DOE NAVY DOE RES/NRC NMSS/NRC OSHA

From: Robert Meck
To: Bishop, Lee; Broaddus, Doug; Brummett, Elaine; Cardile, Frank; Chen, Chia; Collins, Steven; Farrand, David; Feldman, Carl; Gnugnoli, Giorgio; Huffert, Anthony; Kopsick., Deborah; Neave, John; Vazquez, Gustavo EPA
Date: Wed, May 29, 2002 10:00 AM
Subject: ISCORS -- Comparison of IAEA SDL values

Dear Colleagues,

Attached is a Microsoft Word file that is a table of comparisons. It compares the "scope defining levels" from the March 28, 2002, Draft Safety Guide DS161 with clearance values from NUREG-1640 draft (NRC), the IAEA clearance levels derived from meetings dated December 2001 (12'01), January 2002 (01'02) and October 2000 (10'00), as well as the European Commission's Radiation Protection 122 (RP 122).

The comparisons are expressed as ratios. The current IAEA SDL is divided by the respective clearance values. For the cases of the NUREG (NRC) comparison and the RP 122 comparison, when the ratio was >1, then that ratio was listed and in the next column, and it was counted in the column after that. At the foot of the table is a listing of the number of nuclides for which the ratio was greater than 1.

When the ratio is greater than 1, the SDL is less restrictive than the comparative clearance level.

It is impractical to reformat this table in WordPerfect. For those of you who do not have Word, please find a colleague with Word and have them print the table for you.

I will try to get my review comments of the DS161 to you later today. They should be a starting place for the telephone conference tomorrow at 2:00 EDT.

NRC Staff (and visitors from other Federal Agencies, if any) should meet in T10-C2 for the telephone conference. There are 8 lines that can be reached at 301 231-5539 or 1 800 638-8081. Listen to the entire message and AFTER THE BEEP press [redacted] Ex. 2

Best regards,

Bob

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C2

IAEA SCOPE DEFINING LEVEL (MARCH 28, 2002 DRAFT SAFETY GUIDE DS161) COMPARISON

Nuclide	SDL (Bq/g)	NUREG 1640 draft	SDL/NRC RATIO	Ratio > 1	COUNT	IAEA SDL/12'01	IAEA SDL/01'02	IAEA SDL/10'00	EC SDL/RP122	Ratio > 1	COUNT
H-3	100	1136.36	0.088			10	10	10	1		
Be-7	10					0.1	0.1	1	1		
C-14	1	0.63	1.6	1.6	1	1	1	1	0.1		
Na-22	0.1	0.02	4.1	4.1	1	0.1	0.1	1	1		
P-32	100	71.43	1.4	1.4	1	1	0.1	1	1		
P-33	1000					10	0.1	1	10	10	1
S-35	10	1315.79	0.0076			1	1	1	0.1		
Cl-36	0.1	0.06	1.6	1.6	1	1	1	1	0.1		
K-40	5	0.19	26	26	1	1.25	1.25	50	5	5	1
Ca-45	10	121.95	0.082			1	1	1	0.1		
Ca-47	0.1					0.1	0.1	1	0.1		
Sc-46	0.1					0.1	0.1	1	1		
Sc-47	10					0.1	0.1	1	1		
Sc-48	0.1					0.1	0.1	1	1		
V-48	0.1					0.1	0.1	1	1		
Cr-51	10	4.00	2.5	2.5	1	0.1	0.1	1	1		
Mn-52	0.1					0.1	0.1	1	1		
Mn-53	10					1	1	1	0.01		
Mn-54	1	0.12	8.5	8.5	1	1	1	10	10	10	1
Fe-55	100	2941.18	0.034			0.1	0.1	1	1		
Fe-59	0.1	0.08	1.2	1.2	1	0.1	0.1	1	1		
Co-56	0.1					0.1	0.1	1	1		
Co-57	10	1.52	6.6	6.6	1	1	1	10	10	10	1
Co-58	0.1	0.10	0.96			0.1	0.1	1	1		

Co-60	0.1	0.04	2.5	2.5	1	0.1	0.1	1	1		
Ni-59	10	1351.35	0.0074			1	1	1	0.1		
Ni-63	10	1000.00	0.01			1	1	1	0.1		
Zn-65	0.1	0.05	2.1	2.1	1	1	1	1	0.1		
Ge-71	100000					10	1	1	10	10	1
As-73	1000					1	1	10	10	10	1
As-74	1					0.1	0.1	1	1		
As-76	1					0.1	0.1	1	1		
As-77	100					1	0.1	1	1		
Se-75	1	0.28	3.6	3.6	1	0.1	0.1	1	1		
Br-82	0.1					0.1	0.1	1	1		
Rb-86	1					0.1	0.1	1	0.1		
Sr-85	1	0.21	4.7	4.7	1	0.1	0.1	1	1		
Sr-89	100	71.43	1.4	1.4	1	1	1	1	10	10	1
Sr-90	0.1	1.00	0.1			1	1	1	0.1		
Y-90	100					1	0.1	1	1		
Y-91	100	23.26	4.3	4.3	1	1	0.1	1	10	10	1
Zr-93	100					1	0.1	1	10	10	1
Zr-95	0.1	0.14	0.73			0.1	0.1	1	1		
Nb-93m	100	500.00	0.2			1	1	1	1		
Nb-94	0.1	0.03	2.9	2.9	1	0.1	0.1	1	1		
Nb-95	1	0.14	7.4	7.4	1	0.1	0.1	1	1		
Mo-93	1	0.26	3.8	3.8	1	1	1	1	0.1		
Mo-99	1					0.1	0.1	1	1		
Tc-96	0.1					0.1	0.1	1	1		
Tc-97	1					1	1	1	0.1		
Tc-97m	10					1	1	1	1		
Tc-99	0.1	0.08	1.2	1.2	1	1	1	1	0.1		

Ru-97	1					0.1	0.1	1	1
Ru-103	1	0.21	4.7	4.7	1	0.1	0.1	1	1
Ru-106	1	0.48	2.1	2.1	1	1	1	1	1
Rh-105	10					0.1	0.1	1	1
Pd-103	1000					1	1	1	1
Ag-105	1					0.1	0.1	1	1
Ag-110m	0.1	0.04	2.8	2.8	1	0.1	0.1	1	1
Ag-111	10					0.1	0.1	1	1
Cd-109	1	22.73	0.044			1	1	1	0.1
Cd-115	1					0.1	0.1	1	1
Cd-115m	10					0.1	0.1	1	1
In-111	1					0.1	0.1	1	1
In-114m	1					0.1	0.1	1	1
Sn-113	1					0.1	0.1	1	1
Sn-125	1					0.1	0.1	1	1
Sb-122	1					0.1	0.1	1	1
Sb-124	0.1	0.06	1.8	1.8	1	0.1	0.1	1	1
Sb-125	1	0.24	4.1	4.1	1	1	1	10	1
Te-123m	1					1	1	1	1
Te-125m	100					1	1	10	1
Te-127	100					1	0.1	1	
Te-127m	1					1	1	1	0.1
Te-129	10					0.1	0.1	1	
Te-129m	10					0.1	0.1	1	1
Te-131	1					0.1	0.1	1	
Te-131m	0.1					0.1	0.1	1	0.1
Te-132	0.1					0.1	0.1	1	1

I-125	10	3.70	2.7	2.7	1	0.1	0.1	1	10	10	1
I-126	1					0.1	0.1	1	1		
I-129	0.1	0.00	24	24	1	1	1	0.1	1		
I-131	1	0.36	2.8	2.8	1	0.1	0.1	1	1		
Cs-129	1					0.1	0.1	1	1		
Cs-131	1000					1	1	1	1		
Cs-132	1					0.1	0.1	1	1		
Cs-134	0.1	0.02	6.6	6.6	1	0.1	0.1	1	1		
Cs-135	10					1	1	1	1		
Cs-136	0.1					0.1	0.1	1	1		
Cs-137	1	0.04	26	26	1	1	1	10	1		
Ba-131	1					0.1	0.1	1	1		
Ba-140	0.1					0.1	0.1	1	1		
La-140	0.1					0.1	0.1	1	1		
Ce-139	10					1	1	10	10	10	1
Ce-141	10	2.94	3.4	3.4	1	0.1	0.1	1	1		
Ce-143	1					0.1	0.1	1	1		
Ce-144	1	3.03	0.33			1	1	1	0.1		
Pr-143	1000					10	1	1	10	10	1
Nd-147	10					0.1	0.1	1	1		
Pm-147	100	357.14	0.28			1	0.1	1	1		
Pm-149	100					1	0.1	1	1		
Sm-151	1000					1	1	1	10	10	1
Sm-153	10					0.1	0.1	1	1		
Eu-152	0.1	0.09	1.1	1.1	1	0.1	0.1	1	1		
Eu-154	0.1	0.08	1.2	1.2	1	0.1	0.1	1	1		
Eu-155	10	4.00	2.5	2.5	1	1	1	10	1		
Gd-153	10					1	1	10	1		

Tb-160	0.1					0.1	0.1	1	1		
Dy-166	10					0.1	0.1	1	1		
Ho-166	10					0.1	0.1	1	1		
Er-169	1000					10	1	1	10	10	1
Tm-170	100					1	0.1	10	10	10	1
Tm-171	1000					1	1	10	10	10	1
Yb-175	10					0.1	0.1	1	1		
Lu-177	10					0.1	0.1	1	1		
Hf-181	1					0.1	0.1	1	1		
Ta-182	0.1					0.1	0.1	1	1		
W-181	100					1	1	10	10	10	1
W-185	100					1	0.1	1	1		
Re-186	100	32.26	3.1	3.1	1	1	0.1	1	1		
Os-185	1					0.1	0.1	1	1		
Os-191	10					0.1	0.1	1	1		
Os-193	10					0.1	0.1	1	1		
Ir-190	0.1					0.1	0.1	1	1		
Ir-192	1	0.08	12	12	1	0.1	0.1	1	10	10	1
Pt-191	1					0.1	0.1	1	1		
Pt-193m	100					1	0.1	1	1		
Au-198	1					0.1	0.1	1	1		
Au-199	10					0.1	0.1	1	1		
Hg-197	10					0.1	0.1	1	1		
Hg-203	1					0.1	0.1	1	1		
Tl-200	0.1					0.1	0.1	1	0.1		
Tl-201	10					0.1	0.1	1	1		
Tl-202	1					0.1	0.1	1	1		

Tl-204	0.1					1	1	1	0.01		
Pb-203	1					0.1	0.1	1	1		
Pb-210	5	0.07	75	75	1	10	5	500	500	500	1
Bi-206	0.1					0.1	0.1	1	1		
Bi-207	0.1					0.1	0.1	1	1		
Bi-210	0.5	101.01	0.00495			1	0.5	0.005	0.05		
Po-210	5	0.17	30	30	1	10	5	50	500	500	1
Ra-223	0.5	0.53	0.95			1	0.5	0.5	0.5		
Ra-224	0.5	0.13	3.8	3.8	1	1	0.5	5	0.5		
Ra-225	1	1.92	0.52			0.1	0.1	1	1		
Ra-226	0.5	0.02	26.5	26.5	1	1	0.5	500	50	50	1
Ra-228	0.5	0.11	4.45	4.45	1	1	0.5	50	50	50	1
Th-227	0.5	0.91	0.55			1	0.5	0.5	0.5		
Th-228	0.5	0.04	13.5	13.5	1	1	0.5	5	5	5	1
Th-229	0.1	0.01	14	14	1	0.1	0.1	1	1		
Th-230	0.5	0.05	11	11	1	1	0.5	5	5	5	1
Th-231	0.5	256.41	0.00195			1	0.5	0.005	0.005		
Th-232	0.5	0.01	65	65	1	1	0.5	50	50	50	1
Th-234	0.5	13.33	0.0375			1	0.5	0.05	0.05		
Pa-230	1					0.1	0.1	1	1		
Pa-231	0.5	0.00	105	105	1	1	0.5	50	50	50	1
Pa-233	1	0.71	1.4	1.4	1	0.1	0.1	1	1		
U-230	1					0.1	0.1	1	1		
U-231	10					0.1	0.1	1	1		
U-232	0.1					1	1	1	1		
U-233	1	0.06	17	17	1	1	1	1	1		
U-234	0.5	0.06	8.5	8.5	1	1	0.5	0.5	0.5		
U-235	0.5	0.07	7	7	1	1	0.5	0.5	0.5		
U-236	1					1	1	1	1		
U-237	10					0.1	0.1	1	1		

U-238	0.5	0.08	6.5	6.5	1	1	0.5	0.5	0.5		
Np-237	0.1	0.00	710	710	1	1	1	1	1		
Np-239	10					0.1	0.1	1	1		
Pu-236	1					1	0.1	1	10	10	1
Pu-237	10					0.1	0.1	1	1		
Pu-238	0.1	0.06	1.7	1.7	1	0.1	0.1	1	1		
Pu-239	0.1	0.05	2.2	2.2	1	0.1	0.1	1	1		
Pu-240	0.1	0.05	2.2	2.2	1	0.1	0.1	1	1		
Pu-241	10	0.59	17	17	1	1	0.1	1	10	10	1
Pu-242	0.1	0.05	2.1	2.1	1	0.1	0.1	1	1		
Pu-244	0.1					0.1	0.1	1	1		
Am-241	0.1	0.03	3.3	3.3	1	0.1	0.1	1	1		
Am-242	100					1	0.1	1			
Am-242m	0.1					0.1	0.1	1	1		
Am-243	0.1					0.1	0.1	1	1		
Cm-242	1	0.91	1.1	1.1	1	0.1	0.1	1	1		
Cm-243	1					1	1	10	10	10	1
Cm-244	1	0.06	16	16	1	1	0.1	10	10	10	1
Cm-245	0.1					0.1	0.1	1	1		
Cm-246	0.1					0.1	0.1	1	1		
Cm-247	1					1	1	10	10	10	1
Cm-248	0.1					0.1	0.1	1	1		
Bk-249	100					1	0.1	10	10	10	1
Cf-246	10					0.1	0.1	1	1		
Cf-248	1					1	1	1	1		
Cf-249	0.1					1	1	1	1		
Cf-250	0.1					1	1	1	1		
Cf-251	0.1					1	1	1	1		

Cf-252	1		1	1	1	10	10	1
Cf-253	10		1	0.1	10	10	10	1
Cf-254	1		1	1	10	10	10	1
Es-253	10		1	0.1	10	10	10	1
Es-254	1		1	1	10	10	10	1
Es-254m	1		0.1	0.1	1	1		
		Total	59					37

Ratios > 1 =	59
Ratios > 3 =	35
Ratios > 10 =	16
Ratios > 30 =	4