication 116 DCCs and the IGFs for the four dosimeter locations. The measured dose was represented as a normal distribution with a 30% error, while the missed dose was represented by a lognormal distribution with a geometric standard deviation (GSD) of 1.52.

### Monte Carlo Calculation for Dose Analysis

The Monte Carlo simulation calculated the results as follows:

$$Total\ Dose = (Measured\ Dose \times DCC \times IGF) + (Missed\ Dose \times DCC \times IGF) \quad (2-2)$$

where

*Measured Dose* = 500 mrem/yr applied as a normal distribution with a 30% error.

*Missed Dose* = 500 mrem/yr applied as a lognormal distribution with a GSD of 1.52.

*DCC* = Based on the method described in ORAUT-RPRT-0069 (ORAUT 2016b). The DCC is treated as a continuous distribution. A four-point

Lagrange interpolation, as recommended by ICRP Publication 116 (ICRP 2010), is used to determine DCF values between discrete points.

*IGF* = 1 for AP, values in Table 2-3 through 2-6 for ISO and ROT geometries. The IGF was treated as a continuous distribution using a four-point Lagrange interpolation.

### 3.0 **RESULTS**

#### 3.1 **PROBABILITY OF CAUSATION ANALYSIS**

When looking at the detailed results in Appendix A, concise geometry determinations cannot be drawn as in OCAS-IG-001 (NIOSH 2007). The AP and ROT geometries deliver the largest POC for most radiation types, organs, and dosimeter locations. The outlier is the female adrenals, for which ISO becomes more prominent for photons.

##### **Consequential Radiation Energies**

A subset of the data provides a clearer determination. Attachment B focuses on the radiation energies that are most consequential to POC determination: photons from 30 to 250 keV and neutrons from 100 keV to 2 MeV. The analysis determined which geometries result in the highest dose for each pairing of organ and dosimeter location.

For 30 to 250 keV photons, the ROT geometry delivers the highest POC for most pairings. Table 3-1 lists the organs for each location for which ROT is not the most favorable geometry. For the left chest pocket, either AP or ISO delivers the highest POC for 13 of the Publication 116 organs.

The organs with the higher POCs for 30 to 250 keV photons are mostly the same for male and female. A notable exception is the adrenals, for which ISO is most favorable.

The ROT geometry also delivers the highest POC for 0.1- to 2-MeV neutrons at most locations. However, both the center waist and left chest pocket locations have more organs for which the higher POC results from either the AP or ISO geometry (Table 3-2).

Table 3-1. Organs for which ROT is not the most favorable geometry for 30- to 250-keV photons.

<b>Center chest</b>	<b>Center waist</b>	<b>Left chest pocket</b>	<b>Left collar</b>
Adrenals, bladder, thymus	Adrenals, bladder, testes, thymus, thyroid, breast	Adrenals, bladder, testes, thymus, thyroid, breast, colon, eye lens, esophagus, pancreas, small intestine, stomach, uterus	Adrenals, bladder, testes, thymus

Table 3-2. Organs for which ROT is not the most favorable geometry for 100-keV to 2-MeV neutrons.

Center chest	Center waist	Left chest pocket	Left collar
Bladder, testes, thymus, thyroid, breast, colon, small intestine, uterus	Bladder, testes, thymus, thyroid, breast, colon, eye lens, gallbladder, pancreas, prostate, small intestine, stomach, uterus	Bladder, testes, thymus, thyroid, breast, colon, eye lens, esophagus, gallbladder, liver, lymph, ovaries, pancreas, prostate, small intestine, stomach, uterus	Bladder, testes, thymus, thyroid, breast, colon, prostate, small intestine, stomach, uterus

### 3.2 DOSE ANALYSIS

The dose analysis provides an additional comparison. There is overwhelming agreement between the dose and POC analysis results although there are some differences. Attachment C contains the results of the analysis.

### 4.0 SUMMARY

Table 4.1.a of the current OCAS-IG-001 provides a concise list of organs in which geometries other than AP should be considered (NIOSH 2007). The same analysis using Publication 116 DCCs in combination with the IGFs in ORAUT-RPRT-0068 does not yield such a list. In a departure from the current recommendations in OCAS-IG-001, the analysis using Publication 116 heavily favors the ROT geometry.

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**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES**

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**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-1. Adrenals POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.11	0.32	0.03	0	0.16	0.31	0.19	0.57	0.06	0.01	0.28	0.55
Photons, <30 keV	1.88	5.31	2.49	0.39	1.77	2.91	1.77	4.86	2.45	0.38	1.65	2.77
Photons, 30–250 keV	29.2	46.8	38	14	23.5	28.7	22.7	38.9	30.6	10.4	18.1	22.6
Photons, >250 keV	13.4	19.6	17.4	6.22	8.91	9.78	13.1	19.2	17.1	6.1	8.72	9.56
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.6	45.9	54.5	18.7	27.7	34.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26.2	29.4	37.5	10.4	15.8	21
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.1	13.7	19	3.22	7.15	9.56
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.9	27.3	32	9.68	14.7	17.4
<b>Center waist</b>												
Photons, 20 keV	0.11	0.3	0.03	0	0.15	0.28	0.19	0.53	0.05	0.01	0.26	0.5
Photons, <30 keV	1.9	4.88	2.21	0.39	1.63	2.67	1.93	4.54	2.2	0.39	1.76	2.55
Photons, 30–250 keV	29.1	46.4	36.4	14	22.8	27.3	22.9	38.1	29.3	10.4	17.4	21.3
Photons, >250 keV	13.3	19.8	17.2	6.22	8.94	9.58	13.1	19.3	16.9	6.1	8.75	9.33
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.6	43.8	51.4	18.6	26.3	33
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26	27.9	34.6	10.4	15	19.4
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11	13	17.4	3.21	6.65	8.81
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.9	27.2	31.3	9.7	14.5	16.7
<b>Left chest pocket</b>												
Photons, 20 keV	0.11	0.26	0.03	0	0.13	0.25	0.18	0.45	0.05	0.01	0.23	0.44
Photons, <30 keV	1.89	4.17	1.97	0.39	1.43	2.38	1.75	3.95	1.92	0.38	1.36	2.25
Photons, 30–250 keV	29.3	42.6	33.7	14	20.5	25.7	22.8	35	27.1	10.5	15.6	19.9
Photons, >250 keV	13.4	18	16.4	6.2	8.17	9.16	13	17.6	16	6.08	7.96	8.89
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.5	40.3	48.3	18.7	23.7	30.6
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26	24.9	31.9	10.5	13.3	17.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11	11.4	15.8	3.21	5.87	8.05
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.9	24.8	29.5	9.71	13.1	16
<b>Left collar</b>												
Photons, 20 keV	0.11	0.36	0.03	0	0.16	0.29	0.19	0.63	0.06	0.01	0.29	0.5
Photons, <30 keV	1.88	5.75	2.45	0.38	1.96	2.73	1.77	5.32	2.42	0.38	1.91	2.61
Photons, 30–250 keV	29.3	48.7	38.2	14.1	23.7	27.7	22.8	40.7	31	10.4	18.2	21.4
Photons, >250 keV	13.4	20	17.7	6.22	8.88	9.51	13	19.6	17.3	6.08	8.63	9.29
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.6	48.6	53.9	18.7	28.3	33.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26	32	36.8	10.4	16.4	19.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11	14.9	18.9	3.21	7.24	9.02
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.9	28.4	32	9.72	14.6	16.7

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-2. Brain POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.04	0.23	0.23	0.02	0.1	0.07	0.07	0.41	0.4	0.03	0.17	0.12
Photons, <30 keV	0.94	1.7	3.26	0.18	0.63	0.47	0.86	1.85	3.14	0.26	0.71	0.8
Photons, 30–250 keV	15.7	27.2	29.3	7.19	14.4	15.5	11.7	21.1	23	5.23	10.7	11.6
Photons, >250 keV	7.13	10.3	10.6	3.23	4.99	5.17	6.96	10.1	10.3	3.14	4.83	5.02
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	12.9	22.8	26.6	5.79	12.5	14.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	6.85	13.2	15.5	3.04	6.8	7.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.42	10.8	12.3	2.16	4.92	5.42
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.2	17.1	18	4.96	8.31	8.74
<b>Center waist</b>												
Photons, 20 keV	0.04	0.22	0.2	0.02	0.09	0.06	0.07	0.38	0.35	0.03	0.16	0.1
Photons, <30 keV	0.92	1.74	2.9	0.19	0.75	0.62	0.85	1.64	2.7	0.21	0.8	0.66
Photons, 30–250 keV	15.7	26.6	28	7.25	13.9	14.5	11.7	20.5	21.8	5.21	10.3	10.9
Photons, >250 keV	7.11	10.4	10.4	3.22	4.98	5.02	6.97	10.1	10.3	3.13	4.84	4.87
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	12.9	21.3	24.1	5.81	11.9	13.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	6.82	12.2	13.9	3.05	6.42	7.22
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.44	10.4	11.3	2.15	4.63	4.98
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.2	17	17.5	4.96	8.12	8.35
<b>Left chest pocket</b>												
Photons, 20 keV	0.04	0.19	0.17	0.02	0.08	0.05	0.07	0.33	0.3	0.03	0.14	0.09
Photons, <30 keV	0.92	1.27	2.52	0.14	0.59	0.53	0.85	1.59	2.37	0.26	0.67	0.58
Photons, 30–250 keV	15.7	23.8	26	7.21	12.3	13.6	11.7	18.2	20	5.19	9.16	9.99
Photons, >250 keV	7.12	9.36	9.83	3.2	4.49	4.75	6.96	9.07	9.54	3.13	4.38	4.62
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	12.9	19	21.8	5.83	10.4	12.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	6.83	10.7	12.4	3.04	5.57	6.56
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.43	9.05	10.1	2.17	4.03	4.57
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.2	15.3	16.2	4.94	7.27	7.85
<b>Left collar</b>												
Photons, 20 keV	0.04	0.26	0.22	0.02	0.1	0.06	0.07	0.46	0.39	0.03	0.18	0.11
Photons, <30 keV	0.92	1.92	3.22	0.19	0.7	0.61	0.86	1.98	2.98	0.27	0.8	0.77
Photons, 30–250 keV	15.7	28.6	29.7	7.25	14.5	14.8	11.7	22.3	23.3	5.25	10.9	11.1
Photons, >250 keV	7.12	10.6	10.8	3.23	4.95	4.97	6.97	10.3	10.6	3.11	4.79	4.84
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	12.8	24.8	25.9	5.8	12.9	13.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	6.83	14.6	15.2	3.05	7	7.32
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.45	12	12.3	2.16	4.99	5.16
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.2	17.8	17.9	4.96	8.24	8.29

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-3. Breast POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	16.2	12.1	14.5	22	18.3	19.3	25.9	20.2	23.4	33.5	28.5	30
Photons, <30 keV	19	14.5	16.9	24.6	20.5	21.9	45.6	35.8	40.3	57.3	46.6	50.4
Photons, 30–250 keV	31.5	30.3	32.8	34.9	34.7	36.5	25	24.1	26.3	28	28	29.5
Photons, >250 keV	10.4	11.4	11.7	11.4	12.6	13.3	10.1	11	11.4	11	12.2	13
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	27	21.9	27.1	30.5	25	30.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	21.8	17.4	21.4	28	22.8	25.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	19.2	16.9	18.8	23.7	22.4	23.4
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	20.6	20.7	21.7	23.9	25.2	25.7
<b>Center waist</b>												
Photons, 20 keV	16.3	11.4	12.7	21.9	17.3	17.8	26.1	18.9	20.9	33.4	27.2	28
Photons, <30 keV	18.7	13.7	15.1	24.5	19.6	20.3	46.3	33.8	37.1	56.8	44.4	48.4
Photons, 30–250 keV	31.4	29.8	31.6	35.1	33.9	34.7	25	23.7	25	28	27.2	27.9
Photons, >250 keV	10.3	11.4	11.6	11.3	12.5	12.9	10.1	11.1	11.2	11	12.2	12.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	27.1	20.5	24.6	30.5	23.8	28.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	21.8	16.4	19.3	28.1	21.8	24.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	19.2	16	17.3	23.7	21.2	21.8
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	20.4	20.5	21	24	24.8	24.7
<b>Left chest pocket</b>												
Photons, 20 keV	16.3	9.79	11.2	22.1	15.2	16.2	26.1	16.5	18.7	33.5	24.4	25.8
Photons, <30 keV	18.8	11.9	13.5	24.5	17.4	18.3	46.1	31.2	33.9	57.3	40.9	45.1
Photons, 30–250 keV	31.5	26.9	29.3	35	30.9	32.9	24.9	21	23.1	28.1	24.5	26.4
Photons, >250 keV	10.4	10.3	10.9	11.3	11.5	12.4	10.1	10.1	10.6	11.1	11.2	12.1
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	26.9	18.2	22.3	30.5	21.3	26.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	21.8	14.4	17.3	28	19.3	22.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	19.2	14.2	15.6	23.7	18.9	20.2
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	20.6	18.5	19.6	24	22.6	23.6
<b>Left collar</b>												
Photons, 20 keV	16.3	13.5	14	22	18.7	18	26	22.1	22.9	33.4	29.2	28.3
Photons, <30 keV	19	16	16.7	24.5	21.3	20.7	46.2	38.4	39.8	56.8	47.1	48.5
Photons, 30–250 keV	31.5	32	33	34.9	35	35.4	24.8	25.6	26.5	28	28.1	28.4
Photons, >250 keV	10.3	11.6	12	11.4	12.4	12.9	10.1	11.3	11.7	11	12.1	12.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	27.1	23.8	26.4	30.5	25.6	28.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	21.8	19.2	21	28	23.5	24.7
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	19.2	18.3	18.8	23.8	22.7	22.3
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	20.6	21.7	21.7	24	25	24.6

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-4. Colon (colon) POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	4.12	1.63	2.59	2.15	1.22	1.81	7.27	2.83	4.49	3.75	2.13	3.15
Photons, <30 keV	9.76	4.62	6.74	6.27	4.01	5.4	9.8	4.94	7.53	6.38	4.69	6.48
Photons, 30–250 keV	31.7	27.8	33.4	29.5	28.5	34.1	24.8	21.5	26.4	22.9	22.3	26.9
Photons, >250 keV	9.94	10	11	9.55	10.3	11.5	9.71	9.78	10.7	9.29	10	11.1
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	35.7	30.3	38	33.1	30.6	37.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	21.4	17.8	23.5	19.8	18.1	23.1
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	12.7	9.26	12.5	11.1	9.55	12.4
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	18.8	17.2	20.1	17.8	17.6	20.2
<b>Center waist</b>												
Photons, 20 keV	4.11	1.5	2.26	2.16	1.14	1.65	7.31	2.63	3.9	3.77	2	2.87
Photons, <30 keV	9.67	4.11	6.05	6.4	3.83	4.96	9.78	4.61	6.41	6.23	4.4	5.87
Photons, 30–250 keV	31.6	27.4	31.9	29.5	27.7	32.3	24.8	21.1	25	22.9	21.5	25.5
Photons, >250 keV	9.93	10.1	10.8	9.51	10.3	11.1	9.64	9.89	10.6	9.26	10.1	10.8
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	35.7	28.5	34.9	32.9	29.3	35.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	21.4	16.8	21.3	19.8	17.2	21.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	12.6	8.73	11.5	11	8.93	11.4
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	18.9	17.1	19.4	17.6	17.2	19.4
<b>Left chest pocket</b>												
Photons, 20 keV	4.13	1.3	1.99	2.14	0.99	1.48	7.28	2.27	3.46	3.77	1.73	2.58
Photons, <30 keV	9.9	3.7	5.51	6.24	3.15	4.52	9.77	4.04	5.84	6.23	3.76	5.31
Photons, 30–250 keV	31.7	24.5	29.5	29.5	25.1	30.6	24.7	18.8	23.1	22.9	19.4	23.9
Photons, >250 keV	9.96	9.11	10.3	9.55	9.41	10.6	9.63	8.96	9.98	9.29	9.15	10.3
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	35.7	25.7	31.9	33.1	26.2	32.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	21.3	14.9	19.4	19.7	15.2	19.7
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	12.6	7.71	10.3	11.1	7.83	10.5
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	18.9	15.3	18.2	17.7	15.7	18.6
<b>Left collar</b>												
Photons, 20 keV	4.15	1.81	2.52	2.15	1.25	1.67	7.3	3.15	4.38	3.74	2.19	2.93
Photons, <30 keV	9.67	5.04	6.61	6.16	4	5.26	9.77	5.62	7.3	6.18	4.67	4.87
Photons, 30–250 keV	31.5	29.3	33.5	29.5	28.8	32.7	24.7	22.9	26.5	22.9	22.2	26
Photons, >250 keV	9.9	10.3	11.2	9.52	10.2	11.1	9.66	10	10.9	9.26	9.96	10.7
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	35.7	32.6	37	33.1	31.2	35.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	21.4	19.8	23	19.7	18.7	21.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	12.6	10.1	12.5	11.1	9.69	11.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	18.9	17.9	20	17.7	17.5	19.4



**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-5. Colon (rectum) POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	5.12	2	3.2	1.32	0.74	1.12	9.2	3.5	5.6	2.32	1.3	1.94
Photons, <30 keV	11.7	5.32	7.92	3.68	2.28	3.14	12.2	5.86	9.12	3.88	2.72	3.86
Photons, 30–250 keV	46.4	40	49.3	23.5	22.5	28.4	35.2	30	37.6	17.2	16.6	20.9
Photons, >250 keV	14.1	14.3	15.7	6.88	7.5	8.46	13.8	13.9	15.3	6.68	7.28	8.16
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	48.8	40.4	52.6	24.8	22.4	29.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	27.3	22.4	30.3	13.2	11.9	15.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.7	11.3	15.5	7	5.96	7.92
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.9	21.7	25.7	11.6	11.6	13.6
<b>Center waist</b>												
Photons, 20 keV	5.12	1.86	2.8	1.32	0.7	1.02	9.24	3.26	4.86	2.34	1.22	1.78
Photons, <30 keV	11.6	4.72	7.08	3.76	2.18	2.86	12.2	5.44	7.7	3.78	2.54	3.48
Photons, 30–250 keV	46.4	39.3	46.7	23.5	21.6	26.4	35	29.4	35.4	17.2	15.9	19.6
Photons, >250 keV	14.1	14.4	15.5	6.84	7.48	8.2	13.7	14.1	15.1	6.64	7.3	7.92
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	48.9	37.7	47.5	24.6	21.2	26.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	27.4	21	27.2	13.3	11.2	14.6
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.6	10.6	14.2	6.94	5.54	7.22
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.9	21.5	24.8	11.6	11.3	13
<b>Left chest pocket</b>												
Photons, 20 keV	5.12	1.6	2.46	1.32	0.6	0.9	9.22	2.8	4.3	2.34	1.06	1.58
Photons, <30 keV	11.9	4.2	6.4	3.66	1.78	2.6	12.2	4.72	7	3.78	2.16	3.12
Photons, 30–250 keV	46.3	34.6	42.8	23.5	19.2	24.7	35	25.7	32.3	17.2	14	18.1
Photons, >250 keV	14.2	12.8	14.7	6.88	6.76	7.76	13.7	12.6	14.2	6.66	6.54	7.54
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	48.9	33.6	42.9	24.8	18.5	24.6
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	27.2	18.5	24.5	13.2	9.8	13.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.5	9.36	12.6	6.98	4.82	6.62
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	24	19.2	23.1	11.6	10.2	12.4
<b>Left collar</b>												
Photons, 20 keV	5.16	2.24	3.12	1.32	0.76	1.02	9.24	3.9	5.46	2.32	1.34	1.8
Photons, <30 keV	11.6	5.84	7.76	3.62	2.28	3.06	12.2	6.64	8.84	3.76	2.72	2.92
Photons, 30–250 keV	46.2	42.4	49.5	23.5	22.7	26.9	35	32	37.8	17.1	16.5	20
Photons, >250 keV	14.1	14.7	16.1	6.84	7.44	8.16	13.7	14.2	15.6	6.64	7.22	7.86
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	48.8	43.9	51	24.8	23	27.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	27.3	25.1	29.6	13.2	12.4	14.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.7	12.4	15.5	7	6.06	7.44
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	24	22.7	25.6	11.6	11.5	13

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-6. Endost-BS POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	3.13	5.05	5.38	1.13	2.1	1.92	5.36	8.68	9.16	1.98	3.69	3.37
Photons, <30 keV	10.6	11.4	17	4.55	5.48	6.84	10	16.3	17	4.08	6.83	6.66
Photons, 30–250 keV	43.4	49.4	54.2	24.2	30.3	34.1	35.1	40.8	45.4	18.3	23.4	26.8
Photons, >250 keV	15.7	18.5	19.5	7.62	9.56	10.2	15.3	18.1	19	7.41	9.36	9.95
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	37.3	40.7	48.1	19.7	23.7	28.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	23.5	26.1	32.5	11.6	14.3	17.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	17.2	20.3	24.8	7.92	10.6	12.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.3	30.5	33.3	13.2	16.7	18.2
<b>Center waist</b>												
Photons, 20 keV	3.12	4.68	4.7	1.14	1.98	1.75	5.34	8.05	8.07	1.99	3.46	3.05
Photons, <30 keV	10	10.6	15.2	4.26	5.68	6.32	10.8	15	13.6	4.21	6.31	6.08
Photons, 30–250 keV	43.3	48.6	52.7	24.4	29.4	32.3	35.2	40.1	43.8	18.3	22.7	25.4
Photons, >250 keV	15.7	18.6	19.2	7.61	9.58	9.92	15.3	18.3	18.8	7.43	9.31	9.72
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	37.2	38.5	44.8	19.8	22.5	26.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	23.5	24.8	29.6	11.5	13.6	16.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	17.2	19.4	22.7	7.93	9.97	11.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.5	30	32.3	13.2	16.3	17.6
<b>Left chest pocket</b>												
Photons, 20 keV	3.13	4.06	4.15	1.14	1.71	1.57	5.4	6.97	7.08	1.99	3	2.75
Photons, <30 keV	10.6	9.3	14.4	4.5	4.64	5.75	10.8	13.2	13.7	3.73	5.44	5.43
Photons, 30–250 keV	43.3	45	50	24.3	26.8	30.7	35.1	36.7	41.4	18.3	20.5	23.7
Photons, >250 keV	15.7	17	18.3	7.61	8.76	9.46	15.3	16.6	17.9	7.45	8.58	9.26
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	37.2	35.2	41.6	19.7	20.1	25
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	23.3	22.2	27.2	11.4	11.9	14.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	17.1	17.2	20.8	7.95	8.79	10.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.3	27.5	30.8	13.2	14.8	16.6
<b>Left collar</b>												
Photons, 20 keV	3.14	5.61	5.22	1.14	2.16	1.77	5.37	9.55	8.99	1.98	3.76	3.09
Photons, <30 keV	10.1	12.4	16.7	4.41	5.16	6.35	10.9	17.6	16.6	3.77	6.88	7.13
Photons, 30–250 keV	43.6	51.3	54.5	24.2	30.4	32.8	35	42.5	45.7	18.3	23.7	25.7
Photons, >250 keV	15.7	18.9	19.8	7.59	9.47	9.88	15.4	18.5	19.3	7.41	9.22	9.64
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	37.4	43.3	47.2	19.7	24.3	27
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	23.4	28.7	31.6	11.5	14.7	16.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	17.1	22.1	24.6	7.94	10.7	11.9
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.4	31.3	33.3	13.3	16.5	17.6

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-7. ET POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	2.31	2.68	3.22	2.01	2.24	2.59	4.13	4.76	5.75	3.72	4.12	4.82
Photons, <30 keV	3.06	3.94	4.55	2.89	3.06	3.58	4.57	6.84	7.11	5.34	8.41	7.28
Photons, 30–250 keV	18.7	22.9	28.4	10.8	13.3	15.9	13.9	17.5	22	7.89	9.86	12
Photons, >250 keV	7.14	8.99	10.1	3.59	4.62	5.19	6.98	8.78	9.86	3.51	4.5	4.99
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	17	19.5	24.6	8.28	9.45	12.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	9.36	11.2	14.4	4.98	5.93	7.43
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	6.98	8.51	11.3	4.07	4.89	6.07
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	10.8	13.6	15.9	5.7	7.19	8.2
<b>Center waist</b>												
Photons, 20 keV	2.33	2.47	2.79	2.01	2.08	2.31	4.14	4.39	4.99	3.7	3.85	4.3
Photons, <30 keV	3.04	3.63	3.95	2.84	2.83	3.19	4.6	6.39	6.15	5.38	7.89	6.47
Photons, 30–250 keV	18.6	22.4	27	10.8	12.9	14.9	14	17.1	20.9	7.9	9.52	11.2
Photons, >250 keV	7.17	9.15	9.97	3.59	4.61	5.01	6.97	8.87	9.64	3.51	4.49	4.87
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	17	18.1	22.2	8.3	8.93	11.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	9.4	10.4	12.8	4.99	5.58	6.81
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	6.97	8.02	10.3	4.07	4.61	5.58
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	10.9	13.4	15.3	5.73	7.1	7.81
<b>Left chest pocket</b>												
Photons, 20 keV	2.33	2.14	2.44	2	1.78	2.08	4.12	3.77	4.36	3.72	3.28	3.83
Photons, <30 keV	3.06	3.07	3.56	2.88	2.42	2.86	4.63	5.44	5.44	5.38	6.89	6.02
Photons, 30–250 keV	18.7	19.9	24.8	10.8	11.4	14	14	15	19.1	7.9	8.41	10.4
Photons, >250 keV	7.14	8.12	9.33	3.6	4.16	4.73	6.94	7.93	9.08	3.5	4.06	4.59
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.9	16	20	8.3	7.9	10.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	9.4	9.09	11.5	5.03	4.84	6.19
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	6.97	7.03	9.33	4.05	4.03	5.09
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	10.9	12.1	14.4	5.7	6.36	7.46
<b>Left collar</b>												
Photons, 20 keV	2.33	2.99	3.12	2.02	2.31	2.38	4.12	5.34	5.61	3.73	4.24	4.37
Photons, <30 keV	3.09	4.38	4.48	2.84	3.08	3.3	4.56	7.73	6.99	5.29	8.78	6.72
Photons, 30–250 keV	18.6	24.4	28.4	10.8	13.4	15.2	13.8	18.6	22.3	7.9	9.94	11.4
Photons, >250 keV	7.13	9.34	10.4	3.61	4.59	4.99	6.97	9	10.1	3.51	4.46	4.85
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.9	21.3	24	8.25	9.75	11.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	9.34	12.4	14.1	4.98	6.14	6.94
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	6.97	9.31	11.3	4.07	5	5.76
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	10.8	14.1	15.9	5.71	7.15	7.76

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-8. Eye lens POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	36.1	24.6	34.5	22.7	14.7	21.2	50.3	37.1	48.5	34.3	24	32.6
Photons, <30 keV	39.8	29.3	37.2	25.4	18.3	23.2	76.6	67.5	69	62.7	52	54.3
Photons, 30–250 keV	42	41.8	46.2	27.2	28.1	31.6	34.1	34	38.3	20.9	22	25
Photons, >250 keV	13.8	16.5	16.9	7.56	9.61	10	13.4	16	16.5	7.39	9.38	9.7
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	30.6	31.5	33.3	18.7	19.6	20.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	30.9	26.9	31.1	19	16.4	18.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.4	24.1	27.7	15.8	14.9	16.9
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.8	29.1	30.1	16.2	18.6	19.1
<b>Center waist</b>												
Photons, 20 keV	36.1	23.1	31.2	22.6	13.9	19.5	50.2	35.3	44.9	34.4	22.7	30.3
Photons, <30 keV	39.9	27.7	34	25.6	17.3	21.7	76.5	65.3	66.8	62.3	50.6	51.9
Photons, 30–250 keV	42	41.2	44.5	27.2	27.4	30	34.1	33.4	36.6	21.1	21.1	23.7
Photons, >250 keV	13.8	16.6	16.6	7.57	9.55	9.7	13.4	16.3	16.3	7.38	9.32	9.42
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	30.6	29.5	30.5	18.7	18.6	19.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	30.9	25.3	28.2	19	15.5	17.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.3	23.1	25.6	15.8	14	15.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.9	28.9	29.4	16.2	18.3	18.5
<b>Left chest pocket</b>												
Photons, 20 keV	36	20.3	28.3	22.6	12.1	17.7	50.2	31.7	41.8	34.3	20.1	28.1
Photons, <30 keV	40	24.8	31.2	25.6	15.1	19.9	76.3	62	63.6	62.6	47	49.3
Photons, 30–250 keV	42	37.5	41.9	27.1	24.7	28.4	34	30.2	34.2	21.1	19.1	22.1
Photons, >250 keV	13.7	14.9	15.8	7.64	8.75	9.19	13.4	14.6	15.4	7.39	8.55	8.97
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	30.4	26.6	27.8	18.8	16.6	17.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	31	22.4	25.8	19	13.6	16
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.4	20.6	23.4	15.9	12.5	14.4
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.8	26.4	27.7	16.3	16.6	17.5
<b>Left collar</b>												
Photons, 20 keV	36	26.9	33.7	22.6	15.2	19.8	50.2	39.9	47.7	34.3	24.4	30.7
Photons, <30 keV	40	31.8	36.8	25.4	18.6	21.9	76.2	69.6	69.4	62.3	53	51.8
Photons, 30–250 keV	42	43.8	46.3	27.2	28.3	30.5	34	35.7	38.4	21.2	22.2	24.1
Photons, >250 keV	13.8	16.9	17.2	7.64	9.49	9.64	13.4	16.4	16.7	7.42	9.3	9.37
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	30.5	33.8	32.6	18.7	20.1	19.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	30.9	29	30.6	19	16.8	17.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.4	26.1	27.4	15.9	15.2	15.9
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.9	30	30.1	16.3	18.5	18.4



**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-9. GB-wall POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.97	0.37	0.51	0.49	0.33	0.48	1.67	0.64	0.9	0.86	0.58	0.85
Photons, <30 keV	7.9	4.24	5.86	4.88	3.3	5.15	7.71	3.95	5.6	4.75	3.28	4.64
Photons, 30–250 keV	48.2	45.3	53	42.3	42.2	48.7	39.5	37	44.5	34	33.9	40.4
Photons, >250 keV	21.2	22.3	24.6	17.9	19.9	22.3	20.7	21.9	24.1	17.5	19.3	21.8
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	52.1	47.4	56	45.6	41.8	50.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	35.2	31	38.8	29.8	27.2	33.7
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	18.8	15.2	20.3	14.6	13.1	17
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	30.1	29.4	33.5	25.4	25.9	29.6
<b>Center waist</b>												
Photons, 20 keV	0.97	0.34	0.44	0.49	0.31	0.44	1.69	0.59	0.78	0.86	0.54	0.77
Photons, <30 keV	7.94	4	5.39	4.78	3.11	4.51	7.73	3.73	5.05	4.64	3.01	4.34
Photons, 30–250 keV	48.4	44.7	51.6	42.6	41.1	46.9	39.4	36.3	42.9	34	33	38.3
Photons, >250 keV	21.2	22.5	24.3	17.9	19.6	21.7	20.7	22.1	23.8	17.5	19.2	21.1
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	52	45.1	52.8	45.8	40.3	47.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	35.1	29.2	35.7	29.7	25.8	31.7
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	19	14.4	18.7	14.5	12.4	15.8
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	30.1	29	32.9	25.3	25.5	28.5
<b>Left chest pocket</b>												
Photons, 20 keV	0.96	0.29	0.39	0.49	0.27	0.4	1.67	0.51	0.69	0.86	0.47	0.69
Photons, <30 keV	7.76	3.48	4.8	4.91	2.73	3.98	7.74	3.3	4.49	4.71	2.62	3.99
Photons, 30–250 keV	48.2	40.9	48.6	42.5	37.7	44.6	39.4	32.8	40	34.1	29.7	36.1
Photons, >250 keV	21.2	20.4	23	17.9	18.1	20.7	20.6	20	22.6	17.5	17.7	20.3
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	51.8	41.5	49.6	45.7	36.7	45.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	35.1	26.4	33	29.7	23.2	29.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	18.9	12.8	16.9	14.6	11	14.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	30.3	26.6	31.2	25.4	23.4	27.5
<b>Left collar</b>												
Photons, 20 keV	0.96	0.41	0.5	0.49	0.34	0.45	1.68	0.72	0.87	0.86	0.59	0.79
Photons, <30 keV	7.84	4.52	5.78	4.82	3.4	4.55	7.72	4.44	5.62	4.71	3.11	4.45
Photons, 30–250 keV	48.1	47.5	53.4	42.3	42.4	47.3	39.3	38.8	44.8	34	34.3	39
Photons, >250 keV	21.1	22.9	25.1	17.8	19.6	21.6	20.7	22.3	24.6	17.5	19.1	21
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	52.1	49.9	55.2	45.8	42.4	47.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	35	33.5	38.2	29.7	27.7	32.1
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	18.9	16.5	20.4	14.6	13.3	16.1
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	30.2	30.2	33.7	25.4	25.8	28.4

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-10. Kidneys results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.19	0.82	✓ 1.48	0.01	0.25	✓ 0.45	0.34	1.44	✓ 2.58	0.02	0.43	✓ 0.78
Photons, <30 keV	4.74	6.37	✓ 10.3	0.88	2.6	✓ 4.11	4.17	6.22	✓ 10	0.79	2.45	✓ 3.8
Photons, 30–250 keV	37.1	42.5	✓ 50.2	16	24.4	✓ 30.5	29.5	34.5	✓ 42	12.1	18.7	✓ 23.8
Photons, >250 keV	15.4	17.7	✓ 19.8	6.37	8.67	✓ 9.78	15.1	17.3	✓ 19.4	6.22	8.46	✓ 9.58
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	42.7	47.1	✓ 56.1	20.1	28.3	✓ 35.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	27	30.3	✓ 38.7	11.3	16.6	✓ 21.4
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	12	15.1	✓ 20.8	3.71	7.17	✓ 9.98
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.3	28.3	✓ 33.5	10.3	15	✓ 17.8
<b>Center waist</b>												
Photons, 20 keV	0.2	0.76	✓ 1.29	0.01	0.23	✓ 0.41	0.34	1.33	✓ 2.25	0.02	0.4	✓ 0.71
Photons, <30 keV	4.6	6.01	✓ 9.38	0.91	2.47	✓ 3.67	4.31	5.8	✓ 8.8	0.78	2.32	✓ 3.48
Photons, 30–250 keV	37.2	41.8	✓ 48.7	16.1	23.6	✓ 28.9	29.6	34	✓ 40.5	12	18.1	✓ 22.4
Photons, >250 keV	15.3	17.8	✓ 19.7	6.33	8.59	✓ 9.54	15	17.5	✓ 19.2	6.26	8.42	✓ 9.32
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	42.7	44.9	✓ 52.8	20.2	27	✓ 33.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26.9	28.7	✓ 35.6	11.3	15.7	✓ 19.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	12.1	14.3	✓ 19.4	3.71	6.76	✓ 9.21
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.4	28	✓ 32.5	10.3	14.6	✓ 17.1
<b>Left chest pocket</b>												
Photons, 20 keV	0.2	0.66	✓ 1.14	0.01	0.2	✓ 0.37	0.34	1.15	✓ 1.99	0.02	0.35	✓ 0.64
Photons, <30 keV	4.77	5.19	✓ 8.06	0.92	2.12	✓ 3.42	4.23	5.07	✓ 7.88	0.8	2.01	✓ 3.17
Photons, 30–250 keV	37.2	38.4	✓ 45.9	16.2	21.2	✓ 27.2	29.6	30.6	✓ 37.9	12	16.2	✓ 21
Photons, >250 keV	15.3	16.3	✓ 18.5	6.35	7.92	✓ 9.13	15	15.9	✓ 18.2	6.21	7.71	✓ 8.88
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	42.7	41.5	✓ 49.6	20.1	24.2	✓ 31
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26.9	25.9	✓ 32.8	11.2	13.8	✓ 18.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	12	12.7	✓ 17.6	3.74	5.87	✓ 8.38
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.3	25.7	✓ 30.8	10.3	13.3	✓ 16.3
<b>Left collar</b>												
Photons, 20 keV	0.19	0.92	✓ 1.44	0.01	0.25	✓ 0.41	0.34	1.6	✓ 2.51	0.02	0.44	✓ 0.72
Photons, <30 keV	4.69	7.11	✓ 9.88	0.92	2.68	✓ 3.76	4.23	6.89	✓ 9.64	0.8	2.49	✓ 3.67
Photons, 30–250 keV	37.4	44	✓ 50.5	16	24.5	✓ 29.1	29.6	36.3	✓ 42.2	12	18.9	✓ 22.9
Photons, >250 keV	15.3	18.1	✓ 20.2	6.37	8.6	✓ 9.45	15	17.7	✓ 19.8	6.21	8.36	✓ 9.25
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	42.6	49.8	✓ 55.2	20.2	29	✓ 33.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26.9	32.8	✓ 38	11.3	16.9	✓ 20.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	12.1	16.5	✓ 21	3.72	7.29	✓ 9.36
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.3	29.3	✓ 33.3	10.3	14.8	✓ 16.9

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-11. Liver POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	4.72	2.72	4.35	3.31	1.96	3.08	8.04	4.73	7.47	5.63	3.41	5.28
Photons, <30 keV	12.3	8.5	12.4	10.2	10.2	10	13.8	10.3	14.1	12.1	10	11.8
Photons, 30–250 keV	50.7	49.7	56.4	56.9	58	63.6	42	41.3	48.1	48.3	49.7	55.5
Photons, >250 keV	21.2	22.5	24.7	26.9	29.8	32.1	20.8	22.2	24.1	26.4	29.2	31.5
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	53.8	50.5	58.9	61.3	59.9	66.6
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	36.4	33.5	41.5	44.2	43.1	50.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	22.7	19.7	25.8	25.6	24.7	30.4
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	33.2	33	37.2	39.1	41.3	44.8
<b>Center waist</b>												
Photons, 20 keV	4.72	2.54	3.84	3.29	1.84	2.8	8.07	4.36	6.58	5.61	3.19	4.79
Photons, <30 keV	12.3	7.5	11.2	10.2	9.47	9.04	14	9.8	12.5	11.9	9.42	11
Photons, 30–250 keV	50.6	49	54.6	56.8	57.2	61.9	42	40.6	46.4	48.3	48.7	53.6
Photons, >250 keV	21.3	22.9	24.4	26.9	29.9	31.5	20.8	22.4	23.8	26.3	29.3	30.9
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	53.9	48.4	55.8	61.5	58.2	64.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	36.5	31.8	38.5	44.4	41.5	47.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	22.8	18.7	23.8	25.7	23.4	28.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	32.9	32.7	36.3	39.2	40.8	43.6
<b>Left chest pocket</b>												
Photons, 20 keV	4.72	2.19	3.38	3.28	1.6	2.5	8.06	3.77	5.78	5.64	2.76	4.34
Photons, <30 keV	12.1	6.45	9.42	10	8.37	8.27	14.1	8.59	11.3	11.6	8.21	9.82
Photons, 30–250 keV	50.9	45.4	52.1	57	54	59.7	42.1	36.8	43.4	48.3	45.2	51.4
Photons, >250 keV	21.3	20.8	23.2	26.9	27.7	30.3	20.8	20.4	22.6	26.4	27.2	29.5
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	53.7	44.9	52.6	61.4	54.6	62.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	36.5	28.8	35.6	44.3	37.9	45.4
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	22.7	16.6	21.8	25.6	21	26.5
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	33	30	34.4	39.1	37.9	42.4
<b>Left collar</b>												
Photons, 20 keV	4.72	3.06	4.26	3.27	2.01	2.84	8.03	5.22	7.3	5.62	3.48	4.84
Photons, <30 keV	11.9	10	11.6	9.93	10.2	9.39	13.7	11.6	13.9	12.4	10.4	11.4
Photons, 30–250 keV	50.9	51.7	56.6	56.8	58.3	62.4	42	43.1	48.3	48.3	49.9	54
Photons, >250 keV	21.3	23.3	25.1	26.9	29.6	31.3	20.8	22.7	24.6	26.3	29.1	30.7
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	53.9	53.3	58.2	61.4	60.6	64.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	36.5	36.2	40.8	44.5	43.6	48.4
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	22.6	21.3	25.7	25.8	25	29
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	33	34	37.1	39.2	41.1	43.6

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-12. Lungs POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	5.86	4.87	7.48	2.86	1.27	1.7	9.93	8.29	12.5	4.93	2.21	2.96
Photons, <30 keV	16.7	14.7	20.6	7.75	4.31	5.48	21	17.9	25.4	10.1	5.25	6.8
Photons, 30–250 keV	62.6	65.6	70.3	38.7	40.3	44.9	54.1	57.6	62.5	30.8	32.6	36.8
Photons, >250 keV	32.2	35.8	37.9	15.2	17.3	18.5	31.6	35.3	37.3	14.8	16.9	18
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	63.2	64.7	71.2	39.4	40.7	46.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	45.7	47.4	54.8	24.8	25.9	30.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	31.4	33.4	39.7	15.2	14.9	17.9
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	46.2	50.1	53.1	24.5	26.7	28.8
<b>Center waist</b>												
Photons, 20 keV	5.88	4.52	6.6	2.86	1.18	1.55	9.92	7.69	11	4.93	2.06	2.67
Photons, <30 keV	17.5	13.7	18.7	7.62	4.04	5.02	21.4	17.3	24.7	9.85	5.03	6.22
Photons, 30–250 keV	62.1	64.9	68.9	38.7	39.4	43.1	54.1	56.9	61.2	30.9	31.9	35.1
Photons, >250 keV	32.1	36.5	37.5	15.2	17.3	18	31.7	35.6	36.9	14.9	17	17.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	63.3	62.6	68.3	39.3	38.9	44.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	45.8	45.1	51.6	24.7	24.7	28.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	31.4	31.7	37.2	15.2	14.1	16.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	46.5	49.9	52.1	24.5	26.3	27.7
<b>Left chest pocket</b>												
Photons, 20 keV	5.88	3.94	5.85	2.86	1.03	1.39	9.92	6.68	9.82	4.93	1.8	2.43
Photons, <30 keV	16.6	12	17.8	7.62	3.87	4.58	21.1	15.5	20.5	10.3	4.28	5.58
Photons, 30–250 keV	62.5	61.5	66.5	38.7	36.1	41	54	53	58.5	31	28.9	33.1
Photons, >250 keV	32.1	33.7	36	15.2	16	17.3	31.6	33	35.4	14.9	15.6	16.8
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	63.2	59.3	65.4	39.4	35.6	42.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	45.8	41.6	48.2	24.6	21.7	26.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	31.2	28.9	34.6	15.1	12.4	15.3
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	46.2	46.6	50.2	24.5	24	26.5
<b>Left collar</b>												
Photons, 20 keV	5.88	5.43	7.28	2.85	1.3	1.57	9.93	9.18	12.2	4.92	2.26	2.73
Photons, <30 keV	16.8	17.5	20.4	7.39	4.43	5.2	21.4	19.8	24.7	10.3	5.42	6.42
Photons, 30–250 keV	62.4	67.3	70.4	38.6	40.8	43.4	54	59.4	62.7	30.9	32.9	35.6
Photons, >250 keV	32.2	36.8	38.6	15.2	17.1	17.9	31.6	36.1	37.8	14.8	16.7	17.5
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	63.3	67.2	70.5	39.4	41.4	44.7
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	45.6	50.2	53.9	24.9	26.4	29.1
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	31.4	35.7	39.7	15.2	15	17
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	46.3	51.4	52.9	24.3	26.5	27.7



**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-13. Lymph POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	2.46	1.69	2.5	2.92	2.09	2.79	4.51	3	4.57	5.32	3.75	5.03
Photons, <30 keV	3.77	2.55	3.68	4.47	3.24	4.4	5.12	3.62	5.27	7.78	5.31	7.23
Photons, 30–250 keV	17.4	17	20.7	17.7	17.5	21.5	13	12.6	15.5	13.2	13.1	16.3
Photons, >250 keV	5.69	6.2	6.81	5.73	6.45	7.2	5.47	6.02	6.62	5.58	6.27	6.99
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	15.9	14.4	19	16.4	15.3	19.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	8.91	8.03	10.8	9.65	8.92	11.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.76	4.9	6.48	5.93	5.29	6.79
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	8.81	8.83	10.3	8.92	9.41	10.7
<b>Center waist</b>												
Photons, 20 keV	2.47	1.57	2.17	2.91	1.94	2.5	4.52	2.79	3.94	5.3	3.49	4.55
Photons, <30 keV	3.68	2.29	3.22	4.47	3.01	3.89	5.2	3.37	4.56	7.73	4.98	6.5
Photons, 30–250 keV	17.4	16.5	19.8	17.8	16.9	20.3	13	12.4	14.8	13.2	12.6	15.2
Photons, >250 keV	5.64	6.2	6.7	5.74	6.49	7.02	5.48	6.07	6.5	5.61	6.31	6.8
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	15.9	13.4	17.1	16.4	14.4	18
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	8.98	7.47	9.6	9.63	8.42	10.6
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.76	4.67	5.93	5.95	4.99	6.21
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	8.85	8.77	9.91	8.97	9.13	10.3
<b>Left chest pocket</b>												
Photons, 20 keV	2.48	1.35	1.91	2.91	1.68	2.24	4.52	2.38	3.42	5.32	2.98	4.08
Photons, <30 keV	3.71	2.04	2.79	4.46	2.59	3.55	5.09	2.88	4.04	7.73	4.26	5.82
Photons, 30–250 keV	17.6	14.6	18	17.7	15	18.9	13	10.7	13.4	13.2	11.1	14.1
Photons, >250 keV	5.63	5.55	6.25	5.74	5.84	6.63	5.49	5.41	6.06	5.59	5.67	6.43
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	15.9	11.8	15.3	16.4	12.8	16.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	8.95	6.48	8.54	9.67	7.34	9.62
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.8	4.08	5.29	5.98	4.34	5.71
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	8.87	7.78	9.15	8.95	8.21	9.74
<b>Left collar</b>												
Photons, 20 keV	2.47	1.9	2.44	2.91	2.14	2.54	4.52	3.4	4.43	5.3	3.85	4.62
Photons, <30 keV	3.68	2.76	3.57	4.47	3.33	3.94	5.06	4.09	5.01	7.76	5.44	6.64
Photons, 30–250 keV	17.5	18.1	21	17.8	17.7	20.5	13	13.4	15.9	13.2	13.1	15.5
Photons, >250 keV	5.65	6.35	6.94	5.73	6.42	6.95	5.47	6.2	6.75	5.57	6.25	6.75
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	15.9	15.9	18.5	16.4	15.6	18
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	8.93	8.81	10.6	9.7	9.21	10.7
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.78	5.4	6.46	5.97	5.38	6.36
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	8.86	9.21	10.2	9	9.25	10.2

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-14. Muscle POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	6.23	7.32	10.1	3.59	4.43	5.73	10.8	12.6	17.1	6.41	7.87	10.1
Photons, <30 keV	10.2	12.3	15.8	5.14	6.56	8.42	13.3	14.7	19.6	7.55	9.71	12
Photons, 30–250 keV	37.4	42.3	47.4	20.9	25.8	29.6	29.9	34.4	39.4	15.9	19.9	23.1
Photons, >250 keV	14.5	16.8	18	7.23	8.84	9.59	14.2	16.4	17.6	7.04	8.62	9.29
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	38.1	40.5	48.4	20.7	23.5	28.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	23.7	25.7	32.4	12.3	14.1	17.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	16.5	18.8	23.4	8.14	10.2	12.4
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.3	28.5	31.5	12.9	15.7	17.3
<b>Center waist</b>												
Photons, 20 keV	6.26	6.8	8.88	3.58	4.14	5.17	10.8	11.7	15.2	6.39	7.3	9.21
Photons, <30 keV	10.2	11.4	13.9	5.14	6.12	7.52	12.5	14.8	18.6	7.61	8.77	10.8
Photons, 30–250 keV	37.5	41.7	45.9	20.9	24.9	28.1	29.8	33.8	37.9	15.9	19.3	21.9
Photons, >250 keV	14.5	16.9	17.7	7.22	8.87	9.25	14.2	16.6	17.3	7.02	8.62	9.08
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	38	38.5	45.1	20.7	22.3	27.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	23.8	24.2	29.7	12.2	13.3	16.6
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	16.4	17.8	21.6	8.15	9.62	11.5
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.3	28.3	30.7	12.9	15.4	16.7
<b>Left chest pocket</b>												
Photons, 20 keV	6.26	5.89	7.81	3.61	3.54	4.66	10.8	10.1	13.5	6.36	6.33	8.24
Photons, <30 keV	9.39	9.76	12.7	5.17	5.3	6.83	12.5	12.1	16.5	7.52	7.63	9.78
Photons, 30–250 keV	37.6	38.1	43.2	20.9	22.4	26.4	29.8	30.5	35.4	15.8	17.2	20.5
Photons, >250 keV	14.5	15.4	16.8	7.27	8.09	8.83	14.1	15.1	16.4	7.05	7.89	8.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	38.1	35.1	41.6	20.7	20	25.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	23.8	21.7	27	12.3	11.7	15.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	16.4	15.8	19.7	8.16	8.42	10.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.3	25.7	28.8	12.9	13.9	15.9
<b>Left collar</b>												
Photons, 20 keV	6.26	8.16	9.85	3.6	4.5	5.28	10.8	13.9	16.8	6.39	8.01	9.4
Photons, <30 keV	10.1	13.2	15.7	5.26	6.61	7.64	12.4	17.2	19.2	7.55	9.89	10.9
Photons, 30–250 keV	37.3	44.2	47.8	21	25.9	28.3	29.8	36.3	39.6	15.8	20	22.1
Photons, >250 keV	14.4	17.2	18.2	7.22	8.8	9.2	14.1	16.8	17.8	7.03	8.56	9
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	38.1	43.2	47.2	20.6	24	27.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	23.8	28	31.8	12.3	14.4	16.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	16.5	20.4	23.3	8.15	10.3	11.8
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.4	29.5	31.3	12.9	15.7	16.6

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-15. Oesophogus POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	1.38	0.4	0.72	1.5	0.56	0.93	2.4	0.69	1.26	2.58	0.98	1.63
Photons, <30 keV	8.55	4.47	6.9	3.59	1.6	2.71	8.41	4.16	6.6	3.91	2.25	3.21
Photons, 30–250 keV	42.6	38.3	46.4	27.2	27.5	33.1	34.3	30.6	38.1	20.9	21.4	26.3
Photons, >250 keV	16.1	16.2	18.4	10	11.2	12.6	15.6	15.8	18	9.82	10.9	12.3
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.4	42.2	49.6	30.1	30.9	36.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26	25.9	32.7	17.6	18.3	22.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.6	13.9	18.4	9.36	8.64	11.3
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.5	26	29.3	16.4	17.5	20.1
<b>Center waist</b>												
Photons, 20 keV	1.38	0.37	0.63	1.5	0.52	0.84	2.41	0.64	1.1	2.6	0.91	1.48
Photons, <30 keV	8.67	4.19	6.21	3.74	1.52	2.35	8.51	3.91	5.79	3.89	1.78	2.9
Photons, 30–250 keV	42.7	37.6	44.7	27.3	26.7	31.7	34.4	30	36.5	21	20.6	25
Photons, >250 keV	16.1	16.3	18.3	10.1	11.2	12.2	15.7	16	17.8	9.77	10.9	12
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.5	40	46.2	29.9	29.5	34.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26.1	24.3	29.9	17.7	17.4	21
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.7	13.3	16.9	9.35	8.09	10.4
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.4	25.7	28.7	16.5	17.2	19.3
<b>Left chest pocket</b>												
Photons, 20 keV	1.38	0.32	0.55	1.48	0.45	0.76	2.41	0.55	0.98	2.6	0.79	1.33
Photons, <30 keV	8.53	3.58	5.41	3.61	1.58	2.2	8.52	3.37	5.21	3.88	1.52	2.53
Photons, 30–250 keV	42.6	34.2	41.9	27.2	24.1	29.9	34.2	26.9	34	20.9	18.3	23.2
Photons, >250 keV	16.1	14.8	17.3	10	10.2	11.6	15.6	14.5	16.8	9.76	9.92	11.4
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.5	36.6	43.1	30.1	26.5	32.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26.1	21.5	27.3	17.7	15.5	19.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.6	11.8	15.3	9.37	7.13	9.56
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.5	23.5	27	16.4	15.6	18.3
<b>Left collar</b>												
Photons, 20 keV	1.38	0.44	0.7	1.49	0.57	0.86	2.4	0.77	1.23	2.6	1	1.5
Photons, <30 keV	8.56	4.88	6.86	3.62	1.68	2.37	8.53	4.67	6.61	3.92	1.92	2.95
Photons, 30–250 keV	42.6	40.1	46.6	27.3	27.8	32	34.5	32.2	38.4	20.8	21.4	25.2
Photons, >250 keV	16.1	16.6	18.9	10.1	11.1	12.2	15.6	16.2	18.4	9.8	10.9	11.9
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.6	44.8	48.7	30	31.4	34.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	26.1	28	32.1	17.7	18.9	21.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.5	15.3	18.4	9.33	8.77	10.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	25.4	26.9	29.3	16.5	17.4	19.3

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-16. O-mucosa POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	2.41	1.9	2.51	0.62	0.47	0.61	4.24	3.3	4.4	1.08	0.83	1.07
Photons, <30 keV	3.31	2.88	4.18	0.86	0.81	1.01	5.01	4.41	5.82	1.25	1.08	1.39
Photons, 30–250 keV	22.2	25.2	31.1	10.6	13.6	15.8	16.9	19.4	24.3	7.76	10.2	11.9
Photons, >250 keV	8.07	9.54	10.6	3.67	4.71	5.08	7.88	9.3	10.3	3.58	4.58	4.94
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	20.4	22.7	29.3	12	13.4	17.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	11.8	13.3	17.5	6.45	7.4	9.51
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	9.33	10.4	13.7	4.42	4.97	6.18
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.1	16	19	6.67	8.23	9.46
<b>Center waist</b>												
Photons, 20 keV	2.4	1.76	2.18	0.62	0.44	0.55	4.24	3.06	3.85	1.09	0.77	0.97
Photons, <30 keV	3.31	2.65	3.66	0.87	0.75	0.9	5.06	4.09	5.09	1.23	1.01	1.25
Photons, 30–250 keV	22.2	24.7	29.7	10.6	13.1	14.9	17	19.1	23.4	7.79	9.83	11.2
Photons, >250 keV	8.04	9.65	10.4	3.68	4.71	4.9	7.84	9.4	10.2	3.61	4.57	4.81
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	20.4	21.2	26.7	11.9	12.7	15.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	12	12.3	15.6	6.56	7	8.76
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	9.35	9.8	12.6	4.42	4.68	5.61
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.1	15.8	18.5	6.67	8.1	9.04
<b>Left chest pocket</b>												
Photons, 20 keV	2.39	1.51	1.92	0.62	0.38	0.5	4.23	2.64	3.37	1.08	0.67	0.87
Photons, <30 keV	3.31	2.85	3.2	0.86	0.66	0.81	5.03	3.63	4.49	1.24	0.88	1.12
Photons, 30–250 keV	22.1	22	27.4	10.6	11.7	13.8	16.8	16.8	21.4	7.84	8.66	10.4
Photons, >250 keV	8.05	8.62	9.94	3.69	4.27	4.68	7.87	8.42	9.61	3.6	4.15	4.56
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	20.4	19	24.3	12	11.2	14.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	11.7	10.8	14.1	6.43	6.04	7.95
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	9.39	8.64	11.4	4.41	4.07	5.16
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13	14.2	17.1	6.72	7.26	8.49
<b>Left collar</b>												
Photons, 20 keV	2.4	2.11	2.43	0.62	0.48	0.56	4.24	3.7	4.32	1.08	0.85	0.99
Photons, <30 keV	3.27	3.22	4.1	0.86	0.83	0.92	5.05	4.92	5.7	1.24	1.12	1.26
Photons, 30–250 keV	22.3	26.6	31.3	10.5	13.8	15.1	16.9	20.6	24.6	7.8	10.3	11.3
Photons, >250 keV	8.08	9.84	10.9	3.68	4.71	4.9	7.85	9.55	10.6	3.58	4.55	4.77
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	20.4	24.7	28.6	12.1	13.7	15.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	12	14.6	16.8	6.58	7.63	8.88
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	9.35	11.4	13.8	4.42	5.04	5.82
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13	16.7	19	6.72	8.2	9



**ATTACHMENT A**  
**POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-17. Ovaries POC results (% POC).

Location, radiation type, and energy	Female					
	Exposure			Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>						
Photons, 20 keV	0.07	0.08	0.16	0.13	0.13	0.28
Photons, <30 keV	2.09	1.68	2.7	1.98	1.51	2.7
Photons, 30–250 keV	24.1	23.5	28.4	18.4	17.8	22.2
Photons, >250 keV	8.61	9.2	9.95	8.39	8.98	9.73
Neutrons, <10 keV	N/A	N/A	N/A	26.1	25.7	33
Neutrons, 10–100 keV	N/A	N/A	N/A	15.1	15.3	20.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	6.75	6.03	8.01
Neutrons, 2–20 MeV	N/A	N/A	N/A	14.2	14	16
<b>Center waist</b>						
Photons, 20 keV	0.07	0.07	0.14	0.13	0.12	0.25
Photons, <30 keV	2.13	1.54	2.37	1.91	1.38	2.41
Photons, 30–250 keV	24.2	23	27.3	18.5	17.5	20.9
Photons, >250 keV	8.65	9.27	9.91	8.39	9.06	9.61
Neutrons, <10 keV	N/A	N/A	N/A	26.2	23.9	30.2
Neutrons, 10–100 keV	N/A	N/A	N/A	15	14.3	17.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	6.79	5.71	7.31
Neutrons, 2–20 MeV	N/A	N/A	N/A	14.2	13.9	15.5
<b>Left chest pocket</b>						
Photons, 20 keV	0.07	0.06	0.12	0.13	0.1	0.22
Photons, <30 keV	2.12	1.33	2.11	1.95	1.22	2.15
Photons, 30–250 keV	24.1	20.4	25.1	18.4	15.4	19.2
Photons, >250 keV	8.58	8.36	9.28	8.43	8.14	9.07
Neutrons, <10 keV	N/A	N/A	N/A	26.3	21.5	27.5
Neutrons, 10–100 keV	N/A	N/A	N/A	15.1	12.5	16.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	6.78	4.94	6.48
Neutrons, 2–20 MeV	N/A	N/A	N/A	14.1	12.4	14.7
<b>Left collar</b>						
Photons, 20 keV	0.07	0.08	0.16	0.13	0.15	0.27
Photons, <30 keV	2.18	1.84	2.65	2	1.65	2.66
Photons, 30–250 keV	24.2	24.9	28.8	18.3	19.1	22.3
Photons, >250 keV	8.59	9.44	10.2	8.38	9.19	9.94
Neutrons, <10 keV	N/A	N/A	N/A	26.2	27.7	32.1
Neutrons, 10–100 keV	N/A	N/A	N/A	15.1	16.9	19.6
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	6.77	6.64	7.98
Neutrons, 2–20 MeV	N/A	N/A	N/A	14.1	14.5	16.1

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-18. Pancreas POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.61	0.17	0.32	0.07	0.01	0.02	1.06	0.3	0.56	0.12	0.02	0.04
Photons, <30 keV	4	1.92	3.18	1.07	0.52	0.76	3.9	1.86	2.99	1	0.52	0.76
Photons, 30–250 keV	24.4	21.4	27.4	12.3	11.4	14.7	18.6	16.1	21.2	8.97	8.37	11
Photons, >250 keV	7.74	7.85	9.05	3.79	4.06	4.75	7.55	7.64	8.8	3.72	3.97	4.63
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	28.1	23.3	30.3	14	12.5	16
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.2	13.2	17.5	7.67	6.78	8.91
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	7.86	5.7	8.09	2.97	2.4	3.31
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.4	12.3	15	6.27	6.22	7.43
<b>Center waist</b>												
Photons, 20 keV	0.61	0.16	0.28	0.07	0.01	0.02	1.06	0.28	0.49	0.12	0.02	0.04
Photons, <30 keV	3.94	1.83	2.78	1.06	0.49	0.69	3.93	1.75	2.66	1	0.49	0.69
Photons, 30–250 keV	24.5	21.1	26.2	12.3	11	13.8	18.7	15.8	20.2	8.98	8.08	10.2
Photons, >250 keV	7.71	7.89	8.95	3.79	4.06	4.62	7.51	7.71	8.65	3.72	3.94	4.48
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	28	21.6	27.5	14	11.7	14.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.2	12.2	15.8	7.65	6.4	8.17
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	7.82	5.31	7.43	2.98	2.26	3.04
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.4	12.1	14.5	6.28	6.09	7.13
<b>Left chest pocket</b>												
Photons, 20 keV	0.61	0.14	0.24	0.07	0.01	0.02	1.07	0.24	0.43	0.12	0.02	0.03
Photons, <30 keV	3.88	1.56	2.43	1.05	0.43	0.63	3.88	1.52	2.36	0.98	0.42	0.63
Photons, 30–250 keV	24.5	18.4	24	12.3	9.73	12.8	18.6	13.8	18.4	8.99	7.07	9.46
Photons, >250 keV	7.75	7.07	8.38	3.82	3.7	4.38	7.53	6.92	8.2	3.69	3.58	4.28
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	28.1	19.2	25	14.1	10.4	13.7
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.2	10.7	14.2	7.66	5.57	7.49
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	7.81	4.64	6.64	2.96	1.97	2.76
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.3	10.9	13.5	6.28	5.45	6.76
<b>Left collar</b>												
Photons, 20 keV	0.61	0.19	0.31	0.07	0.01	0.02	1.06	0.34	0.55	0.12	0.02	0.04
Photons, <30 keV	3.94	2.2	3.1	1.07	0.53	0.7	3.93	2.07	2.96	1.02	0.54	0.71
Photons, 30–250 keV	24.4	22.8	27.6	12.3	11.4	14.1	18.7	17.1	21.3	9.01	8.46	10.4
Photons, >250 keV	7.73	8.04	9.26	3.81	4.04	4.59	7.52	7.85	9.01	3.69	3.9	4.44
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	28.1	25.1	29.4	14.1	12.8	15
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.2	14.5	17.2	7.68	6.96	8.35
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	7.85	6.21	8.13	2.96	2.46	3.14
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.4	12.7	14.8	6.29	6.16	7.09

**ATTACHMENT A**  
**POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-19. Prostrate POC results (% POC).

Location, radiation type, and energy	Male					
	Exposure			Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>						
Photons, 20 keV	0.02	0.04	0.05	0.04	0.06	0.1
Photons, <30 keV	0.94	0.61	1.17	0.84	0.57	1.17
Photons, 30–250 keV	16.6	15.5	19.4	12.3	11.6	14.8
Photons, >250 keV	5.64	5.93	6.87	5.51	5.75	6.69
Neutrons, <10 keV	N/A	N/A	N/A	19	16.3	21.5
Neutrons, 10–100 keV	N/A	N/A	N/A	10.7	9.29	12.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	4.7	3.62	4.86
Neutrons, 2–20 MeV	N/A	N/A	N/A	8.88	8.68	10.1
<b>Center waist</b>						
Photons, 20 keV	0.02	0.03	0.05	0.04	0.06	0.09
Photons, <30 keV	0.94	0.56	1.05	0.84	0.55	1.06
Photons, 30–250 keV	16.6	15	18.5	12.4	11.1	13.8
Photons, >250 keV	5.63	5.94	6.71	5.48	5.79	6.53
Neutrons, <10 keV	N/A	N/A	N/A	19.1	15.5	19.9
Neutrons, 10–100 keV	N/A	N/A	N/A	10.7	8.69	11.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	4.69	3.41	4.49
Neutrons, 2–20 MeV	N/A	N/A	N/A	8.88	8.54	9.65
<b>Left chest pocket</b>						
Photons, 20 keV	0.02	0.03	0.04	0.04	0.05	0.08
Photons, <30 keV	0.89	0.49	0.96	0.84	0.47	0.97
Photons, 30–250 keV	16.6	13.3	17.2	12.4	9.79	12.7
Photons, >250 keV	5.63	5.39	6.32	5.51	5.22	6.19
Neutrons, <10 keV	N/A	N/A	N/A	19.1	13.7	18.3
Neutrons, 10–100 keV	N/A	N/A	N/A	10.7	7.63	10.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	4.7	2.95	4.11
Neutrons, 2–20 MeV	N/A	N/A	N/A	8.89	7.66	9.2
<b>Left collar</b>						
Photons, 20 keV	0.02	0.04	0.05	0.04	0.07	0.09
Photons, <30 keV	1.18	0.63	1.09	0.85	0.59	1.11
Photons, 30–250 keV	16.7	15.7	18.6	12.4	11.7	14
Photons, >250 keV	5.66	5.85	6.68	5.51	5.71	6.46
Neutrons, <10 keV	N/A	N/A	N/A	19	16.9	20
Neutrons, 10–100 keV	N/A	N/A	N/A	10.8	9.54	11.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	4.68	3.69	4.61
Neutrons, 2–20 MeV	N/A	N/A	N/A	8.86	8.63	9.58

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-20. Remainder POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	3.42	2.43	3.34	1.73	1.31	1.71	5.88	4.2	5.75	3.01	2.29	3.02
Photons, <30 keV	6.65	4.71	7.11	2.87	2.8	4.11	8.3	6.48	8.58	4.2	3.64	4.5
Photons, 30–250 keV	36.4	38	43.2	20.6	22.6	26.8	28.9	30.2	35.2	15.5	17.2	20.9
Photons, >250 keV	13.6	15.3	16.5	6.89	8	8.92	13.3	14.9	16.1	6.69	7.84	8.7
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	40.2	38.9	47.5	23.3	23.5	29.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	25	24.3	30.7	13.6	13.8	17.4
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.1	14.1	18.5	7.34	7.42	9.48
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.7	24.7	28.3	12.3	13.7	15.8
<b>Center waist</b>												
Photons, 20 keV	3.42	2.25	2.96	1.72	1.23	1.56	5.86	3.9	5.1	3.01	2.15	2.72
Photons, <30 keV	6.57	4.79	6.65	2.88	2.69	2.76	8.29	5.85	7.71	4.29	3.41	4.11
Photons, 30–250 keV	36.3	37.1	41.7	20.4	21.8	25.4	28.9	29.6	33.6	15.5	16.5	19.7
Photons, >250 keV	13.6	15.4	16.3	6.86	8.07	8.7	13.3	15.1	15.9	6.68	7.8	8.43
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	40.2	37	43.9	23.4	22.5	27.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.9	22.7	28.2	13.7	13	16.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.1	13.4	17	7.35	6.92	8.73
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.8	24.5	27.6	12.3	13.6	15.2
<b>Left chest pocket</b>												
Photons, 20 keV	3.41	1.94	2.59	1.72	1.07	1.41	5.9	3.37	4.5	3.03	1.86	2.45
Photons, <30 keV	7.1	3.99	5.88	2.88	2.23	3.33	8.31	5.05	6.74	4.23	2.97	3.68
Photons, 30–250 keV	36.4	33.9	39	20.6	19.5	23.8	28.9	26.7	31.3	15.5	14.8	18.2
Photons, >250 keV	13.6	14	15.3	6.84	7.37	8.25	13.3	13.7	15	6.7	7.16	8.03
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	40.1	33.8	40.9	23.4	20	25.6
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	25.1	20.1	25.7	13.6	11.5	15
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.2	11.8	15.4	7.33	6.09	8.03
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.7	22.3	26	12.3	12.1	14.5
<b>Left collar</b>												
Photons, 20 keV	3.42	2.69	3.29	1.72	1.35	1.59	5.89	4.65	5.65	3.04	2.36	2.76
Photons, <30 keV	6.08	5.59	6.45	2.88	2.92	3.75	8.38	6.93	8.47	4.29	3.71	4.26
Photons, 30–250 keV	36.5	39.8	43.4	20.6	22.6	25.7	28.7	32	35.4	15.6	17.2	19.9
Photons, >250 keV	13.7	15.7	16.7	6.86	7.98	8.62	13.3	15.3	16.4	6.68	7.76	8.43
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	40.1	41.7	46.5	23.4	24.1	27.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.9	26.3	30.1	13.6	14.1	16.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	15.2	15.4	18.6	7.29	7.51	8.99
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	23.7	25.6	28.2	12.3	13.7	15.1

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-21. R-marrow (leukemia) POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	19.3	22.7	25.7	19.4	21.9	23.2	29.8	34	37.9	29.7	33.1	34.7
Photons, <30 keV	42	43.4	55.1	38.6	39	50.4	40.7	49.3	52	45.4	47.8	47.8
Photons, 30–250 keV	84.4	86.6	89.3	84.9	87.6	90.1	79	81.7	85.1	79.7	83.2	86.2
Photons, >250 keV	56.7	60.5	62.7	58.3	63.2	65.7	56	59.8	62.1	57.7	62.6	65
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	90.5	91.4	93.5	91	92.6	94.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	82.1	83.7	87.5	83.4	86	88.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	69.6	72.3	77.6	71.1	75.2	79.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	81.8	83.7	85.7	82.8	85.6	87.3
<b>Center waist</b>												
Photons, 20 keV	19.4	21.3	23.1	19.3	20.8	21.5	29.7	32.3	34.6	29.7	31.6	32.5
Photons, <30 keV	42.3	38.7	51.3	38.6	38.5	46.9	40.8	47.3	47.3	45.3	45.9	45.9
Photons, 30–250 keV	84.4	86.1	88.6	85	87.2	89.2	79	81.3	84.1	79.7	82.6	85.3
Photons, >250 keV	56.5	60.8	62.4	58.3	63.4	65	55.9	60.1	61.7	57.6	62.7	64.3
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	90.4	90.6	92.7	91.1	92.1	93.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	82.1	82.4	85.9	83.4	85.2	88
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	69.6	71.1	75.6	70.9	74	78.3
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	81.8	83.5	85.3	82.9	85.3	86.8
<b>Left chest pocket</b>												
Photons, 20 keV	19.4	19	20.9	19.3	18.6	19.6	29.8	29	31.7	29.7	28.6	30.2
Photons, <30 keV	44.7	36.1	49.1	36.2	34.5	44.4	40.6	43.2	44.1	39.7	42.9	42.8
Photons, 30–250 keV	84.4	84.3	87.3	84.9	85.5	88.5	79.1	78.8	82.6	79.8	80.5	84.1
Photons, >250 keV	56.6	57.9	60.7	58.4	60.9	63.8	55.9	57.3	60.2	57.7	60.3	63
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	90.4	89.3	91.7	91.1	91	93.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	82.2	80.4	84.4	83.4	83.2	87
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	69.6	68.1	73.8	71.1	71.2	76.4
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	81.8	81.8	84.2	82.9	83.8	86.2
<b>Left collar</b>												
Photons, 20 keV	19.4	24.7	25.1	19.3	22.3	21.7	29.7	36.6	37.1	29.8	33.6	32.8
Photons, <30 keV	41.9	42	53.7	39.4	46.6	48.8	40.1	52.2	52.1	39.9	48.4	45.9
Photons, 30–250 keV	84.5	87.5	89.5	85	87.8	89.5	79	82.9	85.3	79.7	83.4	85.5
Photons, >250 keV	56.7	61.3	63.2	58.4	63	64.8	56	60.7	62.6	57.7	62.5	64.2
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	90.4	92.2	93.3	91.1	92.8	93.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	82.1	85.2	87.2	83.5	86.4	88
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	69.6	74.3	77.5	71	75.6	78.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	81.7	84.4	85.8	82.9	85.4	86.8



**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-22. R-marrow (acute myeloid leukemia) POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	18.3	21.5	24.4	16.8	19.1	20.3	28.4	32.5	36.3	26.2	29.4	30.9
Photons, <30 keV	39.2	40.8	51.9	33.4	34.1	44.9	38.4	46.4	49.5	39.7	42.2	42.7
Photons, 30–250 keV	83.5	85.8	88.5	82.5	85.6	88.3	77.9	80.7	84.2	76.6	80.5	83.9
Photons, >250 keV	57.2	61	63.2	56.6	61.5	64.1	56.5	60.3	62.6	55.9	60.9	63.4
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	89.4	90.4	92.7	88.9	90.8	92.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	80	81.7	86	79.8	82.7	86.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	66.7	69.5	75.1	65.6	70.2	75.3
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	79.8	81.9	84.1	79.1	82.4	84.4
<b>Center waist</b>												
Photons, 20 keV	18.3	20.2	21.9	16.8	18.1	18.8	28.3	30.8	33.1	26.2	28	28.9
Photons, <30 keV	39.5	36.3	48.2	33.4	33.5	41.1	38.5	44.4	44.9	39.6	40.4	40.9
Photons, 30–250 keV	83.5	85.3	87.8	82.6	85.1	87.4	77.8	80.2	83.2	76.7	79.8	82.9
Photons, >250 keV	57	61.3	62.9	56.5	61.7	63.4	56.4	60.6	62.2	55.8	61	62.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	89.3	89.6	91.8	88.9	90.2	92.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	80.1	80.4	84.2	79.8	81.8	85.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	66.6	68.2	73	65.4	68.8	73.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	79.9	81.7	83.6	79.1	82	83.7
<b>Left chest pocket</b>												
Photons, 20 keV	18.3	18	19.8	16.7	16.1	17.1	28.4	27.7	30.2	26.2	25.2	26.7
Photons, <30 keV	42.3	33.8	45.9	31.4	29.9	38.7	38.3	40.4	41.6	35.1	37.5	37.9
Photons, 30–250 keV	83.5	83.4	86.5	82.5	83.2	86.5	78	77.6	81.6	76.7	77.6	81.6
Photons, >250 keV	57.1	58.4	61.2	56.6	59.2	62.1	56.5	57.8	60.7	55.9	58.6	61.3
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	89.3	88.1	90.7	88.9	88.8	91.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	80.1	78.2	82.5	79.8	79.5	84
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	66.6	65	71	65.6	65.8	71.5
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	79.8	79.8	82.5	79.2	80.2	83.1
<b>Left collar</b>												
Photons, 20 keV	18.3	23.4	23.8	16.8	19.5	18.9	28.3	35	35.5	26.3	29.9	29.2
Photons, <30 keV	39.1	39.6	50.5	34.2	41.1	42.9	37.8	49.2	49.7	35.3	42.9	40.9
Photons, 30–250 keV	83.5	86.7	88.7	82.6	85.8	87.7	77.9	81.9	84.4	76.7	80.8	83.1
Photons, >250 keV	57.2	61.8	63.7	56.7	61.3	63.2	56.5	61.2	63.1	55.9	60.8	62.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	89.3	91.2	92.5	88.9	91	92.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	80	83.4	85.6	79.8	83.3	85.1
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	66.6	71.6	75	65.5	70.6	74.1
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	79.8	82.6	84.2	79.2	82.2	83.7

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-23. R-marrow (acute lymphocytic leukemia) POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	7.5	9.03	10.5	6.99	8.04	8.61	12.6	14.8	17.1	11.6	13.4	14.2
Photons, <30 keV	17.9	19	26.5	15	15.6	22.6	18	23.1	25.4	18.9	20.7	21.1
Photons, 30–250 keV	64.4	68.3	73.3	63.4	68.5	73.5	55.8	60	65.5	54.8	60.4	65.8
Photons, >250 keV	34	37.7	39.9	34	38.7	41.4	33.4	36.9	39.3	33.4	38.1	40.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	58.2	60.9	67.9	57.7	62.8	69
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.3	44	51.8	41.5	46.3	52.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.1	28.7	34.8	25.7	29.9	35.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	40.4	43.8	47.6	40.2	45.4	48.9
<b>Center waist</b>												
Photons, 20 keV	7.52	8.39	9.22	6.96	7.57	7.89	12.5	13.9	15.2	11.6	12.6	13.1
Photons, <30 keV	18	16.5	23.8	14.9	15.2	19.5	17.9	21.7	22.1	18.9	19.5	19.9
Photons, 30–250 keV	64.4	67.4	72	63.5	67.7	71.7	55.7	59.2	63.9	54.9	59.3	64
Photons, >250 keV	33.9	37.9	39.6	33.9	38.9	40.6	33.4	37.2	38.9	33.3	38.2	39.8
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	57.9	58.7	65.1	57.8	61	67
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.3	41.8	48.3	41.5	44.7	50.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.1	27.5	32.4	25.5	28.5	33.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	40.5	43.4	46.7	40.3	44.7	47.8
<b>Left chest pocket</b>												
Photons, 20 keV	7.52	7.34	8.21	6.95	6.65	7.09	12.5	12.2	13.6	11.6	11.1	11.9
Photons, <30 keV	20.2	15.1	22	14.1	13.2	17.9	17.8	19	19.9	16.3	17.6	17.9
Photons, 30–250 keV	64.4	64.2	69.6	63.4	64.5	70.1	55.9	55.4	61.4	55	56.1	62
Photons, >250 keV	34	35.2	37.9	34	36.5	39.3	33.3	34.6	37.3	33.4	35.8	38.5
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	58.1	55.2	61.9	57.9	57.7	64.6
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.4	38.6	45.2	41.5	41.1	48.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.1	24.7	30.2	25.7	25.8	31.2
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	40.4	40.4	44.7	40.3	41.8	46.6
<b>Left collar</b>												
Photons, 20 keV	7.51	9.98	10.2	6.95	8.23	7.97	12.5	16.3	16.6	11.7	13.6	13.2
Photons, <30 keV	17.8	18.5	25.4	15.4	19.7	20.6	17.6	25.2	25.5	16.5	21.1	19.8
Photons, 30–250 keV	64.5	70	73.7	63.6	68.8	72.3	55.8	61.8	65.9	54.8	60.7	64.5
Photons, >250 keV	34	38.5	40.4	34.1	38.5	40.4	33.4	37.8	39.7	33.4	38	39.8
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	58.1	63.3	67.1	57.9	63.4	67.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	41.2	46.8	51	41.5	47.2	50.7
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	26.1	30.8	34.7	25.6	30.3	34.1
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	40.3	45	47.7	40.4	45	47.7

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-24. R-marrow (chronic myeloid leukemia) POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	22.9	26.6	29.9	45.6	49.4	51.2	34.4	38.9	43	59.5	63.3	64.9
Photons, <30 keV	44.5	46.3	57.2	67.6	68.1	77.1	44.6	52.1	55.7	73.1	75.1	75.5
Photons, 30–250 keV	87	88.8	91	95.1	96.1	96.9	82.3	84.7	87.5	93.1	94.5	95.6
Photons, >250 keV	65.6	69.1	71	84.5	87	88.2	65	68.4	70.5	84.1	86.7	87.8
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	91.1	92	94	97	97.6	98.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	82.9	84.4	88.1	94.2	95.1	96.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	70.8	73.4	78.6	88.7	90.6	92.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	82.9	84.8	86.6	94	95.1	95.7
<b>Center waist</b>												
Photons, 20 keV	22.9	25.1	27.1	45.5	47.7	48.9	34.3	37.1	39.5	59.5	61.7	62.7
Photons, <30 keV	44.8	42	53.5	67.5	67.6	74.3	44.7	50	51.2	73	73.7	74
Photons, 30–250 keV	87	88.4	90.5	95.1	95.9	96.6	82.3	84.3	86.7	93.2	94.2	95.2
Photons, >250 keV	65.5	69.3	70.8	84.4	87.1	87.8	64.9	68.7	70.2	84.1	86.7	87.5
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	91	91.3	93.2	97	97.4	98
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	82.9	83.2	86.6	94.2	94.8	95.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	70.8	72.2	76.6	88.6	90	92
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	82.9	84.5	86.2	94	94.9	95.5
<b>Left chest pocket</b>												
Photons, 20 keV	22.9	22.5	24.7	45.4	44.3	46	34.4	33.6	36.4	59.5	58.3	60.1
Photons, <30 keV	48.2	39.4	51	65.4	63.7	72.4	44.5	46	47.7	69.1	71.3	71.7
Photons, 30–250 keV	86.9	86.9	89.4	95.1	95.3	96.3	82.4	82.1	85.4	93.2	93.5	94.8
Photons, >250 keV	65.6	66.8	69.3	84.5	85.8	87.2	64.9	66.2	68.8	84.1	85.5	86.9
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	91.1	90	92.3	97	97	97.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	83	81.3	85.1	94.2	94.1	95.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	70.7	69.2	74.8	88.7	88.7	91.2
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	82.9	82.9	85.2	94	94.3	95.3
<b>Left collar</b>												
Photons, 20 keV	22.9	28.8	29.3	45.4	50	49.1	34.3	41.6	42.1	59.6	63.8	63
Photons, <30 keV	44.4	45.3	55.7	68.3	74.4	75.7	44	54.9	55.9	69.3	75.6	74.1
Photons, 30–250 keV	87	89.6	91.2	95.1	96.1	96.7	82.3	85.7	87.7	93.2	94.6	95.3
Photons, >250 keV	65.6	69.8	71.5	84.5	86.9	87.8	65	69.3	70.9	84.1	86.6	87.5
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	91.1	92.7	93.8	97.1	97.6	98
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	82.9	85.9	87.8	94.2	95.3	95.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	70.7	75.3	78.5	88.6	90.8	92.2
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	82.8	85.4	86.7	94	95	95.5



**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-25. S-glands POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	1.07	5.58	8.17	1.15	4.08	5.47	1.87	9.97	14.1	2.07	7.33	9.58
Photons, <30 keV	2.72	7.33	10.3	2.42	4.9	6.36	3.02	10.8	15.3	2.6	8.75	11.5
Photons, 30–250 keV	19.6	26.4	31.8	10.9	15	17.8	14.9	20.4	25.3	8.03	11.3	13.4
Photons, >250 keV	7.79	9.59	10.9	3.9	4.96	5.45	7.58	9.38	10.6	3.82	4.81	5.31
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	16	21.8	27.9	7.86	11.4	14.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	8.64	13.4	17.9	4.26	7.24	9.44
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	7.2	11.2	15	3.77	6.32	7.75
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.2	16.5	19.5	6.79	8.85	10.1
<b>Center waist</b>												
Photons, 20 keV	1.08	5.17	7.09	1.16	3.81	4.92	1.88	9.16	12.4	2.04	6.84	8.76
Photons, <30 keV	2.72	6.83	9.05	2.4	4.63	5.75	2.96	9.95	13.5	2.57	8.26	10.6
Photons, 30–250 keV	19.7	25.8	30.6	10.9	14.4	16.7	14.8	20	24.1	8.07	10.8	12.7
Photons, >250 keV	7.75	9.78	10.7	3.91	4.95	5.31	7.54	9.48	10.5	3.83	4.82	5.16
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.1	20.3	25.3	7.84	10.6	13.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	8.62	12.5	16	4.28	6.8	8.67
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	7.14	10.7	13.8	3.77	5.95	7.14
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.1	16.3	18.9	6.78	8.66	9.69
<b>Left chest pocket</b>												
Photons, 20 keV	1.07	4.42	6.15	1.16	3.25	4.41	1.86	7.85	11	2.06	5.91	7.84
Photons, <30 keV	2.76	5.8	7.93	2.49	3.97	5.22	2.97	8.61	12.1	2.59	7.11	9.58
Photons, 30–250 keV	19.6	23.1	28.2	10.9	12.9	15.5	14.9	17.7	22.1	8.07	9.59	11.7
Photons, >250 keV	7.74	8.72	10.1	3.91	4.51	5.03	7.55	8.47	9.87	3.8	4.35	4.9
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.1	18.1	23	7.78	9.32	12.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	8.7	11	14.4	4.27	5.92	7.95
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	7.15	9.33	12.6	3.77	5.19	6.52
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.1	14.6	17.7	6.76	7.74	9.15
<b>Left collar</b>												
Photons, 20 keV	1.08	6.23	7.94	1.16	4.18	5.02	1.87	11.1	13.7	2.06	7.5	8.87
Photons, <30 keV	2.64	8.18	10	2.46	5.04	5.92	3.17	11.9	15	2.56	9.02	10.8
Photons, 30–250 keV	19.7	27.9	32.2	11	15.1	17	14.9	21.7	25.5	8.04	11.4	12.9
Photons, >250 keV	7.73	9.9	11.1	3.9	4.91	5.25	7.58	9.64	10.7	3.79	4.78	5.14
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	16.2	23.8	27.3	7.87	11.7	13.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	8.64	14.9	17.5	4.28	7.44	8.76
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	7.16	12.4	15	3.77	6.41	7.28
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.2	17.3	19.6	6.77	8.75	9.57

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-26. SI-wall POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	2.22	0.8	1.34	1.4	0.51	0.79	3.91	1.4	2.33	2.45	0.9	1.39
Photons, <30 keV	6.05	2.87	4.8	3.99	1.83	2.7	7.55	3.44	5.41	5.25	2.23	3.26
Photons, 30–250 keV	28.8	25.5	31.1	22.8	20.7	25.7	22.5	19.7	24.6	17.3	15.6	19.9
Photons, >250 keV	8.83	8.89	9.93	6.84	7.1	8.13	8.55	8.67	9.65	6.67	6.94	7.94
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	34.4	28.7	36.4	26.5	22.7	28.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	20.6	16.6	22	15.3	12.9	16.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.4	8.07	11.3	7.69	5.79	7.96
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	17.7	16.1	19.1	12.7	12.1	14.5
<b>Center waist</b>												
Photons, 20 keV	2.22	0.74	1.17	1.4	0.48	0.72	3.89	1.29	2.03	2.46	0.83	1.26
Photons, <30 keV	6.22	2.96	3.98	3.94	1.83	2.63	7.61	3.12	4.74	5.39	2.08	3.1
Photons, 30–250 keV	28.9	25	29.8	22.9	20	24.2	22.5	19.2	23.4	17.4	15	18.6
Photons, >250 keV	8.84	8.97	9.81	6.88	7.11	7.93	8.62	8.76	9.52	6.71	6.96	7.72
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	34.5	26.9	33.2	26.5	21.6	26.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	20.5	15.5	19.9	15.3	12.1	15.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.3	7.63	10.3	7.68	5.44	7.23
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	17.7	16	18.6	12.8	11.9	13.9
<b>Left chest pocket</b>												
Photons, 20 keV	2.21	0.63	1.02	1.4	0.41	0.65	3.9	1.11	1.79	2.45	0.72	1.14
Photons, <30 keV	6.25	2.28	3.9	3.82	1.53	2.2	7.46	2.68	4.25	5.41	1.81	2.72
Photons, 30–250 keV	28.9	22.5	27.6	22.8	17.7	22.8	22.6	17.1	21.5	17.3	13.3	17.3
Photons, >250 keV	8.82	8.1	9.27	6.85	6.48	7.5	8.62	7.95	8.98	6.66	6.34	7.36
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	34.4	24.1	30.5	26.5	19.2	24.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	20.6	13.8	18.1	15.3	10.7	14.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.3	6.65	9.16	7.67	4.79	6.65
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	17.7	14.4	17.4	12.8	10.7	13.3
<b>Left collar</b>												
Photons, 20 keV	2.22	0.89	1.31	1.4	0.52	0.73	3.88	1.55	2.27	2.46	0.92	1.28
Photons, <30 keV	6.16	3.16	4.43	4.07	1.89	2.8	7.42	3.79	5.43	5.67	2.26	3.12
Photons, 30–250 keV	29	26.9	31.3	23	20.7	24.6	22.5	20.8	24.8	17.4	15.7	19
Photons, >250 keV	8.83	9.09	10.1	6.87	7.05	7.9	8.6	8.88	9.84	6.64	6.91	7.65
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	34.5	30.9	35.4	26.5	23.3	26.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	20.7	18.3	21.6	15.2	13.3	15.7
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.3	8.85	11.2	7.71	5.9	7.45
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	17.6	16.7	19.1	12.8	12.1	13.9

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-27. Spleen POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.16	1.07	1.76	0.03	0.27	0.44	0.28	1.86	3.08	0.05	0.47	0.77
Photons, <30 keV	2.08	4.24	5.84	0.86	2.21	3.23	1.95	4.53	6.93	0.8	2.08	3.08
Photons, 30–250 keV	20.1	27.3	32.6	13.6	21.3	25.6	15.3	21.3	25.7	10.1	16.1	19.6
Photons, >250 keV	7.49	9.29	10.1	5.33	7.37	8.1	7.34	9.08	9.88	5.23	7.21	7.89
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.2	29.9	37.7	16.8	23.6	29.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	13.5	17.2	23.1	9.19	13.6	17.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.6	9.28	12.3	3.13	6.24	8.33
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.3	16.9	19.5	8.46	12.5	14.2
<b>Center waist</b>												
Photons, 20 keV	0.16	0.98	1.55	0.03	0.25	0.4	0.28	1.72	2.7	0.05	0.44	0.7
Photons, <30 keV	2.11	4.01	5.48	0.88	2.08	2.87	1.93	4.25	6.08	0.76	1.96	2.82
Photons, 30–250 keV	20.3	26.7	31.3	13.6	20.6	24.3	15.3	20.8	24.5	9.98	15.5	18.7
Photons, >250 keV	7.51	9.37	10	5.34	7.4	7.85	7.36	9.15	9.7	5.2	7.18	7.68
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.2	28.2	34.5	16.8	22.5	27.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	13.6	16.1	20.8	9.13	12.8	16.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.68	8.7	11.3	3.14	5.91	7.69
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.3	16.9	19	8.41	12.2	13.6
<b>Left chest pocket</b>												
Photons, 20 keV	0.16	0.85	1.37	0.03	0.22	0.36	0.28	1.49	2.37	0.05	0.38	0.63
Photons, <30 keV	2.11	2.9	4.99	0.88	1.8	2.59	1.96	3.83	5.43	0.77	1.72	2.54
Photons, 30–250 keV	20.1	24.1	28.8	13.5	18.5	22.6	15.3	18.5	22.5	10	13.8	17.3
Photons, >250 keV	7.48	8.5	9.41	5.33	6.67	7.45	7.34	8.27	9.18	5.22	6.53	7.31
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.3	25.4	31.7	16.8	20.2	25.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	13.6	14.1	18.6	9.16	11.3	14.7
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.62	7.63	10.2	3.13	5.14	7.01
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.3	15.2	17.7	8.41	11	12.9
<b>Left collar</b>												
Photons, 20 keV	0.16	1.18	1.72	0.03	0.27	0.4	0.28	2.06	3.01	0.05	0.48	0.71
Photons, <30 keV	2.1	4.14	5.63	0.84	2.27	3	1.97	5	6.83	0.78	2.14	2.87
Photons, 30–250 keV	20.3	29	32.7	13.6	21.4	24.6	15.3	22.4	25.8	10	16.3	18.9
Photons, >250 keV	7.52	9.52	10.3	5.35	7.32	7.83	7.36	9.3	10	5.24	7.08	7.63
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.3	32.3	36.7	16.8	24.2	28.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	13.5	18.9	22.4	9.14	13.9	16.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	5.62	10	12.4	3.12	6.39	7.91
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	13.3	17.5	19.5	8.41	12.4	13.6

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-28. St-wall POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	11.2	5.63	8.82	2.18	0.86	1.38	18.6	9.53	14.6	3.74	1.5	2.4
Photons, <30 keV	23.1	17.6	20.7	5.62	4.06	5.74	26.4	18.2	25.1	7.35	4.14	5.99
Photons, 30–250 keV	63.9	61.6	67.9	35.6	33.1	38.6	55.6	53.2	59.8	28.1	25.9	30.7
Photons, >250 keV	31	32.3	34.3	12.7	13.5	14.8	30.3	31.6	33.6	12.4	13.1	14.4
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	66.4	61.8	69.4	37.7	32.6	39.7
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	49.4	44.4	53.2	23.3	19.8	24.9
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	34.8	29	36.5	12.4	9.83	12.7
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	46.1	44.8	49.5	19.7	19.4	21.9
<b>Center waist</b>												
Photons, 20 keV	11.2	5.24	7.77	2.17	0.81	1.25	18.6	8.86	13	3.76	1.41	2.17
Photons, <30 keV	23.9	16.5	18.4	5.91	3.76	5.22	26.6	17.2	21.9	7.41	3.83	5.45
Photons, 30–250 keV	63.8	61	66.4	35.5	32.1	36.8	55.4	52.8	58.6	28	25.1	29.3
Photons, >250 keV	31	32.3	34	12.6	13.5	14.4	30.3	31.8	33.2	12.4	13.2	14
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	66.4	59.7	66.5	37.7	31.2	37.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	49.1	42.4	49.5	23.4	18.6	23.1
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	34.8	27.6	34	12.5	9.33	11.8
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	45.9	44.7	48.3	19.8	19.1	21
<b>Left chest pocket</b>												
Photons, 20 keV	11.2	4.56	6.92	2.17	0.7	1.13	18.6	7.69	11.6	3.78	1.21	1.97
Photons, <30 keV	23.8	14.3	16.4	5.56	3.28	4.81	26.4	15.3	20.3	7.23	3.31	4.95
Photons, 30–250 keV	63.8	57.3	64	35.8	29.1	34.8	55.7	48.6	55.7	28.1	22.3	27.5
Photons, >250 keV	30.9	29.8	32.5	12.6	12.3	13.7	30.3	29.4	31.9	12.3	12	13.3
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	66.3	56.4	63.5	37.7	28.3	35.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	49.4	38.9	46.4	23.2	16.4	21.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	34.9	25	31.4	12.5	8.15	10.8
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	45.9	41.4	46.2	19.8	17.3	20.1
<b>Left collar</b>												
Photons, 20 keV	11.3	6.25	8.63	2.17	0.88	1.27	18.6	10.5	14.4	3.76	1.54	2.22
Photons, <30 keV	23.5	19.1	20.5	5.67	4.12	5.48	26.6	19.9	23.9	7.18	4.28	5.61
Photons, 30–250 keV	63.8	63.5	68	35.7	33.2	37.2	55.6	55.1	60.2	28	26	29.7
Photons, >250 keV	31	32.8	34.8	12.7	13.4	14.3	30.3	32.3	34.2	12.3	13.1	13.9
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	66.2	64.2	68.6	37.7	33.2	37.6
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	49.2	47.4	52.2	23.4	20.1	23.4
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	35	31.1	36.4	12.6	10	12.1
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	45.8	46.1	49.2	19.7	19.1	21

**ATTACHMENT A**  
**POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-29. Testes POC results (% POC).

Location, radiation type, and energy	Male					
	Exposure			Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>						
Photons, 20 keV	✔ 6.25	4.73	5.23	✔ 11.1	8.66	9.4
Photons, <30 keV	✔ 8.44	6.82	6.92	14.5	✔ 15	12.8
Photons, 30–250 keV	22.7	20.2	✔ 22.9	17.2	15.3	✔ 17.6
Photons, >250 keV	6.47	6.76	✔ 7.38	6.28	6.6	✔ 7.19
Neutrons, <10 keV	N/A	N/A	N/A	✔ 20.7	15.7	19.9
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 12.8	10.1	12.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 9.08	7.3	8.24
Neutrons, 2–20 MeV	N/A	N/A	N/A	10.8	10.4	✔ 11.2
<b>Center waist</b>						
Photons, 20 keV	✔ 6.24	4.41	4.68	✔ 11.1	8.05	8.54
Photons, <30 keV	✔ 8.34	6.3	6.29	✔ 14.5	13.9	11.6
Photons, 30–250 keV	✔ 22.7	19.7	21.6	✔ 17.2	14.8	16.5
Photons, >250 keV	6.47	6.78	✔ 7.22	6.28	6.6	✔ 6.99
Neutrons, <10 keV	N/A	N/A	N/A	✔ 20.8	15	18.4
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 12.8	9.49	11.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 9.09	6.83	7.47
Neutrons, 2–20 MeV	N/A	N/A	N/A	✔ 10.8	10.2	10.7
<b>Left chest pocket</b>						
Photons, 20 keV	✔ 6.24	3.78	4.18	✔ 11.2	6.92	7.67
Photons, <30 keV	✔ 8.41	5.48	6.3	✔ 14.6	12.2	10.5
Photons, 30–250 keV	✔ 22.7	17.7	20.2	✔ 17.3	13.1	15.3
Photons, >250 keV	6.47	6.14	✔ 6.84	6.28	6.01	✔ 6.64
Neutrons, <10 keV	N/A	N/A	N/A	✔ 20.8	13.2	16.9
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 12.8	8.23	10.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 9.04	5.97	6.85
Neutrons, 2–20 MeV	N/A	N/A	N/A	✔ 10.7	9.15	10.1
<b>Left collar</b>						
Photons, 20 keV	✔ 6.22	4.89	4.8	✔ 11.1	8.84	8.71
Photons, <30 keV	✔ 8.47	7.05	6.37	14.5	✔ 15.2	11.9
Photons, 30–250 keV	✔ 22.8	20.5	22	✔ 17.3	15.5	16.8
Photons, >250 keV	6.49	6.72	✔ 7.15	6.3	6.56	✔ 6.95
Neutrons, <10 keV	N/A	N/A	N/A	✔ 20.8	16.2	18.6
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 13	10.2	11.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 9.1	7.39	7.75
Neutrons, 2–20 MeV	N/A	N/A	N/A	✔ 10.8	10.3	10.7



**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-30. Thymus POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	5.11	1.62	2.22	2.44	0.78	1.16	9.28	2.8	3.92	4.51	1.38	2.08
Photons, <30 keV	7.97	2.95	3.62	3.6	1.36	1.95	10.2	3.48	4.86	4.9	1.68	2.45
Photons, 30–250 keV	27.3	22.7	25.9	14.7	12	14.3	20.8	17.2	19.9	10.8	8.96	10.6
Photons, >250 keV	8.64	8.69	9.29	4.17	4.29	4.59	8.37	8.46	9.02	4.02	4.19	4.47
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.6	20	25.5	13.8	10.8	13.5
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	14.9	11.4	15.1	8.02	5.89	7.4
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.6	7.13	9.12	5.77	3.71	4.67
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	14	12.5	13.7	6.89	6.23	7.08
<b>Center waist</b>												
Photons, 20 keV	5.11	1.49	1.95	2.44	0.73	1.05	9.22	2.6	3.41	4.51	1.29	1.89
Photons, <30 keV	7.94	2.74	3.58	3.67	1.26	1.75	10.1	3.21	4.28	4.94	1.56	2.23
Photons, 30–250 keV	27.2	22.1	24.6	14.8	11.7	13.4	20.9	16.8	18.9	10.9	8.67	9.83
Photons, >250 keV	8.6	8.77	9.17	4.16	4.32	4.45	8.4	8.51	8.96	4.01	4.2	4.32
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.8	18.7	23.1	13.8	10.1	12.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	14.7	10.6	13.4	7.94	5.51	6.85
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.6	6.74	8.23	5.83	3.49	4.31
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	14	12.4	13.2	6.86	6.08	6.75
<b>Left chest pocket</b>												
Photons, 20 keV	5.12	1.28	1.71	2.45	0.63	0.95	9.22	2.24	2.99	4.51	1.11	1.69
Photons, <30 keV	7.81	2.35	3.07	3.6	1.09	1.57	10.1	2.77	3.71	4.89	1.34	1.97
Photons, 30–250 keV	27.3	19.6	22.7	14.8	10.3	12.4	21	14.6	17.2	10.9	7.57	9.15
Photons, >250 keV	8.63	7.79	8.63	4.13	3.89	4.23	8.31	7.59	8.36	4	3.78	4.11
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.7	16.5	20.8	13.8	8.94	11.4
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	14.8	9.25	11.9	7.91	4.78	6.26
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.7	5.94	7.38	5.8	3.02	3.91
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	14	11	12.3	6.88	5.44	6.38
<b>Left collar</b>												
Photons, 20 keV	5.1	1.78	2.17	2.43	0.8	1.07	9.26	3.13	3.83	4.48	1.42	1.92
Photons, <30 keV	7.9	3.33	4.04	3.62	1.4	1.79	10.1	3.88	4.72	4.92	1.71	2.28
Photons, 30–250 keV	27.2	23.9	26.2	14.7	12.3	13.6	20.9	18.3	20.1	10.9	9.03	10.1
Photons, >250 keV	8.62	8.89	9.54	4.15	4.28	4.42	8.38	8.66	9.35	4.02	4.15	4.32
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	24.7	21.7	24.7	13.8	11.1	12.6
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	14.9	12.6	14.5	8.06	5.97	6.96
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	11.7	7.84	9.03	5.82	3.78	4.38
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	14.1	13	13.7	6.82	6.17	6.72

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-31. Thyroid POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	27.4	11.3	19	23.6	10.4	17.3	41.2	18.8	30.4	36.4	17.5	27.9
Photons, <30 keV	31.6	15.8	23.9	28.9	15.7	23.3	40.5	19.8	30.4	36.2	19	28.6
Photons, 30–250 keV	56.6	51	57.8	56.5	51.3	57.9	48.1	42.2	49.2	47.6	42.6	49.4
Photons, >250 keV	25.3	25.8	27	24.9	25.7	28	24.6	25.4	26.5	24.4	25	27.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	45.5	41.4	49.3	48.1	43.1	50.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	33.2	27.7	35.1	34.2	29.4	36.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	30.7	21.7	28.3	29.8	21.7	28.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	33	30.9	33.8	32.6	31.1	34.7
<b>Center waist</b>												
Photons, 20 keV	27.3	10.5	16.9	23.4	9.77	15.9	41.1	17.5	27.1	36.3	16.5	25.8
Photons, <30 keV	31.6	14.7	22.2	28.9	14.5	21.5	40.7	18.5	27.6	36.2	17.8	26.5
Photons, 30–250 keV	56.8	50.2	55.9	56.3	50.3	56.2	48.1	41.5	47.3	47.6	41.6	47.6
Photons, >250 keV	25.4	26	26.9	25	25.6	27.4	24.7	25.6	26.1	24.4	25	26.8
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	45.4	39.4	46.1	48.1	41.4	47.9
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	33.4	25.6	32.1	34.1	27.9	34
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	30.7	20.8	26.3	29.7	20.8	26.6
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	32.6	30.6	32.8	32.6	31	33.6
<b>Left chest pocket</b>												
Photons, 20 keV	27.3	9.15	15	23.4	8.6	14.4	41.1	15.4	24.6	36.4	14.5	23.6
Photons, <30 keV	31.6	13.1	19.8	29.2	13.1	19.5	40.7	16.3	25.1	36	15.7	24.5
Photons, 30–250 keV	56.7	46.2	53.3	56.3	46.7	54.1	47.9	37.8	44.6	47.7	38.3	45.3
Photons, >250 keV	25.2	23.7	25.4	25	23.6	26.3	24.6	23.1	24.8	24.4	23.2	25.6
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	45.6	36	42.9	48.1	37.9	45.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	33.4	23.4	30	34.2	25.2	31.1
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	30.8	18.5	24.1	29.7	18.6	25
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	32.8	27.9	31.1	32.6	28.5	32.2
<b>Left collar</b>												
Photons, 20 keV	27.4	12.4	18.7	23.5	10.7	16.2	41.2	20.8	29.8	36.3	17.8	26.1
Photons, <30 keV	31.1	17.3	24.4	28.9	15.9	21.9	40.6	21.6	30.2	36	19.3	27
Photons, 30–250 keV	56.8	52.7	57.9	56.4	51.5	56.7	48	44	49.4	47.7	43	48.1
Photons, >250 keV	25.3	26.5	27.6	25	25.6	27.4	24.8	25.7	27	24.5	25	26.7
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	45.5	44.3	48.4	47.9	43.7	48
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	33.3	30.1	34.6	34.1	29.9	34.3
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	30.7	23.6	28.2	29.7	22.2	27.3
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	32.8	31.6	33.7	32.6	31.2	33.5

**ATTACHMENT A  
POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-32. UB-wall POC results (% POC).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 15.8	6.73	9.52	✓ 1.2	0.5	0.8	✓ 25.8	11.6	16.3	✓ 2.1	0.87	1.4
Photons, <30 keV	✓ 20.1	9.8	13	3.18	2.23	✓ 3.33	✓ 26.9	12.5	17	✓ 4.17	2.24	3.47
Photons, 30–250 keV	✓ 48.2	40.5	45.7	26.2	21.7	✓ 26.9	✓ 39.8	32.8	37.4	20.1	16.6	✓ 20.8
Photons, >250 keV	17.7	17	✓ 18.1	8.04	7.98	✓ 8.94	17.3	16.6	✓ 17.7	7.85	7.79	✓ 8.71
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 51.4	40	48.9	30.7	24.1	✓ 31
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 36	25.9	32.8	18.2	13.9	✓ 18.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 25.4	16.1	20.1	✓ 9.41	6.22	8.38
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 30.3	26.3	29	14.7	13	✓ 15.5
<b>Center waist</b>												
Photons, 20 keV	✓ 15.8	6.23	8.3	✓ 1.2	0.46	0.72	✓ 25.9	10.7	14.4	✓ 2.1	0.81	1.27
Photons, <30 keV	✓ 20.3	9.2	11.6	✓ 3.2	2.09	3.04	✓ 26.9	11.7	15.1	✓ 4.21	2.16	3.12
Photons, 30–250 keV	✓ 48.3	40	44.3	✓ 26.3	21.1	25.4	✓ 39.9	32	36	✓ 20.2	16	19.6
Photons, >250 keV	17.8	17.2	✓ 17.9	8.02	8	✓ 8.74	17.3	16.8	✓ 17.5	7.82	7.79	✓ 8.47
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 51.3	37.9	45.2	✓ 30.7	23	29.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 35.8	24.4	30	✓ 18.3	13.2	17
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 25.3	15.2	18.4	✓ 9.42	5.85	7.67
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 30.4	26	28.3	14.7	12.8	✓ 15
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 15.7	5.4	7.4	✓ 1.2	0.4	0.65	✓ 25.8	9.29	12.7	✓ 2.11	0.7	1.14
Photons, <30 keV	✓ 20.1	7.96	10.2	✓ 3.23	1.82	2.7	✓ 26.9	10.1	13.5	✓ 4.09	1.84	2.84
Photons, 30–250 keV	✓ 48.2	36.3	41.5	✓ 26.3	18.9	23.8	✓ 39.7	28.9	33.4	✓ 20.1	14.1	18.3
Photons, >250 keV	✓ 17.7	15.6	16.9	8	7.29	✓ 8.3	✓ 17.3	15.1	16.5	7.8	7.08	✓ 8.06
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 51.4	34.4	42.2	✓ 30.6	20.5	27.2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 36	21.7	27.4	✓ 18.3	11.7	15.8
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 25.4	13.3	16.7	✓ 9.44	5.09	7.05
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 30.3	23.7	26.6	✓ 14.7	11.6	14.2
<b>Left collar</b>												
Photons, 20 keV	✓ 15.8	7.48	9.29	✓ 1.2	0.51	0.73	✓ 25.7	12.8	15.9	✓ 2.1	0.89	1.29
Photons, <30 keV	✓ 20.1	10.6	13.1	✓ 3.45	2.28	3.12	✓ 26.7	13.8	16.8	✓ 4.11	2.36	3.24
Photons, 30–250 keV	✓ 48.2	42.4	45.9	✓ 26.2	21.8	25.8	✓ 39.8	34.4	37.8	✓ 20.1	16.7	19.9
Photons, >250 keV	17.7	17.4	✓ 18.4	8.01	7.86	✓ 8.65	17.3	17	✓ 18	7.81	7.69	✓ 8.45
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 51.3	42.6	47.8	✓ 30.7	24.7	29.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 35.9	28.2	32.2	✓ 18	14.3	17.2
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 25.5	17.4	19.9	✓ 9.43	6.35	7.89
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 30.4	27.2	28.9	14.7	12.9	✓ 14.8



**ATTACHMENT A**  
**POC RESULTS FOR AP, ROT, AND ISO GEOMETRIES (continued)**

Table A-33. Uterus POC results (% POC).

Location, radiation type, and energy	Female					
	Exposure			Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>						
Photons, 20 keV	✔ 0.01	0	0	✔ 0.01	0	✔ 0.01
Photons, <30 keV	✔ 0.05	0.03	0.04	✔ 0.05	0.03	0.04
Photons, 30–250 keV	1.03	0.9	✔ 1.21	0.71	0.62	✔ 0.82
Photons, >250 keV	0.4	0.41	✔ 0.47	0.39	0.4	✔ 0.45
Neutrons, <10 keV	N/A	N/A	N/A	0.8	0.66	✔ 0.94
Neutrons, 10–100 keV	N/A	N/A	N/A	0.42	0.36	✔ 0.5
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 0.21	0.16	✔ 0.21
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.38	0.35	✔ 0.41
<b>Center waist</b>						
Photons, 20 keV	✔ 0.01	0	0	✔ 0.01	0	0
Photons, <30 keV	✔ 0.05	0.03	0.04	✔ 0.05	0.03	0.04
Photons, 30–250 keV	1.03	0.88	✔ 1.11	0.71	0.61	✔ 0.77
Photons, >250 keV	0.4	0.41	✔ 0.46	0.38	0.4	✔ 0.45
Neutrons, <10 keV	N/A	N/A	N/A	0.8	0.61	✔ 0.82
Neutrons, 10–100 keV	N/A	N/A	N/A	0.42	0.33	✔ 0.44
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 0.21	0.15	0.19
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.38	0.34	✔ 0.39
<b>Left chest pocket</b>						
Photons, 20 keV	✔ 0.01	0	0	✔ 0.01	0	0
Photons, <30 keV	✔ 0.05	0.02	0.03	✔ 0.05	0.02	0.03
Photons, 30–250 keV	✔ 1.04	0.74	0.99	✔ 0.72	0.51	0.68
Photons, >250 keV	0.4	0.36	✔ 0.43	0.38	0.35	✔ 0.41
Neutrons, <10 keV	N/A	N/A	N/A	✔ 0.8	0.52	0.72
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 0.42	0.29	0.38
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 0.21	0.13	0.17
Neutrons, 2–20 MeV	N/A	N/A	N/A	✔ 0.38	0.3	0.36
<b>Left collar</b>						
Photons, 20 keV	✔ 0.01	0	0	✔ 0.01	0	✔ 0.01
Photons, <30 keV	✔ 0.05	0.03	0.04	✔ 0.05	0.03	0.04
Photons, 30–250 keV	1.04	0.98	✔ 1.22	0.71	0.67	✔ 0.84
Photons, >250 keV	0.4	0.43	✔ 0.48	0.38	0.41	✔ 0.46
Neutrons, <10 keV	N/A	N/A	N/A	0.8	0.74	✔ 0.91
Neutrons, 10–100 keV	N/A	N/A	N/A	0.42	0.4	✔ 0.49
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 0.21	0.17	✔ 0.21
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.38	0.36	✔ 0.41

**ATTACHMENT B  
POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES**

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**ATTACHMENT B**  
**POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES (continued)**

Table B-1. POC results, *Hp*(10), center chest, neutrons, 100 keV to 2 MeV (POC %).

Organ	Female - <i>Hp</i> (10)			Male - <i>Hp</i> (10)		
	AP	ISO	ROT	AP	ISO	ROT
Adrenals	11.05	13.65	18.98	3.22	7.15	9.56
Brain	5.42	10.84	12.28	2.16	4.92	5.42
Breast	19.23	16.91	18.79	23.67	22.38	23.37
Colon (Colon)	12.7	9.26	12.51	11.07	9.55	12.42
Colon (Rectum)	7.87	5.65	7.74	3.5	2.98	3.96
Endost-BS	17.15	20.31	24.76	7.92	10.61	12.56
ET	6.98	8.51	11.27	4.07	4.89	6.07
Eye lens	26.37	24.11	27.67	15.81	14.88	16.85
GB-wall	18.79	15.23	20.34	14.63	13.09	17.02
Kidneys	12.01	15.12	20.82	3.71	7.17	9.98
Liver	22.65	19.67	25.76	25.63	24.67	30.44
Lungs	31.38	33.43	39.66	15.17	14.91	17.92
Lymph	5.76	4.9	6.48	5.93	5.29	6.79
Muscle	16.51	18.77	23.43	8.14	10.23	12.44
Oesophagus	15.63	13.94	18.43	9.36	8.64	11.26
O-mucosa	9.33	10.4	13.66	4.42	4.97	6.18
Ovaries	6.75	6.03	8.01	N/A	N/A	N/A
Pancreas	7.86	5.7	8.09	2.97	2.4	3.31
Prostate	N/A	N/A	N/A	4.7	3.62	4.86
Remainder	15.12	14.09	18.48	7.34	7.42	9.48
R-marrow (ALL)	26.11	28.67	34.84	25.65	29.88	35.55
R-marrow (AML)	66.65	69.45	75.14	65.61	70.21	75.31
R-marrow (CML)	70.78	73.37	78.55	88.66	90.62	92.59
R-marrow (L)	69.63	72.28	77.62	71.07	75.22	79.71
S-glands	7.2	11.24	15.03	3.77	6.32	7.75
SI-wall	11.39	8.07	11.27	7.69	5.79	7.96
Spleen	5.6	9.28	12.34	3.13	6.24	8.33
St-wall	34.77	29.02	36.53	12.42	9.83	12.73
Testes	N/A	N/A	N/A	9.08	7.3	8.24
Thymus	11.56	7.13	9.12	5.77	3.71	4.67
Thyroid	30.73	21.71	28.33	29.8	21.73	28.59
UB-wall	25.4	16.06	20.11	9.41	6.22	8.38
Uterus	0.21	0.16	0.21	N/A	N/A	N/A

**ATTACHMENT B**  
**POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES (continued)**

Table B-2. POC results, Hp(10), center waist, neutrons, 100 keV to 2 MeV (POC %).

Organ	Female - Hp(10)			Male - Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
Adrenals	11.02	12.96	✓ 17.42	3.21	6.65	✓ 8.81
Brain	5.44	10.39	✓ 11.29	2.15	4.63	✓ 4.98
Breast	✓ 19.19	16	17.26	✓ 23.73	21.17	21.76
Colon (Colon)	✓ 12.57	8.73	11.5	11.01	8.93	✓ 11.42
Colon (Rectum)	✓ 7.78	5.32	7.08	3.47	2.77	✓ 3.61
Endost-BS	17.23	19.44	✓ 22.72	7.93	9.97	✓ 11.62
ET	6.97	8.02	✓ 10.32	4.07	4.61	✓ 5.58
Eye lens	✓ 26.34	23.08	25.6	✓ 15.84	14.04	15.65
GB-wall	✓ 18.95	14.39	18.66	14.54	12.35	✓ 15.75
Kidneys	12.05	14.32	✓ 19.35	3.71	6.76	✓ 9.21
Liver	22.78	18.73	✓ 23.79	25.66	23.37	✓ 28.61
Lungs	31.38	31.73	✓ 37.19	15.22	14.08	✓ 16.7
Lymph	5.76	4.67	✓ 5.93	5.95	4.99	✓ 6.21
Muscle	16.44	17.77	✓ 21.56	8.15	9.62	✓ 11.48
Oesophagus	15.69	13.33	✓ 16.93	9.35	8.09	✓ 10.4
O-mucosa	9.35	9.8	✓ 12.64	4.42	4.68	✓ 5.61
Ovaries	6.79	5.71	✓ 7.31	N/A	N/A	N/A
Pancreas	✓ 7.82	5.31	7.43	2.98	2.26	✓ 3.04
Prostate	N/A	N/A	N/A	✓ 4.69	3.41	4.49
Remainder	15.12	13.37	✓ 16.99	7.35	6.92	✓ 8.73
R-marrow (ALL)	26.11	27.51	✓ 32.37	25.5	28.5	✓ 33.57
R-marrow (AML)	66.64	68.23	✓ 73.02	65.43	68.8	✓ 73.65
R-marrow (CML)	70.77	72.24	✓ 76.63	88.58	90.03	✓ 91.97
R-marrow (L)	69.63	71.11	✓ 75.64	70.91	73.96	✓ 78.26
S-glands	7.14	10.73	✓ 13.82	3.77	5.95	✓ 7.14
SI-wall	✓ 11.33	7.63	10.31	✓ 7.68	5.44	7.23
Spleen	5.68	8.7	✓ 11.29	3.14	5.91	✓ 7.69
St-wall	✓ 34.8	27.57	33.96	✓ 12.54	9.33	11.78
Testes	N/A	N/A	N/A	✓ 9.09	6.83	7.47
Thymus	✓ 11.63	6.74	8.23	✓ 5.83	3.49	4.31
Thyroid	✓ 30.71	20.75	26.26	✓ 29.66	20.77	26.64
UB-wall	✓ 25.27	15.21	18.35	✓ 9.42	5.85	7.67
Uterus	✓ 0.21	0.15	0.19	N/A	N/A	N/A

**ATTACHMENT B**  
**POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES (continued)**

Table B-3. POC results, Hp(10), left chest pocket, neutrons, 100 keV to 2 MeV (POC %).

Organ	Female - Hp(10)			Male - Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
Adrenals	11.03	11.4	15.79	3.21	5.87	8.05
Brain	5.43	9.05	10.1	2.17	4.03	4.57
Breast	19.17	14.19	15.64	23.72	18.9	20.18
Colon (Colon)	12.55	7.71	10.31	11.06	7.83	10.53
Colon (Rectum)	7.77	4.68	6.32	3.49	2.41	3.31
Endost-BS	17.1	17.21	20.79	7.95	8.79	10.66
ET	6.97	7.03	9.33	4.05	4.03	5.09
Eye lens	26.41	20.6	23.43	15.85	12.53	14.44
GB-wall	18.9	12.75	16.92	14.61	10.97	14.64
Kidneys	12.03	12.65	17.58	3.74	5.87	8.38
Liver	22.7	16.58	21.75	25.57	21	26.51
Lungs	31.21	28.93	34.6	15.14	12.4	15.28
Lymph	5.8	4.08	5.29	5.98	4.34	5.71
Muscle	16.37	15.79	19.65	8.16	8.42	10.55
Oesophagus	15.64	11.76	15.27	9.37	7.13	9.56
O-mucosa	9.39	8.64	11.4	4.41	4.07	5.16
Ovaries	6.78	4.94	6.48	N/A	N/A	N/A
Pancreas	7.81	4.64	6.64	2.96	1.97	2.76
Prostate	N/A	N/A	N/A	4.7	2.95	4.11
Remainder	15.21	11.76	15.41	7.33	6.09	8.03
R-marrow (ALL)	26.08	24.72	30.24	25.66	25.8	31.23
R-marrow (AML)	66.61	65	71.03	65.62	65.79	71.53
R-marrow (CML)	70.74	69.24	74.82	88.66	88.74	91.15
R-marrow (L)	69.6	68.05	73.77	71.08	71.24	76.39
S-glands	7.15	9.33	12.55	3.77	5.19	6.52
SI-wall	11.31	6.65	9.16	7.67	4.79	6.65
Spleen	5.62	7.63	10.21	3.13	5.14	7.01
St-wall	34.94	25.04	31.37	12.46	8.15	10.82
Testes	N/A	N/A	N/A	9.04	5.97	6.85
Thymus	11.65	5.94	7.38	5.8	3.02	3.91
Thyroid	30.82	18.46	24.12	29.67	18.61	25
UB-wall	25.4	13.34	16.65	9.44	5.09	7.05
Uterus	0.21	0.13	0.17	N/A	N/A	N/A

**ATTACHMENT B**  
**POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES (continued)**

Table B-4. POC result, Hp(10), left collar, neutrons, 100 keV to 2 MeV (POC %).

Organ	Female - Hp(10)			Male - Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
Adrenals	11.04	14.9	✓ 18.92	3.21	7.24	✓ 9.02
Brain	5.45	11.98	✓ 12.3	2.16	4.99	✓ 5.16
Breast	✓ 19.24	18.33	18.76	✓ 23.75	22.69	22.31
Colon (Colon)	✓ 12.64	10.13	12.53	11.1	9.69	✓ 11.72
Colon (Rectum)	✓ 7.83	6.2	7.75	3.5	3.03	✓ 3.72
Endost-BS	17.12	22.06	✓ 24.58	7.94	10.7	✓ 11.94
ET	6.97	9.31	✓ 11.28	4.07	5	✓ 5.76
Eye lens	26.36	26.11	✓ 27.42	15.86	15.18	✓ 15.93
GB-wall	18.88	16.52	✓ 20.36	14.6	13.32	✓ 16.13
Kidneys	12.06	16.48	✓ 20.99	3.72	7.29	✓ 9.36
Liver	22.58	21.32	✓ 25.71	25.79	25	✓ 28.97
Lungs	31.43	35.73	✓ 39.73	15.24	15.04	✓ 17
Lymph	5.78	5.4	✓ 6.46	5.97	5.38	✓ 6.36
Muscle	16.49	20.37	✓ 23.34	8.15	10.33	✓ 11.77
Oesophagus	15.52	15.28	✓ 18.42	9.33	8.77	✓ 10.67
O-mucosa	9.35	11.36	✓ 13.78	4.42	5.04	✓ 5.82
Ovaries	6.77	6.64	✓ 7.98	N/A	N/A	N/A
Pancreas	7.85	6.21	✓ 8.13	2.96	2.46	✓ 3.14
Prostate	N/A	N/A	N/A	✓ 4.68	3.69	4.61
Remainder	15.24	15.41	✓ 18.57	7.29	7.51	✓ 8.99
R-marrow (ALL)	26.06	30.84	✓ 34.69	25.56	30.25	✓ 34.11
R-marrow (AML)	66.59	71.6	✓ 75.02	65.52	70.58	✓ 74.12
R-marrow (CML)	70.72	75.34	✓ 78.45	88.62	90.77	✓ 92.15
R-marrow (L)	69.58	74.31	✓ 77.51	70.98	75.55	✓ 78.67
S-glands	7.16	12.36	✓ 15.02	3.77	6.41	✓ 7.28
Sl-wall	✓ 11.33	8.85	11.15	✓ 7.71	5.9	7.45
Spleen	5.62	10.04	✓ 12.4	3.12	6.39	✓ 7.91
St-wall	35.02	31.08	✓ 36.35	✓ 12.55	10.01	12.05
Testes	N/A	N/A	N/A	✓ 9.1	7.39	7.75
Thymus	✓ 11.65	7.84	9.03	✓ 5.82	3.78	4.38
Thyroid	✓ 30.73	23.57	28.21	✓ 29.72	22.15	27.29
UB-wall	✓ 25.45	17.39	19.9	✓ 9.43	6.35	7.89
Uterus	✓ 0.21	0.17	✓ 0.21	N/A	N/A	N/A



**ATTACHMENT B  
POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES (continued)**

Table B-5. POC results, *Exposure* and *Hp(10)*, center chest, photons, 30 to 250 keV (POC %).

Organ	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
Adrenals	29.17	46.76	37.97	13.96	23.53	28.72	22.74	38.88	30.61	10.4	18.06	22.56
Brain	15.67	27.15	29.31	7.19	14.37	15.49	11.74	21.05	23	5.23	10.68	11.62
Breast	31.46	30.33	32.84	34.86	34.73	36.48	24.98	24.05	26.28	27.95	28.04	29.46
Colon (Colon)	31.67	27.77	33.39	29.5	28.5	34.05	24.84	21.52	26.38	22.92	22.25	26.89
Colon (Rectum)	23.22	19.98	24.66	11.75	11.23	14.2	17.58	14.99	18.82	8.6	8.28	10.44
Endost-BS	43.44	49.35	54.22	24.23	30.3	34.13	35.1	40.81	45.42	18.27	23.38	26.76
ET	18.7	22.93	28.39	10.83	13.32	15.93	13.85	17.45	22	7.89	9.86	11.96
Eye lens	42.03	41.82	46.17	27.16	28.05	31.61	34.06	33.95	38.25	20.94	21.98	25.04
GB-wall	48.15	45.34	52.96	42.32	42.17	48.73	39.52	36.97	44.5	34.02	33.92	40.37
Kidneys	37.09	42.5	50.21	15.98	24.44	30.46	29.53	34.45	42	12.1	18.71	23.75
Liver	50.74	49.73	56.41	56.92	58.03	63.63	42	41.29	48.08	48.28	49.72	55.49
Lungs	62.55	65.6	70.25	38.68	40.26	44.92	54.05	57.57	62.48	30.82	32.59	36.77
Lymph	17.38	16.98	20.7	17.69	17.47	21.45	13.02	12.62	15.49	13.21	13.07	16.27
Muscle	37.39	42.3	47.38	20.94	25.83	29.55	29.93	34.4	39.38	15.89	19.87	23.09
Oesophagus	42.6	38.28	46.36	27.16	27.46	33.14	34.34	30.61	38.08	20.9	21.42	26.31
O-mucosa	22.23	25.2	31.12	10.63	13.62	15.84	16.9	19.35	24.34	7.76	10.18	11.93
Ovaries	24.12	23.46	28.36	N/A	N/A	N/A	18.38	17.82	22.16	N/A	N/A	N/A
Pancreas	24.39	21.39	27.39	12.3	11.4	14.71	18.64	16.13	21.23	8.97	8.37	10.98
Prostate	N/A	N/A	N/A	16.62	15.47	19.44	N/A	N/A	N/A	12.29	11.55	14.78
Remainder	36.39	37.95	43.15	20.57	22.58	26.78	28.86	30.21	35.21	15.51	17.19	20.88
R-marrow (ALL)	64.41	68.34	73.33	63.39	68.46	73.5	55.84	59.96	65.52	54.8	60.4	65.75
R-marrow (AML)	83.5	85.8	88.52	82.49	85.55	88.31	77.92	80.7	84.15	76.64	80.53	83.91
R-marrow (CML)	86.95	88.82	91.01	95.1	96.06	96.89	82.34	84.67	87.49	93.14	94.48	95.56
R-marrow (L)	84.44	86.64	89.25	84.92	87.63	90.07	79.03	81.73	85.05	79.68	83.19	86.19
S-glands	19.64	26.35	31.78	10.89	14.96	17.82	14.85	20.43	25.31	8.03	11.29	13.42
SI-wall	28.82	25.48	31.11	22.84	20.65	25.67	22.5	19.74	24.58	17.27	15.57	19.93
Spleen	20.13	27.27	32.57	13.58	21.26	25.6	15.31	21.33	25.67	10.05	16.1	19.62
St-wall	63.87	61.58	67.92	35.61	33.09	38.59	55.58	53.22	59.83	28.05	25.88	30.66
Testes	N/A	N/A	N/A	22.67	20.23	22.89	N/A	N/A	N/A	17.19	15.32	17.59
Thymus	27.32	22.71	25.86	14.7	11.99	14.29	20.83	17.17	19.91	10.84	8.96	10.6
Thyroid	56.59	50.99	57.82	56.48	51.3	57.94	48.05	42.18	49.23	47.56	42.64	49.44
UB-wall	48.19	40.46	45.73	26.23	21.65	26.86	39.8	32.81	37.35	20.11	16.57	20.83
Uterus	1.03	0.9	1.21	N/A	N/A	N/A	0.71	0.62	0.82	N/A	N/A	N/A

**ATTACHMENT B  
POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES (continued)**

Table B-6. POC results, *Exposure* and *Hp(10)*, center waist, photons, 30 to 250 keV (POC %).

Organ	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
Adrenals	29.1	46.39	36.38	13.95	22.83	27.25	22.88	38.14	29.31	10.42	17.41	21.29
Brain	15.74	26.57	28.03	7.25	13.87	14.53	11.71	20.52	21.84	5.21	10.3	10.87
Breast	31.43	29.82	31.55	35.05	33.85	34.73	25.01	23.65	24.96	28.03	27.23	27.94
Colon (Colon)	31.63	27.36	31.86	29.48	27.66	32.25	24.77	21.13	24.97	22.92	21.5	25.51
Colon (Rectum)	23.18	19.63	23.37	11.74	10.82	13.22	17.52	14.68	17.69	8.58	7.93	9.79
Endost-BS	43.32	48.64	52.66	24.36	29.39	32.33	35.18	40.14	43.84	18.34	22.7	25.36
ET	18.63	22.43	27.04	10.83	12.88	14.93	13.97	17.11	20.85	7.9	9.52	11.19
Eye lens	41.98	41.2	44.48	27.21	27.36	29.98	34.13	33.4	36.62	21.09	21.13	23.65
GB-wall	48.37	44.66	51.58	42.56	41.1	46.94	39.36	36.3	42.85	34.03	32.99	38.33
Kidneys	37.17	41.8	48.72	16.08	23.55	28.89	29.59	34.02	40.51	12.02	18.09	22.43
Liver	50.63	49.04	54.64	56.78	57.18	61.92	41.98	40.6	46.43	48.27	48.65	53.64
Lungs	62.14	64.93	68.85	38.71	39.35	43.13	54.13	56.86	61.15	30.93	31.86	35.11
Lymph	17.43	16.5	19.79	17.77	16.91	20.3	13.02	12.35	14.75	13.19	12.61	15.18
Muscle	37.45	41.72	45.93	20.9	24.92	28.09	29.81	33.78	37.92	15.89	19.29	21.86
Oesophagus	42.66	37.62	44.68	27.29	26.74	31.73	34.35	29.99	36.48	20.96	20.61	24.97
O-mucosa	22.2	24.67	29.73	10.58	13.1	14.92	16.95	19.09	23.35	7.79	9.83	11.17
Ovaries	24.22	22.96	27.32	N/A	N/A	N/A	18.47	17.5	20.92	N/A	N/A	N/A
Pancreas	24.51	21.11	26.18	12.33	11.03	13.81	18.65	15.83	20.16	8.98	8.08	10.24
Prostate	N/A	N/A	N/A	16.61	15.01	18.46	N/A	N/A	N/A	12.37	11.07	13.83
Remainder	36.29	37.09	41.66	20.44	21.75	25.38	28.85	29.63	33.63	15.51	16.51	19.72
R-marrow (ALL)	64.4	67.41	72.04	63.47	67.66	71.73	55.74	59.22	63.87	54.87	59.32	64.04
R-marrow (AML)	83.49	85.26	87.83	82.55	85.08	87.37	77.84	80.21	83.16	76.69	79.83	82.86
R-marrow (CML)	86.95	88.39	90.46	95.11	95.92	96.61	82.28	84.26	86.69	93.15	94.24	95.23
R-marrow (L)	84.44	86.13	88.59	84.97	87.22	89.24	78.97	81.26	84.11	79.72	82.55	85.26
S-glands	19.68	25.82	30.55	10.91	14.39	16.73	14.81	19.98	24.07	8.07	10.84	12.65
SI-wall	28.87	24.95	29.77	22.89	19.96	24.21	22.51	19.24	23.4	17.37	14.99	18.56
Spleen	20.32	26.73	31.26	13.6	20.56	24.29	15.25	20.84	24.5	9.98	15.54	18.67
St-wall	63.78	61.04	66.36	35.46	32.07	36.81	55.43	52.76	58.6	27.99	25.11	29.25
Testes	N/A	N/A	N/A	22.68	19.65	21.64	N/A	N/A	N/A	17.24	14.83	16.46
Thymus	27.15	22.07	24.64	14.77	11.72	13.38	20.93	16.75	18.89	10.89	8.67	9.83
Thyroid	56.76	50.22	55.94	56.27	50.33	56.18	48.08	41.45	47.26	47.64	41.62	47.55
UB-wall	48.25	40.04	44.28	26.25	21.12	25.44	39.9	32.04	36.04	20.15	15.97	19.63
Uterus	1.03	0.88	1.11	N/A	N/A	N/A	0.71	0.61	0.77	N/A	N/A	N/A

**ATTACHMENT B  
POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES (continued)**

Table B-7. POC results, *Exposure* and *Hp(10)*, left chest pocket, photons, 30 to 250 keV (POC %).

Organ	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
Adrenals	29.28	42.6	33.73	13.98	20.45	25.65	22.78	35	27.06	10.46	15.62	19.86
Brain	15.68	23.81	26	7.21	12.25	13.56	11.71	18.15	20.03	5.19	9.16	9.99
Breast	31.52	26.93	29.26	35.01	30.92	32.92	24.91	20.99	23.07	28.07	24.53	26.39
Colon (Colon)	31.65	24.47	29.48	29.51	25.11	30.58	24.73	18.8	23.07	22.94	19.4	23.87
Colon (Rectum)	23.13	17.29	21.41	11.75	9.61	12.34	17.5	12.87	16.16	8.59	7	9.05
Endost-BS	43.3	45.04	49.99	24.25	26.81	30.7	35.09	36.66	41.37	18.33	20.45	23.71
ET	18.69	19.91	24.82	10.76	11.35	13.96	14.01	15.01	19.11	7.9	8.41	10.4
Eye lens	41.98	37.51	41.88	27.09	24.66	28.36	33.97	30.15	34.19	21.1	19.07	22.09
GB-wall	48.23	40.85	48.64	42.5	37.71	44.61	39.39	32.84	40.02	34.05	29.7	36.14
Kidneys	37.21	38.39	45.88	16.16	21.18	27.15	29.6	30.59	37.86	12.03	16.24	21.02
Liver	50.91	45.36	52.05	57.03	53.98	59.72	42.05	36.84	43.4	48.27	45.22	51.42
Lungs	62.48	61.49	66.46	38.7	36.09	40.97	54.03	52.99	58.46	30.98	28.91	33.1
Lymph	17.59	14.58	17.98	17.72	15.01	18.86	13.02	10.73	13.43	13.19	11.14	14.08
Muscle	37.55	38.14	43.22	20.93	22.42	26.42	29.82	30.53	35.35	15.81	17.21	20.48
Oesophagus	42.62	34.17	41.88	27.23	24.06	29.89	34.22	26.9	34	20.87	18.33	23.21
O-mucosa	22.07	21.97	27.42	10.63	11.65	13.79	16.82	16.75	21.39	7.84	8.66	10.42
Ovaries	24.08	20.43	25.05	N/A	N/A	N/A	18.41	15.36	19.23	N/A	N/A	N/A
Pancreas	24.52	18.44	24.04	12.27	9.73	12.79	18.63	13.83	18.36	8.99	7.07	9.46
Prostate	N/A	N/A	N/A	16.62	13.29	17.17	N/A	N/A	N/A	12.35	9.79	12.71
Remainder	36.38	33.86	38.98	20.58	19.48	23.84	28.89	26.7	31.31	15.53	14.76	18.24
R-marrow (ALL)	64.38	64.23	69.62	63.44	64.5	70.1	55.91	55.44	61.4	54.95	56.05	61.99
R-marrow (AML)	83.47	83.39	86.51	82.52	83.18	86.47	77.97	77.63	81.62	76.74	77.57	81.58
R-marrow (CML)	86.93	86.86	89.4	95.11	95.32	96.34	82.38	82.11	85.42	93.17	93.46	94.82
R-marrow (L)	84.42	84.34	87.33	84.94	85.53	88.45	79.08	78.76	82.62	79.77	80.51	84.12
S-glands	19.63	23.05	28.24	10.9	12.87	15.53	14.9	17.73	22.05	8.07	9.59	11.67
SI-wall	28.88	22.5	27.6	22.83	17.74	22.78	22.58	17.13	21.54	17.33	13.34	17.28
Spleen	20.12	24.14	28.84	13.54	18.49	22.6	15.29	18.53	22.51	10.04	13.84	17.31
St-wall	63.82	57.32	63.96	35.75	29.11	34.8	55.65	48.58	55.71	28.13	22.3	27.45
Testes	N/A	N/A	N/A	22.69	17.65	20.23	N/A	N/A	N/A	17.33	13.08	15.32
Thymus	27.29	19.59	22.65	14.76	10.28	12.4	21	14.62	17.2	10.85	7.57	9.15
Thyroid	56.72	46.17	53.26	56.26	46.72	54.06	47.94	37.78	44.55	47.66	38.32	45.26
UB-wall	48.19	36.34	41.48	26.28	18.86	23.78	39.66	28.91	33.38	20.13	14.13	18.25
Uterus	1.04	0.74	0.99	N/A	N/A	N/A	0.72	0.51	0.68	N/A	N/A	N/A



**ATTACHMENT B  
POC RESULTS FOR CONSEQUENTIAL RADIATION ENERGIES (continued)**

Table B-8. POC results, *Exposure* and *Hp(10)*, left collar, photons, 30 to 250 keV (POC %).

Organ	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
Adrenals	29.29	48.65	38.17	14.05	23.66	27.65	22.77	40.73	30.98	10.41	18.16	21.44
Brain	15.72	28.56	29.7	7.25	14.47	14.77	11.73	22.32	23.32	5.25	10.86	11.1
Breast	31.54	31.97	33.02	34.87	34.98	35.35	24.82	25.57	26.52	27.98	28.1	28.35
Colon (Colon)	31.51	29.26	33.47	29.52	28.75	32.7	24.72	22.86	26.49	22.87	22.24	25.99
Colon (Rectum)	23.08	21.22	24.74	11.76	11.36	13.46	17.49	16.01	18.9	8.56	8.27	10.02
Endost-BS	43.58	51.26	54.54	24.2	30.38	32.81	35.04	42.5	45.68	18.27	23.68	25.66
ET	18.62	24.37	28.43	10.83	13.43	15.18	13.82	18.62	22.27	7.9	9.94	11.38
Eye lens	42.04	43.76	46.29	27.16	28.3	30.5	33.99	35.73	38.43	21.18	22.17	24.05
GB-wall	48.09	47.45	53.42	42.31	42.39	47.31	39.33	38.82	44.81	34	34.26	38.99
Kidneys	37.39	44.04	50.47	16	24.53	29.14	29.56	36.26	42.18	12.04	18.93	22.86
Liver	50.86	51.71	56.61	56.83	58.34	62.38	42.01	43.13	48.34	48.29	49.87	54.03
Lungs	62.37	67.25	70.36	38.59	40.76	43.43	53.98	59.39	62.66	30.91	32.85	35.61
Lymph	17.49	18.12	20.95	17.84	17.72	20.45	13.01	13.41	15.86	13.22	13.12	15.46
Muscle	37.32	44.17	47.77	20.95	25.89	28.34	29.78	36.28	39.58	15.84	20.03	22.14
Oesophagus	42.57	40.07	46.58	27.31	27.77	31.96	34.45	32.23	38.42	20.81	21.37	25.21
O-mucosa	22.25	26.58	31.32	10.54	13.76	15.14	16.86	20.58	24.59	7.8	10.29	11.34
Ovaries	24.16	24.89	28.75	N/A	N/A	N/A	18.32	19.09	22.34	N/A	N/A	N/A
Pancreas	24.43	22.77	27.59	12.28	11.44	14.08	18.65	17.14	21.27	9.01	8.46	10.36
Prostate	N/A	N/A	N/A	16.65	15.69	18.63	N/A	N/A	N/A	12.37	11.67	14.04
Remainder	36.46	39.79	43.44	20.6	22.58	25.74	28.68	31.96	35.35	15.56	17.19	19.89
R-marrow (ALL)	64.48	69.96	73.74	63.57	68.84	72.29	55.83	61.83	65.87	54.84	60.74	64.47
R-marrow (AML)	83.54	86.7	88.72	82.59	85.76	87.66	77.92	81.89	84.35	76.67	80.75	83.12
R-marrow (CML)	86.98	89.55	91.18	95.13	96.12	96.7	82.33	85.65	87.66	93.15	94.55	95.32
R-marrow (L)	84.48	87.51	89.46	85.01	87.82	89.51	79.03	82.89	85.25	79.7	83.38	85.5
S-glands	19.69	27.87	32.19	10.99	15.08	16.98	14.89	21.69	25.5	8.04	11.36	12.87
SI-wall	28.95	26.9	31.28	22.97	20.71	24.6	22.52	20.79	24.83	17.38	15.71	18.98
Spleen	20.29	29.01	32.74	13.6	21.38	24.56	15.32	22.4	25.82	10.04	16.29	18.86
St-wall	63.76	63.46	68.02	35.67	33.23	37.23	55.61	55.08	60.23	28.02	26.04	29.69
Testes	N/A	N/A	N/A	22.76	20.45	22.01	N/A	N/A	N/A	17.25	15.47	16.78
Thymus	27.24	23.87	26.2	14.69	12.29	13.64	20.94	18.29	20.07	10.92	9.03	10.1
Thyroid	56.82	52.7	57.86	56.41	51.46	56.74	48.03	43.98	49.35	47.69	43.01	48.08
UB-wall	48.2	42.38	45.93	26.18	21.81	25.76	39.77	34.42	37.79	20.09	16.65	19.85
Uterus	1.04	0.98	1.22	N/A	N/A	N/A	0.71	0.67	0.84	N/A	N/A	N/A

**ATTACHMENT C  
DOSE RESULTS**

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## ATTACHMENT C DOSE RESULTS (continued)

Table C-1. Adrenals dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.001	0.004	4E-04	9E-05	0.004	0.008	0.002	0.007	7E-04	2E-04	0.007	0.014
Photons, <30 keV	0.02	0.04	0.033	0.011	0.126	0.122	0.065	0.041	0.033	0.011	0.076	0.128
Photons, 30–250 keV	0.584	1.207	0.84	0.506	0.922	1.208	0.425	0.879	0.616	0.367	0.679	0.876
Photons, >250 keV	0.68	1.089	0.942	0.632	0.943	1.05	0.664	1.061	0.922	0.615	0.92	1.023
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.421	1.698	2.415	1.012	1.687	2.375
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.769	0.908	1.32	0.559	0.91	1.265
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.328	0.422	0.621	0.195	0.447	0.62
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.744	0.89	1.101	0.637	0.902	1.087
<b>Center waist</b>												
Photons, 20 keV	0.001	0.004	4E-04	9E-05	0.004	0.007	0.002	0.006	6E-04	2E-04	0.007	0.013
Photons, <30 keV	0.02	0.035	0.029	0.011	0.153	0.116	0.021	0.039	0.029	0.011	0.062	0.11
Photons, 30–250 keV	0.582	1.178	0.79	0.505	0.893	1.12	0.424	0.857	0.58	0.368	0.652	0.812
Photons, >250 keV	0.682	1.106	0.935	0.635	0.947	1.021	0.662	1.072	0.904	0.617	0.923	0.996
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.427	1.567	2.118	1.015	1.577	2.169
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.774	0.842	1.157	0.562	0.85	1.16
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.329	0.392	0.556	0.195	0.419	0.566
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.745	0.879	1.067	0.636	0.88	1.043
<b>Left chest pocket</b>												
Photons, 20 keV	0.001	0.003	3E-04	9E-05	0.003	0.007	0.002	0.005	6E-04	2E-04	0.006	0.012
Photons, <30 keV	0.075	0.03	0.026	0.011	0.115	0.044	0.064	0.034	0.026	0.011	0.075	0.102
Photons, 30–250 keV	0.583	1.016	0.713	0.502	0.781	1.034	0.426	0.747	0.52	0.369	0.573	0.747
Photons, >250 keV	0.68	0.986	0.878	0.631	0.857	0.968	0.663	0.961	0.849	0.618	0.831	0.946
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.428	1.354	1.863	1.013	1.362	1.947
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.769	0.721	1.023	0.562	0.732	1.045
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.33	0.339	0.494	0.194	0.362	0.513
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.742	0.778	0.982	0.637	0.779	0.984
<b>Left collar</b>												
Photons, 20 keV	0.001	0.004	4E-04	9E-05	0.004	0.008	0.002	0.008	7E-04	2E-04	0.007	0.013
Photons, <30 keV	0.13	0.041	0.032	0.011	0.18	0.05	0.015	0.047	0.032	0.011	0.129	0.057
Photons, 30–250 keV	0.585	1.301	0.847	0.506	0.929	1.142	0.428	0.944	0.624	0.369	0.677	0.831
Photons, >250 keV	0.682	1.126	0.966	0.633	0.936	1.015	0.664	1.091	0.94	0.616	0.91	0.982
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.432	1.901	2.314	1.015	1.741	2.185
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.767	1.031	1.287	0.559	0.939	1.17
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.328	0.462	0.616	0.193	0.455	0.581
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.745	0.937	1.1	0.552	0.888	1.033



**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-2. Brain dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.001	0.007	0.007	0.001	0.007	0.004	0.002	0.012	0.012	0.002	0.012	0.008
Photons, <30 keV	0.166	0.021	0.062	0.005	0.021	0.018	0.075	0.03	0.066	0.006	0.028	0.021
Photons, 30–250 keV	0.618	1.167	1.298	0.591	1.211	1.314	0.45	0.85	0.945	0.435	0.886	0.96
Photons, >250 keV	0.745	1.093	1.125	0.734	1.132	1.167	0.725	1.064	1.096	0.714	1.099	1.14
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.755	1.501	1.843	0.737	1.701	2
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.415	0.857	1.032	0.412	0.963	1.118
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.366	0.797	0.916	0.327	0.782	0.874
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.753	1.219	1.291	0.73	1.249	1.299
<b>Center waist</b>												
Photons, 20 keV	0.001	0.006	0.006	0.001	0.006	0.004	0.002	0.011	0.01	0.002	0.011	0.007
Photons, <30 keV	0.115	0.019	0.054	0.006	0.017	0.016	0.08	0.027	0.059	0.006	0.023	0.021
Photons, 30–250 keV	0.616	1.136	1.223	0.593	1.163	1.228	0.449	0.834	0.892	0.433	0.843	0.893
Photons, >250 keV	0.747	1.108	1.108	0.734	1.123	1.14	0.725	1.08	1.076	0.71	1.104	1.108
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.756	1.38	1.61	0.735	1.594	1.825
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.415	0.795	0.91	0.411	0.9	1.02
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.367	0.746	0.823	0.328	0.733	0.792
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.755	1.209	1.246	0.731	1.225	1.251
<b>Left chest pocket</b>												
Photons, 20 keV	0.001	0.005	0.005	0.001	0.005	0.004	0.002	0.009	0.009	0.002	0.009	0.006
Photons, <30 keV	0.159	0.016	0.045	0.006	0.014	0.014	0.123	0.023	0.053	0.007	0.022	0.016
Photons, 30–250 keV	0.613	0.988	1.11	0.59	1.022	1.123	0.448	0.716	0.8	0.432	0.742	0.823
Photons, >250 keV	0.745	0.994	1.036	0.734	1.027	1.079	0.723	0.962	1.008	0.716	0.995	1.051
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.753	1.191	1.419	0.733	1.383	1.644
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.417	0.682	0.793	0.412	0.775	0.916
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.367	0.65	0.732	0.329	0.637	0.724
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.753	1.068	1.149	0.734	1.09	1.181
<b>Left collar</b>												
Photons, 20 keV	0.001	0.008	0.006	0.001	0.007	0.004	0.002	0.013	0.011	0.002	0.012	0.007
Photons, <30 keV	0.025	0.024	0.056	0.006	0.02	0.016	0.113	0.031	0.064	0.007	0.029	0.022
Photons, 30–250 keV	0.613	1.26	1.318	0.592	1.22	1.244	0.45	0.911	0.961	0.433	0.891	0.912
Photons, >250 keV	0.746	1.124	1.152	0.74	1.129	1.13	0.728	1.1	1.119	0.714	1.094	1.104
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.752	1.674	1.774	0.734	1.767	1.84
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.417	0.959	1.008	0.411	0.983	1.035
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.368	0.882	0.915	0.328	0.799	0.811
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.755	1.278	1.284	0.733	1.244	1.246

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-3. Breast dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.407	0.299	0.358	✓ 0.503	0.403	0.428	✓ 0.718	0.526	0.629	✓ 0.88	0.708	0.75
Photons, <30 keV	✓ 0.427	0.303	0.369	✓ 0.536	0.409	0.443	✓ 1.265	0.864	1.037	✓ 1.61	1.154	1.293
Photons, 30–250 keV	1.214	1.146	✓ 1.277	1.222	1.207	✓ 1.298	0.888	0.841	✓ 0.934	0.89	0.881	✓ 0.951
Photons, >250 keV	0.969	1.07	✓ 1.118	0.96	1.069	✓ 1.148	0.947	1.045	✓ 1.091	0.929	1.04	✓ 1.119
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.571	1.194	✓ 1.592	✓ 1.525	1.159	1.485
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.39	1.055	1.35	✓ 1.59	1.22	1.446
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.356	1.143	1.31	✓ 1.461	1.346	1.438
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.263	1.294	✓ 1.35	1.273	1.353	✓ 1.382
<b>Center waist</b>												
Photons, 20 keV	✓ 0.41	0.276	0.312	✓ 0.502	0.377	0.389	✓ 0.716	0.488	0.547	✓ 0.884	0.657	0.682
Photons, <30 keV	✓ 0.428	0.284	0.319	✓ 0.535	0.469	0.404	✓ 1.259	0.793	0.911	✓ 1.624	1.077	1.166
Photons, 30–250 keV	✓ 1.207	1.121	1.195	✓ 1.227	1.164	1.212	✓ 0.886	0.817	0.875	✓ 0.894	0.849	0.885
Photons, >250 keV	0.974	1.087	✓ 1.1	0.958	1.072	✓ 1.114	0.945	1.065	✓ 1.074	0.93	1.045	✓ 1.08
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.57	1.091	1.39	✓ 1.531	1.085	1.358
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.393	0.976	1.177	✓ 1.592	1.14	1.309
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.346	1.072	1.177	✓ 1.466	1.257	1.307
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.264	1.27	✓ 1.308	1.268	1.314	✓ 1.327
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.409	0.238	0.274	✓ 0.499	0.325	0.349	✓ 0.715	0.418	0.485	✓ 0.881	0.57	0.613
Photons, <30 keV	✓ 0.431	0.243	0.284	✓ 0.538	0.332	0.366	✓ 1.249	0.687	0.798	✓ 1.614	0.93	1.043
Photons, 30–250 keV	✓ 1.215	0.969	1.086	✓ 1.224	1.028	1.115	✓ 0.881	0.712	0.791	✓ 0.893	0.746	0.813
Photons, >250 keV	0.97	0.965	✓ 1.035	0.958	0.973	✓ 1.058	0.947	0.938	✓ 1.006	0.929	0.948	✓ 1.029
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.57	0.945	1.222	✓ 1.528	0.939	1.236
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.398	0.829	1.035	✓ 1.59	0.983	1.185
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.356	0.926	1.046	✓ 1.47	1.085	1.181
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.256	1.131	1.208	✓ 1.265	1.171	1.25
<b>Left collar</b>												
Photons, 20 keV	✓ 0.409	0.333	0.35	✓ 0.501	0.409	0.396	✓ 0.718	0.586	0.61	✓ 0.883	0.72	0.695
Photons, <30 keV	✓ 0.435	0.34	0.359	✓ 0.534	0.512	0.412	✓ 1.254	0.967	1.015	✓ 1.622	1.188	1.197
Photons, 30–250 keV	1.214	1.222	✓ 1.291	1.222	1.215	✓ 1.238	0.888	0.902	✓ 0.94	0.891	0.893	✓ 0.895
Photons, >250 keV	0.97	1.095	✓ 1.143	0.955	1.066	✓ 1.109	0.945	1.075	✓ 1.109	0.935	1.036	✓ 1.076
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.57	1.327	1.533	✓ 1.527	1.195	1.371
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.394	1.18	1.315	✓ 1.59	1.26	1.33
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.355	1.273	1.304	✓ 1.464	1.374	1.345
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.262	1.347	✓ 1.35	1.264	✓ 1.344	1.314

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-4. Colon (colon) dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.097	0.038	0.06	✓ 0.051	0.028	0.042	✓ 0.17	0.066	0.106	✓ 0.089	0.05	0.074
Photons, <30 keV	✓ 0.122	0.058	0.083	✓ 0.072	0.047	0.068	✓ 0.349	0.173	0.247	0.222	0.154	✓ 0.247
Photons, 30–250 keV	1.157	1.013	✓ 1.436	1.205	1.046	✓ 1.34	0.842	0.813	✓ 1.035	0.864	0.84	✓ 1.069
Photons, >250 keV	0.936	0.942	✓ 1.047	0.888	0.966	✓ 1.082	0.909	0.913	✓ 1.015	0.866	0.938	✓ 1.055
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.145	1.681	✓ 2.358	1.929	1.72	✓ 2.317
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.156	0.914	✓ 1.302	1.041	0.94	✓ 1.285
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.736	0.523	✓ 0.74	0.642	0.541	✓ 0.734
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.046	0.949	✓ 1.137	0.98	0.987	✓ 1.159
<b>Center waist</b>												
Photons, 20 keV	✓ 0.097	0.035	0.052	✓ 0.05	0.027	0.038	✓ 0.17	0.062	0.092	✓ 0.088	0.047	0.067
Photons, <30 keV	✓ 0.121	0.053	0.076	✓ 0.071	0.046	0.062	✓ 0.336	0.169	0.226	✓ 0.216	0.157	0.211
Photons, 30–250 keV	1.149	0.986	✓ 1.341	1.206	1.007	✓ 1.241	0.84	0.79	✓ 0.971	0.759	0.736	✓ 0.995
Photons, >250 keV	0.936	0.953	✓ 1.032	0.888	0.963	✓ 1.052	0.912	0.923	✓ 1.004	0.866	0.941	✓ 1.018
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.142	1.542	2.062	1.934	1.605	✓ 2.117
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.16	0.845	1.134	1.045	0.884	✓ 1.16
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.74	0.487	0.661	0.639	0.508	✓ 0.668
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.053	0.932	✓ 1.095	0.98	0.961	✓ 1.108
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.097	0.03	0.046	✓ 0.051	0.023	0.035	✓ 0.171	0.053	0.081	✓ 0.088	0.04	0.061
Photons, <30 keV	✓ 0.118	0.045	0.066	✓ 0.072	0.039	0.056	✓ 0.349	0.064	0.211	✓ 0.222	0.132	0.19
Photons, 30–250 keV	✓ 1.155	0.855	1.099	✓ 1.21	0.881	1.149	0.842	0.689	✓ 0.875	0.756	0.711	✓ 0.921
Photons, >250 keV	0.934	0.849	✓ 0.969	0.89	0.875	✓ 0.993	0.907	0.826	✓ 0.94	0.868	0.852	✓ 0.967
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.137	1.332	1.819	✓ 1.918	1.392	✓ 1.914
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.157	0.723	0.996	1.046	0.762	✓ 1.055
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.74	0.427	0.584	✓ 0.641	0.439	0.609
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.045	0.819	1.012	0.978	0.859	✓ 1.045
<b>Left collar</b>												
Photons, 20 keV	✓ 0.096	0.042	0.059	✓ 0.05	0.029	0.039	✓ 0.171	0.073	0.103	✓ 0.088	0.051	0.068
Photons, <30 keV	✓ 0.12	0.063	0.083	✓ 0.073	0.049	0.064	✓ 0.358	0.192	0.124	0.216	0.177	✓ 0.23
Photons, 30–250 keV	1.148	1.2	✓ 1.322	1.204	1.06	✓ 1.274	0.838	0.87	✓ 1.048	0.757	0.842	✓ 1.014
Photons, >250 keV	0.931	0.971	✓ 1.074	0.894	0.96	✓ 1.045	0.913	0.941	✓ 1.036	0.867	0.932	✓ 1.017
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.142	1.871	✓ 2.283	1.932	1.766	✓ 2.13
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.158	1.033	✓ 1.267	1.05	0.969	✓ 1.187
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.741	0.578	0.731	0.644	0.554	✓ 0.684
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.049	0.985	✓ 1.13	0.975	0.973	✓ 1.097

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-5. Colon (rectum) dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.097	0.038	0.06	✓ 0.051	0.028	0.042	✓ 0.17	0.066	0.106	✓ 0.089	0.05	0.074
Photons, <30 keV	✓ 0.122	0.058	0.083	✓ 0.072	0.047	0.068	✓ 0.349	0.173	0.247	0.222	0.154	✓ 0.247
Photons, 30–250 keV	1.157	1.013	✓ 1.436	1.205	1.046	✓ 1.34	0.842	0.813	✓ 1.035	0.864	0.84	✓ 1.069
Photons, >250 keV	0.936	0.942	✓ 1.047	0.888	0.966	✓ 1.082	0.909	0.913	✓ 1.015	0.866	0.938	✓ 1.055
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.145	1.681	✓ 2.358	1.929	1.72	✓ 2.317
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.156	0.914	✓ 1.302	1.041	0.94	✓ 1.285
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.736	0.523	✓ 0.74	0.642	0.541	✓ 0.734
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.046	0.949	✓ 1.137	0.98	0.987	✓ 1.159
<b>Center waist</b>												
Photons, 20 keV	✓ 0.097	0.035	0.052	✓ 0.05	0.027	0.038	✓ 0.17	0.062	0.092	✓ 0.088	0.047	0.067
Photons, <30 keV	✓ 0.121	0.053	0.076	✓ 0.071	0.046	0.062	✓ 0.336	0.169	0.226	✓ 0.216	0.157	0.211
Photons, 30–250 keV	1.149	0.986	✓ 1.341	1.206	1.007	✓ 1.241	0.84	0.79	✓ 0.971	0.759	0.736	✓ 0.995
Photons, >250 keV	0.936	0.953	✓ 1.032	0.888	0.963	✓ 1.052	0.912	0.923	✓ 1.004	0.866	0.941	✓ 1.018
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.142	1.542	2.062	1.934	1.605	✓ 2.117
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.16	0.845	1.134	1.045	0.884	✓ 1.16
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.74	0.487	0.661	0.639	0.508	✓ 0.668
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.053	0.932	✓ 1.095	0.98	0.961	✓ 1.108
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.097	0.03	0.046	✓ 0.051	0.023	0.035	✓ 0.171	0.053	0.081	✓ 0.088	0.04	0.061
Photons, <30 keV	✓ 0.118	0.045	0.066	✓ 0.072	0.039	0.056	✓ 0.349	0.064	0.211	✓ 0.222	0.132	0.19
Photons, 30–250 keV	✓ 1.155	0.855	1.099	✓ 1.21	0.881	1.149	0.842	0.689	✓ 0.875	0.756	0.711	✓ 0.921
Photons, >250 keV	0.934	0.849	✓ 0.969	0.89	0.875	✓ 0.993	0.907	0.826	✓ 0.94	0.868	0.852	✓ 0.967
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.137	1.332	1.819	✓ 1.918	1.392	✓ 1.914
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.157	0.723	0.996	1.046	0.762	✓ 1.055
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.74	0.427	0.584	✓ 0.641	0.439	0.609
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.045	0.819	1.012	0.978	0.859	✓ 1.045
<b>Left collar</b>												
Photons, 20 keV	✓ 0.096	0.042	0.059	✓ 0.05	0.029	0.039	✓ 0.171	0.073	0.103	✓ 0.088	0.051	0.068
Photons, <30 keV	✓ 0.12	0.063	0.083	✓ 0.073	0.049	0.064	✓ 0.358	0.192	0.124	0.216	0.177	✓ 0.23
Photons, 30–250 keV	1.148	1.2	✓ 1.322	1.204	1.06	✓ 1.274	0.838	0.87	✓ 1.048	0.757	0.842	✓ 1.014
Photons, >250 keV	0.931	0.971	✓ 1.074	0.894	0.96	✓ 1.045	0.913	0.941	✓ 1.036	0.867	0.932	✓ 1.017
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.142	1.871	✓ 2.283	1.932	1.766	✓ 2.13
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.158	1.033	✓ 1.267	1.05	0.969	✓ 1.187
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.741	0.578	0.731	0.644	0.554	✓ 0.684
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.049	0.985	✓ 1.13	0.975	0.973	✓ 1.097

## ATTACHMENT C DOSE RESULTS (continued)

Table C-6. Endost-BS dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.039	0.064	0.069	0.032	0.059	0.054	0.069	0.113	0.12	0.056	0.105	0.095
Photons, <30 keV	0.064	0.289	0.112	0.052	0.212	0.088	0.205	0.059	0.334	0.156	0.059	0.237
Photons, 30–250 keV	1.027	1.289	1.562	0.969	1.297	1.529	0.747	0.936	1.137	0.701	0.947	1.109
Photons, >250 keV	0.857	1.045	1.116	0.838	1.081	1.162	0.834	1.015	1.083	0.82	1.05	1.123
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.212	1.401	1.893	1.166	1.479	1.904
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.691	0.815	1.098	0.686	0.881	1.122
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.559	0.695	0.884	0.54	0.732	0.899
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.862	1.048	1.18	0.845	1.113	1.222
<b>Center waist</b>												
Photons, 20 keV	0.039	0.059	0.06	0.032	0.055	0.049	0.069	0.104	0.105	0.056	0.097	0.087
Photons, <30 keV	0.067	0.243	0.097	0.051	0.211	0.079	0.231	0.151	0.289	0.174	0.137	0.214
Photons, 30–250 keV	1.018	1.259	1.465	0.964	1.257	1.414	0.744	0.919	1.065	0.702	0.907	1.034
Photons, >250 keV	0.855	1.052	1.096	0.844	1.081	1.124	0.83	1.027	1.068	0.818	1.051	1.1
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.219	1.281	1.661	1.172	1.378	1.736
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.693	0.752	0.961	0.687	0.825	1.034
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.557	0.645	0.795	0.544	0.686	0.821
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.858	1.033	1.137	0.846	1.086	1.171
<b>Left chest pocket</b>												
Photons, 20 keV	0.039	0.051	0.053	0.032	0.048	0.044	0.069	0.09	0.092	0.056	0.084	0.077
Photons, <30 keV	0.063	0.184	0.083	0.052	0.161	0.086	0.191	0.103	0.247	0.153	0.128	0.228
Photons, 30–250 keV	1.023	1.087	1.314	1.124	1.094	1.31	0.749	0.797	0.954	0.702	0.795	0.957
Photons, >250 keV	0.855	0.937	1.027	0.845	0.98	1.072	0.83	0.91	1.003	0.817	0.954	1.042
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.215	1.11	1.451	1.167	1.195	1.574
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.693	0.646	0.85	0.685	0.716	0.928
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.556	0.559	0.704	0.543	0.6	0.746
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.865	0.911	1.047	0.851	0.964	1.106
<b>Left collar</b>												
Photons, 20 keV	0.039	0.072	0.067	0.032	0.061	0.05	0.069	0.126	0.117	0.056	0.107	0.087
Photons, <30 keV	0.066	0.276	0.105	0.049	0.202	0.08	0.199	0.055	0.334	0.135	0.088	0.242
Photons, 30–250 keV	1.02	1.388	1.572	0.961	1.309	1.451	0.746	1.007	1.142	0.701	0.954	1.062
Photons, >250 keV	0.855	1.069	1.141	0.838	1.071	1.121	0.832	1.042	1.112	0.816	1.044	1.089
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.21	1.557	1.828	1.167	1.514	1.748
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.692	0.914	1.073	0.688	0.907	1.045
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.559	0.765	0.879	0.543	0.747	0.844
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.867	1.096	1.178	0.848	1.093	1.165

## ATTACHMENT C DOSE RESULTS (continued)

Table C-7. ET dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.082	0.094	✔ 0.112	0.148	0.164	✔ 0.187	0.144	0.165	✔ 0.197	0.261	0.289	✔ 0.327
Photons, <30 keV	0.144	0.126	✔ 0.19	0.193	0.169	✔ 0.243	0.148	0.216	✔ 0.222	0.338	✔ 0.454	0.439
Photons, 30–250 keV	0.864	1.099	✔ 1.429	0.934	1.223	✔ 1.636	0.691	0.885	✔ 1.147	0.686	0.981	✔ 1.193
Photons, >250 keV	0.845	1.059	✔ 1.184	0.89	1.124	✔ 1.244	0.82	1.035	✔ 1.15	0.87	1.094	✔ 1.211
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.315	1.552	✔ 2.108	1.263	1.47	✔ 1.934
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.73	0.899	✔ 1.214	0.831	1.005	✔ 1.282
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.613	0.761	✔ 1.043	0.766	0.92	✔ 1.161
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.916	1.163	✔ 1.393	0.976	1.253	✔ 1.432
<b>Center waist</b>												
Photons, 20 keV	0.081	0.087	✔ 0.098	0.149	0.153	✔ 0.169	0.143	0.153	✔ 0.171	0.261	0.269	✔ 0.297
Photons, <30 keV	0.14	0.124	✔ 0.192	0.193	0.156	✔ 0.225	0.147	✔ 0.199	0.194	0.338	✔ 0.428	0.403
Photons, 30–250 keV	0.863	1.074	✔ 1.345	0.939	1.299	✔ 1.523	0.697	0.862	✔ 1.091	0.685	0.943	✔ 1.108
Photons, >250 keV	0.844	1.077	✔ 1.171	0.889	1.119	✔ 1.21	0.82	1.043	✔ 1.136	0.867	1.094	✔ 1.174
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.312	1.421	✔ 1.839	1.261	1.37	✔ 1.753
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.735	0.829	✔ 1.062	0.832	0.946	✔ 1.159
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.613	0.711	✔ 0.941	0.763	0.864	✔ 1.052
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.909	1.156	✔ 1.35	0.979	1.23	✔ 1.361
<b>Left chest pocket</b>												
Photons, 20 keV	0.082	0.075	✔ 0.086	0.148	0.132	✔ 0.151	0.144	0.131	✔ 0.151	0.259	0.233	✔ 0.268
Photons, <30 keV	0.153	0.101	✔ 0.156	0.194	0.179	✔ 0.2	0.149	0.171	✔ 0.172	0.339	✔ 0.369	0.362
Photons, 30–250 keV	0.853	0.929	✔ 1.215	0.939	1.138	✔ 1.275	0.691	0.746	✔ 0.982	0.678	0.828	✔ 1.031
Photons, >250 keV	0.842	0.957	✔ 1.101	0.89	1.021	✔ 1.149	0.817	0.935	✔ 1.066	0.864	0.995	✔ 1.116
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.32	1.228	✔ 1.618	1.26	1.188	✔ 1.587
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.738	0.716	✔ 0.936	0.84	0.812	✔ 1.051
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.61	0.616	✔ 0.834	0.764	0.745	✔ 0.959
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.914	1.017	✔ 1.246	0.982	1.092	✔ 1.283
<b>Left collar</b>												
Photons, 20 keV	0.081	0.105	✔ 0.109	0.148	0.168	✔ 0.173	0.143	0.183	✔ 0.192	0.261	0.293	✔ 0.302
Photons, <30 keV	0.147	✔ 0.169	0.143	0.19	✔ 0.227	0.224	0.149	✔ 0.239	0.217	0.337	✔ 0.465	0.408
Photons, 30–250 keV	0.952	1.182	✔ 1.593	0.928	1.358	✔ 1.555	0.694	0.95	✔ 1.165	0.683	0.993	✔ 1.139
Photons, >250 keV	0.842	1.094	✔ 1.212	0.887	1.121	✔ 1.202	0.819	1.061	✔ 1.183	0.866	1.086	✔ 1.169
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.315	1.739	✔ 2.027	1.258	1.507	✔ 1.777
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.734	1.01	✔ 1.19	0.833	1.034	✔ 1.184
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.616	0.839	✔ 1.036	0.766	0.935	✔ 1.082
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.911	1.218	✔ 1.399	0.981	1.239	✔ 1.359



## ATTACHMENT C DOSE RESULTS (continued)

Table C-8. Eye lens dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✔ 0.734	0.437	0.686	✔ 0.734	0.448	0.676	✔ 1.293	0.769	1.2	✔ 1.294	0.79	1.194
Photons, <30 keV	✔ 0.818	0.496	0.722	✔ 0.82	0.509	0.716	✔ 2.597	1.726	2.125	✔ 2.621	1.558	2.1
Photons, 30–250 keV	1.211	1.207	✔ 1.435	1.204	1.263	✔ 1.495	0.878	0.877	✔ 1.046	0.883	0.923	✔ 1.088
Photons, >250 keV	0.872	1.093	✔ 1.117	0.874	1.138	✔ 1.18	0.849	1.052	✔ 1.085	0.85	1.106	✔ 1.15
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.152	1.209	✔ 1.319	1.152	1.227	✔ 1.289
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 1.405	1.136	1.401	✔ 1.397	1.167	1.392
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.282	1.137	✔ 1.364	1.283	1.184	✔ 1.389
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.12	1.264	✔ 1.323	1.12	1.332	✔ 1.376
<b>Center waist</b>												
Photons, 20 keV	✔ 0.733	0.408	0.597	✔ 0.735	0.419	0.613	✔ 1.299	0.709	1.047	✔ 1.29	0.734	1.084
Photons, <30 keV	✔ 0.814	0.462	0.636	✔ 0.819	0.474	0.649	✔ 2.563	1.408	1.856	✔ 2.584	1.447	1.893
Photons, 30–250 keV	1.214	1.171	✔ 1.342	1.21	1.214	✔ 1.393	0.884	0.854	✔ 0.978	0.886	0.888	✔ 1.013
Photons, >250 keV	0.872	✔ 1.098	✔ 1.098	0.873	1.135	✔ 1.148	0.849	1.065	✔ 1.07	0.851	1.107	✔ 1.116
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.151	1.104	✔ 1.157	1.158	1.144	✔ 1.178
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 1.393	1.053	1.235	✔ 1.401	1.091	1.264
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 1.282	1.064	1.23	✔ 1.286	1.107	1.26
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.122	1.252	✔ 1.283	1.119	1.314	✔ 1.32
<b>Left chest pocket</b>												
Photons, 20 keV	✔ 0.734	0.349	0.522	✔ 0.736	0.363	0.55	✔ 1.292	0.613	0.926	✔ 1.293	0.637	0.968
Photons, <30 keV	✔ 0.819	0.395	0.561	✔ 0.821	0.503	0.592	✔ 2.582	1.204	1.636	✔ 2.588	1.251	1.733
Photons, 30–250 keV	✔ 1.213	1.01	1.21	1.204	1.065	✔ 1.274	✔ 0.886	0.743	0.877	0.88	0.781	✔ 0.923
Photons, >250 keV	0.874	0.978	✔ 1.034	0.87	1.029	✔ 1.085	0.85	0.954	✔ 1.002	0.85	1.001	✔ 1.061
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 1.157	0.957	1.016	✔ 1.158	0.992	1.066
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 1.397	0.91	1.084	✔ 1.398	0.939	1.146
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 1.283	0.921	1.086	✔ 1.287	0.96	1.144
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.121	1.106	✔ 1.181	1.119	1.161	✔ 1.244
<b>Left collar</b>												
Photons, 20 keV	✔ 0.738	0.49	0.669	✔ 0.734	0.459	0.625	✔ 1.289	0.855	1.168	✔ 1.29	0.81	1.093
Photons, <30 keV	✔ 0.826	0.555	0.7	✔ 0.819	0.521	0.66	✔ 2.594	1.682	2.066	✔ 2.583	1.604	1.924
Photons, 30–250 keV	1.211	1.292	✔ 1.448	1.209	1.274	✔ 1.415	0.884	0.941	✔ 1.051	0.886	0.934	✔ 1.034
Photons, >250 keV	0.876	1.117	✔ 1.149	0.878	1.125	✔ 1.14	0.849	1.09	✔ 1.113	0.854	1.096	✔ 1.111
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.154	✔ 1.346	1.275	1.16	✔ 1.262	1.189
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 1.404	1.275	1.374	✔ 1.398	1.201	1.286
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.289	1.261	✔ 1.366	1.285	1.212	✔ 1.295
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.116	✔ 1.323	✔ 1.321	1.121	✔ 1.328	1.305

## ATTACHMENT C DOSE RESULTS (continued)

Table C-9. GB-wall dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.01	0.004	0.005	✓ 0.006	0.004	0.006	✓ 0.017	0.007	0.009	✓ 0.01	0.007	0.01
Photons, <30 keV	0.063	✓ 0.08	0.044	0.044	✓ 0.161	0.044	0.072	✓ 0.073	0.049	0.049	0.072	✓ 0.107
Photons, 30–250 keV	1.019	0.92	✓ 1.221	0.947	0.941	✓ 1.196	0.739	0.669	✓ 0.886	0.685	0.68	✓ 0.874
Photons, >250 keV	0.868	0.924	✓ 1.041	0.818	0.911	✓ 1.046	0.844	0.896	✓ 1.011	0.792	0.883	✓ 1.012
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.049	1.695	✓ 2.414	1.907	1.614	✓ 2.254
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.098	0.909	✓ 1.284	1.026	0.918	✓ 1.231
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.559	0.43	✓ 0.62	0.489	0.434	✓ 0.587
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.942	0.894	✓ 1.103	0.874	0.905	✓ 1.078
<b>Center waist</b>												
Photons, 20 keV	✓ 0.01	0.003	0.005	✓ 0.006	0.004	0.005	✓ 0.017	0.006	0.008	✓ 0.01	0.007	0.009
Photons, <30 keV	✓ 0.062	0.029	0.038	0.044	0.068	✓ 0.102	0.073	✓ 0.116	0.044	0.049	0.064	✓ 0.102
Photons, 30–250 keV	1.019	0.897	✓ 1.152	0.955	0.902	✓ 1.111	0.74	0.654	✓ 0.836	0.683	0.656	✓ 0.812
Photons, >250 keV	0.873	0.929	✓ 1.028	0.815	0.912	✓ 1.018	0.841	0.907	✓ 0.997	0.791	0.883	✓ 0.985
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.042	1.549	✓ 2.093	1.905	1.511	✓ 2.061
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.097	0.845	✓ 1.127	1.019	0.847	✓ 1.129
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.556	0.403	✓ 0.557	0.487	0.404	✓ 0.534
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.944	0.889	✓ 1.065	0.873	0.886	✓ 1.034
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.01	0.003	0.004	✓ 0.006	0.003	0.005	✓ 0.017	0.005	0.007	✓ 0.01	0.006	0.008
Photons, <30 keV	0.063	✓ 0.138	0.035	0.044	0.1	✓ 0.175	0.073	✓ 0.102	0.038	0.048	0.058	✓ 0.089
Photons, 30–250 keV	1.019	0.773	✓ 1.041	0.942	0.795	✓ 1.033	0.739	0.565	✓ 0.749	0.685	0.577	✓ 0.749
Photons, >250 keV	0.868	0.832	✓ 0.958	0.816	0.826	✓ 0.966	0.841	0.81	✓ 0.931	0.791	0.802	✓ 0.938
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.038	1.339	1.846	✓ 1.914	1.312	1.869
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.095	0.722	0.991	✓ 1.03	0.735	1.019
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.563	0.35	0.493	✓ 0.486	0.349	✓ 0.486
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.937	0.787	✓ 0.983	0.875	0.787	✓ 0.975
<b>Left collar</b>												
Photons, 20 keV	✓ 0.01	0.004	0.005	✓ 0.006	0.004	0.005	✓ 0.017	0.007	0.009	✓ 0.01	0.007	0.009
Photons, <30 keV	0.063	✓ 0.159	0.044	0.044	✓ 0.132	0.043	0.072	✓ 0.083	0.049	0.049	✓ 0.119	0.105
Photons, 30–250 keV	1.017	0.979	✓ 1.234	0.946	0.944	✓ 1.143	0.737	0.718	✓ 0.901	0.686	0.691	✓ 0.824
Photons, >250 keV	0.873	0.948	✓ 1.061	0.817	0.905	✓ 1.005	0.847	0.923	✓ 1.031	0.794	0.88	✓ 0.98
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.041	1.882	✓ 2.317	1.899	1.665	✓ 2.088
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.102	1.017	✓ 1.259	1.026	0.934	✓ 1.148
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.562	0.478	✓ 0.612	0.487	0.441	✓ 0.551
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.941	0.939	✓ 1.096	0.877	0.896	✓ 1.025

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-10. Kidneys dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.002	0.01	✓ 0.017	3E-04	0.006	✓ 0.012	0.004	0.017	✓ 0.03	6E-04	0.011	✓ 0.02
Photons, <30 keV	0.029	0.057	✓ 0.091	0.009	0.046	✓ 0.075	0.032	✓ 0.127	0.105	0.01	0.05	✓ 0.081
Photons, 30–250 keV	0.794	0.979	✓ 1.328	0.59	0.975	✓ 1.3	0.577	0.706	✓ 0.966	0.426	0.71	✓ 0.944
Photons, >250 keV	0.778	0.927	✓ 1.063	0.66	0.923	✓ 1.07	0.754	0.896	✓ 1.034	0.64	0.902	✓ 1.045
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.446	1.72	✓ 2.475	1.105	1.729	✓ 2.392
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.783	0.915	✓ 1.333	0.6	0.951	✓ 1.307
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.347	0.455	✓ 0.686	0.224	0.445	✓ 0.648
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.773	0.899	✓ 1.14	0.594	0.908	✓ 1.112
<b>Center waist</b>												
Photons, 20 keV	0.002	0.009	✓ 0.015	3E-04	0.006	✓ 0.011	0.004	0.015	✓ 0.026	6E-04	0.01	✓ 0.019
Photons, <30 keV	0.029	0.053	✓ 0.082	0.009	0.042	✓ 0.066	0.032	0.058	✓ 0.181	0.01	0.047	✓ 0.075
Photons, 30–250 keV	0.793	0.954	✓ 1.256	0.584	0.936	✓ 1.217	0.575	0.695	✓ 0.903	0.432	0.682	✓ 0.878
Photons, >250 keV	0.776	0.933	✓ 1.051	0.658	0.926	✓ 1.037	0.751	0.907	✓ 1.025	0.643	0.904	✓ 1.009
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.448	1.589	✓ 2.167	1.102	1.623	✓ 2.188
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.774	0.844	✓ 1.159	0.608	0.885	✓ 1.183
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.351	0.427	✓ 0.611	0.225	0.42	✓ 0.586
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.776	0.894	✓ 1.094	0.588	0.892	✓ 1.059
<b>Left chest pocket</b>												
Photons, 20 keV	0.002	0.008	✓ 0.013	3E-04	0.005	✓ 0.01	0.004	0.013	✓ 0.023	6E-04	0.009	✓ 0.017
Photons, <30 keV	0.029	0.046	✓ 0.16	0.009	0.037	✓ 0.058	0.032	0.099	✓ 0.158	0.01	0.041	✓ 0.069
Photons, 30–250 keV	0.793	0.828	✓ 1.13	0.587	0.824	✓ 1.118	0.578	0.598	✓ 0.814	0.425	0.598	✓ 0.81
Photons, >250 keV	0.773	0.836	✓ 0.985	0.66	0.84	✓ 0.987	0.755	0.808	✓ 0.955	0.645	0.817	✓ 0.96
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.447	1.364	✓ 1.897	1.105	1.406	✓ 1.972
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.774	0.738	✓ 1.026	0.6	0.76	✓ 1.074
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.35	0.369	✓ 0.542	0.225	0.362	✓ 0.533
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.77	0.79	✓ 1.015	0.591	0.791	✓ 1
<b>Left collar</b>												
Photons, 20 keV	0.002	0.011	✓ 0.017	3E-04	0.007	✓ 0.011	0.004	0.019	✓ 0.029	6E-04	0.011	✓ 0.019
Photons, <30 keV	0.029	0.062	✓ 0.201	0.017	0.046	✓ 0.068	0.032	0.136	✓ 0.2	0.016	0.053	✓ 0.076
Photons, 30–250 keV	0.799	1.059	✓ 1.344	0.587	0.981	✓ 1.238	0.578	0.766	✓ 0.972	0.43	0.715	✓ 0.903
Photons, >250 keV	0.777	0.953	✓ 1.087	0.659	0.921	✓ 1.039	0.754	0.921	✓ 1.055	0.639	0.898	✓ 1.005
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.437	1.921	✓ 2.39	1.107	1.779	✓ 2.207
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.775	1.032	✓ 1.295	0.608	0.972	✓ 1.201
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.348	0.508	✓ 0.677	0.223	0.454	✓ 0.602
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.776	0.944	✓ 1.133	0.589	0.901	✓ 1.061

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-11. Liver dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.047	0.027	0.043	✓ 0.022	0.013	0.021	✓ 0.082	0.047	0.076	✓ 0.039	0.023	0.036
Photons, <30 keV	✓ 0.086	0.046	0.067	0.04	✓ 0.114	0.042	0.1	0.056	✓ 0.251	0.052	✓ 0.117	0.049
Photons, 30–250 keV	1.181	1.043	✓ 1.492	0.962	1.002	✓ 1.256	0.745	0.753	✓ 1.066	0.767	0.735	✓ 0.903
Photons, >250 keV	0.884	0.951	✓ 1.06	0.829	0.953	✓ 1.048	0.863	0.924	✓ 1.035	0.803	0.921	✓ 1.019
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.942	1.71	✓ 2.389	1.836	1.73	✓ 2.3
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.046	0.919	✓ 1.289	0.998	0.951	✓ 1.269
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.631	0.533	✓ 0.751	0.52	0.489	✓ 0.657
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.95	0.957	✓ 1.135	0.863	0.945	✓ 1.086
<b>Center waist</b>												
Photons, 20 keV	✓ 0.047	0.025	0.038	✓ 0.022	0.012	0.019	✓ 0.082	0.043	0.066	✓ 0.039	0.021	0.033
Photons, <30 keV	✓ 0.07	0.042	0.061	0.044	✓ 0.107	0.04	✓ 0.24	0.052	0.081	0.052	✓ 0.103	0.045
Photons, 30–250 keV	1.191	1.013	✓ 1.263	0.961	0.967	✓ 1.168	0.748	0.814	✓ 0.912	0.696	0.705	✓ 0.848
Photons, >250 keV	0.886	0.963	✓ 1.041	0.829	0.949	✓ 1.015	0.861	0.935	✓ 1.01	0.807	0.928	✓ 0.99
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.936	1.563	✓ 2.105	1.843	1.613	✓ 2.109
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.039	0.849	✓ 1.139	0.996	0.887	✓ 1.149
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.631	0.5	✓ 0.673	0.519	0.461	✓ 0.599
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.955	0.943	✓ 1.096	0.866	0.925	✓ 1.037
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.047	0.021	0.033	✓ 0.022	0.011	0.017	✓ 0.082	0.037	0.058	✓ 0.039	0.019	0.029
Photons, <30 keV	✓ 0.069	0.036	0.053	0.046	✓ 0.101	0.036	✓ 0.239	0.044	0.191	0.051	✓ 0.088	0.042
Photons, 30–250 keV	✓ 1.188	0.875	1.137	0.961	0.856	✓ 1.07	0.856	0.704	✓ 0.905	0.694	0.618	✓ 0.78
Photons, >250 keV	0.881	0.861	✓ 0.98	0.829	0.861	✓ 0.965	0.858	0.836	✓ 0.951	0.804	0.838	✓ 0.937
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.944	1.356	1.842	1.836	1.395	✓ 1.905
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.034	0.734	0.989	0.991	0.77	✓ 1.042
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.634	0.429	0.6	0.517	0.397	✓ 0.543
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.96	0.834	✓ 1.009	0.867	0.822	✓ 0.98
<b>Left collar</b>												
Photons, 20 keV	✓ 0.047	0.03	0.042	✓ 0.022	0.013	0.019	✓ 0.082	0.052	0.074	✓ 0.039	0.023	0.033
Photons, <30 keV	✓ 0.073	0.052	0.065	0.04	✓ 0.115	0.042	✓ 0.227	0.18	0.093	0.052	✓ 0.071	0.047
Photons, 30–250 keV	1.19	1.123	✓ 1.501	0.966	1.01	✓ 1.187	0.745	0.894	✓ 1.08	0.696	0.743	✓ 0.866
Photons, >250 keV	0.883	0.977	✓ 1.082	0.829	0.94	✓ 1.01	0.861	0.952	✓ 1.052	0.804	0.913	✓ 0.986
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.941	1.901	✓ 2.309	1.838	1.786	✓ 2.118
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.036	1.027	✓ 1.257	0.996	0.972	✓ 1.179
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.634	0.587	✓ 0.747	0.519	0.5	✓ 0.616
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.955	0.997	✓ 1.132	0.862	0.939	✓ 1.03

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-12. Lungs dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.032	0.027	✔ 0.042	✔ 0.042	0.018	0.025	0.057	0.047	✔ 0.073	✔ 0.073	0.032	0.043
Photons, <30 keV	0.064	0.048	✔ 0.085	✔ 0.065	0.04	0.048	0.07	0.06	✔ 0.087	✔ 0.081	0.042	0.058
Photons, 30–250 keV	1.072	1.107	✔ 1.489	1.101	1.058	✔ 1.272	0.769	0.881	✔ 1.089	0.797	0.771	✔ 1.02
Photons, >250 keV	0.866	1.016	✔ 1.101	0.882	1.021	✔ 1.101	0.839	0.993	✔ 1.065	0.856	0.992	✔ 1.07
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.551	1.649	✔ 2.242	1.621	1.709	✔ 2.181
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.819	0.863	✔ 1.178	0.891	0.935	✔ 1.197
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.531	0.585	✔ 0.779	0.585	0.564	✔ 0.707
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.907	1.063	✔ 1.194	0.942	1.058	✔ 1.174
<b>Center waist</b>												
Photons, 20 keV	0.032	0.025	✔ 0.036	✔ 0.041	0.017	0.022	0.057	0.043	✔ 0.064	✔ 0.073	0.03	0.039
Photons, <30 keV	0.053	0.044	✔ 0.058	✔ 0.064	0.038	0.045	0.068	0.056	✔ 0.077	✔ 0.082	0.04	0.053
Photons, 30–250 keV	1.07	1.071	✔ 1.27	1.098	1.021	✔ 1.177	0.768	0.865	✔ 1.02	0.799	0.824	✔ 0.951
Photons, >250 keV	0.855	1.033	✔ 1.085	0.881	1.019	✔ 1.067	0.836	0.996	✔ 1.054	0.855	0.991	✔ 1.033
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.552	1.509	✔ 1.953	1.617	1.592	✔ 1.991
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.82	0.808	✔ 1.041	0.892	0.882	✔ 1.091
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.533	0.547	✔ 0.697	0.579	0.528	✔ 0.643
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.908	1.043	✔ 1.146	0.946	1.037	✔ 1.118
<b>Left chest pocket</b>												
Photons, 20 keV	✔ 0.032	0.021	0.032	✔ 0.041	0.015	0.02	✔ 0.057	0.037	0.056	✔ 0.072	0.026	0.035
Photons, <30 keV	✔ 0.054	0.044	✔ 0.054	✔ 0.064	0.031	0.043	✔ 0.068	0.047	✔ 0.068	✔ 0.081	0.034	0.047
Photons, 30–250 keV	1.063	0.935	✔ 1.141	✔ 1.098	0.898	1.094	0.769	0.749	✔ 0.917	0.689	0.655	✔ 0.792
Photons, >250 keV	0.861	0.919	✔ 1.02	0.881	0.927	✔ 1.014	0.839	0.894	✔ 0.99	0.858	0.905	✔ 0.985
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.557	1.309	✔ 1.712	1.616	1.388	✔ 1.807
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.823	0.696	✔ 0.918	0.887	0.761	✔ 0.976
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.535	0.472	✔ 0.623	✔ 0.586	0.461	✔ 0.585
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.912	0.924	✔ 1.051	0.944	0.919	✔ 1.054
<b>Left collar</b>												
Photons, 20 keV	0.032	0.03	✔ 0.041	✔ 0.041	0.019	0.022	0.057	0.052	✔ 0.071	✔ 0.073	0.033	0.04
Photons, <30 keV	0.055	0.055	✔ 0.068	✔ 0.065	0.041	0.04	0.068	0.067	✔ 0.087	✔ 0.08	0.045	0.053
Photons, 30–250 keV	0.921	1.188	✔ 1.365	1.095	1.066	✔ 1.207	0.668	0.943	✔ 1.096	0.798	0.78	✔ 0.879
Photons, >250 keV	0.862	1.046	✔ 1.122	0.879	1.011	✔ 1.058	0.839	1.019	✔ 1.093	0.859	0.982	✔ 1.03
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.548	1.84	✔ 2.157	1.628	1.767	✔ 2.021
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.818	0.972	✔ 1.148	0.89	0.969	✔ 1.1
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.535	0.649	✔ 0.77	0.583	0.574	✔ 0.665
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.907	1.1	✔ 1.177	0.942	1.05	✔ 1.116

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-13. Lymph dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.12	0.083	✔ 0.121	✔ 0.135	0.097	0.129	0.209	0.144	✔ 0.212	✔ 0.237	0.17	0.225
Photons, <30 keV	✔ 0.249	0.195	0.234	✔ 0.184	0.131	0.167	✔ 0.255	0.14	0.21	✔ 0.379	0.22	0.294
Photons, 30–250 keV	1.041	1.166	✔ 1.475	1.028	1.172	✔ 1.479	0.764	0.845	✔ 1.072	0.749	0.85	✔ 1.077
Photons, >250 keV	0.903	0.984	✔ 1.084	0.889	0.994	✔ 1.108	0.876	0.956	✔ 1.05	0.87	0.968	✔ 1.083
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.703	1.525	✔ 2.122	1.685	1.556	✔ 2.075
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.971	0.863	✔ 1.189	1.02	0.937	✔ 1.236
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.696	0.584	✔ 0.801	0.696	0.609	✔ 0.799
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.016	1.013	✔ 1.188	0.995	1.038	✔ 1.204
<b>Center waist</b>												
Photons, 20 keV	✔ 0.12	0.076	0.105	✔ 0.136	0.09	0.116	✔ 0.21	0.133	0.185	✔ 0.237	0.159	0.205
Photons, <30 keV	✔ 0.249	0.177	0.212	✔ 0.183	0.119	0.166	✔ 0.2	0.132	0.184	✔ 0.313	0.247	0.266
Photons, 30–250 keV	1.041	1.145	✔ 1.382	1.028	1.126	✔ 1.252	0.763	0.822	✔ 1.004	0.748	0.819	✔ 0.996
Photons, >250 keV	0.902	0.99	✔ 1.065	0.891	0.994	✔ 1.076	0.877	0.966	✔ 1.037	0.867	0.971	✔ 1.047
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.698	1.393	✔ 1.838	1.694	1.451	✔ 1.883
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.97	0.793	✔ 1.048	1.019	0.876	✔ 1.118
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.698	0.548	✔ 0.712	0.695	0.571	✔ 0.729
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.013	1.007	✔ 1.144	0.989	1.018	✔ 1.145
<b>Left chest pocket</b>												
Photons, 20 keV	✔ 0.12	0.066	0.093	✔ 0.135	0.079	0.105	✔ 0.211	0.115	0.163	✔ 0.238	0.139	0.184
Photons, <30 keV	✔ 0.277	0.136	0.203	✔ 0.182	0.112	0.145	✔ 0.255	0.113	0.162	✔ 0.381	0.18	0.242
Photons, 30–250 keV	1.044	0.896	✔ 1.126	1.032	0.897	✔ 1.277	0.762	0.716	✔ 0.905	0.749	0.723	✔ 0.923
Photons, >250 keV	0.904	0.886	✔ 1	0.887	0.903	✔ 1.025	0.879	0.86	✔ 0.976	0.864	0.88	✔ 0.993
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 1.703	1.208	1.624	1.692	1.263	✔ 1.702
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 0.968	0.684	0.916	✔ 1.022	0.755	1.012
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✔ 0.696	0.473	0.631	✔ 0.7	0.496	0.661
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.021	0.888	✔ 1.06	0.991	0.904	✔ 1.094
<b>Left collar</b>												
Photons, 20 keV	✔ 0.12	0.092	0.119	✔ 0.135	0.099	0.118	✔ 0.21	0.161	0.207	✔ 0.237	0.174	0.207
Photons, <30 keV	✔ 0.278	0.206	0.254	✔ 0.189	0.135	0.164	0.201	0.16	✔ 0.204	✔ 0.313	0.226	0.272
Photons, 30–250 keV	1.046	1.271	✔ 1.5	1.027	1.181	✔ 1.413	0.759	0.908	✔ 1.081	0.751	0.862	✔ 1.025
Photons, >250 keV	0.902	1.012	✔ 1.102	0.888	0.985	✔ 1.069	0.88	0.987	✔ 1.075	0.865	0.961	✔ 1.034
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.698	1.689	✔ 2.024	1.689	1.606	✔ 1.902
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.975	0.959	✔ 1.166	1.017	0.964	✔ 1.144
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.692	0.647	✔ 0.789	0.696	0.622	✔ 0.748
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.014	1.061	✔ 1.18	0.995	1.025	✔ 1.146



## ATTACHMENT C DOSE RESULTS (continued)

Table C-14. Muscle dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.089	0.105	✔ 0.146	0.11	0.135	✔ 0.175	0.157	0.185	✔ 0.257	0.193	0.237	✔ 0.306
Photons, <30 keV	0.205	0.266	✔ 0.341	0.204	0.269	✔ 0.317	0.19	0.227	✔ 0.314	0.203	0.255	✔ 0.32
Photons, 30–250 keV	0.893	1.262	✔ 1.341	1.016	1.142	✔ 1.378	0.654	0.8	✔ 0.976	0.641	0.837	✔ 0.999
Photons, >250 keV	0.86	1.03	✔ 1.103	0.856	1.069	✔ 1.161	0.84	0.998	✔ 1.075	0.827	1.041	✔ 1.119
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.411	1.564	✔ 2.139	1.351	1.593	✔ 2.099
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.789	0.876	✔ 1.225	0.804	0.951	✔ 1.26
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.592	0.694	✔ 0.925	0.607	0.777	✔ 0.979
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.917	1.061	✔ 1.22	0.899	1.132	✔ 1.262
<b>Center waist</b>												
Photons, 20 keV	0.089	0.097	✔ 0.128	0.11	0.126	✔ 0.158	0.157	0.17	✔ 0.224	0.194	0.222	✔ 0.277
Photons, <30 keV	0.213	0.205	✔ 0.279	0.213	0.248	✔ 0.323	0.192	✔ 0.212	0.209	0.203	0.238	✔ 0.289
Photons, 30–250 keV	1.033	1.232	✔ 1.258	0.878	1.259	✔ 1.277	0.649	0.773	✔ 0.918	0.643	0.795	✔ 0.936
Photons, >250 keV	0.862	1.042	✔ 1.088	0.856	1.065	✔ 1.128	0.835	1.005	✔ 1.065	0.831	1.033	✔ 1.094
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.412	1.427	✔ 1.873	1.35	1.489	✔ 1.92
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.797	0.81	✔ 1.068	0.807	0.888	✔ 1.147
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.592	0.648	✔ 0.831	0.613	0.727	✔ 0.894
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.915	1.057	✔ 1.181	0.901	1.112	✔ 1.203
<b>Left chest pocket</b>												
Photons, 20 keV	0.089	0.084	✔ 0.113	0.111	0.109	✔ 0.143	0.157	0.147	✔ 0.198	0.194	0.192	✔ 0.25
Photons, <30 keV	0.234	0.194	✔ 0.275	0.201	0.212	✔ 0.321	0.193	0.185	✔ 0.244	0.203	0.207	✔ 0.262
Photons, 30–250 keV	1.029	1.059	✔ 1.307	0.885	0.964	✔ 1.175	0.651	0.67	✔ 0.825	0.645	0.7	✔ 0.859
Photons, >250 keV	0.857	0.923	✔ 1.023	0.856	0.966	✔ 1.064	0.84	0.903	✔ 1	0.832	0.94	✔ 1.036
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.41	1.243	✔ 1.637	1.348	1.287	✔ 1.741
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.789	0.701	✔ 0.941	0.808	0.765	✔ 1.036
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.594	0.561	✔ 0.739	0.613	0.631	✔ 0.807
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.918	0.94	✔ 1.092	0.9	0.983	✔ 1.141
<b>Left collar</b>												
Photons, 20 keV	0.089	0.117	✔ 0.143	0.111	0.139	✔ 0.16	0.157	0.207	✔ 0.25	0.195	0.243	✔ 0.283
Photons, <30 keV	0.2	0.286	✔ 0.369	0.21	0.242	✔ 0.31	0.192	0.26	✔ 0.311	0.2	0.261	✔ 0.292
Photons, 30–250 keV	1.035	✔ 1.356	1.352	0.881	1.151	✔ 1.297	0.654	0.854	✔ 0.989	0.643	0.84	✔ 0.95
Photons, >250 keV	0.86	1.053	✔ 1.134	0.849	1.053	✔ 1.117	0.832	1.023	✔ 1.101	0.832	1.033	✔ 1.081
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.413	1.731	✔ 2.063	1.35	1.627	✔ 1.931
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.796	0.982	✔ 1.183	0.807	0.983	✔ 1.168
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.591	0.765	✔ 0.916	0.606	0.785	✔ 0.914
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.915	1.12	✔ 1.221	0.9	1.122	✔ 1.198

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-15. Oesophagus dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.019	0.005	0.01	✓ 0.034	0.013	0.021	✓ 0.034	0.01	0.018	✓ 0.06	0.022	0.037
Photons, <30 keV	✓ 0.097	0.042	0.068	✓ 0.045	0.025	0.041	✓ 0.109	0.047	0.077	0.147	0.076	✓ 0.266
Photons, 30–250 keV	1.238	0.95	✓ 1.296	0.939	0.948	✓ 1.229	0.892	0.686	✓ 0.936	0.749	0.691	✓ 0.897
Photons, >250 keV	0.896	0.907	✓ 1.054	0.862	0.961	✓ 1.101	0.869	0.88	✓ 1.02	0.841	0.939	✓ 1.06
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.706	1.765	✓ 2.363	1.704	1.77	✓ 2.266
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.932	0.916	✓ 1.285	0.931	0.974	✓ 1.262
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.586	0.515	✓ 0.721	0.539	0.49	✓ 0.667
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.973	0.999	✓ 1.177	0.913	0.986	✓ 1.157
<b>Center waist</b>												
Photons, 20 keV	✓ 0.019	0.005	0.009	✓ 0.034	0.012	0.019	✓ 0.034	0.009	0.015	✓ 0.06	0.021	0.034
Photons, <30 keV	✓ 0.095	0.039	0.06	✓ 0.047	0.024	0.031	✓ 0.109	0.045	0.069	✓ 0.15	0.064	0.113
Photons, 30–250 keV	✓ 1.233	0.918	1.217	0.932	0.907	✓ 1.131	✓ 0.889	0.669	0.88	0.756	0.666	✓ 0.831
Photons, >250 keV	0.893	0.917	✓ 1.034	0.862	0.962	✓ 1.065	0.868	0.892	✓ 1.008	0.837	0.938	✓ 1.038
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.702	1.603	✓ 2.072	1.706	1.649	✓ 2.068
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.937	0.848	✓ 1.127	0.932	0.911	✓ 1.16
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.581	0.48	✓ 0.642	0.54	0.462	✓ 0.608
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.97	0.988	✓ 1.136	0.91	0.957	✓ 1.105
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.019	0.004	0.008	✓ 0.034	0.01	0.017	✓ 0.034	0.008	0.014	✓ 0.06	0.018	0.03
Photons, <30 keV	✓ 0.204	0.034	0.054	✓ 0.048	0.022	0.034	✓ 0.109	0.038	0.061	✓ 0.134	0.066	0.1
Photons, 30–250 keV	✓ 1.235	0.806	1.089	0.934	0.795	✓ 1.054	✓ 0.81	0.58	0.795	0.757	0.583	✓ 0.767
Photons, >250 keV	0.899	0.82	✓ 0.97	0.863	0.873	✓ 1.008	0.872	0.793	✓ 0.946	0.839	0.85	✓ 0.985
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.699	1.399	✓ 1.82	1.705	1.435	✓ 1.871
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.924	0.728	✓ 0.988	0.935	0.783	✓ 1.033
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.586	0.418	0.573	0.541	0.396	✓ 0.55
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.973	0.872	✓ 1.047	0.908	0.857	✓ 1.05
<b>Left collar</b>												
Photons, 20 keV	✓ 0.019	0.006	0.01	✓ 0.034	0.013	0.02	✓ 0.034	0.011	0.017	✓ 0.06	0.023	0.034
Photons, <30 keV	✓ 0.097	0.047	0.068	✓ 0.046	0.027	0.038	✓ 0.109	0.054	0.075	✓ 0.152	0.072	0.121
Photons, 30–250 keV	1.121	1.019	✓ 1.305	0.937	0.948	✓ 1.161	0.809	0.74	✓ 0.94	0.752	0.694	✓ 0.946
Photons, >250 keV	0.893	0.932	✓ 1.077	0.864	0.955	✓ 1.062	0.869	0.907	✓ 1.044	0.841	0.924	✓ 1.033
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.701	1.951	✓ 2.287	1.711	1.82	✓ 2.084
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.927	1.021	✓ 1.251	0.927	1	✓ 1.177
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.582	0.572	✓ 0.712	0.543	0.498	✓ 0.618
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.967	1.044	✓ 1.181	0.916	0.969	✓ 1.104

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-16. O-mucosa dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.072	0.057	✔ 0.075	✔ 0.04	0.03	0.039	0.126	0.099	✔ 0.132	✔ 0.069	0.053	0.068
Photons, <30 keV	0.095	0.079	✔ 0.107	0.071	0.073	✔ 0.076	0.144	0.118	✔ 0.149	0.071	0.056	✔ 0.074
Photons, 30–250 keV	0.94	1.097	✔ 1.451	0.851	1.118	✔ 1.318	0.751	0.892	✔ 1.164	0.691	0.815	✔ 1.075
Photons, >250 keV	0.891	1.064	✔ 1.196	0.847	1.081	✔ 1.166	0.866	1.034	✔ 1.155	0.823	1.048	✔ 1.128
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.313	1.501	✔ 2.125	1.523	1.72	✔ 2.28
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.78	0.869	✔ 1.212	0.865	0.982	✔ 1.282
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.692	0.764	✔ 1.054	0.671	0.757	✔ 0.952
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.882	1.123	✔ 1.374	0.928	1.167	✔ 1.338
<b>Center waist</b>												
Photons, 20 keV	✔ 0.072	0.052	0.065	✔ 0.039	0.028	0.035	✔ 0.126	0.091	0.115	✔ 0.069	0.049	0.062
Photons, <30 keV	✔ 0.12	0.073	0.114	✔ 0.083	0.061	0.059	✔ 0.143	0.112	0.132	✔ 0.072	0.052	0.067
Photons, 30–250 keV	0.94	1.073	✔ 1.371	0.852	1.074	✔ 1.221	0.752	0.867	✔ 1.098	0.619	0.782	✔ 0.901
Photons, >250 keV	0.893	1.07	✔ 1.17	0.842	1.078	✔ 1.125	0.865	1.044	✔ 1.138	0.82	1.052	✔ 1.099
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.302	1.37	✔ 1.861	1.514	1.613	✔ 2.084
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.78	0.803	✔ 1.062	0.869	0.923	✔ 1.179
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.691	0.72	✔ 0.953	0.675	0.704	✔ 0.869
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.883	1.112	✔ 1.333	0.932	1.14	✔ 1.276
<b>Left chest pocket</b>												
Photons, 20 keV	✔ 0.072	0.045	0.058	✔ 0.04	0.024	0.032	✔ 0.126	0.079	0.101	✔ 0.069	0.043	0.056
Photons, <30 keV	✔ 0.118	0.075	0.104	✔ 0.076	0.038	0.072	✔ 0.143	0.095	0.116	✔ 0.072	0.045	0.061
Photons, 30–250 keV	0.942	0.93	✔ 1.227	0.853	0.941	✔ 1.132	0.754	0.755	✔ 0.991	0.621	0.772	✔ 0.834
Photons, >250 keV	0.894	0.961	✔ 1.097	0.844	0.978	✔ 1.073	0.865	0.934	✔ 1.067	0.825	0.952	✔ 1.037
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.304	1.196	✔ 1.627	1.527	1.4	✔ 1.895
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.775	0.69	✔ 0.932	0.864	0.798	✔ 1.061
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.692	0.624	✔ 0.844	0.674	0.615	✔ 0.786
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.885	0.985	✔ 1.23	0.928	1.018	✔ 1.211
<b>Left collar</b>												
Photons, 20 keV	0.072	0.063	✔ 0.073	✔ 0.04	0.031	0.036	0.126	0.11	✔ 0.128	✔ 0.069	0.054	0.063
Photons, <30 keV	0.115	0.125	✔ 0.146	0.052	0.07	✔ 0.087	0.143	0.134	✔ 0.147	✔ 0.072	0.057	0.069
Photons, 30–250 keV	0.939	1.176	✔ 1.466	0.859	1.123	✔ 1.254	0.756	0.954	✔ 1.184	0.622	0.816	✔ 0.917
Photons, >250 keV	0.896	1.093	✔ 1.215	0.841	1.063	✔ 1.126	0.868	1.066	✔ 1.176	0.821	1.048	✔ 1.09
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.311	1.68	✔ 2.046	1.52	1.767	✔ 2.1
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.781	0.973	✔ 1.165	0.869	1.016	✔ 1.199
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.688	0.849	✔ 1.056	0.675	0.77	✔ 0.892
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.888	1.176	✔ 1.37	0.926	1.15	✔ 1.272

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-17. Ovaries dose results (rem).

Location, radiation type, and energy	Female					
	Exposure			Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>						
Photons, 20 keV	0.002	0.002	✓ 0.004	0.003	0.003	✓ 0.007
Photons, <30 keV	0.029	✓ 0.104	0.077	0.031	0.066	✓ 0.077
Photons, 30–250 keV	0.918	0.889	✓ 1.133	0.666	0.649	✓ 0.822
Photons, >250 keV	0.842	0.898	✓ 0.99	0.82	0.874	✓ 0.966
Neutrons, <10 keV	N/A	N/A	N/A	1.592	1.537	✓ 2.189
Neutrons, 10–100 keV	N/A	N/A	N/A	0.865	0.871	✓ 1.22
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	0.423	0.374	✓ 0.507
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.866	0.86	✓ 1.005
<b>Center waist</b>						
Photons, 20 keV	0.002	0.002	✓ 0.004	0.003	0.003	✓ 0.006
Photons, <30 keV	0.028	✓ 0.102	0.068	0.031	0.062	✓ 0.069
Photons, 30–250 keV	0.917	0.862	✓ 1.068	0.666	0.627	✓ 0.777
Photons, >250 keV	0.841	0.911	✓ 0.969	0.818	0.884	✓ 0.949
Neutrons, <10 keV	N/A	N/A	N/A	1.588	1.414	✓ 1.933
Neutrons, 10–100 keV	N/A	N/A	N/A	0.864	0.804	✓ 1.075
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	0.421	0.35	✓ 0.46
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.866	0.845	✓ 0.971
<b>Left chest pocket</b>						
Photons, 20 keV	0.002	0.002	✓ 0.003	0.003	0.003	✓ 0.006
Photons, <30 keV	0.027	✓ 0.137	0.06	0.031	0.05	✓ 0.061
Photons, 30–250 keV	0.918	0.75	✓ 0.962	0.667	0.546	✓ 0.692
Photons, >250 keV	0.842	0.814	✓ 0.913	0.82	0.791	✓ 0.89
Neutrons, <10 keV	N/A	N/A	N/A	1.584	1.229	✓ 1.694
Neutrons, 10–100 keV	N/A	N/A	N/A	0.861	0.693	✓ 0.943
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✓ 0.423	0.304	0.408
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.869	0.747	✓ 0.893
<b>Left collar</b>						
Photons, 20 keV	0.002	0.002	✓ 0.004	0.003	0.004	✓ 0.007
Photons, <30 keV	0.029	✓ 0.076	0.075	0.031	✓ 0.077	0.076
Photons, 30–250 keV	0.917	0.952	✓ 1.146	0.665	0.692	✓ 0.834
Photons, >250 keV	0.841	0.925	✓ 1.006	0.821	0.901	✓ 0.982
Neutrons, <10 keV	N/A	N/A	N/A	1.581	1.727	✓ 2.119
Neutrons, 10–100 keV	N/A	N/A	N/A	0.864	0.981	✓ 1.187
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	0.423	0.414	✓ 0.505
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.868	0.897	✓ 1.003

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-18. Pancreas dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.019	0.005	0.01	✓ 0.004	7E-04	0.001	✓ 0.034	0.01	0.018	✓ 0.008	0.001	0.003
Photons, <30 keV	✓ 0.095	0.042	0.067	0.04	0.035	✓ 0.052	✓ 0.108	0.047	0.077	0.044	0.035	✓ 0.052
Photons, 30–250 keV	1.237	0.95	✓ 1.285	0.962	0.887	✓ 1.172	0.807	0.686	✓ 0.933	0.693	0.642	✓ 0.849
Photons, >250 keV	0.893	0.901	✓ 1.048	0.829	0.88	✓ 1.03	0.868	0.881	✓ 1.021	0.808	0.857	✓ 0.999
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.178	1.675	✓ 2.394	1.798	1.561	✓ 2.104
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.156	0.91	✓ 1.28	1	0.885	✓ 1.183
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.617	0.435	✓ 0.642	0.443	0.357	✓ 0.498
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.993	0.902	✓ 1.138	0.868	0.859	✓ 1.038
<b>Center waist</b>												
Photons, 20 keV	✓ 0.019	0.005	0.009	✓ 0.004	6E-04	0.001	✓ 0.034	0.009	0.015	✓ 0.008	0.001	0.002
Photons, <30 keV	✓ 0.097	0.04	0.06	0.042	0.033	✓ 0.047	0.11	0.045	✓ 0.142	0.046	0.033	✓ 0.047
Photons, 30–250 keV	✓ 1.237	0.916	1.215	0.961	0.854	✓ 1.08	✓ 0.894	0.672	0.88	0.694	0.618	✓ 0.785
Photons, >250 keV	0.896	0.915	✓ 1.037	0.827	0.88	✓ 1.001	0.877	0.887	✓ 1.007	0.808	0.856	✓ 0.974
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.151	1.53	2.085	1.796	1.462	✓ 1.915
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.153	0.841	1.131	0.997	0.817	✓ 1.078
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.618	0.408	0.58	0.444	0.336	✓ 0.452
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.997	0.894	✓ 1.094	0.868	0.84	✓ 0.984
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.019	0.004	0.008	✓ 0.004	6E-04	0.001	✓ 0.034	0.008	0.013	✓ 0.008	1E-03	0.002
Photons, <30 keV	✓ 0.098	0.035	0.054	0.042	0.029	✓ 0.043	✓ 0.111	0.039	0.061	✓ 0.046	0.029	0.043
Photons, 30–250 keV	✓ 1.232	0.804	1.087	0.96	0.745	✓ 1.001	✓ 0.884	0.585	0.793	0.697	0.543	✓ 0.722
Photons, >250 keV	0.894	0.819	✓ 0.972	0.833	0.801	✓ 0.952	0.87	0.795	✓ 0.944	0.807	0.776	✓ 0.922
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.172	1.316	1.838	✓ 1.788	1.269	1.728
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.157	0.727	0.991	✓ 0.992	0.709	0.971
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.619	0.352	0.514	✓ 0.44	0.287	0.411
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.996	0.795	✓ 1.016	0.875	0.751	✓ 0.938
<b>Left collar</b>												
Photons, 20 keV	✓ 0.019	0.006	0.01	✓ 0.004	7E-04	0.001	✓ 0.034	0.011	0.017	✓ 0.008	0.001	0.002
Photons, <30 keV	✓ 0.096	0.047	0.068	0.041	0.036	✓ 0.049	✓ 0.108	0.053	0.077	0.045	0.036	✓ 0.048
Photons, 30–250 keV	1.115	1.016	✓ 1.3	0.958	0.895	✓ 1.098	0.888	0.739	✓ 0.942	0.696	0.65	✓ 0.803
Photons, >250 keV	0.895	0.934	✓ 1.078	0.834	0.876	✓ 0.996	0.871	0.91	✓ 1.041	0.806	0.848	✓ 0.971
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.171	1.855	✓ 2.298	1.792	1.61	✓ 1.921
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.156	1.015	✓ 1.261	1.001	0.907	✓ 1.091
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.616	0.484	✓ 0.644	0.443	0.363	✓ 0.469
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.999	0.953	✓ 1.133	0.869	0.849	✓ 0.984

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-19. Prostrate dose results (rem).

Location, radiation type, and energy	Male					
	Exposure			Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>						
Photons, 20 keV	1E-03	0.002	✓ 0.002	0.002	0.003	✓ 0.004
Photons, <30 keV	0.021	✓ 0.147	0.058	0.065	✓ 0.087	0.059
Photons, 30–250 keV	0.963	0.89	✓ 1.145	0.702	0.648	✓ 0.835
Photons, >250 keV	0.853	0.89	✓ 1.038	0.824	0.863	✓ 1.011
Neutrons, <10 keV	N/A	N/A	N/A	1.916	1.598	✓ 2.204
Neutrons, 10–100 keV	N/A	N/A	N/A	1.058	0.894	✓ 1.218
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	0.513	0.389	✓ 0.533
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.934	0.903	✓ 1.067
<b>Center waist</b>						
Photons, 20 keV	1E-03	0.002	✓ 0.002	0.002	0.003	✓ 0.004
Photons, <30 keV	✓ 0.232	0.126	0.053	✓ 0.111	0.1	0.052
Photons, 30–250 keV	0.956	0.856	✓ 1.07	0.699	0.624	✓ 0.78
Photons, >250 keV	0.852	0.894	✓ 1.005	0.827	0.872	✓ 0.98
Neutrons, <10 keV	N/A	N/A	N/A	1.914	1.491	✓ 1.998
Neutrons, 10–100 keV	N/A	N/A	N/A	1.063	0.838	✓ 1.109
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✓ 0.512	0.363	0.485
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.929	0.89	✓ 1.013
<b>Left chest pocket</b>						
Photons, 20 keV	1E-03	0.001	✓ 0.002	0.002	0.002	✓ 0.003
Photons, <30 keV	✓ 0.237	0.105	0.047	✓ 0.107	0.091	0.048
Photons, 30–250 keV	0.959	0.749	✓ 0.984	0.701	0.548	✓ 0.718
Photons, >250 keV	0.854	0.814	✓ 0.958	0.824	0.792	✓ 0.927
Neutrons, <10 keV	N/A	N/A	N/A	✓ 1.911	1.297	1.823
Neutrons, 10–100 keV	N/A	N/A	N/A	✓ 1.054	0.723	0.999
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✓ 0.511	0.317	0.442
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.923	0.787	✓ 0.962
<b>Left collar</b>						
Photons, 20 keV	1E-03	0.002	✓ 0.002	0.002	0.003	✓ 0.004
Photons, <30 keV	✓ 0.216	0.027	0.054	✓ 0.118	0.028	0.054
Photons, 30–250 keV	0.962	0.893	✓ 1.088	0.696	0.654	✓ 0.793
Photons, >250 keV	0.851	0.887	✓ 0.999	0.83	0.861	✓ 0.971
Neutrons, <10 keV	N/A	N/A	N/A	1.908	1.641	✓ 2.017
Neutrons, 10–100 keV	N/A	N/A	N/A	1.06	0.922	✓ 1.132
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✓ 0.509	0.396	0.498
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.929	0.897	✓ 1.016



**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-20. Remainder dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✔ 0.053	0.037	0.052	✔ 0.054	0.042	0.054	✔ 0.093	0.065	0.091	✔ 0.096	0.073	0.095
Photons, <30 keV	✔ 0.147	0.098	0.13	✔ 0.113	0.02	0.089	0.09	0.072	✔ 0.094	0.113	✔ 0.127	0.118
Photons, 30–250 keV	1.075	1.035	✔ 1.282	1.021	1.024	✔ 1.292	0.78	0.834	✔ 1.03	0.736	0.746	✔ 1.035
Photons, >250 keV	0.865	0.98	✔ 1.073	0.83	0.98	✔ 1.096	0.836	0.956	✔ 1.035	0.805	0.951	✔ 1.067
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.704	1.63	✔ 2.283	1.625	1.645	✔ 2.206
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.936	0.898	✔ 1.258	0.93	0.946	✔ 1.245
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.596	0.547	✔ 0.763	0.555	0.56	✔ 0.735
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.928	0.988	✔ 1.18	0.882	0.996	✔ 1.172
<b>Center waist</b>												
Photons, 20 keV	✔ 0.053	0.034	0.045	✔ 0.054	0.039	0.049	✔ 0.092	0.06	0.08	✔ 0.096	0.069	0.086
Photons, <30 keV	✔ 0.148	0.076	0.123	✔ 0.106	0.065	0.073	✔ 0.124	0.068	0.081	0.112	✔ 0.118	0.108
Photons, 30–250 keV	0.976	1.017	✔ 1.201	0.928	0.992	✔ 1.2	0.783	0.815	✔ 0.968	0.735	0.717	✔ 0.965
Photons, >250 keV	0.859	0.989	✔ 1.056	0.827	0.985	✔ 1.059	0.836	0.96	✔ 1.025	0.807	0.95	✔ 1.033
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.715	1.499	✔ 2.004	1.625	1.541	✔ 2.029
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.946	0.825	✔ 1.102	0.93	0.884	✔ 1.136
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.6	0.513	✔ 0.686	0.559	0.526	✔ 0.677
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.931	0.972	✔ 1.136	0.877	0.982	✔ 1.115
<b>Left chest pocket</b>												
Photons, 20 keV	✔ 0.052	0.029	0.04	✔ 0.054	0.034	0.044	✔ 0.093	0.052	0.07	✔ 0.095	0.059	0.078
Photons, <30 keV	✔ 0.135	0.061	0.093	✔ 0.098	0.052	0.076	✔ 0.123	0.059	0.057	✔ 0.114	0.103	0.096
Photons, 30–250 keV	1.069	0.874	✔ 1.084	0.926	0.867	✔ 1.105	0.706	0.706	✔ 0.87	0.739	0.697	✔ 0.887
Photons, >250 keV	0.858	0.884	✔ 0.989	0.825	0.892	✔ 1.01	0.834	0.859	✔ 0.961	0.808	0.862	✔ 0.982
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.712	1.293	✔ 1.761	1.627	1.336	✔ 1.824
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.945	0.714	✔ 0.968	0.929	0.761	✔ 1.042
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.6	0.442	✔ 0.609	0.562	0.458	✔ 0.617
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.932	0.86	✔ 1.042	0.877	0.872	✔ 1.052
<b>Left collar</b>												
Photons, 20 keV	✔ 0.053	0.041	0.05	✔ 0.055	0.043	0.05	✔ 0.093	0.073	0.089	✔ 0.096	0.075	0.088
Photons, <30 keV	0.132	0.095	✔ 0.162	✔ 0.09	0.047	0.075	✔ 0.123	0.081	0.091	0.112	✔ 0.13	0.109
Photons, 30–250 keV	1.078	1.115	✔ 1.295	1.022	1.032	✔ 1.214	0.772	0.901	✔ 1.033	0.738	0.832	✔ 0.987
Photons, >250 keV	0.86	1.006	✔ 1.091	0.828	0.973	✔ 1.062	0.833	0.984	✔ 1.063	0.808	0.947	✔ 1.023
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.709	1.809	✔ 2.209	1.632	1.693	✔ 2.047
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.939	1	✔ 1.221	0.931	0.969	✔ 1.158
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.599	0.605	✔ 0.755	0.557	0.572	✔ 0.693
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.927	1.03	✔ 1.183	0.877	0.992	✔ 1.11

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-21. R-marrow (leukemia) dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.036	0.044	0.052	0.032	0.038	0.041	0.064	0.078	0.092	0.057	0.067	0.072
Photons, <30 keV	0.162	0.178	0.25	0.121	0.137	0.188	0.126	0.137	0.221	0.087	0.098	0.122
Photons, 30–250 keV	1.126	1.322	1.651	1.046	1.294	1.605	0.731	0.849	1.168	0.751	0.838	1.039
Photons, >250 keV	0.826	0.962	1.057	0.798	0.979	1.084	0.799	0.939	1.028	0.779	0.955	1.057
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.422	1.595	2.173	1.354	1.647	2.19
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.785	0.878	1.2	0.767	0.939	1.23
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.47	0.538	0.714	0.445	0.549	0.714
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.816	0.937	1.088	0.779	0.953	1.103
<b>Center waist</b>												
Photons, 20 keV	0.036	0.041	0.046	0.032	0.035	0.037	0.064	0.072	0.08	0.057	0.063	0.065
Photons, <30 keV	0.173	0.158	0.223	0.117	0.142	0.191	0.129	0.096	0.181	0.084	0.06	0.136
Photons, 30–250 keV	1.123	1.282	1.542	1.047	1.119	1.496	0.731	0.838	1.009	0.682	0.809	0.978
Photons, >250 keV	0.826	0.975	1.036	0.801	0.979	1.056	0.802	0.953	1.01	0.776	0.954	1.027
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.422	1.459	1.898	1.347	1.548	2.007
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.788	0.813	1.048	0.767	0.879	1.121
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.47	0.505	0.64	0.447	0.513	0.645
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.813	0.927	1.054	0.779	0.936	1.053
<b>Left chest pocket</b>												
Photons, 20 keV	0.036	0.035	0.04	0.032	0.031	0.033	0.064	0.062	0.07	0.057	0.054	0.058
Photons, <30 keV	0.176	0.12	0.059	0.122	0.113	0.159	0.141	0.111	0.163	0.078	0.064	0.104
Photons, 30–250 keV	1.119	1.112	1.383	1.044	0.982	1.383	0.729	0.723	0.908	0.68	0.71	0.889
Photons, >250 keV	0.825	0.87	0.977	0.801	0.888	1.004	0.799	0.844	0.947	0.781	0.866	0.976
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.419	1.255	1.677	1.356	1.337	1.8
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.787	0.698	0.925	0.768	0.754	1.003
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.466	0.436	0.57	0.444	0.445	0.586
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.819	0.813	0.969	0.783	0.83	0.998
<b>Left collar</b>												
Photons, 20 keV	0.036	0.049	0.051	0.032	0.039	0.038	0.064	0.087	0.089	0.057	0.069	0.066
Photons, <30 keV	0.152	0.184	0.069	0.135	0.144	0.175	0.088	0.121	0.206	0.089	0.096	0.162
Photons, 30–250 keV	1.126	1.414	1.663	1.045	1.302	1.524	0.729	1.008	1.078	0.681	0.844	0.993
Photons, >250 keV	0.818	0.994	1.085	0.799	0.972	1.056	0.801	0.962	1.055	0.781	0.944	1.022
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.42	1.772	2.086	1.352	1.704	2.017
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.779	0.982	1.167	0.766	0.955	1.141
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.471	0.597	0.709	0.442	0.561	0.666
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.817	0.982	1.084	0.779	0.949	1.053

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-22. R-marrow (acute myeloid leukemia) dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.072	0.088	0.104	0.065	0.075	0.081	0.127	0.154	0.182	0.113	0.133	0.142
Photons, <30 keV	0.1	0.127	0.142	0.094	0.356	0.991	0.326	0.135	0.246	0.096	0.119	0.195
Photons, 30–250 keV	2.172	2.555	3.18	2.022	2.492	3.109	1.559	1.828	2.28	1.451	1.801	2.232
Photons, >250 keV	1.634	1.911	2.09	1.587	1.941	2.161	1.588	1.854	2.042	1.544	1.891	2.097
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.828	3.159	4.298	2.672	3.297	4.35
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.473	1.64	2.26	1.445	1.75	2.284
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.059	1.204	1.601	0.999	1.234	1.597
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.626	1.863	2.169	1.547	1.912	2.205
<b>Center waist</b>												
Photons, 20 keV	0.072	0.081	0.09	0.064	0.07	0.074	0.127	0.143	0.158	0.113	0.124	0.129
Photons, <30 keV	0.099	0.346	0.122	0.093	0.292	0.104	0.169	0.125	0.213	0.097	0.113	0.333
Photons, 30–250 keV	2.174	2.457	2.998	2.028	2.414	2.87	1.554	1.778	2.135	1.455	1.728	2.083
Photons, >250 keV	1.623	1.93	2.067	1.583	1.956	2.095	1.588	1.873	2.009	1.539	1.896	2.033
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.796	2.89	3.786	2.683	3.066	3.962
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.481	1.513	1.959	1.445	1.649	2.101
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.058	1.137	1.435	0.991	1.154	1.464
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.629	1.831	2.097	1.552	1.862	2.105
<b>Left chest pocket</b>												
Photons, 20 keV	0.072	0.07	0.079	0.064	0.061	0.066	0.127	0.123	0.139	0.113	0.107	0.116
Photons, <30 keV	0.885	0.296	0.102	0.277	0.288	0.093	0.169	0.107	0.382	0.155	0.096	0.161
Photons, 30–250 keV	2.166	2.156	2.699	2.026	2.114	2.674	1.562	1.537	1.933	1.457	1.526	1.92
Photons, >250 keV	1.63	1.718	1.927	1.592	1.765	1.987	1.584	1.675	1.883	1.545	1.716	1.921
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.82	2.501	3.299	2.689	2.67	3.567
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.481	1.32	1.734	1.44	1.419	1.911
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.058	0.984	1.299	0.999	1.006	1.316
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.624	1.624	1.93	1.555	1.655	2.008
<b>Left collar</b>												
Photons, 20 keV	0.072	0.098	0.101	0.064	0.077	0.074	0.126	0.172	0.176	0.114	0.135	0.131
Photons, <30 keV	0.1	0.435	0.131	0.093	0.134	0.105	0.347	0.151	0.256	0.158	0.123	0.182
Photons, 30–250 keV	2.176	2.736	3.238	2.035	2.533	2.944	1.559	1.967	2.313	1.453	1.827	2.117
Photons, >250 keV	1.636	1.975	2.137	1.594	1.92	2.079	1.592	1.923	2.081	1.545	1.881	2.027
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.823	3.508	4.149	2.692	3.383	3.983
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.47	1.853	2.182	1.442	1.818	2.645
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.056	1.336	1.591	0.992	1.256	1.497
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.618	1.957	2.182	1.558	1.884	2.344

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-23. R-marrow (acute lymphocytic leukemia) dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.072	0.088	0.104	0.065	0.075	0.081	0.127	0.154	0.182	0.113	0.133	0.142
Photons, <30 keV	0.1	0.127	0.142	0.094	0.356	0.991	0.326	0.135	0.246	0.096	0.119	0.195
Photons, 30–250 keV	2.172	2.555	3.18	2.022	2.492	3.109	1.559	1.828	2.28	1.451	1.801	2.232
Photons, >250 keV	1.634	1.911	2.09	1.587	1.941	2.161	1.588	1.854	2.042	1.544	1.891	2.097
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.828	3.159	4.298	2.672	3.297	4.35
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.473	1.64	2.26	1.445	1.75	2.284
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.059	1.204	1.601	0.999	1.234	1.597
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.626	1.863	2.169	1.547	1.912	2.205
<b>Center waist</b>												
Photons, 20 keV	0.072	0.081	0.09	0.064	0.07	0.074	0.127	0.143	0.158	0.113	0.124	0.129
Photons, <30 keV	0.099	0.346	0.122	0.093	0.292	0.104	0.169	0.125	0.213	0.097	0.113	0.333
Photons, 30–250 keV	2.174	2.457	2.998	2.028	2.414	2.87	1.554	1.778	2.135	1.455	1.728	2.083
Photons, >250 keV	1.623	1.93	2.067	1.583	1.956	2.095	1.588	1.873	2.009	1.539	1.896	2.033
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.796	2.89	3.786	2.683	3.066	3.962
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.481	1.513	1.959	1.445	1.649	2.101
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.058	1.137	1.435	0.991	1.154	1.464
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.629	1.831	2.097	1.552	1.862	2.105
<b>Left chest pocket</b>												
Photons, 20 keV	0.072	0.07	0.079	0.064	0.061	0.066	0.127	0.123	0.139	0.113	0.107	0.116
Photons, <30 keV	0.885	0.296	0.102	0.277	0.288	0.093	0.169	0.107	0.382	0.155	0.096	0.161
Photons, 30–250 keV	2.166	2.156	2.699	2.026	2.114	2.674	1.562	1.537	1.933	1.457	1.526	1.92
Photons, >250 keV	1.63	1.718	1.927	1.592	1.765	1.987	1.584	1.675	1.883	1.545	1.716	1.921
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.82	2.501	3.299	2.689	2.67	3.567
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.481	1.32	1.734	1.44	1.419	1.911
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.058	0.984	1.299	0.999	1.006	1.316
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.624	1.624	1.93	1.555	1.655	2.008
<b>Left collar</b>												
Photons, 20 keV	0.072	0.098	0.101	0.064	0.077	0.074	0.126	0.172	0.176	0.114	0.135	0.131
Photons, <30 keV	0.1	0.435	0.131	0.093	0.134	0.105	0.347	0.151	0.256	0.158	0.123	0.182
Photons, 30–250 keV	2.176	2.736	3.238	2.035	2.533	2.944	1.559	1.967	2.313	1.453	1.827	2.117
Photons, >250 keV	1.636	1.975	2.137	1.594	1.92	2.079	1.592	1.923	2.081	1.545	1.881	2.027
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.823	3.508	4.149	2.692	3.383	3.983
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.47	1.853	2.182	1.442	1.818	2.645
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.056	1.336	1.591	0.992	1.256	1.497
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.618	1.957	2.182	1.558	1.884	2.344

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-24. R-marrow (chronic myeloid leukemia) dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.072	0.088	0.104	0.065	0.075	0.081	0.127	0.154	0.182	0.113	0.133	0.142
Photons, <30 keV	0.1	0.127	0.142	0.094	0.356	0.991	0.326	0.135	0.246	0.096	0.119	0.195
Photons, 30–250 keV	2.172	2.555	3.18	2.022	2.492	3.109	1.559	1.828	2.28	1.451	1.801	2.232
Photons, >250 keV	1.634	1.911	2.09	1.587	1.941	2.161	1.588	1.854	2.042	1.544	1.891	2.097
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.828	3.159	4.298	2.672	3.297	4.35
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.473	1.64	2.26	1.445	1.75	2.284
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.059	1.204	1.601	0.999	1.234	1.597
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.626	1.863	2.169	1.547	1.912	2.205
<b>Center waist</b>												
Photons, 20 keV	0.072	0.081	0.09	0.064	0.07	0.074	0.127	0.143	0.158	0.113	0.124	0.129
Photons, <30 keV	0.099	0.346	0.122	0.093	0.292	0.104	0.169	0.125	0.213	0.097	0.113	0.333
Photons, 30–250 keV	2.174	2.457	2.998	2.028	2.414	2.87	1.554	1.778	2.135	1.455	1.728	2.083
Photons, >250 keV	1.623	1.93	2.067	1.583	1.956	2.095	1.588	1.873	2.009	1.539	1.896	2.033
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.796	2.89	3.786	2.683	3.066	3.962
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.481	1.513	1.959	1.445	1.649	2.101
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.058	1.137	1.435	0.991	1.154	1.464
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.629	1.831	2.097	1.552	1.862	2.105
<b>Left chest pocket</b>												
Photons, 20 keV	0.072	0.07	0.079	0.064	0.061	0.066	0.127	0.123	0.139	0.113	0.107	0.116
Photons, <30 keV	0.885	0.296	0.102	0.277	0.288	0.093	0.169	0.107	0.382	0.155	0.096	0.161
Photons, 30–250 keV	2.166	2.156	2.699	2.026	2.114	2.674	1.562	1.537	1.933	1.457	1.526	1.92
Photons, >250 keV	1.63	1.718	1.927	1.592	1.765	1.987	1.584	1.675	1.883	1.545	1.716	1.921
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.82	2.501	3.299	2.689	2.67	3.567
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.481	1.32	1.734	1.44	1.419	1.911
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.058	0.984	1.299	0.999	1.006	1.316
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.624	1.624	1.93	1.555	1.655	2.008
<b>Left collar</b>												
Photons, 20 keV	0.072	0.098	0.101	0.064	0.077	0.074	0.126	0.172	0.176	0.114	0.135	0.131
Photons, <30 keV	0.1	0.435	0.131	0.093	0.134	0.105	0.347	0.151	0.256	0.158	0.123	0.182
Photons, 30–250 keV	2.176	2.736	3.238	2.035	2.533	2.944	1.559	1.967	2.313	1.453	1.827	2.117
Photons, >250 keV	1.636	1.975	2.137	1.594	1.92	2.079	1.592	1.923	2.081	1.545	1.881	2.027
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.823	3.508	4.149	2.692	3.383	3.983
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.47	1.853	2.182	1.442	1.818	2.645
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.056	1.336	1.591	0.992	1.256	1.497
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.618	1.957	2.182	1.558	1.884	2.344



**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-25. S-glands dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.032	0.164	✔ 0.239	0.074	0.246	✔ 0.325	0.056	0.289	✔ 0.418	0.13	0.435	✔ 0.573
Photons, <30 keV	0.044	0.324	✔ 0.358	0.238	0.385	✔ 0.392	0.152	0.294	✔ 0.433	0.254	0.502	✔ 0.673
Photons, 30–250 keV	0.814	1.117	✔ 1.66	0.888	1.194	✔ 1.456	0.662	0.815	✔ 1.059	0.611	0.874	✔ 1.059
Photons, >250 keV	0.854	1.079	✔ 1.211	0.896	1.136	✔ 1.248	0.838	1.048	✔ 1.183	0.873	1.105	✔ 1.211
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.98	1.426	✔ 1.981	0.944	1.422	✔ 1.882
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.534	0.904	✔ 1.276	0.549	1.01	✔ 1.343
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.493	0.847	✔ 1.191	0.555	0.981	✔ 1.236
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.905	1.168	✔ 1.428	0.936	1.255	✔ 1.432
<b>Center waist</b>												
Photons, 20 keV	0.032	0.153	✔ 0.208	0.074	0.231	✔ 0.293	0.056	0.268	✔ 0.366	0.13	0.405	✔ 0.518
Photons, <30 keV	0.043	0.287	✔ 0.368	0.255	✔ 0.372	0.351	0.146	0.273	✔ 0.383	0.248	0.467	✔ 0.605
Photons, 30–250 keV	0.818	1.249	✔ 1.357	0.974	1.145	✔ 1.347	0.658	0.791	✔ 0.989	0.615	0.837	✔ 0.986
Photons, >250 keV	0.859	1.085	✔ 1.192	0.893	1.134	✔ 1.215	0.837	1.053	✔ 1.167	0.873	1.103	✔ 1.182
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.982	1.304	✔ 1.743	0.941	1.325	✔ 1.71
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.528	0.842	✔ 1.117	0.549	0.949	✔ 1.222
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.497	0.792	✔ 1.075	0.555	0.922	✔ 1.126
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.901	1.152	✔ 1.375	0.942	1.228	✔ 1.363
<b>Left chest pocket</b>												
Photons, 20 keV	0.032	0.131	✔ 0.182	0.074	0.2	✔ 0.266	0.056	0.23	✔ 0.319	0.13	0.351	✔ 0.465
Photons, <30 keV	0.045	0.23	✔ 0.363	0.254	0.311	✔ 0.322	0.133	0.235	✔ 0.337	0.232	0.409	✔ 0.55
Photons, 30–250 keV	0.814	1.088	✔ 1.229	0.967	1.012	✔ 1.242	0.658	0.687	✔ 0.893	0.612	0.736	✔ 0.904
Photons, >250 keV	0.86	0.972	✔ 1.121	0.897	1.033	✔ 1.157	0.83	0.946	✔ 1.095	0.869	1.002	✔ 1.121
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.98	1.129	✔ 1.523	0.935	1.146	✔ 1.544
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.532	0.718	✔ 0.981	0.547	0.816	✔ 1.107
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.494	0.691	✔ 0.959	0.555	0.801	✔ 1.016
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.907	1.022	✔ 1.266	0.943	1.088	✔ 1.289
<b>Left collar</b>												
Photons, 20 keV	0.032	0.184	✔ 0.232	0.074	0.252	✔ 0.299	0.056	0.323	✔ 0.405	0.13	0.444	✔ 0.526
Photons, <30 keV	0.047	0.312	✔ 0.407	0.246	0.304	✔ 0.36	0.141	0.324	✔ 0.423	0.245	0.514	✔ 0.618
Photons, 30–250 keV	0.816	1.381	✔ 1.456	0.971	1.213	✔ 1.378	0.661	0.875	✔ 1.063	0.609	0.885	✔ 1.008
Photons, >250 keV	0.858	1.106	✔ 1.244	0.898	1.128	✔ 1.207	0.836	1.075	✔ 1.205	0.873	1.096	✔ 1.176
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.98	1.603	✔ 1.915	0.938	1.461	✔ 1.723
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.531	1.012	✔ 1.238	0.549	1.041	✔ 1.248
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.493	0.942	✔ 1.188	0.554	1.002	✔ 1.155
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.904	1.225	✔ 1.422	0.946	1.237	✔ 1.353



**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-26. SI-wall dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.055	0.02	0.033	✓ 0.047	0.017	0.027	✓ 0.097	0.034	0.058	✓ 0.084	0.03	0.047
Photons, <30 keV	✓ 0.084	0.04	0.058	✓ 0.091	0.038	0.048	✓ 0.11	0.047	0.075	✓ 0.091	0.043	0.064
Photons, 30–250 keV	1.095	0.975	✓ 1.283	1.254	0.98	✓ 1.304	0.798	0.781	✓ 1.023	0.778	0.716	✓ 0.945
Photons, >250 keV	0.911	0.918	✓ 1.04	0.897	0.935	✓ 1.067	0.886	0.891	✓ 1.011	0.869	0.906	✓ 1.04
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.121	1.617	✓ 2.309	2.064	1.682	✓ 2.29
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.139	0.876	✓ 1.239	1.129	0.924	✓ 1.264
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.684	0.471	0.673	0.633	0.465	✓ 0.648
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.015	0.913	✓ 1.118	0.977	0.93	✓ 1.131
<b>Center waist</b>												
Photons, 20 keV	✓ 0.055	0.018	0.029	✓ 0.047	0.016	0.024	✓ 0.096	0.032	0.051	✓ 0.083	0.028	0.043
Photons, <30 keV	✓ 0.083	0.04	0.051	✓ 0.089	0.037	0.044	✓ 0.113	0.043	0.064	✓ 0.097	0.039	0.055
Photons, 30–250 keV	✓ 1.265	0.944	1.203	✓ 1.237	0.952	1.21	0.796	0.688	✓ 0.878	0.78	0.765	✓ 0.881
Photons, >250 keV	0.911	0.928	✓ 1.026	0.893	0.931	✓ 1.036	0.881	0.901	✓ 0.993	0.874	0.906	✓ 1.011
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.137	1.49	2.026	2.067	1.572	✓ 2.088
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.145	0.811	1.097	1.121	0.863	✓ 1.145
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.676	0.437	0.605	✓ 0.625	0.434	0.59
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.012	0.905	✓ 1.08	0.978	0.906	✓ 1.084
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.055	0.016	0.025	✓ 0.048	0.014	0.022	✓ 0.097	0.027	0.044	✓ 0.083	0.025	0.038
Photons, <30 keV	✓ 0.081	0.035	0.044	✓ 0.089	0.031	0.047	✓ 0.116	0.037	0.058	✓ 0.091	0.034	0.052
Photons, 30–250 keV	✓ 1.272	0.825	1.082	✓ 1.239	0.831	1.117	0.796	0.6	✓ 0.868	✓ 0.895	0.671	0.811
Photons, >250 keV	0.908	0.827	✓ 0.962	0.898	0.846	✓ 0.986	0.883	0.807	✓ 0.937	0.875	0.823	✓ 0.961
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.121	1.285	1.77	✓ 2.062	1.368	1.88
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.142	0.693	0.966	✓ 1.124	0.747	1.043
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.679	0.378	0.537	✓ 0.631	0.378	0.538
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.014	0.797	0.996	0.981	0.807	✓ 1.016
<b>Left collar</b>												
Photons, 20 keV	✓ 0.055	0.022	0.032	✓ 0.047	0.018	0.025	✓ 0.097	0.038	0.056	✓ 0.083	0.031	0.043
Photons, <30 keV	✓ 0.082	0.045	0.057	✓ 0.089	0.04	0.055	✓ 0.108	0.052	0.071	✓ 0.093	0.044	0.058
Photons, 30–250 keV	1.27	1.045	✓ 1.303	✓ 1.246	0.992	1.235	0.797	0.761	✓ 0.941	0.781	0.724	✓ 0.897
Photons, >250 keV	0.911	0.944	✓ 1.064	0.895	0.922	✓ 1.037	0.883	0.916	✓ 1.034	0.873	0.899	✓ 1.005
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.118	1.814	✓ 2.236	2.076	1.736	✓ 2.097
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.134	0.978	✓ 1.213	1.128	0.951	✓ 1.159
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.682	0.517	0.666	✓ 0.629	0.475	0.604
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.018	0.959	✓ 1.122	0.984	0.917	✓ 1.073

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-27. Spleen dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	0.004	0.026	✔ 0.044	9E-04	0.009	✔ 0.015	0.007	0.046	✔ 0.077	0.002	0.016	✔ 0.026
Photons, <30 keV	0.032	0.049	✔ 0.072	0.024	0.053	✔ 0.079	0.036	0.061	✔ 0.105	0.119	0.12	✔ 0.168
Photons, 30–250 keV	0.727	1.071	✔ 1.503	0.616	1.023	✔ 1.292	0.531	0.857	✔ 0.987	0.445	0.746	✔ 0.944
Photons, >250 keV	0.756	0.965	✔ 1.055	0.684	0.958	✔ 1.067	0.733	0.934	✔ 1.033	0.667	0.933	✔ 1.034
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.301	1.736	✔ 2.443	1.146	1.77	✔ 2.434
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.684	0.914	✔ 1.299	0.626	0.986	✔ 1.311
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.314	0.538	✔ 0.758	0.244	0.502	✔ 0.692
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.732	0.968	✔ 1.141	0.616	0.951	✔ 1.102
<b>Center waist</b>												
Photons, 20 keV	0.004	0.024	✔ 0.038	9E-04	0.008	✔ 0.013	0.007	0.042	✔ 0.067	0.002	0.015	✔ 0.024
Photons, <30 keV	0.032	0.045	✔ 0.065	0.024	0.051	✔ 0.072	0.036	0.058	✔ 0.086	0.024	0.058	✔ 0.163
Photons, 30–250 keV	0.727	1.043	✔ 1.417	0.614	0.981	✔ 1.201	0.528	0.836	✔ 0.93	0.447	0.718	✔ 0.876
Photons, >250 keV	0.752	0.972	✔ 1.039	0.688	0.964	✔ 1.043	0.734	0.943	✔ 1.011	0.666	0.936	✔ 1.001
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.294	1.588	✔ 2.135	1.152	1.654	✔ 2.226
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.683	0.838	✔ 1.143	0.617	0.921	✔ 1.195
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.313	0.503	✔ 0.676	0.243	0.47	✔ 0.628
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.733	0.957	✔ 1.105	0.612	0.929	✔ 1.05
<b>Left chest pocket</b>												
Photons, 20 keV	0.004	0.021	✔ 0.034	9E-04	0.007	✔ 0.012	0.007	0.037	✔ 0.059	0.002	0.013	✔ 0.021
Photons, <30 keV	0.032	0.044	✔ 0.058	0.024	0.044	✔ 0.064	0.036	0.049	✔ 0.075	0.024	0.051	✔ 0.14
Photons, 30–250 keV	0.727	0.902	✔ 1.274	0.615	0.871	✔ 1.115	0.532	0.655	✔ 0.925	0.447	0.63	✔ 0.804
Photons, >250 keV	0.756	0.87	✔ 0.983	0.685	0.875	✔ 0.986	0.734	0.848	✔ 0.949	0.667	0.849	✔ 0.953
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.305	1.378	✔ 1.883	1.159	1.439	✔ 2.014
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.683	0.721	✔ 0.995	0.628	0.792	✔ 1.075
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.312	0.439	✔ 0.6	0.243	0.408	✔ 0.57
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.731	0.844	✔ 1.024	0.613	0.83	✔ 0.997
<b>Left collar</b>												
Photons, 20 keV	0.004	0.029	✔ 0.043	9E-04	0.009	✔ 0.014	0.007	0.051	✔ 0.075	0.002	0.016	✔ 0.024
Photons, <30 keV	0.031	0.055	✔ 0.071	0.024	0.055	✔ 0.153	0.036	0.069	✔ 0.097	0.024	0.124	✔ 0.153
Photons, 30–250 keV	0.728	1.141	✔ 1.367	0.613	1.036	✔ 1.227	0.528	0.917	✔ 1.096	0.446	0.749	✔ 0.895
Photons, >250 keV	0.755	0.989	✔ 1.083	0.685	0.954	✔ 1.029	0.732	0.964	✔ 1.051	0.666	0.928	✔ 0.998
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.297	1.933	✔ 2.352	1.15	1.822	✔ 2.219
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	0.685	1.014	✔ 1.267	0.625	1.014	✔ 1.207
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.316	0.593	✔ 0.751	0.244	0.509	✔ 0.649
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.729	1.012	✔ 1.141	0.614	0.944	✔ 1.052

## ATTACHMENT C DOSE RESULTS (continued)

Table C-28. St-wall dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.075	0.035	0.057	✓ 0.042	0.016	0.026	✓ 0.131	0.062	0.101	✓ 0.073	0.029	0.046
Photons, <30 keV	0.1	✓ 0.11	0.083	0.069	0.129	✓ 0.208	✓ 0.152	0.133	0.117	0.089	✓ 0.134	0.118
Photons, 30–250 keV	1.103	1.047	✓ 1.502	1.223	1.001	✓ 1.262	0.8	0.835	✓ 1.078	0.878	0.731	✓ 0.91
Photons, >250 keV	0.915	0.963	✓ 1.058	0.892	0.954	✓ 1.044	0.889	0.936	✓ 1.03	0.867	0.922	✓ 1.021
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.037	1.69	✓ 2.339	2.092	1.677	✓ 2.278
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.106	0.899	✓ 1.264	1.145	0.913	✓ 1.234
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.727	0.548	✓ 0.776	0.635	0.485	✓ 0.65
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.015	0.979	✓ 1.161	0.975	0.957	✓ 1.107
<b>Center waist</b>												
Photons, 20 keV	✓ 0.075	0.033	0.05	✓ 0.042	0.015	0.024	✓ 0.131	0.058	0.088	✓ 0.073	0.027	0.042
Photons, <30 keV	0.103	✓ 0.195	0.076	0.067	✓ 0.132	0.088	✓ 0.148	0.124	0.104	0.093	0.076	✓ 0.171
Photons, 30–250 keV	1.096	1.019	✓ 1.275	✓ 1.232	0.969	1.174	0.799	0.815	✓ 1.022	✓ 0.884	0.699	0.851
Photons, >250 keV	0.916	0.975	✓ 1.039	0.892	0.953	✓ 1.015	0.885	0.946	✓ 1.017	0.868	0.924	✓ 0.99
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.04	1.536	✓ 2.067	✓ 2.1	1.568	2.072
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.097	0.831	✓ 1.106	✓ 1.144	0.855	1.125
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.717	0.511	0.696	✓ 0.637	0.45	0.591
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.019	0.97	✓ 1.12	0.97	0.932	✓ 1.053
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.075	0.028	0.044	✓ 0.042	0.013	0.021	✓ 0.131	0.05	0.077	✓ 0.073	0.023	0.038
Photons, <30 keV	0.1	✓ 0.166	0.065	0.08	0.055	✓ 0.162	✓ 0.153	0.108	0.091	0.089	0.065	✓ 0.096
Photons, 30–250 keV	1.097	0.885	✓ 1.261	✓ 1.229	0.846	1.078	0.8	0.646	✓ 0.907	✓ 0.882	0.619	0.862
Photons, >250 keV	0.913	0.867	✓ 0.982	0.889	0.862	✓ 0.967	0.889	0.841	✓ 0.953	0.862	0.838	✓ 0.942
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.049	1.332	1.812	✓ 2.099	1.359	1.877
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.099	0.722	0.979	✓ 1.139	0.741	1.025
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.723	0.446	0.618	✓ 0.638	0.393	0.536
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.022	0.861	✓ 1.036	0.968	0.832	✓ 1.001
<b>Left collar</b>												
Photons, 20 keV	✓ 0.075	0.04	0.056	✓ 0.042	0.017	0.024	✓ 0.131	0.07	0.098	✓ 0.073	0.029	0.043
Photons, <30 keV	0.102	✓ 0.226	0.084	0.069	0.135	✓ 0.178	✓ 0.149	0.147	0.115	0.091	✓ 0.13	0.109
Photons, 30–250 keV	1.095	1.132	✓ 1.515	✓ 1.233	1.001	1.186	0.794	0.895	✓ 1.092	0.886	0.728	✓ 0.959
Photons, >250 keV	0.917	0.988	✓ 1.079	0.889	0.947	✓ 1.01	0.89	0.969	✓ 1.055	0.86	0.915	✓ 0.986
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.044	1.873	✓ 2.279	✓ 2.11	1.732	2.088
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.103	1.007	✓ 1.246	1.14	0.94	✓ 1.158
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	0.722	0.61	✓ 0.769	✓ 0.638	0.494	0.607
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.021	1.029	✓ 1.165	0.974	0.943	✓ 1.05

## ATTACHMENT C DOSE RESULTS (continued)

Table C-29. Testes dose results (rem).

Location, radiation type, and energy	Male					
	Exposure			Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>						
Photons, 20 keV	✔ 0.264	0.206	0.225	✔ 0.466	0.363	0.396
Photons, <30 keV	0.349	0.28	✔ 0.366	0.572	0.531	✔ 0.603
Photons, 30–250 keV	1.325	1.153	✔ 1.344	0.967	0.841	✔ 0.983
Photons, >250 keV	0.973	1.019	✔ 1.117	0.942	0.99	✔ 1.074
Neutrons, <10 keV	N/A	N/A	N/A	✔ 2.126	1.532	2.016
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 1.352	1.035	1.307
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 1.051	0.817	0.943
Neutrons, 2–20 MeV	N/A	N/A	N/A	1.14	1.1	✔ 1.184
<b>Center waist</b>						
Photons, 20 keV	✔ 0.265	0.193	0.204	✔ 0.466	0.338	0.357
Photons, <30 keV	✔ 0.344	0.261	0.267	✔ 0.564	0.495	0.551
Photons, 30–250 keV	✔ 1.329	1.111	1.244	✔ 0.963	0.808	0.909
Photons, >250 keV	0.971	1.018	✔ 1.078	0.942	0.994	✔ 1.052
Neutrons, <10 keV	N/A	N/A	N/A	✔ 2.138	1.434	1.83
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 1.365	0.962	1.181
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 1.052	0.764	0.856
Neutrons, 2–20 MeV	N/A	N/A	N/A	✔ 1.137	1.08	1.134
<b>Left chest pocket</b>						
Photons, 20 keV	✔ 0.265	0.167	0.183	✔ 0.464	0.294	0.324
Photons, <30 keV	✔ 0.344	0.226	0.241	✔ 0.563	0.425	0.498
Photons, 30–250 keV	✔ 1.321	0.979	1.152	✔ 0.962	0.712	0.838
Photons, >250 keV	0.975	0.926	✔ 1.022	0.945	0.899	✔ 0.997
Neutrons, <10 keV	N/A	N/A	N/A	✔ 2.131	1.238	1.662
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 1.356	0.831	1.063
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 1.054	0.668	0.776
Neutrons, 2–20 MeV	N/A	N/A	N/A	✔ 1.134	0.958	1.072
<b>Left collar</b>						
Photons, 20 keV	✔ 0.265	0.211	0.209	✔ 0.466	0.371	0.364
Photons, <30 keV	✔ 0.451	0.206	0.305	✔ 0.694	0.543	0.567
Photons, 30–250 keV	✔ 1.324	1.167	1.276	✔ 0.965	0.851	0.926
Photons, >250 keV	0.967	1.01	✔ 1.074	0.945	0.984	✔ 1.043
Neutrons, <10 keV	N/A	N/A	N/A	✔ 2.132	1.567	1.843
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 1.348	1.059	1.198
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 1.052	0.839	0.88
Neutrons, 2–20 MeV	N/A	N/A	N/A	✔ 1.136	1.092	1.129

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-30. Thymus dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.176	0.056	0.078	✓ 0.177	0.059	0.087	✓ 0.309	0.099	0.137	✓ 0.31	0.103	0.153
Photons, <30 keV	✓ 0.442	0.196	0.227	✓ 0.403	0.17	0.214	✓ 0.356	0.18	0.171	✓ 0.365	0.128	0.189
Photons, 30–250 keV	1.299	1.076	✓ 1.406	1.298	1.1	✓ 1.451	0.955	0.865	✓ 1.018	0.947	0.884	✓ 1.053
Photons, >250 keV	1.009	1.023	✓ 1.092	1.017	1.053	✓ 1.124	0.977	0.991	✓ 1.063	0.982	1.022	✓ 1.088
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.097	1.615	✓ 2.203	✓ 2.233	1.681	2.165
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.251	0.9	1.244	✓ 1.353	0.957	1.231
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.093	0.634	0.828	✓ 1.12	0.687	0.882
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.208	1.066	1.173	1.187	1.071	✓ 1.225
<b>Center waist</b>												
Photons, 20 keV	✓ 0.176	0.052	0.068	✓ 0.176	0.055	0.079	✓ 0.308	0.091	0.119	✓ 0.311	0.097	0.139
Photons, <30 keV	✓ 0.397	0.161	0.209	✓ 0.422	0.151	0.201	✓ 0.363	0.114	0.148	✓ 0.367	0.12	0.169
Photons, 30–250 keV	✓ 1.307	1.049	1.204	✓ 1.299	1.06	1.222	0.948	0.846	✓ 0.959	0.949	0.856	✓ 0.984
Photons, >250 keV	1.01	1.026	✓ 1.084	1.018	1.05	✓ 1.09	0.984	1.004	✓ 1.047	0.984	1.022	✓ 1.054
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.114	1.471	1.933	✓ 2.234	1.582	1.977
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.243	0.832	1.093	✓ 1.354	0.892	1.122
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.09	0.592	0.738	✓ 1.12	0.65	0.805
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.209	1.055	1.132	✓ 1.177	1.046	1.171
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.176	0.045	0.06	✓ 0.177	0.048	0.071	✓ 0.31	0.079	0.105	✓ 0.309	0.084	0.125
Photons, <30 keV	✓ 0.409	0.136	0.179	✓ 0.446	0.14	0.188	✓ 0.365	0.097	0.179	✓ 0.37	0.104	0.153
Photons, 30–250 keV	✓ 1.303	0.905	1.075	✓ 1.301	0.924	1.136	✓ 0.949	0.733	0.875	✓ 0.947	0.752	0.902
Photons, >250 keV	1.01	0.917	✓ 1.015	1.011	0.951	✓ 1.032	0.982	0.891	✓ 0.984	0.985	0.928	✓ 1.002
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.108	1.267	1.694	✓ 2.241	1.364	1.794
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.25	0.718	0.956	✓ 1.356	0.769	1.02
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.093	0.514	0.657	✓ 1.121	0.561	0.73
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.208	0.931	1.049	✓ 1.185	0.936	1.107
<b>Left collar</b>												
Photons, 20 keV	✓ 0.175	0.063	0.076	✓ 0.177	0.06	0.08	✓ 0.31	0.11	0.134	✓ 0.31	0.105	0.141
Photons, <30 keV	✓ 0.442	0.189	0.237	✓ 0.366	0.173	0.186	✓ 0.36	0.134	0.235	✓ 0.367	0.161	0.175
Photons, 30–250 keV	✓ 1.3	1.153	1.291	1.299	1.111	✓ 1.379	0.952	0.923	✓ 1.037	0.951	0.894	✓ 1.005
Photons, >250 keV	1.015	1.051	✓ 1.118	1.013	1.043	✓ 1.083	0.979	1.013	✓ 1.09	0.983	1.013	✓ 1.047
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	2.105	1.792	✓ 2.138	✓ 2.233	1.73	1.999
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.251	1.01	1.211	✓ 1.356	0.988	1.142
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.094	0.699	0.817	✓ 1.125	0.707	0.826
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.208	1.123	1.177	✓ 1.177	1.067	1.162

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-31. Thyroid dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.352	0.127	0.228	✓ 0.291	0.117	0.205	✓ 0.616	0.223	0.399	✓ 0.509	0.207	0.358
Photons, <30 keV	0.414	0.328	✓ 0.505	✓ 0.641	0.337	0.494	✓ 0.666	0.253	0.441	✓ 0.564	0.237	0.4
Photons, 30–250 keV	1.431	1.146	✓ 1.487	1.415	1.331	✓ 1.497	1.043	0.831	✓ 1.08	1.025	0.842	✓ 1.097
Photons, >250 keV	1.036	1.066	✓ 1.123	1.027	1.055	✓ 1.186	1.006	1.033	✓ 1.101	0.996	1.028	✓ 1.158
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.798	1.533	✓ 2.112	2.002	1.626	✓ 2.172
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.226	0.904	✓ 1.309	1.263	0.984	✓ 1.344
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.189	0.734	1.06	✓ 1.142	0.74	1.073
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.214	1.105	✓ 1.26	1.195	1.127	✓ 1.323
<b>Center waist</b>												
Photons, 20 keV	✓ 0.352	0.118	0.199	✓ 0.291	0.11	0.186	✓ 0.616	0.207	0.348	✓ 0.513	0.193	0.326
Photons, <30 keV	✓ 0.653	0.293	0.463	✓ 0.63	0.267	0.438	✓ 0.675	0.235	0.39	✓ 0.561	0.218	0.365
Photons, 30–250 keV	✓ 1.433	1.277	1.39	1.401	1.288	✓ 1.406	✓ 1.042	0.805	1.016	✓ 1.03	0.926	1.019
Photons, >250 keV	1.039	1.079	✓ 1.107	1.019	1.057	✓ 1.152	1.007	1.043	✓ 1.079	0.995	1.032	✓ 1.117
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.81	1.404	✓ 1.836	✓ 1.995	1.527	1.978
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.224	0.834	1.142	✓ 1.268	0.916	1.22
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.197	0.693	0.954	✓ 1.142	0.692	0.979
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.214	1.087	✓ 1.216	1.199	1.101	✓ 1.252
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.35	0.102	0.174	✓ 0.291	0.095	0.167	✓ 0.615	0.179	0.307	✓ 0.511	0.167	0.293
Photons, <30 keV	✓ 0.721	0.247	0.424	✓ 0.674	0.265	0.394	✓ 0.676	0.207	0.346	✓ 0.567	0.274	0.327
Photons, 30–250 keV	✓ 1.438	1.115	1.251	✓ 1.415	1.127	1.296	✓ 1.047	0.701	0.916	✓ 1.031	0.712	0.941
Photons, >250 keV	1.032	0.958	✓ 1.049	1.022	0.957	✓ 1.095	1.006	0.936	✓ 1.012	0.996	0.933	✓ 1.054
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.79	1.218	1.625	✓ 1.999	1.319	1.784
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.218	0.722	1.016	✓ 1.269	0.789	1.097
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.189	0.597	0.846	✓ 1.138	0.601	0.882
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.209	0.959	1.126	✓ 1.2	0.982	1.184
<b>Left collar</b>												
Photons, 20 keV	✓ 0.351	0.142	0.223	✓ 0.293	0.121	0.189	✓ 0.618	0.249	0.391	✓ 0.512	0.211	0.331
Photons, <30 keV	✓ 0.672	0.37	0.539	✓ 0.625	0.316	0.448	✓ 0.676	0.282	0.439	✓ 0.559	0.241	0.367
Photons, 30–250 keV	1.433	1.226	✓ 1.497	1.411	1.349	✓ 1.425	1.041	0.892	✓ 1.086	1.024	0.848	✓ 1.04
Photons, >250 keV	1.039	1.093	✓ 1.151	1.023	1.047	✓ 1.141	1.01	1.067	✓ 1.122	0.997	1.023	✓ 1.108
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.805	1.71	✓ 2.034	✓ 1.993	1.673	1.98
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	1.227	1.018	✓ 1.277	✓ 1.267	1.005	1.236
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.197	0.814	1.054	✓ 1.139	0.754	1
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	1.205	1.153	✓ 1.261	1.203	1.122	✓ 1.249



**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-32. UB-wall dose results (rem).

Location, radiation type, and energy	Exposure						Hp(10)					
	Female			Male			Female			Male		
	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>												
Photons, 20 keV	✓ 0.226	0.093	0.133	✓ 0.036	0.015	0.024	✓ 0.396	0.163	0.235	✓ 0.063	0.026	0.042
Photons, <30 keV	✓ 0.453	0.204	0.264	0.057	0.116	✓ 0.168	✓ 0.39	0.194	0.27	0.077	0.068	✓ 0.1
Photons, 30–250 keV	1.293	1.116	✓ 1.352	1.188	0.937	✓ 1.217	0.946	0.805	✓ 0.98	0.862	0.682	✓ 0.893
Photons, >250 keV	0.989	0.94	✓ 1.008	0.93	0.925	✓ 1.045	0.961	0.916	✓ 0.984	0.903	0.894	✓ 1.016
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.369	1.486	2.126	2.254	1.625	✓ 2.305
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.403	0.884	1.222	1.241	0.909	✓ 1.251
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 0.999	0.569	0.75	✓ 0.701	0.449	0.618
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.138	0.943	1.081	1.032	0.906	✓ 1.105
<b>Center waist</b>												
Photons, 20 keV	✓ 0.226	0.086	0.116	✓ 0.036	0.014	0.022	✓ 0.394	0.15	0.204	✓ 0.063	0.024	0.038
Photons, <30 keV	✓ 0.429	0.188	0.256	0.056	0.054	✓ 0.14	✓ 0.39	0.178	0.237	0.077	0.062	✓ 0.093
Photons, 30–250 keV	✓ 1.299	1.085	1.277	✓ 1.192	0.896	1.138	✓ 0.941	0.783	0.921	✓ 0.862	0.656	0.829
Photons, >250 keV	0.988	0.951	✓ 0.994	0.927	0.924	✓ 1.01	0.961	0.926	✓ 0.971	0.903	0.895	✓ 0.985
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.373	1.366	1.866	✓ 2.251	1.522	2.095
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.408	0.808	1.074	✓ 1.232	0.849	1.146
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.01	0.533	0.674	✓ 0.7	0.418	0.565
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.142	0.93	1.039	1.031	0.88	✓ 1.051
<b>Left chest pocket</b>												
Photons, 20 keV	✓ 0.225	0.074	0.102	✓ 0.036	0.012	0.019	✓ 0.395	0.13	0.18	✓ 0.063	0.021	0.034
Photons, <30 keV	✓ 0.41	0.166	0.21	0.057	0.092	✓ 0.14	✓ 0.392	0.155	0.213	0.077	✓ 0.09	0.083
Photons, 30–250 keV	✓ 1.299	0.941	1.146	✓ 1.189	0.79	1.048	✓ 0.945	0.681	0.835	✓ 0.86	0.576	0.765
Photons, >250 keV	✓ 0.988	0.851	0.938	0.935	0.837	✓ 0.961	✓ 0.958	0.824	0.91	0.903	0.813	✓ 0.935
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.377	1.184	1.637	✓ 2.251	1.32	1.895
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.413	0.699	0.94	✓ 1.239	0.733	1.031
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.006	0.462	0.597	✓ 0.697	0.362	0.508
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.139	0.823	0.962	✓ 1.035	0.785	0.997
<b>Left collar</b>												
Photons, 20 keV	✓ 0.227	0.103	0.13	✓ 0.036	0.015	0.022	✓ 0.397	0.183	0.228	✓ 0.063	0.027	0.039
Photons, <30 keV	✓ 0.438	0.242	0.294	0.055	0.059	✓ 0.165	✓ 0.39	0.212	0.265	0.078	0.068	✓ 0.095
Photons, 30–250 keV	1.293	1.193	✓ 1.365	✓ 1.195	0.951	1.17	0.949	0.862	✓ 0.991	✓ 0.861	0.692	0.847
Photons, >250 keV	0.982	0.97	✓ 1.036	0.931	0.912	✓ 1.003	0.96	0.942	✓ 1.007	0.908	0.889	✓ 0.976
Neutrons, <10 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 2.368	1.659	2.059	✓ 2.255	1.686	2.106
Neutrons, 10–100 keV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.417	0.981	1.194	✓ 1.238	0.935	1.157
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.007	0.63	0.746	✓ 0.708	0.454	0.575
Neutrons, 2–20 MeV	N/A	N/A	N/A	N/A	N/A	N/A	✓ 1.139	0.994	1.079	1.039	0.892	✓ 1.048

**ATTACHMENT C  
DOSE RESULTS (continued)**

Table C-33. Uterus dose results (rem).

Location, radiation type, and energy	Female					
	Exposure			Hp(10)		
	AP	ISO	ROT	AP	ISO	ROT
<b>Center chest</b>						
Photons, 20 keV	✔ 0.005	0.002	0.003	✔ 0.008	0.003	0.005
Photons, <30 keV	✔ 0.041	0.023	0.033	0.045	✔ 0.151	0.037
Photons, 30–250 keV	0.965	0.863	✔ 1.093	0.711	0.626	✔ 0.799
Photons, >250 keV	0.863	0.876	✔ 0.969	0.837	0.86	✔ 0.951
Neutrons, <10 keV	N/A	N/A	N/A	1.858	1.547	✔ 2.191
Neutrons, 10–100 keV	N/A	N/A	N/A	0.993	0.853	✔ 1.194
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	0.513	0.382	✔ 0.524
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.939	0.861	✔ 1.025
<b>Center waist</b>						
Photons, 20 keV	✔ 0.005	0.002	0.002	✔ 0.008	0.003	0.004
Photons, <30 keV	✔ 0.041	0.021	0.029	✔ 0.045	0.023	0.032
Photons, 30–250 keV	0.972	0.841	✔ 1.03	0.704	0.608	✔ 0.751
Photons, >250 keV	0.861	0.89	✔ 0.962	0.837	0.863	✔ 0.939
Neutrons, <10 keV	N/A	N/A	N/A	1.853	1.398	✔ 1.912
Neutrons, 10–100 keV	N/A	N/A	N/A	0.998	0.784	✔ 1.036
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 0.509	0.354	0.465
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.942	0.855	✔ 0.983
<b>Left chest pocket</b>						
Photons, 20 keV	✔ 0.005	0.001	0.002	✔ 0.008	0.002	0.004
Photons, <30 keV	✔ 0.041	0.019	0.026	✔ 0.046	0.031	0.029
Photons, 30–250 keV	✔ 0.971	0.724	0.932	✔ 0.701	0.528	0.673
Photons, >250 keV	0.859	0.793	✔ 0.901	0.838	0.77	✔ 0.879
Neutrons, <10 keV	N/A	N/A	N/A	✔ 1.853	1.224	1.683
Neutrons, 10–100 keV	N/A	N/A	N/A	✔ 1.002	0.677	0.923
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	✔ 0.512	0.307	0.416
Neutrons, 2–20 MeV	N/A	N/A	N/A	✔ 0.941	0.758	0.912
<b>Left collar</b>						
Photons, 20 keV	✔ 0.005	0.002	0.003	✔ 0.008	0.003	0.005
Photons, <30 keV	✔ 0.04	0.025	0.033	✔ 0.046	0.029	0.037
Photons, 30–250 keV	0.975	0.923	✔ 1.109	0.702	0.672	✔ 0.808
Photons, >250 keV	0.857	0.908	✔ 1.007	0.834	0.882	✔ 0.973
Neutrons, <10 keV	N/A	N/A	N/A	1.858	1.719	✔ 2.111
Neutrons, 10–100 keV	N/A	N/A	N/A	1.002	0.962	✔ 1.159
Neutrons, 100 keV–2 MeV	N/A	N/A	N/A	0.511	0.419	✔ 0.515
Neutrons, 2–20 MeV	N/A	N/A	N/A	0.946	0.906	✔ 1.02

### ATTACHMENT D EXAMPLE IREP SHEET

PERSONAL INFORMATION									
Claimant Name	NIOSH ID #	DOL Case No	DOL District Office	Gender	Birth Year	Year of Diagnosis	Cancer Model	Should alt model be run?	
John Q. Doe	123456	123-45-6789	CL	Male	1940	1989	Lung	No	
CLAIMANT CANCER DIAGNOSES									
	Primary Cancer #1	Primary Cancer #2	Primary Cancer #3	Secondary Cancer #1	Secondary Cancer #2	Secondary Cancer #3			
Cancer Type	N/A	N/A	N/A	N/A	N/A	N/A			
Date of Diagnosis	N/A	N/A	N/A	N/A	N/A	N/A			
EXPOSURE INFORMATION									
Number of exposures				Show only required exposure entry rows		Show all exposure entry			
5									
Exposure #	Exposure Year	Exposure Rate	Radiation Type	Dose Distribution Type	Parameter 1	Parameter 2	Parameter 3		
1	1975	acute	photons E=30-250keV	Weibull	3.205	1.816	-0.126		
2	1976	acute	photons E=30-250keV	Weibull	3.205	1.816	-0.126		
3	1977	acute	photons E=30-250keV	Weibull	3.205	1.816	-0.126		
4	1978	acute	photons E=30-250keV	Weibull	3.205	1.816	-0.126		
5	1979	acute	photons E=30-250keV	Weibull	3.205	1.816	-0.126		
OTHER ADVANCED FEATURES									
Sample Size		Random Seed							
10000		see below							
User Defined Uncertainty Distribution									
Dose Distribution Type	Parameter 1	Parameter 2	Parameter 3						
Lognormal	1.000	1.000	0.000						
SKIN CANCER INPUTS									
Ethnic Origin		Not used for cancer selected:							
White-Non-Hispanic		Lung							
LUNG CANCER INPUTS									
Exposure from		Smoking History							
Other Sources		Never smoked							
				Show only required exposure entry rows		Show all exposure entry			
Randomseed values (for 30 runs)									
Run	Random seed								
1	402632								
2	802221								
3	241140								
4	577262								
5	336729								
6	186105								
7	40033								
8	527679								
9	107677								
10	414041								
11	964677								
12	34								
13	229195								
14	165457								
15	610467								
16	613586								
17	104060								
18	266281								
19	317701								
20	136319								
21	804016								
22	582773								
23	956583								
24	249270								
25	957042								
26	44704								
27	636030								
28	951885								
29	949918								
30	894711								

Figure D-1. Example IREP sheet. Results are for male lung, ISO geometry, 30- to 250-keV photons, dosimeter on center chest.