

ag110 8.37E-10 5.26E-12 3.31E-14 1.31E-18 2.05E-27 .00E+00 .00E+00 .00E+00 .00E+00 .00E+00 .00E+00
 ag110m 6.15E-08 3.87E-10 2.43E-12 9.64E-17 1.51E-25 .00E+00 .00E+00 .00E+00 .00E+00 .00E+00 .00E+00

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Part B 8X UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 71

	nuclide radioactivity, curies basis =per critical mass 10.1 MT UO2											
	initial	15.0 yr	20.0 yr	30.0 yr	50.0 yr	100.0 yr	150.0 yr	200.0 yr	250.0 yr	300.0 yr	400.0 yr	
cd110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
nb111	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo111	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc111	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru111	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh111	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd111	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd111m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag111	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag111m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd111	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd111m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
nb112	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo112	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc112	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru112	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh112	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd112	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag112	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd112	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo113	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc113	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru113	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh113	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd113	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag113	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag113m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd113	6.67E-14	6.67E-14	6.67E-14	6.67E-14	6.67E-14	6.67E-14	6.67E-14	6.67E-14	6.67E-14	6.67E-14	6.67E-14	
cd113m	8.56E-04	6.70E-04	5.24E-04	3.20E-04	1.20E-04	1.03E-05	8.78E-07	7.52E-08	6.44E-09	5.51E-10	4.04E-12	
in113	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
in113m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo114	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc114	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru114	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh114	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd114	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag114	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd114	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
in114	3.13E-28	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
in114m	3.27E-28	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
sn114	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo115	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc115	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru115	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh115	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd115	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag115	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag115m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd115	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd115m	5.08E-28	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
in115	1.18E-11	1.18E-11	1.18E-11	1.18E-11	1.18E-11	1.18E-11	1.18E-11	1.18E-11	1.18E-11	1.18E-11	1.18E-11	
in115m	4.56E-32	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	

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-te132	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
i132	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
xe132	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cs132	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba132	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in133	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn133	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb133	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te133	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te133m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
i133	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
i133m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
xe133	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
xe133m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cs133	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba133	3.38E-10	2.43E-10	1.75E-10	9.05E-11	2.42E-11	8.98E-13	3.33E-14	1.24E-15	4.58E-17	1.70E-18	2.34E-21	
in134	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn134	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb134	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb134m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te134	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
i134	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
i134m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
xe134	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
xe134m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cs134	1.92E-02	3.58E-03	6.66E-04	2.31E-05	2.77E-08	1.39E-15	6.96E-23	3.49E-30	.00E+00	.00E+00	.00E+00	.00E+00
cs134m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba134	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn135	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb135	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te135	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
i135	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
xe135	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
xe135m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cs135	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00
cs135m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba135	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba135m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn136	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb136	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te136	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
i136	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
i136m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
xe136	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cs136	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba136	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba136m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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	Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle											fission products				page 76
	nuclide radioactivity, curies															
	basis =per critical mass 10.1 MT UO2															
	initial	15.0 yr	20.0 yr	30.0 yr	50.0 yr	100.0 yr	150.0 yr	200.0 yr	250.0 yr	300.0 yr	400.0 yr					
sb137	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00		
te137	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00		
i137	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00		
xe137	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00		
cs137	2.06E+01	1.84E+01	1.64E+01	1.30E+01	8.19E+00	2.58E+00	8.12E-01	2.56E-01	8.06E-02	2.54E-02	2.52E-03					
ba137	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00					
ba137m	1.95E+01	1.74E+01	1.55E+01	1.23E+01	7.73E+00	2.44E+00	7.67E-01	2.42E-01	7.61E-02	2.40E-02	2.38E-03					
sb138	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00					

-eu165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
gd165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy165m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho166m	1.11E-07	1.11E-07	1.10E-07	1.10E-07	1.08E-07	1.05E-07	1.02E-07	9.94E-08	9.66E-08	9.38E-08	8.86E-08	
er166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
er167	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
er167m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
er168	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
yb168	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
er169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tm169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
yb169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
er170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tm170	1.76E-19	9.32E-24	4.94E-28	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tm170m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
yb170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
er171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tm171	4.06E-10	6.68E-11	1.10E-11	2.97E-13	2.18E-16	3.15E-24	4.56E-32	.00E+00	.00E+00	.00E+00	.00E+00	
yb171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
er172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tm172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
yb172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
total	9.47E+01	8.51E+01	7.71E+01	6.39E+01	4.54E+01	2.44E+01	1.79E+01	1.58E+01	1.51E+01	1.48E+01	1.46E+01	

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 81
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr
he 4	2.72E+02	2.72E+02	2.74E+02	2.77E+02	2.84E+02	2.90E+02	2.96E+02	3.02E+02	3.07E+02	3.13E+02	3.18E+02
tl206	4.30E-14	4.31E-14	4.33E-14	4.37E-14	4.45E-14	4.54E-14	4.62E-14	4.69E-14	4.77E-14	4.84E-14	4.91E-14
tl207	1.78E-09	1.78E-09	1.78E-09	1.78E-09	1.78E-09	1.78E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09
tl208	1.71E-13	7.20E-14	1.43E-14	1.41E-14	1.44E-14	1.48E-14	1.51E-14	1.55E-14	1.58E-14	1.62E-14	1.65E-14
tl209	8.08E-11	8.09E-11	8.14E-11	8.25E-11	8.46E-11	8.68E-11	8.89E-11	9.10E-11	9.32E-11	9.53E-11	9.74E-11
pb206	1.13E+02	1.14E+02	1.15E+02	1.18E+02	1.24E+02	1.30E+02	1.36E+02	1.42E+02	1.48E+02	1.55E+02	1.61E+02
pb207	6.42E+00	6.44E+00	6.50E+00	6.64E+00	6.91E+00	7.18E+00	7.46E+00	7.73E+00	8.00E+00	8.27E+00	8.54E+00
pb208	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01
pb209	3.41E-07	3.42E-07	3.44E-07	3.48E-07	3.57E-07	3.66E-07	3.76E-07	3.85E-07	3.94E-07	4.03E-07	4.11E-07
pb210	9.28E-02	9.29E-02	9.34E-02	9.43E-02	9.61E-02	9.78E-02	9.95E-02	1.01E-01	1.03E-01	1.04E-01	1.06E-01
pb211	1.38E-08	1.38E-08	1.38E-08	1.38E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08
pb212	1.01E-10	4.27E-11	8.49E-12	8.35E-12	8.56E-12	8.76E-12	8.97E-12	9.18E-12	9.38E-12	9.59E-12	9.80E-12
pb214	2.16E-07	2.16E-07	2.17E-07	2.20E-07	2.24E-07	2.28E-07	2.32E-07	2.36E-07	2.40E-07	2.43E-07	2.47E-07
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	2.24E+01	2.25E+01	2.28E+01	2.34E+01	2.47E+01	2.61E+01	2.75E+01	2.89E+01	3.04E+01	3.18E+01	3.34E+01
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	5.71E-05	5.72E-05	5.75E-05	5.80E-05	5.91E-05	6.02E-05	6.13E-05	6.23E-05	6.33E-05	6.43E-05	6.52E-05
bi211	8.16E-10	8.16E-10	8.16E-10	8.15E-10	8.15E-10	8.14E-10	8.14E-10	8.13E-10	8.13E-10	8.13E-10	8.13E-10
bi212	9.60E-12	4.05E-12	8.05E-13	7.92E-13	8.12E-13	8.31E-13	8.51E-13	8.70E-13	8.90E-13	9.10E-13	9.29E-13
bi213	8.12E-08	8.13E-08	8.18E-08	8.29E-08	8.51E-08	8.72E-08	8.94E-08	9.15E-08	9.37E-08	9.58E-08	9.79E-08
bi214	1.60E-07	1.61E-07	1.61E-07	1.63E-07	1.66E-07	1.69E-07	1.72E-07	1.75E-07	1.78E-07	1.81E-07	1.83E-07
po210	1.58E-03	1.58E-03	1.59E-03	1.60E-03	1.63E-03	1.66E-03	1.69E-03	1.72E-03	1.75E-03	1.77E-03	1.80E-03
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	9.01E-15	9.01E-15	9.02E-15	9.01E-15	9.00E-15	9.00E-15	8.99E-15	8.99E-15	8.99E-15	8.98E-15	8.98E-15
po212	5.05E-22	2.13E-22	4.23E-23	4.16E-23	4.27E-23	4.37E-23	4.47E-23	4.57E-23	4.68E-23	4.78E-23	4.88E-23
po213	1.22E-16	1.22E-16	1.23E-16	1.25E-16	1.28E-16	1.31E-16	1.34E-16	1.38E-16	1.41E-16	1.44E-16	1.47E-16
po214	2.21E-14	2.21E-14	2.22E-14	2.24E-14	2.29E-14	2.33E-14	2.37E-14	2.41E-14	2.45E-14	2.48E-14	2.52E-14

pu236	1.42E-09	1.42E-09	1.41E-09	1.40E-09	1.39E-09	1.37E-09	1.35E-09	1.34E-09	1.32E-09	1.31E-09	1.29E-09
pu237	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu238	2.78E-02	1.26E-02	2.43E-04	8.98E-08	3.22E-14	1.07E-18	5.76E-23	3.10E-27	1.66E-31	8.93E-36	4.80E-40
pu239	5.74E+03	5.72E+03	5.64E+03	5.48E+03	5.18E+03	4.89E+03	4.61E+03	4.36E+03	4.11E+03	3.88E+03	3.67E+03
pu240	5.63E+01	5.57E+01	5.29E+01	4.76E+01	3.85E+01	3.12E+01	2.52E+01	2.04E+01	1.65E+01	1.34E+01	1.08E+01
pu241	1.19E-11	9.74E-14	2.10E-15	1.93E-15	1.64E-15	1.39E-15	1.18E-15	1.01E-15	8.55E-16	7.26E-16	6.17E-16
pu242	1.17E-02	1.17E-02	1.17E-02	1.17E-02	1.17E-02	1.16E-02	1.16E-02	1.15E-02	1.15E-02	1.15E-02	1.14E-02
pu243	8.11E-28	8.11E-28	8.11E-28	8.11E-28	8.11E-28	8.11E-28	8.11E-28	8.11E-28	8.11E-28	8.11E-28	8.11E-28
pu244	6.52E-21	6.54E-21	6.68E-21	6.95E-21	7.50E-21	8.04E-21	8.59E-21	9.13E-21	9.66E-21	1.02E-20	1.07E-20
pu245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am240	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am241	4.81E-02	4.10E-02	1.84E-02	3.71E-03	1.50E-04	6.09E-06	2.47E-07	1.00E-08	4.06E-10	1.65E-11	6.87E-13
am242m	7.21E-07	4.41E-07	3.77E-08	2.77E-10	1.49E-14	7.98E-19	4.29E-23	2.30E-27	1.24E-31	6.65E-36	3.57E-40
am242	9.30E-12	5.69E-12	4.87E-13	3.57E-15	1.92E-19	1.03E-23	5.53E-28	2.97E-32	1.61E-36	.00E+00	.00E+00
am243	4.01E-05	3.97E-05	3.79E-05	3.45E-05	2.86E-05	2.37E-05	1.96E-05	1.62E-05	1.35E-05	1.11E-05	9.24E-06
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 83

nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

cm242	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr
cm243	1.88E-09	1.15E-09	9.83E-11	7.21E-13	3.88E-17	2.09E-21	1.12E-25	6.02E-30	3.23E-34	1.74E-38	1.02E-42
cm243	1.40E-17	1.23E-18	6.44E-24	1.76E-34	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm244	1.36E-16	2.95E-18	1.42E-26	3.42E-43	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm245	1.32E-12	1.31E-12	1.26E-12	1.16E-12	9.87E-13	8.38E-13	7.12E-13	6.05E-13	5.14E-13	4.37E-13	3.71E-13
cm246	8.71E-15	8.59E-15	7.98E-15	6.89E-15	5.14E-15	3.84E-15	2.86E-15	2.13E-15	1.59E-15	1.19E-15	8.86E-16
cm247	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17
cm248	1.49E-19	1.49E-19	1.49E-19	1.49E-19	1.48E-19	1.48E-19	1.47E-19	1.46E-19	1.46E-19	1.45E-19	1.45E-19
cm249	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm250	5.20E-35	5.18E-35	5.08E-35	4.88E-35	4.51E-35	4.16E-35	3.84E-35	3.55E-35	3.28E-35	3.03E-35	2.79E-35
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk249	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf249	7.47E-25	6.13E-25	2.28E-25	3.15E-26	6.04E-28	1.16E-29	2.21E-31	4.23E-33	8.11E-35	1.55E-36	2.97E-38
cf250	2.20E-38	5.54E-39	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf251	1.09E-31	1.01E-31	6.88E-32	3.18E-32	6.79E-33	1.45E-33	3.10E-34	6.61E-35	1.41E-35	3.02E-36	6.44E-37
cf252	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf253	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf254	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf255	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es253	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es254m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es254	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es255	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
s250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
total	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 84

nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

he 4	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr
tl206	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tl206	9.35E-06	9.36E-06	9.41E-06	9.50E-06	9.69E-06	9.86E-06	1.00E-05	1.02E-05	1.04E-05	1.05E-05	1.07E-05

tl207	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01
tl208	5.06E-05	2.13E-05	4.24E-06	4.17E-06	4.28E-06	4.38E-06	4.48E-06	4.58E-06	4.69E-06	4.79E-06	4.89E-06	4.89E-06
tl209	3.30E-02	3.31E-02	3.33E-02	3.37E-02	3.46E-02	3.55E-02	3.64E-02	3.72E-02	3.81E-02	3.90E-02	3.98E-02	3.98E-02
pb206	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pb207	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pb208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pb209	1.57E+00	1.58E+00	1.59E+00	1.61E+00	1.65E+00	1.69E+00	1.73E+00	1.77E+00	1.82E+00	1.86E+00	1.90E+00	1.90E+00
pb210	7.08E+00	7.09E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.60E+00	7.73E+00	7.85E+00	7.97E+00	8.09E+00	8.09E+00
pb211	3.40E-01	3.40E-01	3.40E-01	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01
pb212	1.41E-04	5.93E-05	1.18E-05	1.16E-05	1.19E-05	1.22E-05	1.25E-05	1.28E-05	1.30E-05	1.33E-05	1.36E-05	1.36E-05
pb214	7.09E+00	7.10E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.60E+00	7.73E+00	7.86E+00	7.98E+00	8.09E+00	8.09E+00
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	7.09E+00	7.09E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.60E+00	7.73E+00	7.85E+00	7.97E+00	8.09E+00	8.09E+00
bi211	3.40E-01	3.40E-01	3.40E-01	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01
bi212	1.41E-04	5.93E-05	1.18E-05	1.16E-05	1.19E-05	1.22E-05	1.25E-05	1.28E-05	1.30E-05	1.33E-05	1.36E-05	1.36E-05
bi213	1.57E+00	1.58E+00	1.59E+00	1.61E+00	1.65E+00	1.69E+00	1.73E+00	1.77E+00	1.82E+00	1.86E+00	1.90E+00	1.90E+00
bi214	7.09E+00	7.10E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.60E+00	7.73E+00	7.86E+00	7.98E+00	8.09E+00	8.09E+00
po210	7.09E+00	7.09E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.60E+00	7.73E+00	7.85E+00	7.97E+00	8.09E+00	8.09E+00
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	9.34E-04	9.34E-04	9.35E-04	9.34E-04	9.33E-04	9.33E-04	9.32E-04	9.32E-04	9.31E-04	9.31E-04	9.31E-04	9.31E-04
po212	9.02E-05	3.80E-05	7.56E-06	7.44E-06	7.62E-06	7.80E-06	7.99E-06	8.17E-06	8.36E-06	8.54E-06	8.72E-06	8.72E-06
po213	1.54E+00	1.54E+00	1.55E+00	1.57E+00	1.61E+00	1.65E+00	1.70E+00	1.74E+00	1.78E+00	1.82E+00	1.86E+00	1.86E+00
po214	7.09E+00	7.10E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.60E+00	7.73E+00	7.85E+00	7.97E+00	8.09E+00	8.09E+00
po215	3.40E-01	3.40E-01	3.40E-01	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01
po216	1.41E-04	5.93E-05	1.18E-05	1.16E-05	1.19E-05	1.22E-05	1.25E-05	1.28E-05	1.30E-05	1.33E-05	1.36E-05	1.36E-05
po218	7.09E+00	7.10E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.61E+00	7.73E+00	7.86E+00	7.98E+00	8.09E+00	8.09E+00
at217	1.57E+00	1.58E+00	1.59E+00	1.61E+00	1.65E+00	1.69E+00	1.73E+00	1.77E+00	1.82E+00	1.86E+00	1.90E+00	1.90E+00
rn218	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rn219	3.40E-01	3.40E-01	3.40E-01	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01
rn220	1.41E-04	5.93E-05	1.18E-05	1.16E-05	1.19E-05	1.22E-05	1.25E-05	1.28E-05	1.30E-05	1.33E-05	1.36E-05	1.36E-05
rn222	7.09E+00	7.10E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.61E+00	7.73E+00	7.86E+00	7.98E+00	8.09E+00	8.09E+00
fr221	1.57E+00	1.58E+00	1.59E+00	1.61E+00	1.65E+00	1.69E+00	1.73E+00	1.77E+00	1.82E+00	1.86E+00	1.90E+00	1.90E+00
fr223	4.69E-03	4.69E-03	4.69E-03	4.69E-03	4.68E-03	4.68E-03	4.68E-03	4.68E-03	4.67E-03	4.67E-03	4.67E-03	4.67E-03
ra222	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ra223	3.40E-01	3.40E-01	3.40E-01	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01
ra224	1.41E-04	5.93E-05	1.18E-05	1.16E-05	1.19E-05	1.22E-05	1.25E-05	1.28E-05	1.30E-05	1.33E-05	1.36E-05	1.36E-05
ra225	1.57E+00	1.58E+00	1.59E+00	1.61E+00	1.65E+00	1.69E+00	1.73E+00	1.77E+00	1.82E+00	1.86E+00	1.90E+00	1.90E+00
ra226	7.09E+00	7.10E+00	7.13E+00	7.20E+00	7.34E+00	7.47E+00	7.61E+00	7.73E+00	7.86E+00	7.98E+00	8.09E+00	8.09E+00
ra228	1.06E-05	1.07E-05	1.07E-05	1.09E-05	1.12E-05	1.15E-05	1.18E-05	1.21E-05	1.24E-05	1.26E-05	1.29E-05	1.29E-05
ac225	1.57E+00	1.58E+00	1.59E+00	1.61E+00	1.65E+00	1.69E+00	1.73E+00	1.77E+00	1.82E+00	1.86E+00	1.90E+00	1.90E+00
ac227	3.40E-01	3.40E-01	3.40E-01	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01
ac228	1.06E-05	1.07E-05	1.07E-05	1.09E-05	1.12E-05	1.15E-05	1.18E-05	1.21E-05	1.24E-05	1.26E-05	1.29E-05	1.29E-05
th226	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
th227	3.35E-01	3.35E-01	3.35E-01	3.35E-01	3.35E-01	3.35E-01	3.34E-01	3.34E-01	3.34E-01	3.34E-01	3.34E-01	3.34E-01
th228	1.41E-04	5.93E-05	1.18E-05	1.16E-05	1.19E-05	1.22E-05	1.25E-05	1.28E-05	1.30E-05	1.33E-05	1.36E-05	1.36E-05
th229	1.57E+00	1.58E+00	1.59E+00	1.61E+00	1.65E+00	1.69E+00	1.73E+00	1.77E+00	1.82E+00	1.86E+00	1.90E+00	1.90E+00
th230	7.25E+00	7.26E+00	7.29E+00	7.36E+00	7.50E+00	7.63E+00	7.75E+00	7.88E+00	8.00E+00	8.11E+00	8.23E+00	8.23E+00
th231	3.32E-01	3.32E-01	3.32E-01	3.33E-01	3.33E-01	3.34E-01	3.35E-01	3.35E-01	3.36E-01	3.36E-01	3.37E-01	3.37E-01

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	Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle												actinides	page	85
	nuclide radioactivity, curies														
	basis =per critical mass 10.1 MT UO2														
	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr				
th232	1.06E-05	1.07E-05	1.07E-05	1.09E-05	1.12E-05	1.15E-05	1.18E-05	1.21E-05	1.24E-05	1.26E-05	1.29E-05				
th233	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00				
th234	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00				
pa231	3.40E-01	3.40E-01	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01				
pa232	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00				

pa233	6.72E+00	6.72E+00	6.72E+00	6.71E+00	6.71E+00	6.71E+00	6.70E+00	6.70E+00	6.69E+00	6.69E+00	6.68E+00
pa234m	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00
pa234	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03	3.77E-03
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u231	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u232	1.27E-04	4.73E-05	1.06E-06	7.34E-07	7.25E-07	7.16E-07	7.08E-07	6.99E-07	6.91E-07	6.83E-07	6.74E-07
u233	1.81E+00	1.81E+00	1.82E+00	1.84E+00	1.89E+00	1.93E+00	1.97E+00	2.01E+00	2.05E+00	2.09E+00	2.13E+00
u234	1.48E+01	1.48E+01	1.48E+01	1.48E+01	1.47E+01	1.46E+01	1.46E+01	1.45E+01	1.44E+01	1.44E+01	1.43E+01
u235	3.32E-01	3.32E-01	3.32E-01	3.33E-01	3.33E-01	3.34E-01	3.35E-01	3.35E-01	3.36E-01	3.36E-01	3.37E-01
u236	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00
u237	2.96E-14	2.41E-16	5.18E-18	4.78E-18	4.06E-18	3.45E-18	2.93E-18	2.49E-18	2.11E-18	1.80E-18	1.52E-18
u238	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00
u239	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u240	1.19E-25	1.20E-25	1.22E-25	1.27E-25	1.37E-25	1.47E-25	1.57E-25	1.67E-25	1.77E-25	1.87E-25	1.96E-25
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np236m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np236	8.32E-06	8.32E-06	8.29E-06	8.24E-06	8.15E-06	8.05E-06	7.95E-06	7.86E-06	7.76E-06	7.67E-06	7.58E-06
np237	6.72E+00	6.72E+00	6.72E+00	6.71E+00	6.71E+00	6.70E+00	6.70E+00	6.69E+00	6.69E+00	6.68E+00	6.68E+00
np238	3.40E-08	2.08E-08	1.78E-09	1.30E-11	7.01E-16	3.76E-20	2.02E-24	1.09E-28	.00E+00	.00E+00	.00E+00
np239	8.00E-06	7.92E-06	7.56E-06	6.88E-06	5.70E-06	4.72E-06	3.91E-06	3.24E-06	2.69E-06	2.23E-06	1.84E-06
np240m	1.19E-25	1.20E-25	1.22E-25	1.27E-25	1.37E-25	1.47E-25	1.57E-25	1.67E-25	1.77E-25	1.87E-25	1.96E-25
np240	1.43E-28	1.44E-28	1.47E-28	1.53E-28	1.65E-28	1.77E-28	1.89E-28	2.00E-28	2.12E-28	2.24E-28	2.36E-28
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	7.41E-07	7.40E-07	7.38E-07	7.34E-07	7.25E-07	7.16E-07	7.08E-07	6.99E-07	6.91E-07	6.83E-07	6.74E-07
pu237	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu238	4.76E-01	2.16E-01	4.15E-03	1.54E-06	5.51E-13	1.84E-17	9.87E-22	5.30E-26	2.85E-30	.00E+00	.00E+00
pu239	3.56E+02	3.55E+02	3.50E+02	3.40E+02	3.21E+02	3.03E+02	2.86E+02	2.70E+02	2.55E+02	2.41E+02	2.28E+02
pu240	1.28E+01	1.27E+01	1.20E+01	1.08E+01	8.74E+00	7.08E+00	5.73E+00	4.64E+00	3.76E+00	3.04E+00	2.46E+00
pu241	1.24E-09	1.01E-11	2.17E-13	2.00E-13	1.70E-13	1.44E-13	1.23E-13	1.04E-13	8.84E-14	7.51E-14	6.38E-14
pu242	4.65E-05	4.65E-05	4.64E-05	4.63E-05	4.62E-05	4.60E-05	4.58E-05	4.56E-05	4.55E-05	4.53E-05	4.51E-05
pu243	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21
pu244	1.19E-25	1.20E-25	1.22E-25	1.27E-25	1.37E-25	1.47E-25	1.57E-25	1.67E-25	1.77E-25	1.87E-25	1.97E-25
pu245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am240	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am241	1.65E-01	1.41E-01	6.32E-02	1.27E-02	5.16E-04	2.09E-05	8.48E-07	3.44E-08	1.39E-09	5.66E-11	2.36E-12
am242m	7.56E-06	4.62E-06	3.96E-07	2.90E-09	1.56E-13	8.37E-18	4.49E-22	2.41E-26	1.30E-30	.00E+00	.00E+00
am242	7.52E-06	4.60E-06	3.94E-07	2.89E-09	1.55E-13	8.33E-18	4.47E-22	2.40E-26	1.30E-30	.00E+00	.00E+00
am243	8.00E-06	7.92E-06	7.56E-06	6.88E-06	5.70E-06	4.72E-06	3.91E-06	3.24E-06	2.69E-06	2.23E-06	1.84E-06
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis = per critical mass 10.1 MT UO2

	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr
cm242	6.22E-06	3.80E-06	3.26E-07	2.39E-09	1.29E-13	6.91E-18	3.71E-22	1.99E-26	1.07E-30	.00E+00	.00E+00
cm243	7.24E-16	6.36E-17	3.33E-22	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm244	1.10E-14	2.39E-16	1.15E-24	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm245	2.27E-13	2.26E-13	2.17E-13	2.00E-13	1.70E-13	1.44E-13	1.22E-13	1.04E-13	8.83E-14	7.50E-14	6.37E-14
cm246	2.68E-15	2.64E-15	2.45E-15	2.12E-15	1.58E-15	1.18E-15	8.79E-16	6.56E-16	4.89E-16	3.65E-16	2.72E-16
cm247	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21	2.11E-21
cm248	6.33E-22	6.33E-22	6.32E-22	6.31E-22	6.29E-22	6.26E-22	6.23E-22	6.21E-22	6.18E-22	6.16E-22	6.13E-22
cm249	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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zr 93	4.49E+02	4.49E+02	4.49E+02	4.48E+02	4.48E+02	4.47E+02	4.47E+02	4.47E+02	4.46E+02	4.46E+02	4.45E+02
nb 93	9.52E+00	9.54E+00	9.64E+00	9.85E+00	1.03E+01	1.07E+01	1.11E+01	1.15E+01	1.19E+01	1.23E+01	1.27E+01
nb 93m	4.73E-03	4.73E-03	4.73E-03	4.73E-03	4.72E-03	4.72E-03	4.71E-03	4.71E-03	4.70E-03	4.70E-03	4.70E-03
br 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle nuclide concentrations, grams fission products page 91
basis =per critical mass 10.1 MT UO2

	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr
sr 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 94	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02
nb 94	5.41E-04	5.39E-04	5.30E-04	5.12E-04	4.78E-04	4.47E-04	4.17E-04	3.90E-04	3.64E-04	3.40E-04	3.18E-04
nb 94m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
br 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 95m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 95	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02
br 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 96	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02
nb 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 96	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00
kr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 97m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 97	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02
kr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 98m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 98	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02
tc 98	2.01E-04	2.01E-04	2.01E-04	2.01E-04	2.01E-04	2.01E-04	2.01E-04	2.01E-04	2.01E-04	2.01E-04	2.01E-04
rb 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 99m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc 99	6.20E+02	6.19E+02	6.19E+02	6.16E+02	6.12E+02	6.08E+02	6.04E+02	6.01E+02	5.97E+02	5.93E+02	5.89E+02
tc 99m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru 99	1.00E+02	1.01E+02	1.02E+02	1.04E+02	1.08E+02	1.12E+02	1.16E+02	1.20E+02	1.24E+02	1.27E+02	1.31E+02

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle											fission products		page 93
	nuclide concentrations, grams												
	basis =per critical mass 10.1 MT UO2												
	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr		
y106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh106m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd106	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01
ag106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd107	4.54E+01	4.54E+01	4.54E+01	4.54E+01	4.54E+01	4.54E+01	4.54E+01	4.54E+01	4.54E+01	4.53E+01	4.53E+01	4.53E+01	4.53E+01
pd107m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag107	2.11E-01	2.11E-01	2.14E-01	2.18E-01	2.28E-01	2.38E-01	2.48E-01	2.57E-01	2.67E-01	2.77E-01	2.86E-01	2.86E-01	2.86E-01
zr108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh108m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd108	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01
ag108	9.60E-19	5.56E-19	3.63E-20	1.55E-22	2.81E-27	5.10E-32	9.27E-37	3.10E-41	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag108m	3.11E-10	1.80E-10	1.18E-11	5.01E-14	9.11E-19	1.65E-23	3.00E-28	5.46E-33	9.91E-38	1.82E-42	.00E+00	.00E+00	.00E+00
cd108	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04
zr109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag109	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01
ag109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh110m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd110	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00
ag110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag110m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle											fission products		page 94
	nuclide concentrations, grams												

	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr
pd121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in121m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn121	2.40E-06	6.82E-07	1.25E-09	4.21E-15	4.78E-26	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn121m	3.10E-06	8.78E-07	1.61E-09	5.43E-15	6.16E-26	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in122m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb122m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in123m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn123m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te123	3.96E-16	3.96E-16	3.96E-16	3.96E-16	3.96E-16	3.96E-16	3.96E-16	3.96E-16	3.96E-16	3.96E-16	3.96E-16
te123m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb124m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in125m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn125m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te125m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd126	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag126	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd126	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in126	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn126	1.72E-01	1.72E-01	1.71E-01	1.70E-01	1.68E-01	1.66E-01	1.63E-01	1.61E-01	1.59E-01	1.57E-01	1.54E-01

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle nuclide radioactivity, curies fission products page 114

	initial	500.0 yr	1000.0 yr	2000.0 yr	4000.0 yr	6000.0 yr	8000.0 yr	10000.0 yr	12000.0 yr	14000.0 yr	16000.0 yr
sb126	2.41E-02	2.41E-02	2.40E-02	2.38E-02	2.35E-02	2.32E-02	2.29E-02	2.25E-02	2.22E-02	2.19E-02	2.16E-02
sb126m	1.72E-01	1.72E-01	1.71E-01	1.70E-01	1.68E-01	1.66E-01	1.63E-01	1.61E-01	1.59E-01	1.57E-01	1.54E-01

eu165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
gd165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy165m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho166m	8.86E-08	8.36E-08	6.26E-08	3.51E-08	1.11E-08	3.49E-09	1.10E-09	3.46E-10	1.09E-10	3.43E-11	1.08E-11	.00E+00
er166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er167	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er167m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er168	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb168	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm170m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
total	1.46E+01	1.46E+01	1.45E+01	1.45E+01	1.44E+01	1.43E+01	1.42E+01	1.42E+01	1.41E+01	1.40E+01	1.39E+01	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 121

	initial	18000.0 yr	20000.0 yr	22000.0 yr	24000.0 yr	26000.0 yr	28000.0 yr	30000.0 yr	32000.0 yr	36000.0 yr	38000.0 yr
he 4	3.18E+02	3.23E+02	3.27E+02	3.32E+02	3.36E+02	3.40E+02	3.44E+02	3.48E+02	3.52E+02	3.59E+02	3.63E+02
tl206	4.91E-14	4.98E-14	5.05E-14	5.11E-14	5.18E-14	5.24E-14	5.30E-14	5.36E-14	5.41E-14	5.52E-14	5.57E-14
tl207	1.77E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09	1.77E-09
tl208	1.65E-14	1.69E-14	1.72E-14	1.76E-14	1.79E-14	1.83E-14	1.86E-14	1.90E-14	1.93E-14	2.00E-14	2.04E-14
tl209	9.74E-11	9.95E-11	1.02E-10	1.04E-10	1.06E-10	1.08E-10	1.10E-10	1.12E-10	1.14E-10	1.18E-10	1.20E-10
pb206	1.61E+02	1.68E+02	1.74E+02	1.81E+02	1.88E+02	1.95E+02	2.02E+02	2.09E+02	2.16E+02	2.30E+02	2.38E+02
pb207	8.54E+00	8.81E+00	9.09E+00	9.36E+00	9.63E+00	9.90E+00	1.02E+01	1.04E+01	1.07E+01	1.13E+01	1.15E+01
pb208	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01
pb209	4.11E-07	4.20E-07	4.29E-07	4.38E-07	4.47E-07	4.55E-07	4.64E-07	4.72E-07	4.81E-07	4.97E-07	5.05E-07
pb210	1.06E-01	1.07E-01	1.09E-01	1.10E-01	1.12E-01	1.13E-01	1.14E-01	1.16E-01	1.17E-01	1.19E-01	1.20E-01
pb211	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08
pb212	9.80E-12	1.00E-11	1.02E-11	1.04E-11	1.06E-11	1.08E-11	1.10E-11	1.12E-11	1.14E-11	1.19E-11	1.21E-11
pb214	2.47E-07	2.50E-07	2.54E-07	2.57E-07	2.60E-07	2.63E-07	2.66E-07	2.69E-07	2.72E-07	2.77E-07	2.80E-07
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	3.34E+01	3.49E+01	3.65E+01	3.81E+01	3.98E+01	4.15E+01	4.32E+01	4.49E+01	4.67E+01	5.04E+01	5.22E+01
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	6.52E-05	6.61E-05	6.70E-05	6.79E-05	6.87E-05	6.95E-05	7.03E-05	7.11E-05	7.18E-05	7.33E-05	7.39E-05
bi211	8.13E-10	8.12E-10	8.12E-10	8.12E-10	8.12E-10	8.12E-10	8.12E-10	8.12E-10	8.12E-10	8.13E-10	8.13E-10
bi212	9.29E-13	9.49E-13	9.68E-13	9.88E-13	1.01E-12	1.03E-12	1.05E-12	1.07E-12	1.09E-12	1.13E-12	1.14E-12
bi213	9.79E-08	1.00E-07	1.02E-07	1.04E-07	1.06E-07	1.08E-07	1.10E-07	1.12E-07	1.14E-07	1.18E-07	1.20E-07
bi214	1.83E-07	1.86E-07	1.88E-07	1.91E-07	1.93E-07	1.95E-07	1.98E-07	2.00E-07	2.02E-07	2.06E-07	2.08E-07
po210	1.80E-03	1.83E-03	1.85E-03	1.87E-03	1.90E-03	1.92E-03	1.94E-03	1.96E-03	1.98E-03	2.02E-03	2.04E-03
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	8.98E-15	8.98E-15	8.98E-15	8.98E-15	8.98E-15	8.98E-15	8.98E-15	8.98E-15	8.98E-15	8.98E-15	8.98E-15
po212	4.88E-23	4.99E-23	5.09E-23	5.19E-23	5.29E-23	5.40E-23	5.50E-23	5.60E-23	5.71E-23	5.91E-23	6.02E-23
po213	1.47E-16	1.50E-16	1.54E-16	1.57E-16	1.60E-16	1.63E-16	1.66E-16	1.69E-16	1.72E-16	1.78E-16	1.81E-16
po214	2.52E-14	2.56E-14	2.59E-14	2.62E-14	2.66E-14	2.69E-14	2.72E-14	2.75E-14	2.78E-14	2.83E-14	2.86E-14

pu236	1.29E-09	1.28E-09	1.26E-09	1.24E-09	1.23E-09	1.22E-09	1.20E-09	1.19E-09	1.17E-09	1.14E-09	1.13E-09
pu237	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu238	4.80E-40	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu239	3.67E+03	3.46E+03	3.27E+03	3.09E+03	2.91E+03	2.75E+03	2.60E+03	2.45E+03	2.31E+03	2.06E+03	1.95E+03
pu240	1.08E+01	8.77E+00	7.10E+00	5.75E+00	4.66E+00	3.77E+00	3.05E+00	2.47E+00	2.00E+00	1.31E+00	1.06E+00
pu241	6.17E-16	5.24E-16	4.45E-16	3.78E-16	3.21E-16	2.73E-16	2.32E-16	1.97E-16	1.67E-16	1.21E-16	1.03E-16
pu242	1.14E-02	1.14E-02	1.13E-02	1.13E-02	1.12E-02	1.12E-02	1.12E-02	1.11E-02	1.11E-02	1.10E-02	1.10E-02
pu243	8.11E-28	8.11E-28	8.11E-28	8.11E-28	8.10E-28	8.10E-28	8.10E-28	8.10E-28	8.10E-28	8.10E-28	8.10E-28
pu244	1.07E-20	1.13E-20	1.18E-20	1.23E-20	1.28E-20	1.34E-20	1.39E-20	1.44E-20	1.49E-20	1.59E-20	1.65E-20
pu245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am240	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am241	6.87E-13	4.36E-14	1.51E-14	1.19E-14	1.01E-14	8.58E-15	7.29E-15	6.19E-15	5.26E-15	3.81E-15	3.23E-15
am242m	3.57E-40	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am242	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am243	9.24E-06	7.65E-06	6.34E-06	5.25E-06	4.35E-06	3.61E-06	2.99E-06	2.48E-06	2.05E-06	1.41E-06	1.17E-06
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 123
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

	initial	18000.0 yr	20000.0 yr	22000.0 yr	24000.0 yr	26000.0 yr	28000.0 yr	30000.0 yr	32000.0 yr	36000.0 yr	38000.0 yr
cm242	1.02E-42	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm243	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm244	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm245	3.71E-13	3.15E-13	2.68E-13	2.27E-13	1.93E-13	1.64E-13	1.39E-13	1.18E-13	1.01E-13	7.26E-14	6.16E-14
cm246	8.86E-16	6.61E-16	4.93E-16	3.68E-16	2.74E-16	2.05E-16	1.53E-16	1.14E-16	8.50E-17	4.73E-17	3.53E-17
cm247	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17
cm248	1.45E-19	1.44E-19	1.43E-19	1.43E-19	1.42E-19	1.42E-19	1.41E-19	1.41E-19	1.40E-19	1.39E-19	1.38E-19
cm249	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm250	2.79E-35	2.58E-35	2.38E-35	2.20E-35	2.03E-35	1.88E-35	1.73E-35	1.60E-35	1.48E-35	1.26E-35	1.16E-35
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk249	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf249	2.97E-38	5.69E-40	1.08E-41	3.49E-43	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf251	6.44E-37	1.38E-37	2.94E-38	6.27E-39	1.34E-39	2.86E-40	6.12E-41	1.30E-41	2.81E-42	.00E+00	.00E+00
cf252	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf253	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf254	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf255	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es253	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es254m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es254	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es255	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
s250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
total	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 124
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

	initial	18000.0 yr	20000.0 yr	22000.0 yr	24000.0 yr	26000.0 yr	28000.0 yr	30000.0 yr	32000.0 yr	36000.0 yr	38000.0 yr
he 4	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tl206	1.07E-05	1.08E-05	1.10E-05	1.11E-05	1.13E-05	1.14E-05	1.15E-05	1.16E-05	1.18E-05	1.20E-05	1.21E-05

zr 93	4.45E+02	4.45E+02	4.45E+02	4.44E+02	4.44E+02	4.43E+02	4.43E+02	4.43E+02	4.42E+02	4.41E+02	4.41E+02
nb 93	1.27E+01	1.31E+01	1.35E+01	1.39E+01	1.43E+01	1.47E+01	1.51E+01	1.55E+01	1.59E+01	1.67E+01	1.71E+01
nb 93m	4.70E-03	4.69E-03	4.69E-03	4.68E-03	4.68E-03	4.68E-03	4.67E-03	4.67E-03	4.66E-03	4.65E-03	4.65E-03
br 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8X UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 131

	nuclide concentrations, grams basis =per critical mass 10.1 MT UO2											
	initial	18000.0 yr	20000.0 yr	22000.0 yr	24000.0 yr	26000.0 yr	28000.0 yr	30000.0 yr	32000.0 yr	36000.0 yr	38000.0 yr	yr
sr 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 94	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02
nb 94	3.18E-04	2.97E-04	2.77E-04	2.59E-04	2.42E-04	2.26E-04	2.11E-04	1.97E-04	1.84E-04	1.60E-04	1.50E-04	
nb 94m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
br 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 95m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 95	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02
br 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 96	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02
nb 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 96	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00
kr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 97m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 97	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02
kr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 98m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 98	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02
tc 98	2.01E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04	2.00E-04
rb 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 99m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc 99	5.89E+02	5.85E+02	5.81E+02	5.77E+02	5.74E+02	5.70E+02	5.66E+02	5.62E+02	5.59E+02	5.51E+02	5.48E+02	
tc 99m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru 99	1.31E+02	1.35E+02	1.39E+02	1.43E+02	1.47E+02	1.50E+02	1.54E+02	1.58E+02	1.61E+02	1.69E+02	1.72E+02	

1
0 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 133

nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

	initial	18000.0 yr	20000.0 yr	22000.0 yr	24000.0 yr	26000.0 yr	28000.0 yr	30000.0 yr	32000.0 yr	36000.0 yr	38000.0 yr
y106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh106m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd106	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01
ag106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd107	4.53E+01	4.53E+01	4.53E+01	4.53E+01	4.53E+01	4.53E+01	4.53E+01	4.53E+01	4.52E+01	4.52E+01	4.52E+01
pd107m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag107	2.86E-01	2.96E-01	3.06E-01	3.15E-01	3.25E-01	3.35E-01	3.44E-01	3.54E-01	3.63E-01	3.83E-01	3.92E-01
zr108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh108m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd108	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01
ag108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag108m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd108	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04
zr109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag109	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01
ag109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh110m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd110	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00
ag110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag110m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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0 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 134
nuclide concentrations, grams

eu165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
gd165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy165m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho166m	1.08E-11	3.40E-12	1.07E-12	3.38E-13	1.06E-13	3.35E-14	1.05E-14	3.32E-15	1.05E-15	1.04E-16	3.27E-17	
er166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er167	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er167m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er168	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb168	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm170m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
total	1.39E+01	1.39E+01	1.38E+01	1.37E+01	1.37E+01	1.36E+01	1.35E+01	1.34E+01	1.34E+01	1.32E+01	1.32E+01	

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 161

	nuclide concentrations, grams											
	basis =per critical mass 10.1 MT UO2											
	initial	40000. yr	45000. yr	50000. yr	55000. yr	60000. yr	65000. yr	70000. yr	100000. yr	200000. yr	250000. yr	
he 4	3.63E+02	3.66E+02	3.74E+02	3.81E+02	3.88E+02	3.95E+02	4.02E+02	4.08E+02	4.41E+02	5.35E+02	5.80E+02	
tl206	5.57E-14	5.62E-14	5.74E-14	5.84E-14	5.94E-14	6.03E-14	6.12E-14	6.19E-14	6.62E-14	6.51E-14	6.22E-14	
tl207	1.77E-09	1.77E-09	1.77E-09	1.78E-09	1.78E-09	1.78E-09	1.78E-09	1.78E-09	1.79E-09	1.80E-09	1.80E-09	
tl208	2.04E-14	2.07E-14	2.16E-14	2.25E-14	2.33E-14	2.42E-14	2.51E-14	2.60E-14	3.12E-14	4.88E-14	5.77E-14	
tl209	1.20E-10	1.22E-10	1.26E-10	1.31E-10	1.35E-10	1.40E-10	1.44E-10	1.48E-10	1.71E-10	2.38E-10	2.46E-10	
pb206	2.38E+02	2.45E+02	2.64E+02	2.83E+02	3.02E+02	3.22E+02	3.42E+02	3.63E+02	4.89E+02	9.26E+02	1.14E+03	
pb207	1.15E+01	1.18E+01	1.25E+01	1.32E+01	1.38E+01	1.45E+01	1.52E+01	1.59E+01	2.00E+01	3.38E+01	4.07E+01	
pb208	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.06E-01	2.06E-01	
pb209	5.05E-07	5.14E-07	5.33E-07	5.53E-07	5.72E-07	5.91E-07	6.09E-07	6.26E-07	7.24E-07	1.01E-06	1.04E-06	
pb210	1.20E-01	1.21E-01	1.24E-01	1.26E-01	1.28E-01	1.30E-01	1.32E-01	1.34E-01	1.43E-01	1.40E-01	1.34E-01	
pb211	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.37E-08	1.38E-08	1.38E-08	1.38E-08	1.38E-08	1.39E-08	1.39E-08	
pb212	1.21E-11	1.23E-11	1.28E-11	1.33E-11	1.38E-11	1.44E-11	1.49E-11	1.54E-11	1.85E-11	2.90E-11	3.42E-11	
pb214	2.80E-07	2.82E-07	2.88E-07	2.94E-07	2.99E-07	3.03E-07	3.07E-07	3.11E-07	3.33E-07	3.27E-07	3.12E-07	
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
bi209	5.22E+01	5.41E+01	5.90E+01	6.41E+01	6.93E+01	7.48E+01	8.04E+01	8.61E+01	1.24E+02	2.88E+02	3.82E+02	
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
bi210	7.39E-05	7.46E-05	7.61E-05	7.76E-05	7.89E-05	8.01E-05	8.12E-05	8.22E-05	8.79E-05	8.64E-05	8.26E-05	
bi211	8.13E-10	8.13E-10	8.14E-10	8.14E-10	8.15E-10	8.15E-10	8.16E-10	8.17E-10	8.20E-10	8.25E-10	8.26E-10	
bi212	1.14E-12	1.16E-12	1.21E-12	1.26E-12	1.31E-12	1.36E-12	1.41E-12	1.46E-12	1.76E-12	2.75E-12	3.24E-12	
bi213	1.20E-07	1.22E-07	1.27E-07	1.32E-07	1.36E-07	1.41E-07	1.45E-07	1.49E-07	1.72E-07	2.39E-07	2.47E-07	
bi214	2.08E-07	2.10E-07	2.14E-07	2.18E-07	2.22E-07	2.25E-07	2.28E-07	2.31E-07	2.47E-07	2.43E-07	2.32E-07	
po210	2.04E-03	2.06E-03	2.10E-03	2.14E-03	2.18E-03	2.21E-03	2.24E-03	2.27E-03	2.43E-03	2.39E-03	2.28E-03	
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
po211	8.98E-15	8.99E-15	8.99E-15	9.00E-15	9.01E-15	9.01E-15	9.02E-15	9.03E-15	9.06E-15	9.12E-15	9.13E-15	
po212	6.02E-23	6.12E-23	6.38E-23	6.64E-23	6.89E-23	7.15E-23	7.41E-23	7.67E-23	9.23E-23	1.44E-22	1.70E-22	
po213	1.81E-16	1.84E-16	1.91E-16	1.98E-16	2.05E-16	2.11E-16	2.18E-16	2.24E-16	2.59E-16	3.60E-16	3.71E-16	
po214	2.86E-14	2.88E-14	2.94E-14	3.00E-14	3.05E-14	3.10E-14	3.14E-14	3.18E-14	3.40E-14	3.34E-14	3.19E-14	

pu236	1.13E-09	1.12E-09	1.08E-09	1.05E-09	1.02E-09	9.90E-10	9.60E-10	9.32E-10	7.78E-10	4.26E-10	3.15E-10
pu237	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu238	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu239	1.95E+03	1.84E+03	1.59E+03	1.38E+03	1.19E+03	1.03E+03	8.96E+02	7.76E+02	3.28E+02	1.85E+01	4.39E+00
pu240	1.06E+00	8.59E-01	5.07E-01	2.99E-01	1.76E-01	1.04E-01	6.13E-02	3.61E-02	1.52E-03	3.93E-08	2.00E-10
pu241	1.03E-16	8.71E-17	5.79E-17	3.85E-17	2.56E-17	1.70E-17	1.13E-17	7.54E-18	6.53E-19	1.87E-22	3.17E-24
pu242	1.10E-02	1.09E-02	1.08E-02	1.07E-02	1.06E-02	1.05E-02	1.04E-02	1.03E-02	9.76E-03	8.11E-03	7.39E-03
pu243	8.10E-28	8.10E-28	8.10E-28	8.10E-28	8.09E-28	8.09E-28	8.09E-28	8.09E-28	8.08E-28	8.04E-28	8.03E-28
pu244	1.65E-20	1.70E-20	1.82E-20	1.95E-20	2.07E-20	2.19E-20	2.31E-20	2.43E-20	3.13E-20	5.15E-20	6.02E-20
pu245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am240	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am241	3.23E-15	2.74E-15	1.75E-15	1.16E-15	7.73E-16	5.14E-16	3.42E-16	2.27E-16	1.97E-17	5.95E-21	9.56E-23
am242m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am242	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am243	1.17E-06	9.67E-07	6.04E-07	3.77E-07	2.36E-07	1.47E-07	9.21E-08	5.75E-08	3.42E-09	2.82E-13	2.56E-15
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 163

nuclide concentrations, grams											
basis =per critical mass 10.1 MT UO2											
	initial	40000. yr	45000. yr	50000. yr	55000. yr	60000. yr	65000. yr	70000. yr	100000. yr	200000. yr	250000. yr
cm242	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm243	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm244	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm245	6.16E-14	5.24E-14	3.48E-14	2.32E-14	1.54E-14	1.02E-14	6.81E-15	4.53E-15	3.92E-16	1.13E-19	1.91E-21
cm246	3.53E-17	2.63E-17	1.27E-17	6.08E-18	2.92E-18	1.40E-18	6.75E-19	3.25E-19	4.00E-21	1.73E-27	1.14E-30
cm247	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.33E-17	2.32E-17	2.31E-17	2.31E-17
cm248	1.38E-19	1.38E-19	1.36E-19	1.35E-19	1.34E-19	1.32E-19	1.31E-19	1.30E-19	1.22E-19	9.94E-20	8.97E-20
cm249	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm250	1.16E-35	1.07E-35	8.80E-36	7.21E-36	5.91E-36	4.84E-36	3.97E-36	3.25E-36	9.84E-37	1.83E-38	2.50E-39
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk249	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf249	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf252	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf253	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf254	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf255	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es253	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es254m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es254	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
es255	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
s250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
total	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06	8.85E+06

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 164

nuclide radioactivity, curies											
basis =per critical mass 10.1 MT UO2											
	initial	40000. yr	45000. yr	50000. yr	55000. yr	60000. yr	65000. yr	70000. yr	100000. yr	200000. yr	250000. yr
he 4	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tl206	1.21E-05	1.22E-05	1.25E-05	1.27E-05	1.29E-05	1.31E-05	1.33E-05	1.35E-05	1.44E-05	1.42E-05	1.35E-05

tl207	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.41E-01	3.43E-01	3.43E-01
tl208	6.03E-06	6.13E-06	6.39E-06	6.65E-06	6.91E-06	7.17E-06	7.43E-06	7.69E-06	9.25E-06	1.45E-05	1.71E-05	1.71E-05
tl209	4.89E-02	4.97E-02	5.17E-02	5.36E-02	5.54E-02	5.72E-02	5.89E-02	6.07E-02	7.01E-02	9.74E-02	1.01E-01	1.01E-01
pb206	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pb207	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pb208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pb209	2.33E+00	2.37E+00	2.46E+00	2.55E+00	2.64E+00	2.72E+00	2.81E+00	2.89E+00	3.34E+00	4.64E+00	4.79E+00	4.79E+00
pb210	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.02E+01	1.02E+01
pb211	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.40E-01	3.40E-01	3.40E-01	3.42E-01	3.44E-01	3.44E-01	3.44E-01
pb212	1.68E-05	1.71E-05	1.78E-05	1.85E-05	1.92E-05	1.99E-05	2.07E-05	2.14E-05	2.57E-05	4.02E-05	4.75E-05	4.75E-05
pb214	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.02E+01	1.02E+01
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.02E+01	1.02E+01
bi211	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.40E-01	3.40E-01	3.40E-01	3.42E-01	3.44E-01	3.44E-01	3.44E-01
bi212	1.68E-05	1.71E-05	1.78E-05	1.85E-05	1.92E-05	1.99E-05	2.07E-05	2.14E-05	2.57E-05	4.02E-05	4.75E-05	4.75E-05
bi213	2.33E+00	2.37E+00	2.46E+00	2.55E+00	2.64E+00	2.72E+00	2.81E+00	2.89E+00	3.34E+00	4.64E+00	4.79E+00	4.79E+00
bi214	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.02E+01	1.02E+01
po210	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.02E+01	1.02E+01
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	9.31E-04	9.32E-04	9.32E-04	9.33E-04	9.34E-04	9.34E-04	9.35E-04	9.36E-04	9.40E-04	9.46E-04	9.47E-04	9.47E-04
po212	1.07E-05	1.09E-05	1.14E-05	1.19E-05	1.23E-05	1.28E-05	1.32E-05	1.37E-05	1.65E-05	2.58E-05	3.04E-05	3.04E-05
po213	2.28E+00	2.32E+00	2.41E+00	2.50E+00	2.58E+00	2.67E+00	2.75E+00	2.83E+00	3.27E+00	4.54E+00	4.69E+00	4.69E+00
po214	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.02E+01	1.02E+01
po215	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.40E-01	3.40E-01	3.40E-01	3.42E-01	3.44E-01	3.44E-01	3.44E-01
po216	1.68E-05	1.71E-05	1.78E-05	1.85E-05	1.92E-05	1.99E-05	2.07E-05	2.14E-05	2.57E-05	4.02E-05	4.75E-05	4.75E-05
po218	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.03E+01	1.03E+01
at217	2.33E+00	2.37E+00	2.46E+00	2.55E+00	2.64E+00	2.72E+00	2.81E+00	2.89E+00	3.34E+00	4.64E+00	4.79E+00	4.79E+00
rn218	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rn219	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.40E-01	3.40E-01	3.40E-01	3.42E-01	3.44E-01	3.44E-01	3.44E-01
rn220	1.68E-05	1.71E-05	1.78E-05	1.85E-05	1.92E-05	1.99E-05	2.07E-05	2.14E-05	2.57E-05	4.02E-05	4.75E-05	4.75E-05
rn222	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.03E+01	1.03E+01
fr221	2.33E+00	2.37E+00	2.46E+00	2.55E+00	2.64E+00	2.72E+00	2.81E+00	2.89E+00	3.34E+00	4.64E+00	4.79E+00	4.79E+00
fr223	4.67E-03	4.67E-03	4.68E-03	4.68E-03	4.68E-03	4.69E-03	4.69E-03	4.70E-03	4.72E-03	4.75E-03	4.75E-03	4.75E-03
ra222	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ra223	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.40E-01	3.40E-01	3.40E-01	3.42E-01	3.44E-01	3.44E-01	3.44E-01
ra224	1.68E-05	1.71E-05	1.78E-05	1.85E-05	1.92E-05	1.99E-05	2.07E-05	2.14E-05	2.57E-05	4.02E-05	4.75E-05	4.75E-05
ra225	2.33E+00	2.37E+00	2.46E+00	2.55E+00	2.64E+00	2.72E+00	2.81E+00	2.89E+00	3.34E+00	4.64E+00	4.79E+00	4.79E+00
ra226	9.18E+00	9.26E+00	9.45E+00	9.63E+00	9.79E+00	9.94E+00	1.01E+01	1.02E+01	1.09E+01	1.07E+01	1.03E+01	1.03E+01
ra228	1.62E-05	1.65E-05	1.72E-05	1.80E-05	1.87E-05	1.94E-05	2.02E-05	2.09E-05	2.53E-05	4.00E-05	4.74E-05	4.74E-05
ac225	2.33E+00	2.37E+00	2.46E+00	2.55E+00	2.64E+00	2.72E+00	2.81E+00	2.89E+00	3.34E+00	4.64E+00	4.79E+00	4.79E+00
ac227	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.40E-01	3.40E-01	3.40E-01	3.42E-01	3.44E-01	3.44E-01	3.44E-01
ac228	1.62E-05	1.65E-05	1.72E-05	1.80E-05	1.87E-05	1.94E-05	2.02E-05	2.09E-05	2.53E-05	4.00E-05	4.74E-05	4.74E-05
th226	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
th227	3.34E-01	3.34E-01	3.34E-01	3.35E-01	3.35E-01	3.35E-01	3.35E-01	3.36E-01	3.37E-01	3.39E-01	3.39E-01	3.39E-01
th228	1.68E-05	1.71E-05	1.78E-05	1.85E-05	1.92E-05	1.99E-05	2.07E-05	2.14E-05	2.57E-05	4.02E-05	4.75E-05	4.75E-05
th229	2.33E+00	2.37E+00	2.46E+00	2.55E+00	2.64E+00	2.72E+00	2.81E+00	2.89E+00	3.34E+00	4.64E+00	4.79E+00	4.79E+00
th230	9.27E+00	9.35E+00	9.54E+00	9.71E+00	9.86E+00	1.00E+01	1.01E+01	1.03E+01	1.07E+01	1.06E+01	1.01E+01	1.01E+01
th231	3.40E-01	3.40E-01	3.41E-01	3.41E-01	3.42E-01	3.42E-01	3.42E-01	3.43E-01	3.44E-01	3.44E-01	3.44E-01	3.44E-01

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

	initial	40000. yr	45000. yr	50000. yr	55000. yr	60000. yr	65000. yr	70000. yr	100000. yr	200000. yr	250000. yr
th232	1.62E-05	1.65E-05	1.72E-05	1.80E-05	1.87E-05	1.94E-05	2.02E-05	2.09E-05	2.53E-05	4.00E-05	4.74E-05
th233	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
th234	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00
pa231	3.38E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.40E-01	3.40E-01	3.40E-01	3.42E-01	3.44E-01	3.44E-01
pa232	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

actinides page 165

zr 93	4.41E+02	4.41E+02	4.40E+02	4.39E+02	4.38E+02	4.37E+02	4.36E+02	4.35E+02	4.29E+02	4.10E+02	4.01E+02
nb 93	1.71E+01	1.75E+01	1.85E+01	1.95E+01	2.05E+01	2.15E+01	2.25E+01	2.34E+01	2.93E+01	4.83E+01	5.75E+01
nb 93m	4.65E-03	4.65E-03	4.64E-03	4.62E-03	4.61E-03	4.60E-03	4.59E-03	4.58E-03	4.52E-03	4.32E-03	4.22E-03
br 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle nuclide concentrations, grams fission products page 171
basis =per critical mass 10.1 MT UO2

	initial	40000. yr	45000. yr	50000. yr	55000. yr	60000. yr	65000. yr	70000. yr	100000. yr	200000. yr	250000. yr
sr 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 94	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02
nb 94	1.50E-04	1.40E-04	1.18E-04	9.95E-05	8.39E-05	7.07E-05	5.96E-05	5.02E-05	1.80E-05	5.93E-07	1.08E-07
nb 94m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
br 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 95m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 95	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02
br 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 96	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02
nb 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 96	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00
kr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 97m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 97	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02
kr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 98m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 98	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02	6.81E+02
tc 98	2.00E-04	2.00E-04	2.00E-04	1.99E-04	1.99E-04	1.99E-04	1.99E-04	1.98E-04	1.95E-04	1.93E-04	1.93E-04
rb 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 99m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc 99	5.48E+02	5.44E+02	5.35E+02	5.27E+02	5.18E+02	5.10E+02	5.01E+02	4.93E+02	4.47E+02	3.22E+02	2.73E+02
tc 99m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru 99	1.72E+02	1.76E+02	1.85E+02	1.94E+02	2.02E+02	2.11E+02	2.19E+02	2.27E+02	2.73E+02	3.98E+02	4.47E+02

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 173

	initial	40000. yr	45000. yr	50000. yr	55000. yr	60000. yr	65000. yr	70000. yr	100000. yr	200000. yr	250000. yr	
nuclide concentrations, grams basis =per critical mass 10.1 MT UO2												
y106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
zr106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
nb106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh106m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd106	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	
ag106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
y107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
zr107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
nb107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd107	4.52E+01	4.52E+01	4.52E+01	4.52E+01	4.51E+01	4.51E+01	4.51E+01	4.51E+01	4.49E+01	4.44E+01	4.42E+01	
pd107m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag107	3.92E-01	4.02E-01	4.26E-01	4.50E-01	4.74E-01	4.98E-01	5.22E-01	5.46E-01	6.90E-01	1.17E+00	1.40E+00	
zr108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
nb108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh108m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd108	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	
ag108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag108m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd108	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	
zr109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
nb109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag109	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	
ag109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
cd109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
nb110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
mo110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
tc110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ru110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
rh110m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
pd110	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	
ag110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
ag110m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 174

nuclide concentrations, grams

eu165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
gd165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy165m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ho166m	3.27E-17	1.03E-17	5.73E-19	3.19E-20	1.78E-21	9.89E-23	5.51E-24	3.07E-25	.00E+00	.00E+00	.00E+00	.00E+00
er166	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er167	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er167m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er168	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb168	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb169	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm170m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb170	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb171	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
er172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tm172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
yb172	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
total	1.32E+01	1.31E+01	1.29E+01	1.28E+01	1.26E+01	1.24E+01	1.23E+01	1.21E+01	1.13E+01	8.88E+00	7.95E+00	

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle actinides page 201
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

	initial	300000. yr	500000. yr	999999. yr
he 4	5.80E+02	6.23E+02	7.83E+02	1.10E+03
tl206	6.22E-14	5.83E-14	4.25E-14	2.38E-14
tl207	1.80E-09	1.80E-09	1.80E-09	1.80E-09
tl208	5.77E-14	6.65E-14	1.02E-13	1.89E-13
tl209	2.46E-10	2.59E-10	2.91E-10	2.68E-10
pb206	1.14E+03	1.33E+03	1.99E+03	3.02E+03
pb207	4.07E+01	4.76E+01	7.52E+01	1.44E+02
pb208	2.06E-01	2.08E-01	2.13E-01	2.37E-01
pb209	1.04E-06	1.10E-06	1.23E-06	1.13E-06
pb210	1.34E-01	1.26E-01	9.16E-02	5.14E-02
pb211	1.39E-08	1.39E-08	1.39E-08	1.39E-08
pb212	3.42E-11	3.94E-11	6.04E-11	1.12E-10
pb214	3.12E-07	2.93E-07	2.13E-07	1.20E-07
bi208	.00E+00	.00E+00	.00E+00	.00E+00
bi209	3.82E+02	4.82E+02	9.26E+02	2.05E+03
bi210m	.00E+00	.00E+00	.00E+00	.00E+00
bi210	8.26E-05	7.74E-05	5.64E-05	3.16E-05
bi211	8.26E-10	8.26E-10	8.26E-10	8.26E-10
bi212	3.24E-12	3.74E-12	5.73E-12	1.07E-11
bi213	2.47E-07	2.61E-07	2.92E-07	2.69E-07
bi214	2.32E-07	2.17E-07	1.59E-07	8.89E-08
po210	2.28E-03	2.14E-03	1.56E-03	8.74E-04
po211m	.00E+00	.00E+00	.00E+00	.00E+00
po211	9.13E-15	9.13E-15	9.13E-15	9.13E-15
po212	1.70E-22	1.97E-22	3.01E-22	5.60E-22
po213	3.71E-16	3.92E-16	4.40E-16	4.04E-16
po214	3.19E-14	2.99E-14	2.18E-14	1.22E-14

po215	1.17E-14	1.17E-14	1.17E-14	1.17E-14
po216	1.32E-16	1.52E-16	2.33E-16	4.33E-16
po218	3.68E-08	3.45E-08	2.52E-08	1.41E-08
at217	2.97E-12	3.14E-12	3.52E-12	3.24E-12
rn218	.00E+00	.00E+00	.00E+00	.00E+00
rn219	2.64E-11	2.65E-11	2.64E-11	2.64E-11
rn220	5.15E-14	5.94E-14	9.09E-14	1.69E-13
rn222	6.66E-05	6.24E-05	4.55E-05	2.55E-05
fr221	2.76E-08	2.91E-08	3.26E-08	3.00E-08
fr223	1.23E-10	1.23E-10	1.23E-10	1.23E-10
ra222	.00E+00	.00E+00	.00E+00	.00E+00
ra223	6.72E-06	6.72E-06	6.72E-06	6.71E-06
ra224	2.98E-10	3.44E-10	5.27E-10	9.80E-10
ra225	1.22E-04	1.29E-04	1.44E-04	1.33E-04
ra226	1.04E+01	9.71E+00	7.08E+00	3.97E+00
ra228	1.74E-07	2.00E-07	3.07E-07	5.72E-07
ac225	8.25E-05	8.71E-05	9.76E-05	8.98E-05
ac227	4.76E-03	4.76E-03	4.76E-03	4.75E-03
ac228	2.12E-11	2.45E-11	3.75E-11	6.98E-11
th226	.00E+00	.00E+00	.00E+00	.00E+00
th227	1.10E-05	1.10E-05	1.10E-05	1.10E-05
th228	5.80E-08	6.68E-08	1.02E-07	1.90E-07
th229	2.42E+01	2.55E+01	2.86E+01	2.63E+01
th230	4.90E+02	4.59E+02	3.38E+02	1.90E+02
th231	6.47E-07	6.47E-07	6.47E-07	6.47E-07

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

actinides

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	initial300000.	yr500000.	yr999999.	yr
th232	4.32E+02	4.98E+02	7.64E+02	1.42E+03
th233	.00E+00	.00E+00	.00E+00	.00E+00
th234	1.25E-04	1.25E-04	1.25E-04	1.25E-04
pa231	7.28E+00	7.28E+00	7.28E+00	7.28E+00
pa232	.00E+00	.00E+00	.00E+00	.00E+00
pa233	2.98E-04	2.94E-04	2.75E-04	2.34E-04
pa234m	4.23E-09	4.23E-09	4.23E-09	4.23E-09
pa234	1.89E-09	1.89E-09	1.89E-09	1.89E-09
pa235	.00E+00	.00E+00	.00E+00	.00E+00
u230	.00E+00	.00E+00	.00E+00	.00E+00
u231	.00E+00	.00E+00	.00E+00	.00E+00
u232	7.45E-09	5.51E-09	1.65E-09	8.11E-11
u233	5.04E+02	5.30E+02	5.76E+02	5.37E+02
u234	1.41E+03	1.29E+03	9.34E+02	5.81E+02
u235	1.59E+05	1.59E+05	1.59E+05	1.59E+05
u236	4.59E+04	4.58E+04	4.56E+04	4.49E+04
u237	9.60E-32	1.63E-33	1.34E-40	.00E+00
u238	8.63E+06	8.63E+06	8.63E+06	8.63E+06
u239	.00E+00	.00E+00	.00E+00	.00E+00
u240	1.19E-30	1.34E-30	1.82E-30	2.43E-30
u241	.00E+00	.00E+00	.00E+00	.00E+00
np235	.00E+00	.00E+00	.00E+00	.00E+00
np236m	.00E+00	.00E+00	.00E+00	.00E+00
np236	1.40E-04	1.04E-04	3.11E-05	1.53E-06
np237	8.79E+03	8.64E+03	8.10E+03	6.89E+03
np238	.00E+00	.00E+00	.00E+00	.00E+00
np239	2.20E-21	2.00E-23	8.91E-27	8.72E-27
np240m	1.01E-32	1.15E-32	1.56E-32	2.07E-32
np240	1.04E-34	1.18E-34	1.60E-34	2.13E-34
np241	.00E+00	.00E+00	.00E+00	.00E+00

pu236	3.15E-10	2.33E-10	6.98E-11	3.43E-12
pu237	.00E+00	.00E+00	.00E+00	.00E+00
pu238	.00E+00	.00E+00	.00E+00	.00E+00
pu239	4.39E+00	1.04E+00	3.31E-03	1.89E-09
pu240	2.00E-10	1.02E-12	6.86E-22	9.91E-24
pu241	3.17E-24	5.37E-26	4.42E-33	.00E+00
pu242	7.39E-03	6.74E-03	4.65E-03	1.84E-03
pu243	8.03E-28	8.01E-28	7.94E-28	7.77E-28
pu244	6.02E-20	6.80E-20	9.23E-20	1.23E-19
pu245	.00E+00	.00E+00	.00E+00	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00
am239	.00E+00	.00E+00	.00E+00	.00E+00
am240	.00E+00	.00E+00	.00E+00	.00E+00
am241	9.56E-23	1.62E-24	1.40E-31	.00E+00
am242m	.00E+00	.00E+00	.00E+00	.00E+00
am242	.00E+00	.00E+00	.00E+00	.00E+00
am243	2.56E-15	2.32E-17	1.04E-20	1.01E-20
am244m	.00E+00	.00E+00	.00E+00	.00E+00
am244	.00E+00	.00E+00	.00E+00	.00E+00
am245	.00E+00	.00E+00	.00E+00	.00E+00
am246	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

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	initial300000.	yr500000.	yr999999.	yr
cm242	.00E+00	.00E+00	.00E+00	.00E+00
cm243	.00E+00	.00E+00	.00E+00	.00E+00
cm244	.00E+00	.00E+00	.00E+00	.00E+00
cm245	1.91E-21	3.23E-23	2.66E-30	.00E+00
cm246	1.14E-30	7.51E-34	.00E+00	.00E+00
cm247	2.31E-17	2.30E-17	2.28E-17	2.23E-17
cm248	8.97E-20	8.10E-20	5.39E-20	1.94E-20
cm249	.00E+00	.00E+00	.00E+00	.00E+00
cm250	2.50E-39	3.41E-40	.00E+00	.00E+00
cm251	.00E+00	.00E+00	.00E+00	.00E+00
bk249	.00E+00	.00E+00	.00E+00	.00E+00
bk250	.00E+00	.00E+00	.00E+00	.00E+00
bk251	.00E+00	.00E+00	.00E+00	.00E+00
cf249	.00E+00	.00E+00	.00E+00	.00E+00
cf250	.00E+00	.00E+00	.00E+00	.00E+00
cf251	.00E+00	.00E+00	.00E+00	.00E+00
cf252	.00E+00	.00E+00	.00E+00	.00E+00
cf253	.00E+00	.00E+00	.00E+00	.00E+00
cf254	.00E+00	.00E+00	.00E+00	.00E+00
cf255	.00E+00	.00E+00	.00E+00	.00E+00
es253	.00E+00	.00E+00	.00E+00	.00E+00
es254m	.00E+00	.00E+00	.00E+00	.00E+00
es254	.00E+00	.00E+00	.00E+00	.00E+00
es255	.00E+00	.00E+00	.00E+00	.00E+00
s250	.00E+00	.00E+00	.00E+00	.00E+00
total	8.85E+06	8.85E+06	8.85E+06	8.85E+06

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

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	initial300000.	yr500000.	yr999999.	yr
he 4	.00E+00	.00E+00	.00E+00	.00E+00
tl206	1.35E-05	1.27E-05	9.24E-06	5.18E-06

tl207	3.43E-01	3.43E-01	3.43E-01	3.43E-01
tl208	1.71E-05	1.97E-05	3.01E-05	5.61E-05
tl209	1.01E-01	1.06E-01	1.19E-01	1.09E-01
pb206	.00E+00	.00E+00	.00E+00	.00E+00
pb207	.00E+00	.00E+00	.00E+00	.00E+00
pb208	.00E+00	.00E+00	.00E+00	.00E+00
pb209	4.79E+00	5.06E+00	5.67E+00	5.21E+00
pb210	1.02E+01	9.60E+00	7.00E+00	3.93E+00
pb211	3.44E-01	3.44E-01	3.44E-01	3.44E-01
pb212	4.75E-05	5.48E-05	8.39E-05	1.56E-04
pb214	1.02E+01	9.60E+00	7.00E+00	3.93E+00
bi208	.00E+00	.00E+00	.00E+00	.00E+00
bi209	.00E+00	.00E+00	.00E+00	.00E+00
bi210m	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.02E+01	9.60E+00	7.00E+00	3.93E+00
bi211	3.44E-01	3.44E-01	3.44E-01	3.44E-01
bi212	4.75E-05	5.48E-05	8.39E-05	1.56E-04
bi213	4.79E+00	5.06E+00	5.67E+00	5.21E+00
bi214	1.02E+01	9.60E+00	7.00E+00	3.93E+00
po210	1.02E+01	9.60E+00	7.00E+00	3.93E+00
po211m	.00E+00	.00E+00	.00E+00	.00E+00
po211	9.47E-04	9.47E-04	9.47E-04	9.46E-04
po212	3.04E-05	3.51E-05	5.38E-05	1.00E-04
po213	4.69E+00	4.95E+00	5.55E+00	5.10E+00
po214	1.02E+01	9.60E+00	7.00E+00	3.93E+00
po215	3.44E-01	3.44E-01	3.44E-01	3.44E-01
po216	4.75E-05	5.48E-05	8.39E-05	1.56E-04
po218	1.03E+01	9.60E+00	7.00E+00	3.93E+00
at217	4.79E+00	5.06E+00	5.67E+00	5.21E+00
rn218	.00E+00	.00E+00	.00E+00	.00E+00
rn219	3.44E-01	3.44E-01	3.44E-01	3.44E-01
rn220	4.75E-05	5.48E-05	8.39E-05	1.56E-04
rn222	1.03E+01	9.60E+00	7.00E+00	3.93E+00
fr221	4.79E+00	5.06E+00	5.67E+00	5.21E+00
fr223	4.75E-03	4.75E-03	4.75E-03	4.75E-03
ra222	.00E+00	.00E+00	.00E+00	.00E+00
ra223	3.44E-01	3.44E-01	3.44E-01	3.44E-01
ra224	4.75E-05	5.48E-05	8.39E-05	1.56E-04
ra225	4.79E+00	5.06E+00	5.67E+00	5.21E+00
ra226	1.03E+01	9.60E+00	7.00E+00	3.93E+00
ra228	4.74E-05	5.47E-05	8.39E-05	1.56E-04
ac225	4.79E+00	5.06E+00	5.67E+00	5.21E+00
ac227	3.44E-01	3.44E-01	3.44E-01	3.44E-01
ac228	4.74E-05	5.47E-05	8.39E-05	1.56E-04
th226	.00E+00	.00E+00	.00E+00	.00E+00
th227	3.39E-01	3.40E-01	3.39E-01	3.39E-01
th228	4.75E-05	5.48E-05	8.39E-05	1.56E-04
th229	4.79E+00	5.06E+00	5.67E+00	5.21E+00
th230	1.01E+01	9.46E+00	6.97E+00	3.93E+00
th231	3.44E-01	3.44E-01	3.44E-01	3.44E-01

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

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	initial	300000. yr	500000. yr	999999. yr
th232	4.74E-05	5.47E-05	8.39E-05	1.56E-04
th233	.00E+00	.00E+00	.00E+00	.00E+00
th234	2.90E+00	2.90E+00	2.90E+00	2.90E+00
pa231	3.44E-01	3.44E-01	3.44E-01	3.44E-01
pa232	.00E+00	.00E+00	.00E+00	.00E+00

pa233	6.20E+00	6.10E+00	5.71E+00	4.86E+00
pa234m	2.90E+00	2.90E+00	2.90E+00	2.90E+00
pa234	3.77E-03	3.77E-03	3.77E-03	3.77E-03
pa235	.00E+00	.00E+00	.00E+00	.00E+00
u230	.00E+00	.00E+00	.00E+00	.00E+00
u231	.00E+00	.00E+00	.00E+00	.00E+00
u232	1.65E-07	1.22E-07	3.65E-08	1.79E-09
u233	4.86E+00	5.11E+00	5.55E+00	5.18E+00
u234	8.79E+00	8.02E+00	5.81E+00	3.61E+00
u235	3.44E-01	3.44E-01	3.44E-01	3.44E-01
u236	2.97E+00	2.97E+00	2.95E+00	2.91E+00
u237	7.84E-27	1.33E-28	.00E+00	.00E+00
u238	2.90E+00	2.90E+00	2.90E+00	2.90E+00
u239	.00E+00	.00E+00	.00E+00	.00E+00
u240	1.10E-24	1.24E-24	1.69E-24	2.25E-24
u241	.00E+00	.00E+00	.00E+00	.00E+00
np235	.00E+00	.00E+00	.00E+00	.00E+00
np236m	.00E+00	.00E+00	.00E+00	.00E+00
np236	1.85E-06	1.37E-06	4.10E-07	2.01E-08
np237	6.20E+00	6.10E+00	5.71E+00	4.86E+00
np238	.00E+00	.00E+00	.00E+00	.00E+00
np239	5.11E-16	4.64E-18	2.07E-21	2.02E-21
np240m	1.10E-24	1.24E-24	1.69E-24	2.25E-24
np240	1.32E-27	1.49E-27	2.03E-27	2.70E-27
np241	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.65E-07	1.22E-07	3.65E-08	1.79E-09
pu237	.00E+00	.00E+00	.00E+00	.00E+00
pu238	.00E+00	.00E+00	.00E+00	.00E+00
pu239	2.72E-01	6.47E-02	2.06E-04	1.17E-10
pu240	4.53E-11	2.31E-13	1.56E-22	2.25E-24
pu241	3.28E-22	5.55E-24	4.56E-31	.00E+00
pu242	2.92E-05	2.66E-05	1.84E-05	7.27E-06
pu243	2.09E-21	2.08E-21	2.07E-21	2.02E-21
pu244	1.10E-24	1.25E-24	1.69E-24	2.25E-24
pu245	.00E+00	.00E+00	.00E+00	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00
am239	.00E+00	.00E+00	.00E+00	.00E+00
am240	.00E+00	.00E+00	.00E+00	.00E+00
am241	3.28E-22	5.55E-24	4.79E-31	.00E+00
am242m	.00E+00	.00E+00	.00E+00	.00E+00
am242	.00E+00	.00E+00	.00E+00	.00E+00
am243	5.11E-16	4.64E-18	2.07E-21	2.02E-21
am244m	.00E+00	.00E+00	.00E+00	.00E+00
am244	.00E+00	.00E+00	.00E+00	.00E+00
am245	.00E+00	.00E+00	.00E+00	.00E+00
am246	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

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	initial	300000. yr	500000. yr	999999. yr
cm242	.00E+00	.00E+00	.00E+00	.00E+00
cm243	.00E+00	.00E+00	.00E+00	.00E+00
cm244	.00E+00	.00E+00	.00E+00	.00E+00
cm245	3.27E-22	5.55E-24	4.56E-31	.00E+00
cm246	3.42E-31	.00E+00	.00E+00	.00E+00
cm247	2.09E-21	2.08E-21	2.07E-21	2.02E-21
cm248	3.81E-22	3.44E-22	2.29E-22	8.25E-23
cm249	.00E+00	.00E+00	.00E+00	.00E+00

cm250	.00E+00	.00E+00	.00E+00	.00E+00
cm251	.00E+00	.00E+00	.00E+00	.00E+00
bk249	.00E+00	.00E+00	.00E+00	.00E+00
bk250	.00E+00	.00E+00	.00E+00	.00E+00
bk251	.00E+00	.00E+00	.00E+00	.00E+00
cf249	.00E+00	.00E+00	.00E+00	.00E+00
cf250	.00E+00	.00E+00	.00E+00	.00E+00
cf251	.00E+00	.00E+00	.00E+00	.00E+00
cf252	.00E+00	.00E+00	.00E+00	.00E+00
cf253	.00E+00	.00E+00	.00E+00	.00E+00
cf254	.00E+00	.00E+00	.00E+00	.00E+00
cf255	.00E+00	.00E+00	.00E+00	.00E+00
es253	.00E+00	.00E+00	.00E+00	.00E+00
es254m	.00E+00	.00E+00	.00E+00	.00E+00
es254	.00E+00	.00E+00	.00E+00	.00E+00
es255	.00E+00	.00E+00	.00E+00	.00E+00
s250	.00E+00	.00E+00	.00E+00	.00E+00
total	1.82E+02	1.77E+02	1.54E+02	1.15E+02

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

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	initial	300000. yr	500000. yr	999999. yr
h 3	.00E+00	.00E+00	.00E+00	.00E+00
li 6	3.17E-04	3.17E-04	3.17E-04	3.17E-04
li 7	8.41E-06	8.41E-06	8.41E-06	8.41E-06
be 9	1.62E-05	1.62E-05	1.62E-05	1.62E-05
be 10	9.51E-05	9.31E-05	8.53E-05	6.87E-05
c 14	9.20E-20	2.17E-22	6.71E-33	.00E+00
ni 66	.00E+00	.00E+00	.00E+00	.00E+00
cu 66	.00E+00	.00E+00	.00E+00	.00E+00
zn 66	3.03E-07	3.03E-07	3.03E-07	3.03E-07
cu 67	.00E+00	.00E+00	.00E+00	.00E+00
zn 67	4.98E-08	4.98E-08	4.98E-08	4.98E-08
zn 68	2.95E-09	2.95E-09	2.95E-09	2.95E-09
zn 69	.00E+00	.00E+00	.00E+00	.00E+00
zn 69m	.00E+00	.00E+00	.00E+00	.00E+00
ga 69	9.59E-08	9.59E-08	9.59E-08	9.59E-08
zn 70	2.40E-06	2.40E-06	2.40E-06	2.40E-06
ga 70	.00E+00	.00E+00	.00E+00	.00E+00
ge 70	2.53E-09	2.53E-09	2.53E-09	2.53E-09
zn 71	.00E+00	.00E+00	.00E+00	.00E+00
zn 71m	.00E+00	.00E+00	.00E+00	.00E+00
ga 71	2.90E-05	2.90E-05	2.90E-05	2.90E-05
ge 71	.00E+00	.00E+00	.00E+00	.00E+00
ge 71m	.00E+00	.00E+00	.00E+00	.00E+00
co 72	.00E+00	.00E+00	.00E+00	.00E+00
ni 72	.00E+00	.00E+00	.00E+00	.00E+00
cu 72	.00E+00	.00E+00	.00E+00	.00E+00
zn 72	.00E+00	.00E+00	.00E+00	.00E+00
ga 72	.00E+00	.00E+00	.00E+00	.00E+00
ge 72	2.66E-03	2.66E-03	2.66E-03	2.66E-03
co 73	.00E+00	.00E+00	.00E+00	.00E+00
ni 73	.00E+00	.00E+00	.00E+00	.00E+00
cu 73	.00E+00	.00E+00	.00E+00	.00E+00
zn 73	.00E+00	.00E+00	.00E+00	.00E+00
ga 73	.00E+00	.00E+00	.00E+00	.00E+00
ge 73	1.07E-02	1.07E-02	1.07E-02	1.07E-02
ge 73m	.00E+00	.00E+00	.00E+00	.00E+00
co 74	.00E+00	.00E+00	.00E+00	.00E+00

ni 74	.00E+00	.00E+00	.00E+00	.00E+00
cu 74	.00E+00	.00E+00	.00E+00	.00E+00
zn 74	.00E+00	.00E+00	.00E+00	.00E+00
ga 74	.00E+00	.00E+00	.00E+00	.00E+00
ge 74	9.24E-03	9.24E-03	9.24E-03	9.24E-03
co 75	.00E+00	.00E+00	.00E+00	.00E+00
ni 75	.00E+00	.00E+00	.00E+00	.00E+00
cu 75	.00E+00	.00E+00	.00E+00	.00E+00
zn 75	.00E+00	.00E+00	.00E+00	.00E+00
ga 75	.00E+00	.00E+00	.00E+00	.00E+00
ge 75	.00E+00	.00E+00	.00E+00	.00E+00
ge 75m	.00E+00	.00E+00	.00E+00	.00E+00
as 75	1.04E-01	1.04E-01	1.04E-01	1.04E-01
ni 76	.00E+00	.00E+00	.00E+00	.00E+00
cu 76	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
zn 76	.00E+00	.00E+00	.00E+00	.00E+00
ga 76	.00E+00	.00E+00	.00E+00	.00E+00
ge 76	3.39E-01	3.39E-01	3.39E-01	3.39E-01
as 76	.00E+00	.00E+00	.00E+00	.00E+00
se 76	1.09E-04	1.09E-04	1.09E-04	1.09E-04
ni 77	.00E+00	.00E+00	.00E+00	.00E+00
cu 77	.00E+00	.00E+00	.00E+00	.00E+00
zn 77	.00E+00	.00E+00	.00E+00	.00E+00
ga 77	.00E+00	.00E+00	.00E+00	.00E+00
ge 77	.00E+00	.00E+00	.00E+00	.00E+00
ge 77m	.00E+00	.00E+00	.00E+00	.00E+00
as 77	.00E+00	.00E+00	.00E+00	.00E+00
se 77	7.55E-01	7.55E-01	7.55E-01	7.55E-01
se 77m	.00E+00	.00E+00	.00E+00	.00E+00
ni 78	.00E+00	.00E+00	.00E+00	.00E+00
cu 78	.00E+00	.00E+00	.00E+00	.00E+00
zn 78	.00E+00	.00E+00	.00E+00	.00E+00
ga 78	.00E+00	.00E+00	.00E+00	.00E+00
ge 78	.00E+00	.00E+00	.00E+00	.00E+00
as 78	.00E+00	.00E+00	.00E+00	.00E+00
se 78	2.05E+00	2.05E+00	2.05E+00	2.05E+00
cu 79	.00E+00	.00E+00	.00E+00	.00E+00
zn 79	.00E+00	.00E+00	.00E+00	.00E+00
ga 79	.00E+00	.00E+00	.00E+00	.00E+00
ge 79	.00E+00	.00E+00	.00E+00	.00E+00
as 79	.00E+00	.00E+00	.00E+00	.00E+00
se 79	2.25E+00	2.03E+00	1.33E+00	4.65E-01
se 79m	.00E+00	.00E+00	.00E+00	.00E+00
br 79	1.94E+00	2.16E+00	2.86E+00	3.72E+00
br 79m	.00E+00	.00E+00	.00E+00	.00E+00
kr 79	.00E+00	.00E+00	.00E+00	.00E+00
cu 80	.00E+00	.00E+00	.00E+00	.00E+00
zn 80	.00E+00	.00E+00	.00E+00	.00E+00
ga 80	.00E+00	.00E+00	.00E+00	.00E+00
ge 80	.00E+00	.00E+00	.00E+00	.00E+00
as 80	.00E+00	.00E+00	.00E+00	.00E+00
se 80	1.23E+01	1.23E+01	1.23E+01	1.23E+01
br 80	.00E+00	.00E+00	.00E+00	.00E+00
br 80m	.00E+00	.00E+00	.00E+00	.00E+00
kr 80	3.99E-04	3.99E-04	3.99E-04	3.99E-04

cu 81	.00E+00	.00E+00	.00E+00	.00E+00
zn 81	.00E+00	.00E+00	.00E+00	.00E+00
ga 81	.00E+00	.00E+00	.00E+00	.00E+00
ge 81	.00E+00	.00E+00	.00E+00	.00E+00
as 81	.00E+00	.00E+00	.00E+00	.00E+00
se 81	.00E+00	.00E+00	.00E+00	.00E+00
se 81m	.00E+00	.00E+00	.00E+00	.00E+00
br 81	1.84E+01	1.84E+01	1.84E+01	1.84E+01
kr 81	3.56E-07	3.02E-07	1.58E-07	3.10E-08
kr 81m	.00E+00	.00E+00	.00E+00	.00E+00
zn 82	.00E+00	.00E+00	.00E+00	.00E+00
ga 82	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
ge 82	.00E+00	.00E+00	.00E+00	.00E+00
as 82	.00E+00	.00E+00	.00E+00	.00E+00
as 82m	.00E+00	.00E+00	.00E+00	.00E+00
se 82	3.13E+01	3.13E+01	3.13E+01	3.13E+01
br 82	.00E+00	.00E+00	.00E+00	.00E+00
br 82m	.00E+00	.00E+00	.00E+00	.00E+00
kr 82	3.52E-02	3.52E-02	3.52E-02	3.52E-02
zn 83	.00E+00	.00E+00	.00E+00	.00E+00
ga 83	.00E+00	.00E+00	.00E+00	.00E+00
ge 83	.00E+00	.00E+00	.00E+00	.00E+00
as 83	.00E+00	.00E+00	.00E+00	.00E+00
se 83	.00E+00	.00E+00	.00E+00	.00E+00
se 83m	.00E+00	.00E+00	.00E+00	.00E+00
br 83	.00E+00	.00E+00	.00E+00	.00E+00
kr 83	5.03E+01	5.03E+01	5.03E+01	5.03E+01
kr 83m	.00E+00	.00E+00	.00E+00	.00E+00
ga 84	.00E+00	.00E+00	.00E+00	.00E+00
ge 84	.00E+00	.00E+00	.00E+00	.00E+00
as 84	.00E+00	.00E+00	.00E+00	.00E+00
se 84	.00E+00	.00E+00	.00E+00	.00E+00
br 84	.00E+00	.00E+00	.00E+00	.00E+00
br 84m	.00E+00	.00E+00	.00E+00	.00E+00
kr 84	1.06E+02	1.06E+02	1.06E+02	1.06E+02
ga 85	.00E+00	.00E+00	.00E+00	.00E+00
ge 85	.00E+00	.00E+00	.00E+00	.00E+00
as 85	.00E+00	.00E+00	.00E+00	.00E+00
se 85	.00E+00	.00E+00	.00E+00	.00E+00
se 85m	.00E+00	.00E+00	.00E+00	.00E+00
br 85	.00E+00	.00E+00	.00E+00	.00E+00
kr 85	.00E+00	.00E+00	.00E+00	.00E+00
kr 85m	.00E+00	.00E+00	.00E+00	.00E+00
rb 85	1.20E+02	1.20E+02	1.20E+02	1.20E+02
ge 86	.00E+00	.00E+00	.00E+00	.00E+00
as 86	.00E+00	.00E+00	.00E+00	.00E+00
se 86	.00E+00	.00E+00	.00E+00	.00E+00
br 86	.00E+00	.00E+00	.00E+00	.00E+00
br 86m	.00E+00	.00E+00	.00E+00	.00E+00
kr 86	1.94E+02	1.94E+02	1.94E+02	1.94E+02
rb 86	.00E+00	.00E+00	.00E+00	.00E+00
rb 86m	.00E+00	.00E+00	.00E+00	.00E+00
sr 86	1.28E-02	1.28E-02	1.28E-02	1.28E-02
ge 87	.00E+00	.00E+00	.00E+00	.00E+00
as 87	.00E+00	.00E+00	.00E+00	.00E+00

se 87	.00E+00	.00E+00	.00E+00	.00E+00
br 87	.00E+00	.00E+00	.00E+00	.00E+00
kr 87	.00E+00	.00E+00	.00E+00	.00E+00
rb 87	2.54E+02	2.54E+02	2.54E+02	2.54E+02
sr 87	1.57E-03	1.76E-03	2.49E-03	4.33E-03
sr 87m	.00E+00	.00E+00	.00E+00	.00E+00
ge 88	.00E+00	.00E+00	.00E+00	.00E+00
as 88	.00E+00	.00E+00	.00E+00	.00E+00
se 88	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
br 88	.00E+00	.00E+00	.00E+00	.00E+00
kr 88	.00E+00	.00E+00	.00E+00	.00E+00
rb 88	.00E+00	.00E+00	.00E+00	.00E+00
sr 88	3.67E+02	3.67E+02	3.67E+02	3.67E+02
as 89	.00E+00	.00E+00	.00E+00	.00E+00
se 89	.00E+00	.00E+00	.00E+00	.00E+00
br 89	.00E+00	.00E+00	.00E+00	.00E+00
kr 89	.00E+00	.00E+00	.00E+00	.00E+00
rb 89	.00E+00	.00E+00	.00E+00	.00E+00
sr 89	.00E+00	.00E+00	.00E+00	.00E+00
y 89	4.96E+02	4.96E+02	4.96E+02	4.96E+02
y 89m	.00E+00	.00E+00	.00E+00	.00E+00
as 90	.00E+00	.00E+00	.00E+00	.00E+00
se 90	.00E+00	.00E+00	.00E+00	.00E+00
br 90	.00E+00	.00E+00	.00E+00	.00E+00
kr 90	.00E+00	.00E+00	.00E+00	.00E+00
rb 90	.00E+00	.00E+00	.00E+00	.00E+00
rb 90m	.00E+00	.00E+00	.00E+00	.00E+00
sr 90	.00E+00	.00E+00	.00E+00	.00E+00
y 90	.00E+00	.00E+00	.00E+00	.00E+00
y 90m	.00E+00	.00E+00	.00E+00	.00E+00
zr 90	6.06E+02	6.06E+02	6.06E+02	6.06E+02
zr 90m	.00E+00	.00E+00	.00E+00	.00E+00
se 91	.00E+00	.00E+00	.00E+00	.00E+00
br 91	.00E+00	.00E+00	.00E+00	.00E+00
kr 91	.00E+00	.00E+00	.00E+00	.00E+00
rb 91	.00E+00	.00E+00	.00E+00	.00E+00
sr 91	.00E+00	.00E+00	.00E+00	.00E+00
y 91	.00E+00	.00E+00	.00E+00	.00E+00
y 91m	.00E+00	.00E+00	.00E+00	.00E+00
zr 91	6.22E+02	6.22E+02	6.22E+02	6.22E+02
nb 91	.00E+00	.00E+00	.00E+00	.00E+00
se 92	.00E+00	.00E+00	.00E+00	.00E+00
br 92	.00E+00	.00E+00	.00E+00	.00E+00
kr 92	.00E+00	.00E+00	.00E+00	.00E+00
rb 92	.00E+00	.00E+00	.00E+00	.00E+00
sr 92	.00E+00	.00E+00	.00E+00	.00E+00
y 92	.00E+00	.00E+00	.00E+00	.00E+00
zr 92	6.37E+02	6.37E+02	6.37E+02	6.37E+02
nb 92	3.94E-07	3.93E-07	3.92E-07	3.88E-07
se 93	.00E+00	.00E+00	.00E+00	.00E+00
br 93	.00E+00	.00E+00	.00E+00	.00E+00
kr 93	.00E+00	.00E+00	.00E+00	.00E+00
rb 93	.00E+00	.00E+00	.00E+00	.00E+00
sr 93	.00E+00	.00E+00	.00E+00	.00E+00
y 93	.00E+00	.00E+00	.00E+00	.00E+00

zr 93	4.01E+02	3.92E+02	3.58E+02	2.85E+02
nb 93	5.75E+01	6.65E+01	1.00E+02	1.73E+02
nb 93m	4.22E-03	4.13E-03	3.77E-03	3.01E-03
br 94	.00E+00	.00E+00	.00E+00	.00E+00
kr 94	.00E+00	.00E+00	.00E+00	.00E+00
rb 94	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial300000.	yr500000.	yr999999.	yr
sr 94	.00E+00	.00E+00	.00E+00	.00E+00
y 94	.00E+00	.00E+00	.00E+00	.00E+00
zr 94	7.10E+02	7.10E+02	7.10E+02	7.10E+02
nb 94	1.08E-07	1.95E-08	2.11E-11	8.10E-19
nb 94m	.00E+00	.00E+00	.00E+00	.00E+00
br 95	.00E+00	.00E+00	.00E+00	.00E+00
kr 95	.00E+00	.00E+00	.00E+00	.00E+00
rb 95	.00E+00	.00E+00	.00E+00	.00E+00
sr 95	.00E+00	.00E+00	.00E+00	.00E+00
y 95	.00E+00	.00E+00	.00E+00	.00E+00
zr 95	.00E+00	.00E+00	.00E+00	.00E+00
nb 95	.00E+00	.00E+00	.00E+00	.00E+00
nb 95m	.00E+00	.00E+00	.00E+00	.00E+00
mo 95	7.23E+02	7.23E+02	7.23E+02	7.23E+02
br 96	.00E+00	.00E+00	.00E+00	.00E+00
kr 96	.00E+00	.00E+00	.00E+00	.00E+00
rb 96	.00E+00	.00E+00	.00E+00	.00E+00
sr 96	.00E+00	.00E+00	.00E+00	.00E+00
y 96	.00E+00	.00E+00	.00E+00	.00E+00
zr 96	7.13E+02	7.13E+02	7.13E+02	7.13E+02
nb 96	.00E+00	.00E+00	.00E+00	.00E+00
mo 96	3.07E+00	3.07E+00	3.07E+00	3.07E+00
kr 97	.00E+00	.00E+00	.00E+00	.00E+00
rb 97	.00E+00	.00E+00	.00E+00	.00E+00
sr 97	.00E+00	.00E+00	.00E+00	.00E+00
y 97	.00E+00	.00E+00	.00E+00	.00E+00
zr 97	.00E+00	.00E+00	.00E+00	.00E+00
nb 97	.00E+00	.00E+00	.00E+00	.00E+00
nb 97m	.00E+00	.00E+00	.00E+00	.00E+00
mo 97	6.53E+02	6.53E+02	6.53E+02	6.53E+02
kr 98	.00E+00	.00E+00	.00E+00	.00E+00
rb 98	.00E+00	.00E+00	.00E+00	.00E+00
sr 98	.00E+00	.00E+00	.00E+00	.00E+00
y 98	.00E+00	.00E+00	.00E+00	.00E+00
zr 98	.00E+00	.00E+00	.00E+00	.00E+00
nb 98	.00E+00	.00E+00	.00E+00	.00E+00
nb 98m	.00E+00	.00E+00	.00E+00	.00E+00
mo 98	6.81E+02	6.81E+02	6.81E+02	6.81E+02
tc 98	1.93E-04	1.91E-04	1.85E-04	1.70E-04
rb 99	.00E+00	.00E+00	.00E+00	.00E+00
sr 99	.00E+00	.00E+00	.00E+00	.00E+00
y 99	.00E+00	.00E+00	.00E+00	.00E+00
zr 99	.00E+00	.00E+00	.00E+00	.00E+00
nb 99	.00E+00	.00E+00	.00E+00	.00E+00
nb 99m	.00E+00	.00E+00	.00E+00	.00E+00
mo 99	.00E+00	.00E+00	.00E+00	.00E+00
tc 99	2.73E+02	2.32E+02	1.20E+02	2.33E+01
tc 99m	.00E+00	.00E+00	.00E+00	.00E+00
ru 99	4.47E+02	4.88E+02	6.00E+02	6.97E+02

rb100 .00E+00 .00E+00 .00E+00 .00E+00
 sr100 .00E+00 .00E+00 .00E+00 .00E+00
 y100 .00E+00 .00E+00 .00E+00 .00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle

fission products

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nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

	initial	300000. yr	500000. yr	999999. yr
zr100	.00E+00	.00E+00	.00E+00	.00E+00
nb100	.00E+00	.00E+00	.00E+00	.00E+00
nb100m	.00E+00	.00E+00	.00E+00	.00E+00
mo100	7.55E+02	7.55E+02	7.55E+02	7.55E+02
tc100	.00E+00	.00E+00	.00E+00	.00E+00
ru100	5.50E+00	5.50E+00	5.50E+00	5.50E+00
rb101	.00E+00	.00E+00	.00E+00	.00E+00
sr101	.00E+00	.00E+00	.00E+00	.00E+00
y101	.00E+00	.00E+00	.00E+00	.00E+00
zr101	.00E+00	.00E+00	.00E+00	.00E+00
nb101	.00E+00	.00E+00	.00E+00	.00E+00
mo101	.00E+00	.00E+00	.00E+00	.00E+00
tc101	.00E+00	.00E+00	.00E+00	.00E+00
ru101	6.24E+02	6.24E+02	6.24E+02	6.24E+02
sr102	.00E+00	.00E+00	.00E+00	.00E+00
y102	.00E+00	.00E+00	.00E+00	.00E+00
zr102	.00E+00	.00E+00	.00E+00	.00E+00
nb102	.00E+00	.00E+00	.00E+00	.00E+00
mo102	.00E+00	.00E+00	.00E+00	.00E+00
tc102	.00E+00	.00E+00	.00E+00	.00E+00
tc102m	.00E+00	.00E+00	.00E+00	.00E+00
ru102	5.39E+02	5.39E+02	5.39E+02	5.39E+02
rh102	.00E+00	.00E+00	.00E+00	.00E+00
pd102	.00E+00	.00E+00	.00E+00	.00E+00
sr103	.00E+00	.00E+00	.00E+00	.00E+00
y103	.00E+00	.00E+00	.00E+00	.00E+00
zr103	.00E+00	.00E+00	.00E+00	.00E+00
nb103	.00E+00	.00E+00	.00E+00	.00E+00
mo103	.00E+00	.00E+00	.00E+00	.00E+00
tc103	.00E+00	.00E+00	.00E+00	.00E+00
ru103	.00E+00	.00E+00	.00E+00	.00E+00
rh103	3.99E+02	3.99E+02	3.99E+02	3.99E+02
rh103m	.00E+00	.00E+00	.00E+00	.00E+00
sr104	.00E+00	.00E+00	.00E+00	.00E+00
y104	.00E+00	.00E+00	.00E+00	.00E+00
zr104	.00E+00	.00E+00	.00E+00	.00E+00
nb104	.00E+00	.00E+00	.00E+00	.00E+00
mo104	.00E+00	.00E+00	.00E+00	.00E+00
tc104	.00E+00	.00E+00	.00E+00	.00E+00
ru104	2.69E+02	2.69E+02	2.69E+02	2.69E+02
rh104	.00E+00	.00E+00	.00E+00	.00E+00
rh104m	.00E+00	.00E+00	.00E+00	.00E+00
pd104	1.58E+01	1.58E+01	1.58E+01	1.58E+01
y105	.00E+00	.00E+00	.00E+00	.00E+00
zr105	.00E+00	.00E+00	.00E+00	.00E+00
nb105	.00E+00	.00E+00	.00E+00	.00E+00
mo105	.00E+00	.00E+00	.00E+00	.00E+00
tc105	.00E+00	.00E+00	.00E+00	.00E+00
ru105	.00E+00	.00E+00	.00E+00	.00E+00
rh105	.00E+00	.00E+00	.00E+00	.00E+00
rh105m	.00E+00	.00E+00	.00E+00	.00E+00
pd105	1.64E+02	1.64E+02	1.64E+02	1.64E+02

1 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 213
 0 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

	initial	300000. yr	500000. yr	999999. yr
y106	.00E+00	.00E+00	.00E+00	.00E+00
zr106	.00E+00	.00E+00	.00E+00	.00E+00
nb106	.00E+00	.00E+00	.00E+00	.00E+00
mo106	.00E+00	.00E+00	.00E+00	.00E+00
tc106	.00E+00	.00E+00	.00E+00	.00E+00
ru106	.00E+00	.00E+00	.00E+00	.00E+00
rh106	.00E+00	.00E+00	.00E+00	.00E+00
rh106m	.00E+00	.00E+00	.00E+00	.00E+00
pd106	8.76E+01	8.76E+01	8.76E+01	8.76E+01
ag106	.00E+00	.00E+00	.00E+00	.00E+00
y107	.00E+00	.00E+00	.00E+00	.00E+00
zr107	.00E+00	.00E+00	.00E+00	.00E+00
nb107	.00E+00	.00E+00	.00E+00	.00E+00
mo107	.00E+00	.00E+00	.00E+00	.00E+00
tc107	.00E+00	.00E+00	.00E+00	.00E+00
ru107	.00E+00	.00E+00	.00E+00	.00E+00
rh107	.00E+00	.00E+00	.00E+00	.00E+00
pd107	4.42E+01	4.40E+01	4.30E+01	4.08E+01
pd107m	.00E+00	.00E+00	.00E+00	.00E+00
ag107	1.40E+00	1.64E+00	2.57E+00	4.80E+00
zr108	.00E+00	.00E+00	.00E+00	.00E+00
nb108	.00E+00	.00E+00	.00E+00	.00E+00
mo108	.00E+00	.00E+00	.00E+00	.00E+00
tc108	.00E+00	.00E+00	.00E+00	.00E+00
ru108	.00E+00	.00E+00	.00E+00	.00E+00
rh108	.00E+00	.00E+00	.00E+00	.00E+00
rh108m	.00E+00	.00E+00	.00E+00	.00E+00
pd108	2.60E+01	2.60E+01	2.60E+01	2.60E+01
ag108	.00E+00	.00E+00	.00E+00	.00E+00
ag108m	.00E+00	.00E+00	.00E+00	.00E+00
cd108	5.25E-04	5.25E-04	5.25E-04	5.25E-04
zr109	.00E+00	.00E+00	.00E+00	.00E+00
nb109	.00E+00	.00E+00	.00E+00	.00E+00
mo109	.00E+00	.00E+00	.00E+00	.00E+00
tc109	.00E+00	.00E+00	.00E+00	.00E+00
ru109	.00E+00	.00E+00	.00E+00	.00E+00
rh109	.00E+00	.00E+00	.00E+00	.00E+00
rh109m	.00E+00	.00E+00	.00E+00	.00E+00
pd109	.00E+00	.00E+00	.00E+00	.00E+00
pd109m	.00E+00	.00E+00	.00E+00	.00E+00
ag109	1.84E+01	1.84E+01	1.84E+01	1.84E+01
ag109m	.00E+00	.00E+00	.00E+00	.00E+00
cd109	.00E+00	.00E+00	.00E+00	.00E+00
nb110	.00E+00	.00E+00	.00E+00	.00E+00
mo110	.00E+00	.00E+00	.00E+00	.00E+00
tc110	.00E+00	.00E+00	.00E+00	.00E+00
ru110	.00E+00	.00E+00	.00E+00	.00E+00
rh110	.00E+00	.00E+00	.00E+00	.00E+00
rh110m	.00E+00	.00E+00	.00E+00	.00E+00
pd110	8.63E+00	8.63E+00	8.63E+00	8.63E+00
ag110	.00E+00	.00E+00	.00E+00	.00E+00
ag110m	.00E+00	.00E+00	.00E+00	.00E+00

1 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 214
 0 nuclide concentrations, grams

basis =per critical mass 10.1 MT UO2

	initial300000.	yr500000.	yr999999.	yr
cd110	5.61E-01	5.61E-01	5.61E-01	5.61E-01
nb111	.00E+00	.00E+00	.00E+00	.00E+00
mo111	.00E+00	.00E+00	.00E+00	.00E+00
tc111	.00E+00	.00E+00	.00E+00	.00E+00
ru111	.00E+00	.00E+00	.00E+00	.00E+00
rh111	.00E+00	.00E+00	.00E+00	.00E+00
pd111	.00E+00	.00E+00	.00E+00	.00E+00
pd111m	.00E+00	.00E+00	.00E+00	.00E+00
ag111	.00E+00	.00E+00	.00E+00	.00E+00
ag111m	.00E+00	.00E+00	.00E+00	.00E+00
cd111	5.01E+00	5.01E+00	5.01E+00	5.01E+00
cd111m	.00E+00	.00E+00	.00E+00	.00E+00
nb112	.00E+00	.00E+00	.00E+00	.00E+00
mo112	.00E+00	.00E+00	.00E+00	.00E+00
tc112	.00E+00	.00E+00	.00E+00	.00E+00
ru112	.00E+00	.00E+00	.00E+00	.00E+00
rh112	.00E+00	.00E+00	.00E+00	.00E+00
pd112	.00E+00	.00E+00	.00E+00	.00E+00
ag112	.00E+00	.00E+00	.00E+00	.00E+00
cd112	3.25E+00	3.25E+00	3.25E+00	3.25E+00
mo113	.00E+00	.00E+00	.00E+00	.00E+00
tc113	.00E+00	.00E+00	.00E+00	.00E+00
ru113	.00E+00	.00E+00	.00E+00	.00E+00
rh113	.00E+00	.00E+00	.00E+00	.00E+00
pd113	.00E+00	.00E+00	.00E+00	.00E+00
ag113	.00E+00	.00E+00	.00E+00	.00E+00
ag113m	.00E+00	.00E+00	.00E+00	.00E+00
cd113	1.96E-01	1.96E-01	1.96E-01	1.96E-01
cd113m	.00E+00	.00E+00	.00E+00	.00E+00
in113	4.50E-02	4.50E-02	4.50E-02	4.50E-02
in113m	.00E+00	.00E+00	.00E+00	.00E+00
mo114	.00E+00	.00E+00	.00E+00	.00E+00
tc114	.00E+00	.00E+00	.00E+00	.00E+00
ru114	.00E+00	.00E+00	.00E+00	.00E+00
rh114	.00E+00	.00E+00	.00E+00	.00E+00
pd114	.00E+00	.00E+00	.00E+00	.00E+00
ag114	.00E+00	.00E+00	.00E+00	.00E+00
cd114	4.91E+00	4.91E+00	4.91E+00	4.91E+00
in114	.00E+00	.00E+00	.00E+00	.00E+00
in114m	.00E+00	.00E+00	.00E+00	.00E+00
sn114	1.10E-04	1.10E-04	1.10E-04	1.10E-04
mo115	.00E+00	.00E+00	.00E+00	.00E+00
tc115	.00E+00	.00E+00	.00E+00	.00E+00
ru115	.00E+00	.00E+00	.00E+00	.00E+00
rh115	.00E+00	.00E+00	.00E+00	.00E+00
pd115	.00E+00	.00E+00	.00E+00	.00E+00
ag115	.00E+00	.00E+00	.00E+00	.00E+00
ag115m	.00E+00	.00E+00	.00E+00	.00E+00
cd115	.00E+00	.00E+00	.00E+00	.00E+00
cd115m	.00E+00	.00E+00	.00E+00	.00E+00
in115	1.67E+00	1.67E+00	1.67E+00	1.67E+00
in115m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2
 initial300000. yr500000. yr999999. yr
 sn115 8.75E-02 8.75E-02 8.75E-02 8.75E-02

tc116	.00E+00	.00E+00	.00E+00	.00E+00
ru116	.00E+00	.00E+00	.00E+00	.00E+00
rh116	.00E+00	.00E+00	.00E+00	.00E+00
pd116	.00E+00	.00E+00	.00E+00	.00E+00
ag116	.00E+00	.00E+00	.00E+00	.00E+00
ag116m	.00E+00	.00E+00	.00E+00	.00E+00
cd116	2.72E+00	2.72E+00	2.72E+00	2.72E+00
in116	.00E+00	.00E+00	.00E+00	.00E+00
in116m	.00E+00	.00E+00	.00E+00	.00E+00
sn116	7.57E-02	7.57E-02	7.57E-02	7.57E-02
tc117	.00E+00	.00E+00	.00E+00	.00E+00
ru117	.00E+00	.00E+00	.00E+00	.00E+00
rh117	.00E+00	.00E+00	.00E+00	.00E+00
pd117	.00E+00	.00E+00	.00E+00	.00E+00
ag117	.00E+00	.00E+00	.00E+00	.00E+00
ag117m	.00E+00	.00E+00	.00E+00	.00E+00
cd117	.00E+00	.00E+00	.00E+00	.00E+00
cd117m	.00E+00	.00E+00	.00E+00	.00E+00
in117	.00E+00	.00E+00	.00E+00	.00E+00
in117m	.00E+00	.00E+00	.00E+00	.00E+00
sn117	1.99E+00	1.99E+00	1.99E+00	1.99E+00
sn117m	.00E+00	.00E+00	.00E+00	.00E+00
tc118	.00E+00	.00E+00	.00E+00	.00E+00
ru118	.00E+00	.00E+00	.00E+00	.00E+00
rh118	.00E+00	.00E+00	.00E+00	.00E+00
pd118	.00E+00	.00E+00	.00E+00	.00E+00
ag118	.00E+00	.00E+00	.00E+00	.00E+00
ag118m	.00E+00	.00E+00	.00E+00	.00E+00
cd118	.00E+00	.00E+00	.00E+00	.00E+00
in118	.00E+00	.00E+00	.00E+00	.00E+00
in118m	.00E+00	.00E+00	.00E+00	.00E+00
sn118	1.88E+00	1.88E+00	1.88E+00	1.88E+00
ru119	.00E+00	.00E+00	.00E+00	.00E+00
rh119	.00E+00	.00E+00	.00E+00	.00E+00
pd119	.00E+00	.00E+00	.00E+00	.00E+00
ag119	.00E+00	.00E+00	.00E+00	.00E+00
cd119	.00E+00	.00E+00	.00E+00	.00E+00
cd119m	.00E+00	.00E+00	.00E+00	.00E+00
in119	.00E+00	.00E+00	.00E+00	.00E+00
in119m	.00E+00	.00E+00	.00E+00	.00E+00
sn119	2.06E+00	2.06E+00	2.06E+00	2.06E+00
sn119m	.00E+00	.00E+00	.00E+00	.00E+00
ru120	.00E+00	.00E+00	.00E+00	.00E+00
rh120	.00E+00	.00E+00	.00E+00	.00E+00
pd120	.00E+00	.00E+00	.00E+00	.00E+00
ag120	.00E+00	.00E+00	.00E+00	.00E+00
cd120	.00E+00	.00E+00	.00E+00	.00E+00
in120	.00E+00	.00E+00	.00E+00	.00E+00
in120m	.00E+00	.00E+00	.00E+00	.00E+00
sn120	2.05E+00	2.05E+00	2.05E+00	2.05E+00
rh121	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
pd121	.00E+00	.00E+00	.00E+00	.00E+00
ag121	.00E+00	.00E+00	.00E+00	.00E+00
cd121	.00E+00	.00E+00	.00E+00	.00E+00
in121	.00E+00	.00E+00	.00E+00	.00E+00

in121m	.00E+00	.00E+00	.00E+00	.00E+00
sn121	.00E+00	.00E+00	.00E+00	.00E+00
sn121m	.00E+00	.00E+00	.00E+00	.00E+00
sb121	2.22E+00	2.22E+00	2.22E+00	2.22E+00
rh122	.00E+00	.00E+00	.00E+00	.00E+00
pd122	.00E+00	.00E+00	.00E+00	.00E+00
ag122	.00E+00	.00E+00	.00E+00	.00E+00
cd122	.00E+00	.00E+00	.00E+00	.00E+00
in122	.00E+00	.00E+00	.00E+00	.00E+00
in122m	.00E+00	.00E+00	.00E+00	.00E+00
sn122	2.63E+00	2.63E+00	2.63E+00	2.63E+00
sb122	.00E+00	.00E+00	.00E+00	.00E+00
sb122m	.00E+00	.00E+00	.00E+00	.00E+00
te122	3.56E-03	3.56E-03	3.56E-03	3.56E-03
rh123	.00E+00	.00E+00	.00E+00	.00E+00
pd123	.00E+00	.00E+00	.00E+00	.00E+00
ag123	.00E+00	.00E+00	.00E+00	.00E+00
cd123	.00E+00	.00E+00	.00E+00	.00E+00
in123	.00E+00	.00E+00	.00E+00	.00E+00
in123m	.00E+00	.00E+00	.00E+00	.00E+00
sn123	.00E+00	.00E+00	.00E+00	.00E+00
sn123m	.00E+00	.00E+00	.00E+00	.00E+00
sb123	2.68E+00	2.68E+00	2.68E+00	2.68E+00
te123	1.69E-06	1.69E-06	1.69E-06	1.69E-06
te123m	.00E+00	.00E+00	.00E+00	.00E+00
pd124	.00E+00	.00E+00	.00E+00	.00E+00
ag124	.00E+00	.00E+00	.00E+00	.00E+00
cd124	.00E+00	.00E+00	.00E+00	.00E+00
in124	.00E+00	.00E+00	.00E+00	.00E+00
sn124	4.46E+00	4.46E+00	4.46E+00	4.46E+00
sb124	.00E+00	.00E+00	.00E+00	.00E+00
sb124m	.00E+00	.00E+00	.00E+00	.00E+00
te124	5.36E-03	5.36E-03	5.36E-03	5.36E-03
pd125	.00E+00	.00E+00	.00E+00	.00E+00
ag125	.00E+00	.00E+00	.00E+00	.00E+00
cd125	.00E+00	.00E+00	.00E+00	.00E+00
in125	.00E+00	.00E+00	.00E+00	.00E+00
in125m	.00E+00	.00E+00	.00E+00	.00E+00
sn125	.00E+00	.00E+00	.00E+00	.00E+00
sn125m	.00E+00	.00E+00	.00E+00	.00E+00
sb125	.00E+00	.00E+00	.00E+00	.00E+00
te125	5.20E+00	5.20E+00	5.20E+00	5.20E+00
te125m	.00E+00	.00E+00	.00E+00	.00E+00
pd126	.00E+00	.00E+00	.00E+00	.00E+00
ag126	.00E+00	.00E+00	.00E+00	.00E+00
cd126	.00E+00	.00E+00	.00E+00	.00E+00
in126	.00E+00	.00E+00	.00E+00	.00E+00
sn126	1.07E+00	7.60E-01	1.90E-01	5.94E-03

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sb126	5.11E-08	3.61E-08	9.03E-09	2.82E-10
sb126m	3.88E-10	2.74E-10	6.86E-11	2.14E-12
te126	7.21E+00	7.52E+00	8.09E+00	8.28E+00
xe126	8.47E-10	8.47E-10	8.47E-10	8.47E-10
ag127	.00E+00	.00E+00	.00E+00	.00E+00
cd127	.00E+00	.00E+00	.00E+00	.00E+00
in127	.00E+00	.00E+00	.00E+00	.00E+00

in127m	.00E+00	.00E+00	.00E+00	.00E+00
sn127	.00E+00	.00E+00	.00E+00	.00E+00
sn127m	.00E+00	.00E+00	.00E+00	.00E+00
sb127	.00E+00	.00E+00	.00E+00	.00E+00
te127	.00E+00	.00E+00	.00E+00	.00E+00
te127m	.00E+00	.00E+00	.00E+00	.00E+00
i127	2.21E+01	2.21E+01	2.21E+01	2.21E+01
xe127	.00E+00	.00E+00	.00E+00	.00E+00
ag128	.00E+00	.00E+00	.00E+00	.00E+00
cd128	.00E+00	.00E+00	.00E+00	.00E+00
in128	.00E+00	.00E+00	.00E+00	.00E+00
sn128	.00E+00	.00E+00	.00E+00	.00E+00
sb128	.00E+00	.00E+00	.00E+00	.00E+00
sb128m	.00E+00	.00E+00	.00E+00	.00E+00
te128	5.81E+01	5.81E+01	5.81E+01	5.81E+01
i128	.00E+00	.00E+00	.00E+00	.00E+00
xe128	3.17E-02	3.17E-02	3.17E-02	3.17E-02
cd129	.00E+00	.00E+00	.00E+00	.00E+00
in129	.00E+00	.00E+00	.00E+00	.00E+00
sn129	.00E+00	.00E+00	.00E+00	.00E+00
sn129m	.00E+00	.00E+00	.00E+00	.00E+00
sb129	.00E+00	.00E+00	.00E+00	.00E+00
te129	.00E+00	.00E+00	.00E+00	.00E+00
te129m	.00E+00	.00E+00	.00E+00	.00E+00
i129	1.22E+02	1.22E+02	1.21E+02	1.18E+02
xe129	1.60E+00	1.87E+00	2.94E+00	5.58E+00
xe129m	.00E+00	.00E+00	.00E+00	.00E+00
cd130	.00E+00	.00E+00	.00E+00	.00E+00
in130	.00E+00	.00E+00	.00E+00	.00E+00
sn130	.00E+00	.00E+00	.00E+00	.00E+00
sb130	.00E+00	.00E+00	.00E+00	.00E+00
sb130m	.00E+00	.00E+00	.00E+00	.00E+00
te130	2.79E+02	2.79E+02	2.79E+02	2.79E+02
i130	.00E+00	.00E+00	.00E+00	.00E+00
i130m	.00E+00	.00E+00	.00E+00	.00E+00
xe130	5.45E-01	5.45E-01	5.45E-01	5.45E-01
cd131	.00E+00	.00E+00	.00E+00	.00E+00
in131	.00E+00	.00E+00	.00E+00	.00E+00
sn131	.00E+00	.00E+00	.00E+00	.00E+00
sb131	.00E+00	.00E+00	.00E+00	.00E+00
te131	.00E+00	.00E+00	.00E+00	.00E+00
te131m	.00E+00	.00E+00	.00E+00	.00E+00
i131	.00E+00	.00E+00	.00E+00	.00E+00
xe131	4.50E+02	4.50E+02	4.50E+02	4.50E+02
xe131m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
cd132	.00E+00	.00E+00	.00E+00	.00E+00
in132	.00E+00	.00E+00	.00E+00	.00E+00
sn132	.00E+00	.00E+00	.00E+00	.00E+00
sb132	.00E+00	.00E+00	.00E+00	.00E+00
sb132m	.00E+00	.00E+00	.00E+00	.00E+00
te132	.00E+00	.00E+00	.00E+00	.00E+00
i132	.00E+00	.00E+00	.00E+00	.00E+00
xe132	7.09E+02	7.09E+02	7.09E+02	7.09E+02
cs132	.00E+00	.00E+00	.00E+00	.00E+00
ba132	4.87E-06	4.87E-06	4.87E-06	4.87E-06

in133	.00E+00	.00E+00	.00E+00	.00E+00
sn133	.00E+00	.00E+00	.00E+00	.00E+00
sb133	.00E+00	.00E+00	.00E+00	.00E+00
te133	.00E+00	.00E+00	.00E+00	.00E+00
te133m	.00E+00	.00E+00	.00E+00	.00E+00
i133	.00E+00	.00E+00	.00E+00	.00E+00
i133m	.00E+00	.00E+00	.00E+00	.00E+00
xe133	.00E+00	.00E+00	.00E+00	.00E+00
xe133m	.00E+00	.00E+00	.00E+00	.00E+00
cs133	1.06E+03	1.06E+03	1.06E+03	1.06E+03
ba133	.00E+00	.00E+00	.00E+00	.00E+00
in134	.00E+00	.00E+00	.00E+00	.00E+00
sn134	.00E+00	.00E+00	.00E+00	.00E+00
sb134	.00E+00	.00E+00	.00E+00	.00E+00
sb134m	.00E+00	.00E+00	.00E+00	.00E+00
te134	.00E+00	.00E+00	.00E+00	.00E+00
i134	.00E+00	.00E+00	.00E+00	.00E+00
i134m	.00E+00	.00E+00	.00E+00	.00E+00
xe134	1.26E+03	1.26E+03	1.26E+03	1.26E+03
xe134m	.00E+00	.00E+00	.00E+00	.00E+00
cs134	.00E+00	.00E+00	.00E+00	.00E+00
cs134m	.00E+00	.00E+00	.00E+00	.00E+00
ba134	1.07E+01	1.07E+01	1.07E+01	1.07E+01
sn135	.00E+00	.00E+00	.00E+00	.00E+00
sb135	.00E+00	.00E+00	.00E+00	.00E+00
te135	.00E+00	.00E+00	.00E+00	.00E+00
i135	.00E+00	.00E+00	.00E+00	.00E+00
xe135	.00E+00	.00E+00	.00E+00	.00E+00
xe135m	.00E+00	.00E+00	.00E+00	.00E+00
cs135	9.77E+02	9.62E+02	9.06E+02	7.79E+02
cs135m	.00E+00	.00E+00	.00E+00	.00E+00
ba135	9.11E+01	1.06E+02	1.62E+02	2.89E+02
ba135m	.00E+00	.00E+00	.00E+00	.00E+00
sn136	.00E+00	.00E+00	.00E+00	.00E+00
sb136	.00E+00	.00E+00	.00E+00	.00E+00
te136	.00E+00	.00E+00	.00E+00	.00E+00
i136	.00E+00	.00E+00	.00E+00	.00E+00
i136m	.00E+00	.00E+00	.00E+00	.00E+00
xe136	1.03E+03	1.03E+03	1.03E+03	1.03E+03
cs136	.00E+00	.00E+00	.00E+00	.00E+00
ba136	4.03E+00	4.03E+00	4.03E+00	4.03E+00
ba136m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sb137	.00E+00	.00E+00	.00E+00	.00E+00
te137	.00E+00	.00E+00	.00E+00	.00E+00
i137	.00E+00	.00E+00	.00E+00	.00E+00
xe137	.00E+00	.00E+00	.00E+00	.00E+00
cs137	.00E+00	.00E+00	.00E+00	.00E+00
ba137	1.04E+03	1.04E+03	1.04E+03	1.04E+03
ba137m	.00E+00	.00E+00	.00E+00	.00E+00
sb138	.00E+00	.00E+00	.00E+00	.00E+00
te138	.00E+00	.00E+00	.00E+00	.00E+00
i138	.00E+00	.00E+00	.00E+00	.00E+00
xe138	.00E+00	.00E+00	.00E+00	.00E+00
cs138	.00E+00	.00E+00	.00E+00	.00E+00
cs138m	.00E+00	.00E+00	.00E+00	.00E+00

ba138	1.10E+03	1.10E+03	1.10E+03	1.10E+03
la138	5.84E-03	5.84E-03	5.84E-03	5.84E-03
sb139	.00E+00	.00E+00	.00E+00	.00E+00
te139	.00E+00	.00E+00	.00E+00	.00E+00
i139	.00E+00	.00E+00	.00E+00	.00E+00
xe139	.00E+00	.00E+00	.00E+00	.00E+00
cs139	.00E+00	.00E+00	.00E+00	.00E+00
ba139	.00E+00	.00E+00	.00E+00	.00E+00
la139	1.05E+03	1.05E+03	1.05E+03	1.05E+03
ce139	.00E+00	.00E+00	.00E+00	.00E+00
pr139	.00E+00	.00E+00	.00E+00	.00E+00
te140	.00E+00	.00E+00	.00E+00	.00E+00
i140	.00E+00	.00E+00	.00E+00	.00E+00
xe140	.00E+00	.00E+00	.00E+00	.00E+00
cs140	.00E+00	.00E+00	.00E+00	.00E+00
ba140	.00E+00	.00E+00	.00E+00	.00E+00
la140	.00E+00	.00E+00	.00E+00	.00E+00
ce140	1.05E+03	1.05E+03	1.05E+03	1.05E+03
pr140	.00E+00	.00E+00	.00E+00	.00E+00
te141	.00E+00	.00E+00	.00E+00	.00E+00
i141	.00E+00	.00E+00	.00E+00	.00E+00
xe141	.00E+00	.00E+00	.00E+00	.00E+00
cs141	.00E+00	.00E+00	.00E+00	.00E+00
ba141	.00E+00	.00E+00	.00E+00	.00E+00
la141	.00E+00	.00E+00	.00E+00	.00E+00
ce141	.00E+00	.00E+00	.00E+00	.00E+00
pr141	9.73E+02	9.73E+02	9.73E+02	9.73E+02
nd141	.00E+00	.00E+00	.00E+00	.00E+00
te142	.00E+00	.00E+00	.00E+00	.00E+00
i142	.00E+00	.00E+00	.00E+00	.00E+00
xe142	.00E+00	.00E+00	.00E+00	.00E+00
cs142	.00E+00	.00E+00	.00E+00	.00E+00
ba142	.00E+00	.00E+00	.00E+00	.00E+00
la142	.00E+00	.00E+00	.00E+00	.00E+00
ce142	9.88E+02	9.88E+02	9.88E+02	9.88E+02
pr142	.00E+00	.00E+00	.00E+00	.00E+00
pr142m	.00E+00	.00E+00	.00E+00	.00E+00
nd142	1.90E+00	1.90E+00	1.90E+00	1.90E+00
i143	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
xe143	.00E+00	.00E+00	.00E+00	.00E+00
cs143	.00E+00	.00E+00	.00E+00	.00E+00
ba143	.00E+00	.00E+00	.00E+00	.00E+00
la143	.00E+00	.00E+00	.00E+00	.00E+00
ce143	.00E+00	.00E+00	.00E+00	.00E+00
pr143	.00E+00	.00E+00	.00E+00	.00E+00
nd143	9.53E+02	9.53E+02	9.53E+02	9.53E+02
i144	.00E+00	.00E+00	.00E+00	.00E+00
xe144	.00E+00	.00E+00	.00E+00	.00E+00
cs144	.00E+00	.00E+00	.00E+00	.00E+00
ba144	.00E+00	.00E+00	.00E+00	.00E+00
la144	.00E+00	.00E+00	.00E+00	.00E+00
ce144	.00E+00	.00E+00	.00E+00	.00E+00
pr144	.00E+00	.00E+00	.00E+00	.00E+00
pr144m	.00E+00	.00E+00	.00E+00	.00E+00
nd144	9.70E+02	9.70E+02	9.70E+02	9.70E+02

i145	.00E+00	.00E+00	.00E+00	.00E+00
xe145	.00E+00	.00E+00	.00E+00	.00E+00
cs145	.00E+00	.00E+00	.00E+00	.00E+00
ba145	.00E+00	.00E+00	.00E+00	.00E+00
la145	.00E+00	.00E+00	.00E+00	.00E+00
ce145	.00E+00	.00E+00	.00E+00	.00E+00
pr145	.00E+00	.00E+00	.00E+00	.00E+00
nd145	6.66E+02	6.66E+02	6.66E+02	6.66E+02
pm145	.00E+00	.00E+00	.00E+00	.00E+00
sm145	.00E+00	.00E+00	.00E+00	.00E+00
xe146	.00E+00	.00E+00	.00E+00	.00E+00
cs146	.00E+00	.00E+00	.00E+00	.00E+00
ba146	.00E+00	.00E+00	.00E+00	.00E+00
la146	.00E+00	.00E+00	.00E+00	.00E+00
ce146	.00E+00	.00E+00	.00E+00	.00E+00
pr146	.00E+00	.00E+00	.00E+00	.00E+00
nd146	5.25E+02	5.25E+02	5.25E+02	5.25E+02
pm146	.00E+00	.00E+00	.00E+00	.00E+00
sm146	8.36E-04	8.35E-04	8.34E-04	8.31E-04
xe147	.00E+00	.00E+00	.00E+00	.00E+00
cs147	.00E+00	.00E+00	.00E+00	.00E+00
ba147	.00E+00	.00E+00	.00E+00	.00E+00
la147	.00E+00	.00E+00	.00E+00	.00E+00
ce147	.00E+00	.00E+00	.00E+00	.00E+00
pr147	.00E+00	.00E+00	.00E+00	.00E+00
nd147	.00E+00	.00E+00	.00E+00	.00E+00
pm147	.00E+00	.00E+00	.00E+00	.00E+00
sm147	3.89E+02	3.89E+02	3.89E+02	3.89E+02
cs148	.00E+00	.00E+00	.00E+00	.00E+00
ba148	.00E+00	.00E+00	.00E+00	.00E+00
la148	.00E+00	.00E+00	.00E+00	.00E+00
ce148	.00E+00	.00E+00	.00E+00	.00E+00
pr148	.00E+00	.00E+00	.00E+00	.00E+00
nd148	2.98E+02	2.98E+02	2.98E+02	2.98E+02
pm148	.00E+00	.00E+00	.00E+00	.00E+00
pm148m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sm148	8.64E+00	8.64E+00	8.64E+00	8.64E+00
cs149	.00E+00	.00E+00	.00E+00	.00E+00
ba149	.00E+00	.00E+00	.00E+00	.00E+00
la149	.00E+00	.00E+00	.00E+00	.00E+00
ce149	.00E+00	.00E+00	.00E+00	.00E+00
pr149	.00E+00	.00E+00	.00E+00	.00E+00
nd149	.00E+00	.00E+00	.00E+00	.00E+00
pm149	.00E+00	.00E+00	.00E+00	.00E+00
sm149	8.79E+00	8.79E+00	8.79E+00	8.79E+00
eu149	.00E+00	.00E+00	.00E+00	.00E+00
cs150	.00E+00	.00E+00	.00E+00	.00E+00
ba150	.00E+00	.00E+00	.00E+00	.00E+00
la150	.00E+00	.00E+00	.00E+00	.00E+00
ce150	.00E+00	.00E+00	.00E+00	.00E+00
pr150	.00E+00	.00E+00	.00E+00	.00E+00
nd150	1.23E+02	1.23E+02	1.23E+02	1.23E+02
pm150	.00E+00	.00E+00	.00E+00	.00E+00
sm150	1.85E+02	1.85E+02	1.85E+02	1.85E+02
eu150	.00E+00	.00E+00	.00E+00	.00E+00

ba151	.00E+00	.00E+00	.00E+00	.00E+00
la151	.00E+00	.00E+00	.00E+00	.00E+00
ce151	.00E+00	.00E+00	.00E+00	.00E+00
pr151	.00E+00	.00E+00	.00E+00	.00E+00
nd151	.00E+00	.00E+00	.00E+00	.00E+00
pm151	.00E+00	.00E+00	.00E+00	.00E+00
sm151	.00E+00	.00E+00	.00E+00	.00E+00
eu151	3.76E+01	3.76E+01	3.76E+01	3.76E+01
ba152	.00E+00	.00E+00	.00E+00	.00E+00
la152	.00E+00	.00E+00	.00E+00	.00E+00
ce152	.00E+00	.00E+00	.00E+00	.00E+00
pr152	.00E+00	.00E+00	.00E+00	.00E+00
nd152	.00E+00	.00E+00	.00E+00	.00E+00
pm152	.00E+00	.00E+00	.00E+00	.00E+00
pm152m	.00E+00	.00E+00	.00E+00	.00E+00
sm152	7.57E+01	7.57E+01	7.57E+01	7.57E+01
eu152	.00E+00	.00E+00	.00E+00	.00E+00
eu152m	.00E+00	.00E+00	.00E+00	.00E+00
gd152	2.01E+01	2.01E+01	2.01E+01	2.01E+01
la153	.00E+00	.00E+00	.00E+00	.00E+00
ce153	.00E+00	.00E+00	.00E+00	.00E+00
pr153	.00E+00	.00E+00	.00E+00	.00E+00
nd153	.00E+00	.00E+00	.00E+00	.00E+00
pm153	.00E+00	.00E+00	.00E+00	.00E+00
sm153	.00E+00	.00E+00	.00E+00	.00E+00
eu153	3.65E+01	3.65E+01	3.65E+01	3.65E+01
gd153	.00E+00	.00E+00	.00E+00	.00E+00
la154	.00E+00	.00E+00	.00E+00	.00E+00
ce154	.00E+00	.00E+00	.00E+00	.00E+00
pr154	.00E+00	.00E+00	.00E+00	.00E+00
nd154	.00E+00	.00E+00	.00E+00	.00E+00
pm154	.00E+00	.00E+00	.00E+00	.00E+00
pm154m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sm154	1.64E+01	1.64E+01	1.64E+01	1.64E+01
eu154	.00E+00	.00E+00	.00E+00	.00E+00
gd154	2.15E+00	2.15E+00	2.15E+00	2.15E+00
la155	.00E+00	.00E+00	.00E+00	.00E+00
ce155	.00E+00	.00E+00	.00E+00	.00E+00
pr155	.00E+00	.00E+00	.00E+00	.00E+00
nd155	.00E+00	.00E+00	.00E+00	.00E+00
pm155	.00E+00	.00E+00	.00E+00	.00E+00
sm155	.00E+00	.00E+00	.00E+00	.00E+00
eu155	.00E+00	.00E+00	.00E+00	.00E+00
gd155m	.00E+00	.00E+00	.00E+00	.00E+00
gd155	6.66E-01	6.66E-01	6.66E-01	6.66E-01
ce156	.00E+00	.00E+00	.00E+00	.00E+00
pr156	.00E+00	.00E+00	.00E+00	.00E+00
nd156	.00E+00	.00E+00	.00E+00	.00E+00
pm156	.00E+00	.00E+00	.00E+00	.00E+00
sm156	.00E+00	.00E+00	.00E+00	.00E+00
eu156	.00E+00	.00E+00	.00E+00	.00E+00
gd156	1.12E+01	1.12E+01	1.12E+01	1.12E+01
ce157	.00E+00	.00E+00	.00E+00	.00E+00
pr157	.00E+00	.00E+00	.00E+00	.00E+00
nd157	.00E+00	.00E+00	.00E+00	.00E+00

pm157	.00E+00	.00E+00	.00E+00	.00E+00
sm157	.00E+00	.00E+00	.00E+00	.00E+00
eu157	.00E+00	.00E+00	.00E+00	.00E+00
gd157	5.42E-02	5.42E-02	5.42E-02	5.42E-02
pr158	.00E+00	.00E+00	.00E+00	.00E+00
nd158	.00E+00	.00E+00	.00E+00	.00E+00
pm158	.00E+00	.00E+00	.00E+00	.00E+00
sm158	.00E+00	.00E+00	.00E+00	.00E+00
eu158	.00E+00	.00E+00	.00E+00	.00E+00
gd158	3.07E+00	3.07E+00	3.07E+00	3.07E+00
pr159	.00E+00	.00E+00	.00E+00	.00E+00
nd159	.00E+00	.00E+00	.00E+00	.00E+00
pm159	.00E+00	.00E+00	.00E+00	.00E+00
sm159	.00E+00	.00E+00	.00E+00	.00E+00
eu159	.00E+00	.00E+00	.00E+00	.00E+00
gd159	.00E+00	.00E+00	.00E+00	.00E+00
tb159	4.41E-01	4.41E-01	4.41E-01	4.41E-01
nd160	.00E+00	.00E+00	.00E+00	.00E+00
pm160	.00E+00	.00E+00	.00E+00	.00E+00
sm160	.00E+00	.00E+00	.00E+00	.00E+00
eu160	.00E+00	.00E+00	.00E+00	.00E+00
gd160	1.79E-01	1.79E-01	1.79E-01	1.79E-01
tb160	.00E+00	.00E+00	.00E+00	.00E+00
dy160	2.30E-03	2.30E-03	2.30E-03	2.30E-03
nd161	.00E+00	.00E+00	.00E+00	.00E+00
pm161	.00E+00	.00E+00	.00E+00	.00E+00
sm161	.00E+00	.00E+00	.00E+00	.00E+00
eu161	.00E+00	.00E+00	.00E+00	.00E+00
gd161	.00E+00	.00E+00	.00E+00	.00E+00
tb161	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
dy161	7.00E-02	7.00E-02	7.00E-02	7.00E-02
pm162	.00E+00	.00E+00	.00E+00	.00E+00
sm162	.00E+00	.00E+00	.00E+00	.00E+00
eu162	.00E+00	.00E+00	.00E+00	.00E+00
gd162	.00E+00	.00E+00	.00E+00	.00E+00
tb162	.00E+00	.00E+00	.00E+00	.00E+00
tb162m	.00E+00	.00E+00	.00E+00	.00E+00
dy162	3.62E-02	3.62E-02	3.62E-02	3.62E-02
sm163	.00E+00	.00E+00	.00E+00	.00E+00
eu163	.00E+00	.00E+00	.00E+00	.00E+00
gd163	.00E+00	.00E+00	.00E+00	.00E+00
tb163	.00E+00	.00E+00	.00E+00	.00E+00
tb163m	.00E+00	.00E+00	.00E+00	.00E+00
dy163	1.35E-02	1.35E-02	1.35E-02	1.35E-02
sm164	.00E+00	.00E+00	.00E+00	.00E+00
eu164	.00E+00	.00E+00	.00E+00	.00E+00
gd164	.00E+00	.00E+00	.00E+00	.00E+00
tb164	.00E+00	.00E+00	.00E+00	.00E+00
dy164	3.85E-03	3.85E-03	3.85E-03	3.85E-03
sm165	.00E+00	.00E+00	.00E+00	.00E+00
eu165	.00E+00	.00E+00	.00E+00	.00E+00
gd165	.00E+00	.00E+00	.00E+00	.00E+00
tb165	.00E+00	.00E+00	.00E+00	.00E+00
dy165	.00E+00	.00E+00	.00E+00	.00E+00
dy165m	.00E+00	.00E+00	.00E+00	.00E+00

- ho165	2.94E-03	2.94E-03	2.94E-03	2.94E-03
dy166	.00E+00	.00E+00	.00E+00	.00E+00
ho166	.00E+00	.00E+00	.00E+00	.00E+00
ho166m	.00E+00	.00E+00	.00E+00	.00E+00
er166	3.07E-04	3.07E-04	3.07E-04	3.07E-04
er167	1.25E-06	1.25E-06	1.25E-06	1.25E-06
er167m	.00E+00	.00E+00	.00E+00	.00E+00
er168	3.38E-07	3.38E-07	3.38E-07	3.38E-07
yb168	.00E+00	.00E+00	.00E+00	.00E+00
er169	.00E+00	.00E+00	.00E+00	.00E+00
tm169	4.80E-07	4.80E-07	4.80E-07	4.80E-07
yb169	.00E+00	.00E+00	.00E+00	.00E+00
er170	5.06E-07	5.06E-07	5.06E-07	5.06E-07
tm170	.00E+00	.00E+00	.00E+00	.00E+00
tm170m	.00E+00	.00E+00	.00E+00	.00E+00
yb170	2.88E-09	2.88E-09	2.88E-09	2.88E-09
er171	.00E+00	.00E+00	.00E+00	.00E+00
tm171	.00E+00	.00E+00	.00E+00	.00E+00
yb171	7.02E-07	7.02E-07	7.02E-07	7.02E-07
er172	.00E+00	.00E+00	.00E+00	.00E+00
tm172	.00E+00	.00E+00	.00E+00	.00E+00
yb172	4.57E-07	4.57E-07	4.57E-07	4.57E-07
total	2.78E+04	2.78E+04	2.78E+04	2.78E+04

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
h 3	.00E+00	.00E+00	.00E+00	.00E+00
li 6	.00E+00	.00E+00	.00E+00	.00E+00
li 7	.00E+00	.00E+00	.00E+00	.00E+00
be 9	.00E+00	.00E+00	.00E+00	.00E+00
be 10	2.13E-06	2.08E-06	1.91E-06	1.54E-06
c 14	4.10E-19	9.68E-22	2.28E-32	.00E+00
ni 66	.00E+00	.00E+00	.00E+00	.00E+00
cu 66	.00E+00	.00E+00	.00E+00	.00E+00
zn 66	.00E+00	.00E+00	.00E+00	.00E+00
cu 67	.00E+00	.00E+00	.00E+00	.00E+00
zn 67	.00E+00	.00E+00	.00E+00	.00E+00
zn 68	.00E+00	.00E+00	.00E+00	.00E+00
zn 69	.00E+00	.00E+00	.00E+00	.00E+00
zn 69m	.00E+00	.00E+00	.00E+00	.00E+00
ga 69	.00E+00	.00E+00	.00E+00	.00E+00
zn 70	.00E+00	.00E+00	.00E+00	.00E+00
ga 70	.00E+00	.00E+00	.00E+00	.00E+00
ge 70	.00E+00	.00E+00	.00E+00	.00E+00
zn 71	.00E+00	.00E+00	.00E+00	.00E+00
zn 71m	.00E+00	.00E+00	.00E+00	.00E+00
ga 71	.00E+00	.00E+00	.00E+00	.00E+00
ge 71	.00E+00	.00E+00	.00E+00	.00E+00
ge 71m	.00E+00	.00E+00	.00E+00	.00E+00
co 72	.00E+00	.00E+00	.00E+00	.00E+00
ni 72	.00E+00	.00E+00	.00E+00	.00E+00
cu 72	.00E+00	.00E+00	.00E+00	.00E+00
zn 72	.00E+00	.00E+00	.00E+00	.00E+00
ga 72	.00E+00	.00E+00	.00E+00	.00E+00
ge 72	.00E+00	.00E+00	.00E+00	.00E+00
co 73	.00E+00	.00E+00	.00E+00	.00E+00
ni 73	.00E+00	.00E+00	.00E+00	.00E+00
cu 73	.00E+00	.00E+00	.00E+00	.00E+00

zn 73	.00E+00	.00E+00	.00E+00	.00E+00
ga 73	.00E+00	.00E+00	.00E+00	.00E+00
ge 73	.00E+00	.00E+00	.00E+00	.00E+00
ge 73m	.00E+00	.00E+00	.00E+00	.00E+00
co 74	.00E+00	.00E+00	.00E+00	.00E+00
ni 74	.00E+00	.00E+00	.00E+00	.00E+00
cu 74	.00E+00	.00E+00	.00E+00	.00E+00
zn 74	.00E+00	.00E+00	.00E+00	.00E+00
ga 74	.00E+00	.00E+00	.00E+00	.00E+00
ge 74	.00E+00	.00E+00	.00E+00	.00E+00
co 75	.00E+00	.00E+00	.00E+00	.00E+00
ni 75	.00E+00	.00E+00	.00E+00	.00E+00
cu 75	.00E+00	.00E+00	.00E+00	.00E+00
zn 75	.00E+00	.00E+00	.00E+00	.00E+00
ga 75	.00E+00	.00E+00	.00E+00	.00E+00
ge 75	.00E+00	.00E+00	.00E+00	.00E+00
ge 75m	.00E+00	.00E+00	.00E+00	.00E+00
as 75	.00E+00	.00E+00	.00E+00	.00E+00
ni 76	.00E+00	.00E+00	.00E+00	.00E+00
cu 76	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
zn 76	.00F+00	.00E+00	.00E+00	.00E+00
ga 76	.00E+00	.00E+00	.00E+00	.00E+00
ge 76	.00E+00	.00E+00	.00E+00	.00E+00
as 76	.00E+00	.00E+00	.00E+00	.00E+00
se 76	.00E+00	.00E+00	.00E+00	.00E+00
ni 77	.00E+00	.00E+00	.00E+00	.00E+00
cu 77	.00E+00	.00E+00	.00E+00	.00E+00
zn 77	.00E+00	.00E+00	.00E+00	.00E+00
ga 77	.00E+00	.00E+00	.00E+00	.00E+00
ge 77	.00E+00	.00E+00	.00E+00	.00E+00
ge 77m	.00E+00	.00E+00	.00E+00	.00E+00
as 77	.00E+00	.00E+00	.00E+00	.00E+00
se 77	.00E+00	.00E+00	.00E+00	.00E+00
se 77m	.00E+00	.00E+00	.00E+00	.00E+00
ni 78	.00E+00	.00E+00	.00E+00	.00E+00
cu 78	.00E+00	.00E+00	.00E+00	.00E+00
zn 78	.00E+00	.00E+00	.00E+00	.00E+00
ga 78	.00E+00	.00E+00	.00E+00	.00E+00
ge 78	.00E+00	.00E+00	.00E+00	.00E+00
as 78	.00E+00	.00E+00	.00E+00	.00E+00
se 78	.00E+00	.00E+00	.00E+00	.00E+00
cu 79	.00E+00	.00E+00	.00E+00	.00E+00
zn 79	.00E+00	.00E+00	.00E+00	.00E+00
ga 79	.00E+00	.00E+00	.00E+00	.00E+00
ge 79	.00E+00	.00E+00	.00E+00	.00E+00
as 79	.00E+00	.00E+00	.00E+00	.00E+00
se 79	3.09E-02	2.78E-02	1.83E-02	6.38E-03
se 79m	.00E+00	.00E+00	.00E+00	.00E+00
br 79	.00E+00	.00E+00	.00E+00	.00E+00
br 79m	.00E+00	.00E+00	.00E+00	.00E+00
kr 79	.00E+00	.00E+00	.00E+00	.00E+00
cu 80	.00E+00	.00E+00	.00E+00	.00E+00
zn 80	.00E+00	.00E+00	.00E+00	.00E+00
ga 80	.00E+00	.00E+00	.00E+00	.00E+00
ge 80	.00E+00	.00E+00	.00E+00	.00E+00

as 80	.00E+00	.00E+00	.00E+00	.00E+00
se 80	.00E+00	.00E+00	.00E+00	.00E+00
br 80	.00E+00	.00E+00	.00E+00	.00E+00
br 80m	.00E+00	.00E+00	.00E+00	.00E+00
kr 80	.00E+00	.00E+00	.00E+00	.00E+00
cu 81	.00E+00	.00E+00	.00E+00	.00E+00
zn 81	.00E+00	.00E+00	.00E+00	.00E+00
ga 81	.00E+00	.00E+00	.00E+00	.00E+00
ge 81	.00E+00	.00E+00	.00E+00	.00E+00
as 81	.00E+00	.00E+00	.00E+00	.00E+00
se 81	.00E+00	.00E+00	.00E+00	.00E+00
se 81m	.00E+00	.00E+00	.00E+00	.00E+00
br 81	.00E+00	.00E+00	.00E+00	.00E+00
kr 81	7.38E-09	6.27E-09	3.27E-09	6.43E-10
kr 81m	.00E+00	.00E+00	.00E+00	.00E+00
zn 82	.00E+00	.00E+00	.00E+00	.00E+00
ga 82	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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initial300000. yr500000. yr999999. yr				
ge 82	.00E+00	.00E+00	.00E+00	.00E+00
as 82	.00E+00	.00E+00	.00E+00	.00E+00
as 82m	.00E+00	.00E+00	.00E+00	.00E+00
se 82	.00E+00	.00E+00	.00E+00	.00E+00
br 82	.00E+00	.00E+00	.00E+00	.00E+00
br 82m	.00E+00	.00E+00	.00E+00	.00E+00
kr 82	.00E+00	.00E+00	.00E+00	.00E+00
zn 83	.00E+00	.00E+00	.00E+00	.00E+00
ga 83	.00E+00	.00E+00	.00E+00	.00E+00
ge 83	.00E+00	.00E+00	.00E+00	.00E+00
as 83	.00E+00	.00E+00	.00E+00	.00E+00
se 83	.00E+00	.00E+00	.00E+00	.00E+00
se 83m	.00E+00	.00E+00	.00E+00	.00E+00
br 83	.00E+00	.00E+00	.00E+00	.00E+00
kr 83	.00E+00	.00E+00	.00E+00	.00E+00
kr 83m	.00E+00	.00E+00	.00E+00	.00E+00
ga 84	.00E+00	.00E+00	.00E+00	.00E+00
ge 84	.00E+00	.00E+00	.00E+00	.00E+00
as 84	.00E+00	.00E+00	.00E+00	.00E+00
se 84	.00E+00	.00E+00	.00E+00	.00E+00
br 84	.00E+00	.00E+00	.00E+00	.00E+00
br 84m	.00E+00	.00E+00	.00E+00	.00E+00
kr 84	.00E+00	.00E+00	.00E+00	.00E+00
ga 85	.00E+00	.00E+00	.00E+00	.00E+00
ge 85	.00E+00	.00E+00	.00E+00	.00E+00
as 85	.00E+00	.00E+00	.00E+00	.00E+00
se 85	.00E+00	.00E+00	.00E+00	.00E+00
se 85m	.00E+00	.00E+00	.00E+00	.00E+00
br 85	.00E+00	.00E+00	.00E+00	.00E+00
kr 85	.00E+00	.00E+00	.00E+00	.00E+00
kr 85m	.00E+00	.00E+00	.00E+00	.00E+00
rb 85	.00E+00	.00E+00	.00E+00	.00E+00
ge 86	.00E+00	.00E+00	.00E+00	.00E+00
as 86	.00E+00	.00E+00	.00E+00	.00E+00
se 86	.00E+00	.00E+00	.00E+00	.00E+00
br 86	.00E+00	.00E+00	.00E+00	.00E+00
br 86m	.00E+00	.00E+00	.00E+00	.00E+00
kr 86	.00E+00	.00E+00	.00E+00	.00E+00

rb 86	.00E+00	.00E+00	.00E+00	.00E+00
rb 86m	.00E+00	.00E+00	.00E+00	.00E+00
sr 86	.00E+00	.00E+00	.00E+00	.00E+00
ge 87	.00E+00	.00E+00	.00E+00	.00E+00
as 87	.00E+00	.00E+00	.00E+00	.00E+00
se 87	.00E+00	.00E+00	.00E+00	.00E+00
br 87	.00E+00	.00E+00	.00E+00	.00E+00
kr 87	.00E+00	.00E+00	.00E+00	.00E+00
rb 87	2.18E-05	2.18E-05	2.18E-05	2.18E-05
sr 87	.00E+00	.00E+00	.00E+00	.00E+00
sr 87m	.00E+00	.00E+00	.00E+00	.00E+00
ge 88	.00E+00	.00E+00	.00E+00	.00E+00
as 88	.00E+00	.00E+00	.00E+00	.00E+00
se 88	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
br 88	.00E+00	.00E+00	.00E+00	.00E+00
kr 88	.00E+00	.00E+00	.00E+00	.00E+00
rb 88	.00E+00	.00E+00	.00E+00	.00E+00
sr 88	.00E+00	.00E+00	.00E+00	.00E+00
as 89	.00E+00	.00E+00	.00E+00	.00E+00
se 89	.00E+00	.00E+00	.00E+00	.00E+00
br 89	.00E+00	.00E+00	.00E+00	.00E+00
kr 89	.00E+00	.00E+00	.00E+00	.00E+00
rb 89	.00E+00	.00E+00	.00E+00	.00E+00
sr 89	.00E+00	.00E+00	.00E+00	.00E+00
y 89	.00E+00	.00E+00	.00E+00	.00E+00
y 89m	.00E+00	.00E+00	.00E+00	.00E+00
as 90	.00E+00	.00E+00	.00E+00	.00E+00
se 90	.00E+00	.00E+00	.00E+00	.00E+00
br 90	.00E+00	.00E+00	.00E+00	.00E+00
kr 90	.00E+00	.00E+00	.00E+00	.00E+00
rb 90	.00E+00	.00E+00	.00E+00	.00E+00
rb 90m	.00E+00	.00E+00	.00E+00	.00E+00
sr 90	.00E+00	.00E+00	.00E+00	.00E+00
y 90	.00E+00	.00E+00	.00E+00	.00E+00
y 90m	.00E+00	.00E+00	.00E+00	.00E+00
zr 90	.00E+00	.00E+00	.00E+00	.00E+00
zr 90m	.00E+00	.00E+00	.00E+00	.00E+00
se 91	.00E+00	.00E+00	.00E+00	.00E+00
br 91	.00E+00	.00E+00	.00E+00	.00E+00
kr 91	.00E+00	.00E+00	.00E+00	.00E+00
rb 91	.00E+00	.00E+00	.00E+00	.00E+00
sr 91	.00E+00	.00E+00	.00E+00	.00E+00
y 91	.00E+00	.00E+00	.00E+00	.00E+00
y 91m	.00E+00	.00E+00	.00E+00	.00E+00
zr 91	.00E+00	.00E+00	.00E+00	.00E+00
nb 91	.00E+00	.00E+00	.00E+00	.00E+00
se 92	.00E+00	.00E+00	.00E+00	.00E+00
br 92	.00E+00	.00E+00	.00E+00	.00E+00
kr 92	.00E+00	.00E+00	.00E+00	.00E+00
rb 92	.00E+00	.00E+00	.00E+00	.00E+00
sr 92	.00E+00	.00E+00	.00E+00	.00E+00
y 92	.00E+00	.00E+00	.00E+00	.00E+00
zr 92	.00E+00	.00E+00	.00E+00	.00E+00
nb 92	4.37E-11	4.37E-11	4.35E-11	4.31E-11
se 93	.00E+00	.00E+00	.00E+00	.00E+00

br 93	.00E+00	.00E+00	.00E+00	.00E+00
kr 93	.00E+00	.00E+00	.00E+00	.00E+00
rb 93	.00E+00	.00E+00	.00E+00	.00E+00
sr 93	.00E+00	.00E+00	.00E+00	.00E+00
y 93	.00E+00	.00E+00	.00E+00	.00E+00
zr 93	1.01E+00	9.85E-01	8.99E-01	7.17E-01
nb 93	.00E+00	.00E+00	.00E+00	.00E+00
nb 93m	1.01E+00	9.85E-01	8.99E-01	7.17E-01
br 94	.00E+00	.00E+00	.00E+00	.00E+00
kr 94	.00E+00	.00E+00	.00E+00	.00E+00
rb 94	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial300000.	yr500000.	yr999999.	yr
sr 94	.00E+00	.00E+00	.00E+00	.00E+00
y 94	.00E+00	.00E+00	.00E+00	.00E+00
zr 94	.00E+00	.00E+00	.00E+00	.00E+00
nb 94	2.02E-08	3.65E-09	3.95E-12	1.52E-19
nb 94m	.00E+00	.00E+00	.00E+00	.00E+00
br 95	.00E+00	.00E+00	.00E+00	.00E+00
kr 95	.00E+00	.00E+00	.00E+00	.00E+00
rb 95	.00E+00	.00E+00	.00E+00	.00E+00
sr 95	.00E+00	.00E+00	.00E+00	.00E+00
y 95	.00E+00	.00E+00	.00E+00	.00E+00
zr 95	.00E+00	.00E+00	.00E+00	.00E+00
nb 95	.00E+00	.00E+00	.00E+00	.00E+00
nb 95m	.00E+00	.00E+00	.00E+00	.00E+00
mo 95	.00E+00	.00E+00	.00E+00	.00E+00
br 96	.00E+00	.00E+00	.00E+00	.00E+00
kr 96	.00E+00	.00E+00	.00E+00	.00E+00
rb 96	.00E+00	.00E+00	.00E+00	.00E+00
sr 96	.00E+00	.00E+00	.00E+00	.00E+00
y 96	.00E+00	.00E+00	.00E+00	.00E+00
zr 96	.00E+00	.00E+00	.00E+00	.00E+00
nb 96	.00E+00	.00E+00	.00E+00	.00E+00
mo 96	.00E+00	.00E+00	.00E+00	.00E+00
kr 97	.00E+00	.00E+00	.00E+00	.00E+00
rb 97	.00E+00	.00E+00	.00E+00	.00E+00
sr 97	.00E+00	.00E+00	.00E+00	.00E+00
y 97	.00E+00	.00E+00	.00E+00	.00E+00
zr 97	.00E+00	.00E+00	.00E+00	.00E+00
nb 97	.00E+00	.00E+00	.00E+00	.00E+00
nb 97m	.00E+00	.00E+00	.00E+00	.00E+00
mo 97	.00E+00	.00E+00	.00E+00	.00E+00
kr 98	.00E+00	.00E+00	.00E+00	.00E+00
rb 98	.00E+00	.00E+00	.00E+00	.00E+00
sr 98	.00E+00	.00E+00	.00E+00	.00E+00
y 98	.00E+00	.00E+00	.00E+00	.00E+00
zr 98	.00E+00	.00E+00	.00E+00	.00E+00
nb 98	.00E+00	.00E+00	.00E+00	.00E+00
nb 98m	.00E+00	.00E+00	.00E+00	.00E+00
mo 98	.00E+00	.00E+00	.00E+00	.00E+00
tc 98	1.68E-07	1.66E-07	1.61E-07	1.48E-07
rb 99	.00E+00	.00E+00	.00E+00	.00E+00
sr 99	.00E+00	.00E+00	.00E+00	.00E+00
y 99	.00E+00	.00E+00	.00E+00	.00E+00
zr 99	.00E+00	.00E+00	.00E+00	.00E+00
nb 99	.00E+00	.00E+00	.00E+00	.00E+00

nb 99m	.00E+00	.00E+00	.00E+00	.00E+00
mo 99	.00E+00	.00E+00	.00E+00	.00E+00
tc 99	4.67E+00	3.97E+00	2.06E+00	3.98E-01
tc 99m	.00E+00	.00E+00	.00E+00	.00E+00
ru 99	.00E+00	.00E+00	.00E+00	.00E+00
rb100	.00E+00	.00E+00	.00E+00	.00E+00
sr100	.00E+00	.00E+00	.00E+00	.00E+00
y100	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
zr100	.00E+00	.00E+00	.00E+00	.00E+00
nb100	.00E+00	.00E+00	.00E+00	.00E+00
nb100m	.00E+00	.00E+00	.00E+00	.00E+00
mo100	.00E+00	.00E+00	.00E+00	.00E+00
tc100	.00E+00	.00E+00	.00E+00	.00E+00
ru100	.00E+00	.00E+00	.00E+00	.00E+00
rb101	.00E+00	.00E+00	.00E+00	.00E+00
sr101	.00E+00	.00E+00	.00E+00	.00E+00
y101	.00E+00	.00E+00	.00E+00	.00E+00
zr101	.00E+00	.00E+00	.00E+00	.00E+00
nb101	.00E+00	.00E+00	.00E+00	.00E+00
mo101	.00E+00	.00E+00	.00E+00	.00E+00
tc101	.00E+00	.00E+00	.00E+00	.00E+00
ru101	.00E+00	.00E+00	.00E+00	.00E+00
sr102	.00E+00	.00E+00	.00E+00	.00E+00
y102	.00E+00	.00E+00	.00E+00	.00E+00
zr102	.00E+00	.00E+00	.00E+00	.00E+00
nb102	.00E+00	.00E+00	.00E+00	.00E+00
mo102	.00E+00	.00E+00	.00E+00	.00E+00
tc102	.00E+00	.00E+00	.00E+00	.00E+00
tc102m	.00E+00	.00E+00	.00E+00	.00E+00
ru102	.00E+00	.00E+00	.00E+00	.00E+00
rh102	.00E+00	.00E+00	.00E+00	.00E+00
pd102	.00E+00	.00E+00	.00E+00	.00E+00
sr103	.00E+00	.00E+00	.00E+00	.00E+00
y103	.00E+00	.00E+00	.00E+00	.00E+00
zr103	.00E+00	.00E+00	.00E+00	.00E+00
nb103	.00E+00	.00E+00	.00E+00	.00E+00
mo103	.00E+00	.00E+00	.00E+00	.00E+00
tc103	.00E+00	.00E+00	.00E+00	.00E+00
ru103	.00E+00	.00E+00	.00E+00	.00E+00
rh103	.00E+00	.00E+00	.00E+00	.00E+00
rh103m	.00E+00	.00E+00	.00E+00	.00E+00
sr104	.00E+00	.00E+00	.00E+00	.00E+00
y104	.00E+00	.00E+00	.00E+00	.00E+00
zr104	.00E+00	.00E+00	.00E+00	.00E+00
nb104	.00E+00	.00E+00	.00E+00	.00E+00
mo104	.00E+00	.00E+00	.00E+00	.00E+00
tc104	.00E+00	.00E+00	.00E+00	.00E+00
ru104	.00E+00	.00E+00	.00E+00	.00E+00
rh104	.00E+00	.00E+00	.00E+00	.00E+00
rh104m	.00E+00	.00E+00	.00E+00	.00E+00
pd104	.00E+00	.00E+00	.00E+00	.00E+00
y105	.00E+00	.00E+00	.00E+00	.00E+00
zr105	.00E+00	.00E+00	.00E+00	.00E+00
nb105	.00E+00	.00E+00	.00E+00	.00E+00
mo105	.00E+00	.00E+00	.00E+00	.00E+00

tc105	.00E+00	.00E+00	.00E+00	.00E+00
ru105	.00E+00	.00E+00	.00E+00	.00E+00
rh105	.00E+00	.00E+00	.00E+00	.00E+00
rh105m	.00E+00	.00E+00	.00E+00	.00E+00
pd105	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000.	yr500000.	yr999999.	yr
y106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh106m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag106	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd107	2.27E-02	2.26E-02	2.21E-02	2.10E-02	
pd107m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag107	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh108m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag108m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd108	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag109m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd109	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ru110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh110m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd110	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

ag110 .00E+00 .00E+00 .00E+00 .00E+00
 ag110m .00E+00 .00E+00 .00E+00 .00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
cd110	.00E+00	.00E+00	.00E+00	.00E+00
nb111	.00E+00	.00E+00	.00E+00	.00E+00
mo111	.00E+00	.00E+00	.00E+00	.00E+00
tc111	.00E+00	.00E+00	.00E+00	.00E+00
ru111	.00E+00	.00E+00	.00E+00	.00E+00
rh111	.00E+00	.00E+00	.00E+00	.00E+00
pd111	.00E+00	.00E+00	.00E+00	.00E+00
pd111m	.00E+00	.00E+00	.00E+00	.00E+00
ag111	.00E+00	.00E+00	.00E+00	.00E+00
ag111m	.00E+00	.00E+00	.00E+00	.00E+00
cd111	.00E+00	.00E+00	.00E+00	.00E+00
cd111m	.00E+00	.00E+00	.00E+00	.00E+00
nb112	.00E+00	.00E+00	.00E+00	.00E+00
mo112	.00E+00	.00E+00	.00E+00	.00E+00
tc112	.00E+00	.00E+00	.00E+00	.00E+00
ru112	.00E+00	.00E+00	.00E+00	.00E+00
rh112	.00E+00	.00E+00	.00E+00	.00E+00
pd112	.00E+00	.00E+00	.00E+00	.00E+00
ag112	.00E+00	.00E+00	.00E+00	.00E+00
cd112	.00E+00	.00E+00	.00E+00	.00E+00
mo113	.00E+00	.00E+00	.00E+00	.00E+00
tc113	.00E+00	.00E+00	.00E+00	.00E+00
ru113	.00E+00	.00E+00	.00E+00	.00E+00
rh113	.00E+00	.00E+00	.00E+00	.00E+00
pd113	.00E+00	.00E+00	.00E+00	.00E+00
ag113	.00E+00	.00E+00	.00E+00	.00E+00
ag113m	.00E+00	.00E+00	.00E+00	.00E+00
cd113	6.67E-14	6.67E-14	6.67E-14	6.67E-14
cd113m	.00E+00	.00E+00	.00E+00	.00E+00
in113	.00E+00	.00E+00	.00E+00	.00E+00
in113m	.00E+00	.00E+00	.00E+00	.00E+00
mo114	.00E+00	.00E+00	.00E+00	.00E+00
tc114	.00E+00	.00E+00	.00E+00	.00E+00
ru114	.00E+00	.00E+00	.00E+00	.00E+00
rh114	.00E+00	.00E+00	.00E+00	.00E+00
pd114	.00E+00	.00E+00	.00E+00	.00E+00
ag114	.00E+00	.00E+00	.00E+00	.00E+00
cd114	.00E+00	.00E+00	.00E+00	.00E+00
in114	.00E+00	.00E+00	.00E+00	.00E+00
in114m	.00E+00	.00E+00	.00E+00	.00E+00
sn114	.00E+00	.00E+00	.00E+00	.00E+00
mo115	.00E+00	.00E+00	.00E+00	.00E+00
tc115	.00E+00	.00E+00	.00E+00	.00E+00
ru115	.00E+00	.00E+00	.00E+00	.00E+00
rh115	.00E+00	.00E+00	.00E+00	.00E+00
pd115	.00E+00	.00E+00	.00E+00	.00E+00
ag115	.00E+00	.00E+00	.00E+00	.00E+00
ag115m	.00E+00	.00E+00	.00E+00	.00E+00
cd115	.00E+00	.00E+00	.00E+00	.00E+00
cd115m	.00E+00	.00E+00	.00E+00	.00E+00
in115	1.18E-11	1.18E-11	1.18E-11	1.18E-11
in115m	.00E+00	.00E+00	.00E+00	.00E+00

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0 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 232
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

	initial	300000. yr	500000. yr	999999. yr
sn115	.00E+00	.00E+00	.00E+00	.00E+00
tc116	.00E+00	.00E+00	.00E+00	.00E+00
ru116	.00E+00	.00E+00	.00E+00	.00E+00
rh116	.00E+00	.00E+00	.00E+00	.00E+00
pd116	.00E+00	.00E+00	.00E+00	.00E+00
ag116	.00E+00	.00E+00	.00E+00	.00E+00
ag116m	.00E+00	.00E+00	.00E+00	.00E+00
cd116	.00E+00	.00E+00	.00E+00	.00E+00
in116	.00E+00	.00E+00	.00E+00	.00E+00
in116m	.00E+00	.00E+00	.00E+00	.00E+00
sn116	.00E+00	.00E+00	.00E+00	.00E+00
tc117	.00E+00	.00E+00	.00E+00	.00E+00
ru117	.00E+00	.00E+00	.00E+00	.00E+00
rh117	.00E+00	.00E+00	.00E+00	.00E+00
pd117	.00E+00	.00E+00	.00E+00	.00E+00
ag117	.00E+00	.00E+00	.00E+00	.00E+00
ag117m	.00E+00	.00E+00	.00E+00	.00E+00
cd117	.00E+00	.00E+00	.00E+00	.00E+00
cd117m	.00E+00	.00E+00	.00E+00	.00E+00
in117	.00E+00	.00E+00	.00E+00	.00E+00
in117m	.00E+00	.00E+00	.00E+00	.00E+00
sn117	.00E+00	.00E+00	.00E+00	.00E+00
sn117m	.00E+00	.00E+00	.00E+00	.00E+00
tc118	.00E+00	.00E+00	.00E+00	.00E+00
ru118	.00E+00	.00E+00	.00E+00	.00E+00
rh118	.00E+00	.00E+00	.00E+00	.00E+00
pd118	.00E+00	.00E+00	.00E+00	.00E+00
ag118	.00E+00	.00E+00	.00E+00	.00E+00
ag118m	.00E+00	.00E+00	.00E+00	.00E+00
cd118	.00E+00	.00E+00	.00E+00	.00E+00
in118	.00E+00	.00E+00	.00E+00	.00E+00
in118m	.00E+00	.00E+00	.00E+00	.00E+00
sn118	.00E+00	.00E+00	.00E+00	.00E+00
ru119	.00E+00	.00E+00	.00E+00	.00E+00
rh119	.00E+00	.00E+00	.00E+00	.00E+00
pd119	.00E+00	.00E+00	.00E+00	.00E+00
ag119	.00E+00	.00E+00	.00E+00	.00E+00
cd119	.00E+00	.00E+00	.00E+00	.00E+00
cd119m	.00E+00	.00E+00	.00E+00	.00E+00
in119	.00E+00	.00E+00	.00E+00	.00E+00
in119m	.00E+00	.00E+00	.00E+00	.00E+00
sn119	.00E+00	.00E+00	.00E+00	.00E+00
sn119m	.00E+00	.00E+00	.00E+00	.00E+00
ru120	.00E+00	.00E+00	.00E+00	.00E+00
rh120	.00E+00	.00E+00	.00E+00	.00E+00
pd120	.00E+00	.00E+00	.00E+00	.00E+00
ag120	.00E+00	.00E+00	.00E+00	.00E+00
cd120	.00E+00	.00E+00	.00E+00	.00E+00
in120	.00E+00	.00E+00	.00E+00	.00E+00
in120m	.00E+00	.00E+00	.00E+00	.00E+00
sn120	.00E+00	.00E+00	.00E+00	.00E+00
rh121	.00E+00	.00E+00	.00E+00	.00E+00

1 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 233
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

	initial300000.	yr500000.	yr999999.	yr
pd121	.00E+00	.00E+00	.00E+00	.00E+00
ag121	.00E+00	.00E+00	.00E+00	.00E+00
cd121	.00E+00	.00E+00	.00E+00	.00E+00
in121	.00E+00	.00E+00	.00E+00	.00E+00
in121m	.00E+00	.00E+00	.00E+00	.00E+00
sn121	.00E+00	.00E+00	.00E+00	.00E+00
sn121m	.00E+00	.00E+00	.00E+00	.00E+00
sb121	.00E+00	.00E+00	.00E+00	.00E+00
rh122	.00E+00	.00E+00	.00E+00	.00E+00
pd122	.00E+00	.00E+00	.00E+00	.00E+00
ag122	.00E+00	.00E+00	.00E+00	.00E+00
cd122	.00E+00	.00E+00	.00E+00	.00E+00
in122	.00E+00	.00E+00	.00E+00	.00E+00
in122m	.00E+00	.00E+00	.00E+00	.00E+00
sn122	.00E+00	.00E+00	.00E+00	.00E+00
sb122	.00E+00	.00E+00	.00E+00	.00E+00
sb122m	.00E+00	.00E+00	.00E+00	.00E+00
te122	.00E+00	.00E+00	.00E+00	.00E+00
rh123	.00E+00	.00E+00	.00E+00	.00E+00
pd123	.00E+00	.00E+00	.00E+00	.00E+00
ag123	.00E+00	.00E+00	.00E+00	.00E+00
cd123	.00E+00	.00E+00	.00E+00	.00E+00
in123	.00E+00	.00E+00	.00E+00	.00E+00
in123m	.00E+00	.00E+00	.00E+00	.00E+00
sn123	.00E+00	.00E+00	.00E+00	.00E+00
sn123m	.00E+00	.00E+00	.00E+00	.00E+00
sb123	.00E+00	.00E+00	.00E+00	.00E+00
te123	3.96E-16	3.96E-16	3.96E-16	3.96E-16
te123m	.00E+00	.00E+00	.00E+00	.00E+00
pd124	.00E+00	.00E+00	.00E+00	.00E+00
ag124	.00E+00	.00E+00	.00E+00	.00E+00
cd124	.00E+00	.00E+00	.00E+00	.00E+00
in124	.00E+00	.00E+00	.00E+00	.00E+00
sn124	.00E+00	.00E+00	.00E+00	.00E+00
sb124	.00E+00	.00E+00	.00E+00	.00E+00
sb124m	.00E+00	.00E+00	.00E+00	.00E+00
te124	.00E+00	.00E+00	.00E+00	.00E+00
pd125	.00E+00	.00E+00	.00E+00	.00E+00
ag125	.00E+00	.00E+00	.00E+00	.00E+00
cd125	.00E+00	.00E+00	.00E+00	.00E+00
in125	.00E+00	.00E+00	.00E+00	.00E+00
in125m	.00E+00	.00E+00	.00E+00	.00E+00
sn125	.00E+00	.00E+00	.00E+00	.00E+00
sn125m	.00E+00	.00E+00	.00E+00	.00E+00
sb125	.00E+00	.00E+00	.00E+00	.00E+00
te125	.00E+00	.00E+00	.00E+00	.00E+00
te125m	.00E+00	.00E+00	.00E+00	.00E+00
pd126	.00E+00	.00E+00	.00E+00	.00E+00
ag126	.00E+00	.00E+00	.00E+00	.00E+00
cd126	.00E+00	.00E+00	.00E+00	.00E+00
in126	.00E+00	.00E+00	.00E+00	.00E+00
sn126	3.05E-02	2.16E-02	5.39E-03	1.69E-04

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

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	initial300000.	yr500000.	yr999999.	yr
sb126	4.27E-03	3.02E-03	7.55E-04	2.36E-05
sb126m	3.05E-02	2.16E-02	5.39E-03	1.69E-04

te126	.00E+00	.00E+00	.00E+00	.00E+00
xe126	.00E+00	.00E+00	.00E+00	.00E+00
ag127	.00E+00	.00E+00	.00E+00	.00E+00
cd127	.00E+00	.00E+00	.00E+00	.00E+00
in127	.00E+00	.00E+00	.00E+00	.00E+00
in127m	.00E+00	.00E+00	.00E+00	.00E+00
sn127	.00E+00	.00E+00	.00E+00	.00E+00
sn127m	.00E+00	.00E+00	.00E+00	.00E+00
sb127	.00E+00	.00E+00	.00E+00	.00E+00
te127	.00E+00	.00E+00	.00E+00	.00E+00
te127m	.00E+00	.00E+00	.00E+00	.00E+00
i127	.00E+00	.00E+00	.00E+00	.00E+00
xe127	.00E+00	.00E+00	.00E+00	.00E+00
ag128	.00E+00	.00E+00	.00E+00	.00E+00
cd128	.00E+00	.00E+00	.00E+00	.00E+00
in128	.00E+00	.00E+00	.00E+00	.00E+00
sn128	.00E+00	.00E+00	.00E+00	.00E+00
sb128	.00E+00	.00E+00	.00E+00	.00E+00
sb128m	.00E+00	.00E+00	.00E+00	.00E+00
te128	.00E+00	.00E+00	.00E+00	.00E+00
i128	.00E+00	.00E+00	.00E+00	.00E+00
xe128	.00E+00	.00E+00	.00E+00	.00E+00
cd129	.00E+00	.00E+00	.00E+00	.00E+00
in129	.00E+00	.00E+00	.00E+00	.00E+00
sn129	.00E+00	.00E+00	.00E+00	.00E+00
sn129m	.00E+00	.00E+00	.00E+00	.00E+00
sb129	.00E+00	.00E+00	.00E+00	.00E+00
te129	.00E+00	.00E+00	.00E+00	.00E+00
te129m	.00E+00	.00E+00	.00E+00	.00E+00
i129	2.15E-02	2.15E-02	2.13E-02	2.08E-02
xe129	.00E+00	.00E+00	.00E+00	.00E+00
xe129m	.00E+00	.00E+00	.00E+00	.00E+00
cd130	.00E+00	.00E+00	.00E+00	.00E+00
in130	.00E+00	.00E+00	.00E+00	.00E+00
sn130	.00E+00	.00E+00	.00E+00	.00E+00
sb130	.00E+00	.00E+00	.00E+00	.00E+00
sb130m	.00E+00	.00E+00	.00E+00	.00E+00
te130	.00E+00	.00E+00	.00E+00	.00E+00
i130	.00E+00	.00E+00	.00E+00	.00E+00
i130m	.00E+00	.00E+00	.00E+00	.00E+00
xe130	.00E+00	.00E+00	.00E+00	.00E+00
cd131	.00E+00	.00E+00	.00E+00	.00E+00
in131	.00E+00	.00E+00	.00E+00	.00E+00
sn131	.00E+00	.00E+00	.00E+00	.00E+00
sb131	.00E+00	.00E+00	.00E+00	.00E+00
te131	.00E+00	.00E+00	.00E+00	.00E+00
te131m	.00E+00	.00E+00	.00E+00	.00E+00
i131	.00E+00	.00E+00	.00E+00	.00E+00
xe131	.00E+00	.00E+00	.00E+00	.00E+00
xe131m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
cd132	.00E+00	.00E+00	.00E+00	.00E+00
in132	.00E+00	.00E+00	.00E+00	.00E+00
sn132	.00E+00	.00E+00	.00E+00	.00E+00
sb132	.00E+00	.00E+00	.00E+00	.00E+00
sb132m	.00E+00	.00E+00	.00E+00	.00E+00

te132	.00E+00	.00E+00	.00E+00	.00E+00
i132	.00E+00	.00E+00	.00E+00	.00E+00
xe132	.00E+00	.00E+00	.00E+00	.00E+00
cs132	.00E+00	.00E+00	.00E+00	.00E+00
ba132	.00E+00	.00E+00	.00E+00	.00E+00
in133	.00E+00	.00E+00	.00E+00	.00E+00
sn133	.00E+00	.00E+00	.00E+00	.00E+00
sb133	.00E+00	.00E+00	.00E+00	.00E+00
te133	.00E+00	.00E+00	.00E+00	.00E+00
te133m	.00E+00	.00E+00	.00E+00	.00E+00
i133	.00E+00	.00E+00	.00E+00	.00E+00
i133m	.00E+00	.00E+00	.00E+00	.00E+00
xe133	.00E+00	.00E+00	.00E+00	.00E+00
xe133m	.00E+00	.00E+00	.00E+00	.00E+00
cs133	.00E+00	.00E+00	.00E+00	.00E+00
ba133	.00E+00	.00E+00	.00E+00	.00E+00
in134	.00E+00	.00E+00	.00E+00	.00E+00
sn134	.00E+00	.00E+00	.00E+00	.00E+00
sb134	.00E+00	.00E+00	.00E+00	.00E+00
sb134m	.00E+00	.00E+00	.00E+00	.00E+00
te134	.00E+00	.00E+00	.00E+00	.00E+00
i134	.00E+00	.00E+00	.00E+00	.00E+00
i134m	.00E+00	.00E+00	.00E+00	.00E+00
xe134	.00E+00	.00E+00	.00E+00	.00E+00
xe134m	.00E+00	.00E+00	.00E+00	.00E+00
cs134	.00E+00	.00E+00	.00E+00	.00E+00
cs134m	.00E+00	.00E+00	.00E+00	.00E+00
ba134	.00E+00	.00E+00	.00E+00	.00E+00
sn135	.00E+00	.00E+00	.00E+00	.00E+00
sb135	.00E+00	.00E+00	.00E+00	.00E+00
te135	.00E+00	.00E+00	.00E+00	.00E+00
i135	.00E+00	.00E+00	.00E+00	.00E+00
xe135	.00E+00	.00E+00	.00E+00	.00E+00
xe135m	.00E+00	.00E+00	.00E+00	.00E+00
cs135	1.13E+00	1.11E+00	1.04E+00	8.97E-01
cs135m	.00E+00	.00E+00	.00E+00	.00E+00
ba135	.00E+00	.00E+00	.00E+00	.00E+00
ba135m	.00E+00	.00E+00	.00E+00	.00E+00
sn136	.00E+00	.00E+00	.00E+00	.00E+00
sb136	.00E+00	.00E+00	.00E+00	.00E+00
te136	.00E+00	.00E+00	.00E+00	.00E+00
i136	.00E+00	.00E+00	.00E+00	.00E+00
i136m	.00E+00	.00E+00	.00E+00	.00E+00
xe136	.00E+00	.00E+00	.00E+00	.00E+00
cs136	.00E+00	.00E+00	.00E+00	.00E+00
ba136	.00E+00	.00E+00	.00E+00	.00E+00
ba136m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sb137	.00E+00	.00E+00	.00E+00	.00E+00
te137	.00E+00	.00E+00	.00E+00	.00E+00
i137	.00E+00	.00E+00	.00E+00	.00E+00
xe137	.00E+00	.00E+00	.00E+00	.00E+00
cs137	.00E+00	.00E+00	.00E+00	.00E+00
ba137	.00E+00	.00E+00	.00E+00	.00E+00
ba137m	.00E+00	.00E+00	.00E+00	.00E+00
sb138	.00E+00	.00E+00	.00E+00	.00E+00

te138	.00E+00	.00E+00	.00E+00	.00E+00
i138	.00E+00	.00E+00	.00E+00	.00E+00
xe138	.00E+00	.00E+00	.00E+00	.00E+00
cs138	.00E+00	.00E+00	.00E+00	.00E+00
cs138m	.00E+00	.00E+00	.00E+00	.00E+00
ba138	.00E+00	.00E+00	.00E+00	.00E+00
la138	1.44E-10	1.44E-10	1.44E-10	1.44E-10
sb139	.00E+00	.00E+00	.00E+00	.00E+00
te139	.00E+00	.00E+00	.00E+00	.00E+00
i139	.00E+00	.00E+00	.00E+00	.00E+00
xe139	.00E+00	.00E+00	.00E+00	.00E+00
cs139	.00E+00	.00E+00	.00E+00	.00E+00
ba139	.00E+00	.00E+00	.00E+00	.00E+00
la139	.00E+00	.00E+00	.00E+00	.00E+00
ce139	.00E+00	.00E+00	.00E+00	.00E+00
pr139	.00E+00	.00E+00	.00E+00	.00E+00
te140	.00E+00	.00E+00	.00E+00	.00E+00
i140	.00E+00	.00E+00	.00E+00	.00E+00
xe140	.00E+00	.00E+00	.00E+00	.00E+00
cs140	.00E+00	.00E+00	.00E+00	.00E+00
ba140	.00E+00	.00E+00	.00E+00	.00E+00
la140	.00E+00	.00E+00	.00E+00	.00E+00
ce140	.00E+00	.00E+00	.00E+00	.00E+00
pr140	.00E+00	.00E+00	.00E+00	.00E+00
te141	.00E+00	.00E+00	.00E+00	.00E+00
i141	.00E+00	.00E+00	.00E+00	.00E+00
xe141	.00E+00	.00E+00	.00E+00	.00E+00
cs141	.00E+00	.00E+00	.00E+00	.00E+00
ba141	.00E+00	.00E+00	.00E+00	.00E+00
la141	.00E+00	.00E+00	.00E+00	.00E+00
ce141	.00E+00	.00E+00	.00E+00	.00E+00
pr141	.00E+00	.00E+00	.00E+00	.00E+00
nd141	.00E+00	.00E+00	.00E+00	.00E+00
te142	.00E+00	.00E+00	.00E+00	.00E+00
i142	.00E+00	.00E+00	.00E+00	.00E+00
xe142	.00E+00	.00E+00	.00E+00	.00E+00
cs142	.00E+00	.00E+00	.00E+00	.00E+00
ba142	.00E+00	.00E+00	.00E+00	.00E+00
la142	.00E+00	.00E+00	.00E+00	.00E+00
ce142	2.37E-05	2.37E-05	2.37E-05	2.37E-05
pr142	.00E+00	.00E+00	.00E+00	.00E+00
pr142m	.00E+00	.00E+00	.00E+00	.00E+00
nd142	.00E+00	.00E+00	.00E+00	.00E+00
i143	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial300000.	yr500000.	yr999999.	yr
xe143	.00E+00	.00E+00	.00E+00	.00E+00
cs143	.00E+00	.00E+00	.00E+00	.00E+00
ba143	.00E+00	.00E+00	.00E+00	.00E+00
la143	.00E+00	.00E+00	.00E+00	.00E+00
ce143	.00E+00	.00E+00	.00E+00	.00E+00
pr143	.00E+00	.00E+00	.00E+00	.00E+00
nd143	.00E+00	.00E+00	.00E+00	.00E+00
i144	.00E+00	.00E+00	.00E+00	.00E+00
xe144	.00E+00	.00E+00	.00E+00	.00E+00
cs144	.00E+00	.00E+00	.00E+00	.00E+00
ba144	.00E+00	.00E+00	.00E+00	.00E+00

la144	.00E+00	.00E+00	.00E+00	.00E+00
ce144	.00E+00	.00E+00	.00E+00	.00E+00
pr144	.00E+00	.00E+00	.00E+00	.00E+00
pr144m	.00E+00	.00E+00	.00E+00	.00E+00
nd144	1.15E-09	1.15E-09	1.15E-09	1.15E-09
i145	.00E+00	.00E+00	.00E+00	.00E+00
xe145	.00E+00	.00E+00	.00E+00	.00E+00
cs145	.00E+00	.00E+00	.00E+00	.00E+00
ba145	.00E+00	.00E+00	.00E+00	.00E+00
la145	.00E+00	.00E+00	.00E+00	.00E+00
ce145	.00E+00	.00E+00	.00E+00	.00E+00
pr145	.00E+00	.00E+00	.00E+00	.00E+00
nd145	.00E+00	.00E+00	.00E+00	.00E+00
pm145	.00E+00	.00E+00	.00E+00	.00E+00
sm145	.00E+00	.00E+00	.00E+00	.00E+00
xe146	.00E+00	.00E+00	.00E+00	.00E+00
cs146	.00E+00	.00E+00	.00E+00	.00E+00
ba146	.00E+00	.00E+00	.00E+00	.00E+00
la146	.00E+00	.00E+00	.00E+00	.00E+00
ce146	.00E+00	.00E+00	.00E+00	.00E+00
pr146	.00E+00	.00E+00	.00E+00	.00E+00
nd146	.00E+00	.00E+00	.00E+00	.00E+00
pm146	.00E+00	.00E+00	.00E+00	.00E+00
sm146	1.99E-08	1.99E-08	1.98E-08	1.98E-08
xe147	.00E+00	.00E+00	.00E+00	.00E+00
cs147	.00F+00	.00F+00	.00E+00	.00E+00
ba147	.00E+00	.00E+00	.00E+00	.00E+00
la147	.00E+00	.00E+00	.00E+00	.00E+00
ce147	.00E+00	.00E+00	.00E+00	.00E+00
pr147	.00E+00	.00E+00	.00E+00	.00E+00
nd147	.00E+00	.00E+00	.00E+00	.00E+00
pm147	.00E+00	.00E+00	.00E+00	.00E+00
sm147	8.92E-06	8.92E-06	8.92E-06	8.92E-06
cs148	.00E+00	.00E+00	.00E+00	.00E+00
ba148	.00E+00	.00E+00	.00E+00	.00E+00
la148	.00E+00	.00E+00	.00E+00	.00E+00
ce148	.00E+00	.00E+00	.00E+00	.00E+00
pr148	.00E+00	.00E+00	.00E+00	.00E+00
nd148	.00E+00	.00E+00	.00E+00	.00E+00
pm148	.00E+00	.00E+00	.00E+00	.00E+00
pm148m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sm148	2.64E-12	2.64E-12	2.64E-12	2.64E-12
cs149	.00E+00	.00E+00	.00E+00	.00E+00
ba149	.00E+00	.00E+00	.00E+00	.00E+00
la149	.00E+00	.00E+00	.00E+00	.00E+00
ce149	.00E+00	.00E+00	.00E+00	.00E+00
pr149	.00E+00	.00E+00	.00E+00	.00E+00
nd149	.00E+00	.00E+00	.00E+00	.00E+00
pm149	.00E+00	.00E+00	.00E+00	.00E+00
sm149	2.11E-12	2.11E-12	2.11E-12	2.11E-12
eu149	.00E+00	.00E+00	.00E+00	.00E+00
cs150	.00E+00	.00E+00	.00E+00	.00E+00
ba150	.00E+00	.00E+00	.00E+00	.00E+00
la150	.00E+00	.00E+00	.00E+00	.00E+00
ce150	.00E+00	.00E+00	.00E+00	.00E+00

pr150	.00E+00	.00E+00	.00E+00	.00E+00
nd150	.00E+00	.00E+00	.00E+00	.00E+00
pm150	.00E+00	.00E+00	.00E+00	.00E+00
sm150	.00E+00	.00E+00	.00E+00	.00E+00
eu150	.00E+00	.00E+00	.00E+00	.00E+00
ba151	.00E+00	.00E+00	.00E+00	.00E+00
la151	.00E+00	.00E+00	.00E+00	.00E+00
ce151	.00E+00	.00E+00	.00E+00	.00E+00
pr151	.00E+00	.00E+00	.00E+00	.00E+00
nd151	.00E+00	.00E+00	.00E+00	.00E+00
pm151	.00E+00	.00E+00	.00E+00	.00E+00
sm151	.00E+00	.00E+00	.00E+00	.00E+00
eu151	.00E+00	.00E+00	.00E+00	.00E+00
ba152	.00E+00	.00E+00	.00E+00	.00E+00
la152	.00E+00	.00E+00	.00E+00	.00E+00
ce152	.00E+00	.00E+00	.00E+00	.00E+00
pr152	.00E+00	.00E+00	.00E+00	.00E+00
nd152	.00E+00	.00E+00	.00E+00	.00E+00
pm152	.00E+00	.00E+00	.00E+00	.00E+00
pm152m	.00E+00	.00E+00	.00E+00	.00E+00
sm152	.00E+00	.00E+00	.00E+00	.00E+00
eu152	.00E+00	.00E+00	.00E+00	.00E+00
eu152m	.00E+00	.00E+00	.00E+00	.00E+00
gd152	4.39E-10	4.39E-10	4.39E-10	4.39E-10
la153	.00E+00	.00E+00	.00E+00	.00E+00
ce153	.00E+00	.00E+00	.00E+00	.00E+00
pr153	.00E+00	.00E+00	.00E+00	.00E+00
nd153	.00E+00	.00E+00	.00E+00	.00E+00
pm153	.00E+00	.00E+00	.00E+00	.00E+00
sm153	.00E+00	.00E+00	.00E+00	.00E+00
eu153	.00E+00	.00E+00	.00E+00	.00E+00
gd153	.00E+00	.00E+00	.00E+00	.00E+00
la154	.00E+00	.00E+00	.00E+00	.00E+00
ce154	.00E+00	.00E+00	.00E+00	.00E+00
pr154	.00E+00	.00E+00	.00E+00	.00E+00
nd154	.00E+00	.00E+00	.00E+00	.00E+00
pm154	.00E+00	.00E+00	.00E+00	.00E+00
pm154m	.00E+00	.00E+00	.00E+00	.00E+00

1
0

Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sm154	.00E+00	.00E+00	.00E+00	.00E+00
eu154	.00E+00	.00E+00	.00E+00	.00E+00
gd154	.00E+00	.00E+00	.00E+00	.00E+00
la155	.00E+00	.00E+00	.00E+00	.00E+00
ce155	.00E+00	.00E+00	.00E+00	.00E+00
pr155	.00E+00	.00E+00	.00E+00	.00E+00
nd155	.00E+00	.00E+00	.00E+00	.00E+00
pm155	.00E+00	.00E+00	.00E+00	.00E+00
sm155	.00E+00	.00E+00	.00E+00	.00E+00
eu155	.00E+00	.00E+00	.00E+00	.00E+00
gd155m	.00E+00	.00E+00	.00E+00	.00E+00
gd155	.00E+00	.00E+00	.00E+00	.00E+00
ce156	.00E+00	.00E+00	.00E+00	.00E+00
pr156	.00E+00	.00E+00	.00E+00	.00E+00
nd156	.00E+00	.00E+00	.00E+00	.00E+00
pm156	.00E+00	.00E+00	.00E+00	.00E+00
sm156	.00E+00	.00E+00	.00E+00	.00E+00

eu156	.00E+00	.00E+00	.00E+00	.00E+00
gd156	.00E+00	.00E+00	.00E+00	.00E+00
ce157	.00E+00	.00E+00	.00E+00	.00E+00
pr157	.00E+00	.00E+00	.00E+00	.00E+00
nd157	.00E+00	.00E+00	.00E+00	.00E+00
pm157	.00E+00	.00E+00	.00E+00	.00E+00
sm157	.00E+00	.00E+00	.00E+00	.00E+00
eu157	.00E+00	.00E+00	.00E+00	.00E+00
gd157	.00E+00	.00E+00	.00E+00	.00E+00
pr158	.00E+00	.00E+00	.00E+00	.00E+00
nd158	.00E+00	.00E+00	.00E+00	.00E+00
pm158	.00E+00	.00E+00	.00E+00	.00E+00
sm158	.00E+00	.00E+00	.00E+00	.00E+00
eu158	.00E+00	.00E+00	.00E+00	.00E+00
gd158	.00E+00	.00E+00	.00E+00	.00E+00
pr159	.00E+00	.00E+00	.00E+00	.00E+00
nd159	.00E+00	.00E+00	.00E+00	.00E+00
pm159	.00E+00	.00E+00	.00E+00	.00E+00
sm159	.00E+00	.00E+00	.00E+00	.00E+00
eu159	.00E+00	.00E+00	.00E+00	.00E+00
gd159	.00E+00	.00E+00	.00E+00	.00E+00
tb159	.00E+00	.00E+00	.00E+00	.00E+00
nd160	.00E+00	.00E+00	.00E+00	.00E+00
pm160	.00E+00	.00E+00	.00E+00	.00E+00
sm160	.00E+00	.00E+00	.00E+00	.00E+00
eu160	.00E+00	.00E+00	.00E+00	.00E+00
gd160	.00E+00	.00E+00	.00E+00	.00E+00
tb160	.00E+00	.00E+00	.00E+00	.00E+00
dy160	.00E+00	.00E+00	.00E+00	.00E+00
nd161	.00E+00	.00E+00	.00E+00	.00E+00
pm161	.00E+00	.00E+00	.00E+00	.00E+00
sm161	.00E+00	.00E+00	.00E+00	.00E+00
eu161	.00E+00	.00E+00	.00E+00	.00E+00
gd161	.00E+00	.00E+00	.00E+00	.00E+00
tb161	.00E+00	.00E+00	.00E+00	.00E+00

1
0

Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

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	initial	300000. yr	500000. yr	999999. yr
dy161	.00E+00	.00E+00	.00E+00	.00E+00
pm162	.00E+00	.00E+00	.00E+00	.00E+00
sm162	.00E+00	.00E+00	.00E+00	.00E+00
eu162	.00E+00	.00E+00	.00E+00	.00E+00
gd162	.00E+00	.00E+00	.00E+00	.00E+00
tb162	.00E+00	.00E+00	.00E+00	.00E+00
tb162m	.00E+00	.00E+00	.00E+00	.00E+00
dy162	.00E+00	.00E+00	.00E+00	.00E+00
sm163	.00E+00	.00E+00	.00E+00	.00E+00
eu163	.00E+00	.00E+00	.00E+00	.00E+00
gd163	.00E+00	.00E+00	.00E+00	.00E+00
tb163	.00E+00	.00E+00	.00E+00	.00E+00
tb163m	.00E+00	.00E+00	.00E+00	.00E+00
dy163	.00E+00	.00E+00	.00E+00	.00E+00
sm164	.00E+00	.00E+00	.00E+00	.00E+00
eu164	.00E+00	.00E+00	.00E+00	.00E+00
gd164	.00E+00	.00E+00	.00E+00	.00E+00
tb164	.00E+00	.00E+00	.00E+00	.00E+00
dy164	.00E+00	.00E+00	.00E+00	.00E+00
sm165	.00E+00	.00E+00	.00E+00	.00E+00

eu165	.00E+00	.00E+00	.00E+00	.00E+00
gd165	.00E+00	.00E+00	.00E+00	.00E+00
tb165	.00E+00	.00E+00	.00E+00	.00E+00
dy165	.00E+00	.00E+00	.00E+00	.00E+00
dy165m	.00E+00	.00E+00	.00E+00	.00E+00
ho165	.00E+00	.00E+00	.00E+00	.00E+00
dy166	.00E+00	.00E+00	.00E+00	.00E+00
ho166	.00E+00	.00E+00	.00E+00	.00E+00
ho166m	.00E+00	.00E+00	.00E+00	.00E+00
er166	.00E+00	.00E+00	.00E+00	.00E+00
er167	.00E+00	.00E+00	.00E+00	.00E+00
er167m	.00E+00	.00E+00	.00E+00	.00E+00
er168	.00E+00	.00E+00	.00E+00	.00E+00
yb168	.00E+00	.00E+00	.00E+00	.00E+00
er169	.00E+00	.00E+00	.00E+00	.00E+00
tm169	.00E+00	.00E+00	.00E+00	.00E+00
yb169	.00E+00	.00E+00	.00E+00	.00E+00
er170	.00E+00	.00E+00	.00E+00	.00E+00
tm170	.00E+00	.00E+00	.00E+00	.00E+00
tm170m	.00E+00	.00E+00	.00E+00	.00E+00
yb170	.00E+00	.00E+00	.00E+00	.00E+00
er171	.00E+00	.00E+00	.00E+00	.00E+00
tm171	.00E+00	.00E+00	.00E+00	.00E+00
yb171	.00E+00	.00E+00	.00E+00	.00E+00
er172	.00E+00	.00E+00	.00E+00	.00E+00
tm172	.00E+00	.00E+00	.00E+00	.00E+00
yb172	.00E+00	.00E+00	.00E+00	.00E+00
total	7.95E+00	7.16E+00	4.97E+00	2.78E+00

1 * normal termination of execution *
0
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table of contents for material tables
case or subcase printed page

1	1
2	41
3	81
4	121
5	161
6	201

Ondset 21 33 4 1 27 6 0 0 0 0 0
0 0 0 0 0 0 0 -1 1698 690 130
880 7935 0 0 5 99 3 13 96 18 18
0 18 0 71

0 35\$ array 1 entries read
0 0t
54\$\$\$ a8 1 e
56\$\$\$ 0 7 a5 1 a13 -1 a15 3 0 4 e 5t
0 56\$ array 20 entries read
0 5t
l90 97344
l116 60787
l32 33663 nudata (library) storage size
l44 33734
l103 75921
61** f1-20
65\$\$\$ a4 1 2z 1 2z 1 5z 1 2z 1
a25 1 2z 1 2z 1 5z 1 2z 1
a46 1 2z 1 2z 1 5z 1 2z 1 e
0 60* array 7 entries read
0 65\$ array 63 entries read

```

0 6t
  l140 66851
  used 100723 in size 150000
0jopt
  0 12
  0 0 0 0 0 0 0 0 0 0
0therm
  5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non
  7935 5 20 6 18 1697
0mmn
  0 19 7 0 0 1 1 0 0 0 0
  21 100 -1 4 3 0 4 0 0
0tconst
  8.640000E+04 .000000E+00 .000000E+00 .000000E+00 5.000000E-02
0mzero
  0 4 689 129 879
0pow
  .000000E+00 .000000E+00 .000000E+00
0 linp
  6 9 0 51 26 2 3000 1000 1697 5
0 case or subcase 1 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ 0 -6 a10 1 e t
0 56$ array 20 entries read
0 57* array 5 entries read
0 5t
  l90 102444
  l116 66199
  l32 33663 nudata (library) storage size
  l44 33734
  l103 81099
61** f1-20
65$$ a4 1 2z 1 2z 1 5z 1 2z 1
  a25 1 2z 1 2z 1 5z 1 2z 1
  a46 1 2z 1 2z 1 5z 1 2z 1 e
0 60* array 10 entries read
0 65$ array 63 entries read
0 6t
  l140 71957
  used 107068 in size 150000
0jopt
  0 12
  0 0 0 0 0 0 0 0 0 0
0therm
  5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non
  7935 5 20 6 18 1697
0mmn
  0 19 10 0 0 1 1 0 0 0 7
  21 100 0 5 0 0 4 0 0
0tconst
  3.156000E+07 1.000000E+01 2.300000E+01 .000000E+00 5.000000E-02
0mzero
  18 4 689 129 879
0pow
  .000000E+00 .000000E+00 .000000E+00
0 linp
  6 9 0 51 26 2 3000 1000 1697 5
0 case or subcase 2 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ array 20 entries read

```

```

0 57* array      5 entries read
0 5t
  l90 102444
  l116 66199
  l32 33663 nudata (library) storage size
  l44 33734
  l103 81099
  61** f1-20
0 60* array      10 entries read
0 65$ array      63 entries read
0 6t
  l140 71957
  used 107068 in size 150000
0jopt
  0 12
  0 0 0 0 0 0 0 0 0 0 0
0therm
  5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non
  7935 5 20 6 18 1697
0mmn
  0 19 10 0 0 1 1 0 0 0 10
  21 100 0 5 0 0 4 0 0
0tconst
  3.156000E+07 4.000000E+02 2.800000E+01 .000000E+00 5.000000E-02
0mzero
  21 4 689 129 879
0pow
  .000000E+00 .000000E+00 .000000E+00
0 linp
  6 9 0 51 26 2 3000 1000 1697 5
0 case or subcase 3 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ array      20 entries read
0 57* array      5 entries read
0 5t
  l90 102444
  l116 66199
  l32 33663 nudata (library) storage size
  l44 33734
  l103 81099
  61** f1-20
0 60* array      10 entries read
0 65$ array      63 entries read
0 6t
  l140 71957
  used 107068 in size 150000
0jopt
  0 12
  0 0 0 0 0 0 0 0 0 0 0
0therm
  5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non
  7935 5 20 6 18 1697
0mmn
  0 19 10 0 0 1 1 0 0 0 10
  21 100 0 5 0 0 4 0 0
0tconst
  3.156000E+07 1.600000E+04 2.500000E+01 .000000E+00 5.000000E-02
0mzero
  21 4 689 129 879

```

```

Opow      3
.000000E+00 .000000E+00 .000000E+00
0 linp      9
      6      0      51      26      2      3000      1000      1697      5
0 case or subcase 4 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ array      20 entries read
0 57* array      5 entries read
0 5t
  l90 102444
  l116 66199
  l32 33663 nudata (library) storage size
  l44 33734
  l103 81099
  61** f1-20
0 60* array      10 entries read
0 65$ array      63 entries read
0 6t
  l140 71957
  used 107068 in size 150000
0jopt      12
      0      0      0      0      0      0      0      0      0
      0      0
Otherm      4
5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non      5
      7935      20      6      18      1697
0mmn      19
      0      10      0      0      1      0      0      0      10
      21      100      0      5      0      4      0
0tconst      5
3.156000E+07 3.800000E+04 2.500000E+01 .000000E+00 5.000000E-02
0mzero      4
      21      689      129      879
Opow      3
.000000E+00 .000000E+00 .000000E+00
0 linp      9
      6      0      51      26      2      3000      1000      1697      5
0 case or subcase 5 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ array      20 entries read
0 57* array      5 entries read
0 5t
  l90 90544
  l116 53571
  l32 33663 nudata (library) storage size
  l44 33734
  l103 69017
  61** f1-20
0 60* array      3 entries read
0 65$ array      63 entries read
0 6t
  l140 60057
  used 92263 in size 150000
0jopt      12
      0      0      0      0      0      0      0      0      0
      0      0
Otherm      4
5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non      5
      7935      20      6      18      1697
0mmn      19

```


	0	3	0	0	1	1	0	0	0	10
	21	100	0	5	0	0	4	0	0	
0tconst	5									
	3.156000E+07	2.500000E+05	2.600000E+01	.000000E+00	5.000000E-02					
0mzero	4									
	21	689	129	879						
0pow	3									
	.000000E+00	.000000E+00	.000000E+00							
0 linp	9									
	6	0	51	26	2	3000	1000	1697	5	
0 case or subcase	6	Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle								
	56\$ 0 -10 a10 1 e t									
0	56\$ array	20 entries read								
0	0t									

1
0

Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

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	initial300000.	yr500000.	yr999999.	yr
y106	.00E+00	.00E+00	.00E+00	.00E+00
zr106	.00E+00	.00E+00	.00E+00	.00E+00
nb106	.00E+00	.00E+00	.00E+00	.00E+00
mo106	.00E+00	.00E+00	.00E+00	.00E+00
tc106	.00E+00	.00E+00	.00E+00	.00E+00
ru106	.00E+00	.00E+00	.00E+00	.00E+00
rh106	.00E+00	.00E+00	.00E+00	.00E+00
rh106m	.00E+00	.00E+00	.00E+00	.00E+00
pd106	8.76E+01	8.76E+01	8.76E+01	8.76E+01
ag106	.00E+00	.00E+00	.00E+00	.00E+00
y107	.00E+00	.00E+00	.00E+00	.00E+00
zr107	.00E+00	.00E+00	.00E+00	.00E+00
nb107	.00E+00	.00E+00	.00E+00	.00E+00
mo107	.00E+00	.00E+00	.00E+00	.00E+00
tc107	.00E+00	.00E+00	.00E+00	.00E+00
ru107	.00E+00	.00E+00	.00E+00	.00E+00
rh107	.00E+00	.00E+00	.00E+00	.00E+00
pd107	4.42E+01	4.40E+01	4.30E+01	4.08E+01
pd107m	.00E+00	.00E+00	.00E+00	.00E+00
ag107	1.40E+00	1.64E+00	2.57E+00	4.80E+00
zr108	.00E+00	.00E+00	.00E+00	.00E+00
nb108	.00E+00	.00E+00	.00E+00	.00E+00
mo108	.00E+00	.00E+00	.00E+00	.00E+00
tc108	.00E+00	.00E+00	.00E+00	.00E+00
ru108	.00E+00	.00E+00	.00E+00	.00E+00
rh108	.00E+00	.00E+00	.00E+00	.00E+00
rh108m	.00E+00	.00E+00	.00E+00	.00E+00
pd108	2.60E+01	2.60E+01	2.60E+01	2.60E+01
ag108	.00E+00	.00E+00	.00E+00	.00E+00
ag108m	.00E+00	.00E+00	.00E+00	.00E+00
cd108	5.25E-04	5.25E-04	5.25E-04	5.25E-04
zr109	.00E+00	.00E+00	.00E+00	.00E+00
nb109	.00E+00	.00E+00	.00E+00	.00E+00
mo109	.00E+00	.00E+00	.00E+00	.00E+00
tc109	.00E+00	.00E+00	.00E+00	.00E+00
ru109	.00E+00	.00E+00	.00E+00	.00E+00
rh109	.00E+00	.00E+00	.00E+00	.00E+00
rh109m	.00E+00	.00E+00	.00E+00	.00E+00
pd109	.00E+00	.00E+00	.00E+00	.00E+00
pd109m	.00E+00	.00E+00	.00E+00	.00E+00
ag109	1.84E+01	1.84E+01	1.84E+01	1.84E+01
ag109m	.00E+00	.00E+00	.00E+00	.00E+00
cd109	.00E+00	.00E+00	.00E+00	.00E+00
nb110	.00E+00	.00E+00	.00E+00	.00E+00
mo110	.00E+00	.00E+00	.00E+00	.00E+00
tc110	.00E+00	.00E+00	.00E+00	.00E+00
ru110	.00E+00	.00E+00	.00E+00	.00E+00
rh110	.00E+00	.00E+00	.00E+00	.00E+00
rh110m	.00E+00	.00E+00	.00E+00	.00E+00
pd110	8.63E+00	8.63E+00	8.63E+00	8.63E+00
ag110	.00E+00	.00E+00	.00E+00	.00E+00
ag110m	.00E+00	.00E+00	.00E+00	.00E+00

1
0

Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams

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basis =per critical mass 10.1 MT UO2

	initial300000.	yr500000.	yr999999.	yr
cd110	5.61E-01	5.61E-01	5.61E-01	5.61E-01
nb111	.00E+00	.00E+00	.00E+00	.00E+00
mo111	.00E+00	.00E+00	.00E+00	.00E+00
tc111	.00E+00	.00E+00	.00E+00	.00E+00
ru111	.00E+00	.00E+00	.00E+00	.00E+00
rh111	.00E+00	.00E+00	.00E+00	.00E+00
pd111	.00E+00	.00E+00	.00E+00	.00E+00
pd111m	.00E+00	.00E+00	.00E+00	.00E+00
ag111	.00E+00	.00E+00	.00E+00	.00E+00
ag111m	.00E+00	.00E+00	.00E+00	.00E+00
cd111	5.01E+00	5.01E+00	5.01E+00	5.01E+00
cd111m	.00E+00	.00E+00	.00E+00	.00E+00
nb112	.00E+00	.00E+00	.00E+00	.00E+00
mo112	.00E+00	.00E+00	.00E+00	.00E+00
tc112	.00E+00	.00E+00	.00E+00	.00E+00
ru112	.00E+00	.00E+00	.00E+00	.00E+00
rh112	.00E+00	.00E+00	.00E+00	.00E+00
pd112	.00E+00	.00E+00	.00E+00	.00E+00
ag112	.00E+00	.00E+00	.00E+00	.00E+00
cd112	3.25E+00	3.25E+00	3.25E+00	3.25E+00
mo113	.00E+00	.00E+00	.00E+00	.00E+00
tc113	.00E+00	.00E+00	.00E+00	.00E+00
ru113	.00E+00	.00E+00	.00E+00	.00E+00
rh113	.00E+00	.00E+00	.00E+00	.00E+00
pd113	.00E+00	.00E+00	.00E+00	.00E+00
ag113	.00E+00	.00E+00	.00E+00	.00E+00
ag113m	.00E+00	.00E+00	.00E+00	.00E+00
cd113	1.96E-01	1.96E-01	1.96E-01	1.96E-01
cd113m	.00E+00	.00E+00	.00E+00	.00E+00
in113	4.50E-02	4.50E-02	4.50E-02	4.50E-02
in113m	.00E+00	.00E+00	.00E+00	.00E+00
mo114	.00E+00	.00E+00	.00E+00	.00E+00
tc114	.00E+00	.00E+00	.00E+00	.00E+00
ru114	.00E+00	.00E+00	.00E+00	.00E+00
rh114	.00E+00	.00E+00	.00E+00	.00E+00
pd114	.00E+00	.00E+00	.00E+00	.00E+00
ag114	.00E+00	.00E+00	.00E+00	.00E+00
cd114	4.91E+00	4.91E+00	4.91E+00	4.91E+00
in114	.00E+00	.00E+00	.00E+00	.00E+00
in114m	.00E+00	.00E+00	.00E+00	.00E+00
sn114	1.10E-04	1.10E-04	1.10E-04	1.10E-04
mo115	.00E+00	.00E+00	.00E+00	.00E+00
tc115	.00E+00	.00E+00	.00E+00	.00E+00
ru115	.00E+00	.00E+00	.00E+00	.00E+00
rh115	.00E+00	.00E+00	.00E+00	.00E+00
pd115	.00E+00	.00E+00	.00E+00	.00E+00
ag115	.00E+00	.00E+00	.00E+00	.00E+00
ag115m	.00E+00	.00E+00	.00E+00	.00E+00
cd115	.00E+00	.00E+00	.00E+00	.00E+00
cd115m	.00E+00	.00E+00	.00E+00	.00E+00
in115	1.67E+00	1.67E+00	1.67E+00	1.67E+00
in115m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

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	initial300000.	yr500000.	yr999999.	yr
sn115	8.75E-02	8.75E-02	8.75E-02	8.75E-02

tc116	.00E+00	.00E+00	.00E+00	.00E+00
ru116	.00E+00	.00E+00	.00E+00	.00E+00
rh116	.00E+00	.00E+00	.00E+00	.00E+00
pd116	.00E+00	.00E+00	.00E+00	.00E+00
ag116	.00E+00	.00E+00	.00E+00	.00E+00
ag116m	.00E+00	.00E+00	.00E+00	.00E+00
cd116	2.72E+00	2.72E+00	2.72E+00	2.72E+00
in116	.00E+00	.00E+00	.00E+00	.00E+00
in116m	.00E+00	.00E+00	.00E+00	.00E+00
sn116	7.57E-02	7.57E-02	7.57E-02	7.57E-02
tc117	.00E+00	.00E+00	.00E+00	.00E+00
ru117	.00E+00	.00E+00	.00E+00	.00E+00
rh117	.00E+00	.00E+00	.00E+00	.00E+00
pd117	.00E+00	.00E+00	.00E+00	.00E+00
ag117	.00E+00	.00E+00	.00E+00	.00E+00
ag117m	.00E+00	.00E+00	.00E+00	.00E+00
cd117	.00E+00	.00E+00	.00E+00	.00E+00
cd117m	.00E+00	.00E+00	.00E+00	.00E+00
in117	.00E+00	.00E+00	.00E+00	.00E+00
in117m	.00E+00	.00E+00	.00E+00	.00E+00
sn117	1.99E+00	1.99E+00	1.99E+00	1.99E+00
sn117m	.00E+00	.00E+00	.00E+00	.00E+00
tc118	.00E+00	.00E+00	.00E+00	.00E+00
ru118	.00E+00	.00E+00	.00E+00	.00E+00
rh118	.00E+00	.00E+00	.00E+00	.00E+00
pd118	.00E+00	.00E+00	.00E+00	.00E+00
ag118	.00E+00	.00E+00	.00E+00	.00E+00
ag118m	.00E+00	.00E+00	.00E+00	.00E+00
cd118	.00E+00	.00E+00	.00E+00	.00E+00
in118	.00E+00	.00E+00	.00E+00	.00E+00
in118m	.00E+00	.00E+00	.00E+00	.00E+00
sn118	1.88E+00	1.88E+00	1.88E+00	1.88E+00
ru119	.00E+00	.00E+00	.00E+00	.00E+00
rh119	.00E+00	.00E+00	.00E+00	.00E+00
pd119	.00E+00	.00E+00	.00E+00	.00E+00
ag119	.00E+00	.00E+00	.00E+00	.00E+00
cd119	.00E+00	.00E+00	.00E+00	.00E+00
cd119m	.00E+00	.00E+00	.00E+00	.00E+00
in119	.00E+00	.00E+00	.00E+00	.00E+00
in119m	.00E+00	.00E+00	.00E+00	.00E+00
sn119	2.06E+00	2.06E+00	2.06E+00	2.06E+00
sn119m	.00E+00	.00E+00	.00E+00	.00E+00
ru120	.00E+00	.00E+00	.00E+00	.00E+00
rh120	.00E+00	.00E+00	.00E+00	.00E+00
pd120	.00E+00	.00E+00	.00E+00	.00E+00
ag120	.00E+00	.00E+00	.00E+00	.00E+00
cd120	.00E+00	.00E+00	.00E+00	.00E+00
in120	.00E+00	.00E+00	.00E+00	.00E+00
in120m	.00E+00	.00E+00	.00E+00	.00E+00
sn120	2.05E+00	2.05E+00	2.05E+00	2.05E+00
rh121	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2
 initial300000. yr500000. yr999999. yr

pd121	.00E+00	.00E+00	.00E+00	.00E+00
ag121	.00E+00	.00E+00	.00E+00	.00E+00
cd121	.00E+00	.00E+00	.00E+00	.00E+00
in121	.00E+00	.00E+00	.00E+00	.00E+00

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in121m	.00E+00	.00E+00	.00E+00	.00E+00
sn121	.00E+00	.00E+00	.00E+00	.00E+00
sn121m	.00E+00	.00E+00	.00E+00	.00E+00
sb121	2.22E+00	2.22E+00	2.22E+00	2.22E+00
rh122	.00E+00	.00E+00	.00E+00	.00E+00
pd122	.00E+00	.00E+00	.00E+00	.00E+00
ag122	.00E+00	.00E+00	.00E+00	.00E+00
cd122	.00E+00	.00E+00	.00E+00	.00E+00
in122	.00E+00	.00E+00	.00E+00	.00E+00
in122m	.00E+00	.00E+00	.00E+00	.00E+00
sn122	2.63E+00	2.63E+00	2.63E+00	2.63E+00
sb122	.00E+00	.00E+00	.00E+00	.00E+00
sb122m	.00E+00	.00E+00	.00E+00	.00E+00
te122	3.56E-03	3.56E-03	3.56E-03	3.56E-03
rh123	.00E+00	.00E+00	.00E+00	.00E+00
pd123	.00E+00	.00E+00	.00E+00	.00E+00
ag123	.00E+00	.00E+00	.00E+00	.00E+00
cd123	.00E+00	.00E+00	.00E+00	.00E+00
in123	.00E+00	.00E+00	.00E+00	.00E+00
in123m	.00E+00	.00E+00	.00E+00	.00E+00
sn123	.00E+00	.00E+00	.00E+00	.00E+00
sn123m	.00E+00	.00E+00	.00E+00	.00E+00
sb123	2.68E+00	2.68E+00	2.68E+00	2.68E+00
te123	1.69E-06	1.69E-06	1.69E-06	1.69E-06
te123m	.00E+00	.00E+00	.00E+00	.00E+00
pd124	.00E+00	.00E+00	.00E+00	.00E+00
ag124	.00E+00	.00E+00	.00E+00	.00E+00
cd124	.00E+00	.00E+00	.00E+00	.00E+00
in124	.00E+00	.00E+00	.00E+00	.00E+00
sn124	4.46E+00	4.46E+00	4.46E+00	4.46E+00
sb124	.00E+00	.00E+00	.00E+00	.00E+00
sb124m	.00E+00	.00E+00	.00E+00	.00E+00
te124	5.36E-03	5.36E-03	5.36E-03	5.36E-03
pd125	.00E+00	.00E+00	.00E+00	.00E+00
ag125	.00E+00	.00E+00	.00E+00	.00E+00
cd125	.00E+00	.00E+00	.00E+00	.00E+00
in125	.00E+00	.00E+00	.00E+00	.00E+00
in125m	.00E+00	.00E+00	.00E+00	.00E+00
sn125	.00E+00	.00E+00	.00E+00	.00E+00
sn125m	.00E+00	.00E+00	.00E+00	.00E+00
sb125	.00E+00	.00E+00	.00E+00	.00E+00
te125	5.20E+00	5.20E+00	5.20E+00	5.20E+00
te125m	.00E+00	.00E+00	.00E+00	.00E+00
pd126	.00E+00	.00E+00	.00E+00	.00E+00
ag126	.00E+00	.00E+00	.00E+00	.00E+00
cd126	.00E+00	.00E+00	.00E+00	.00E+00
in126	.00E+00	.00E+00	.00E+00	.00E+00
sn126	1.07E+00	7.60E-01	1.90E-01	5.94E-03

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sb126	5.11E-08	3.61E-08	9.03E-09	2.82E-10
sb126m	3.88E-10	2.74E-10	6.86E-11	2.14E-12
te126	7.21E+00	7.52E+00	8.09E+00	8.28E+00
xe126	8.47E-10	8.47E-10	8.47E-10	8.47E-10
ag127	.00E+00	.00E+00	.00E+00	.00E+00
cd127	.00E+00	.00E+00	.00E+00	.00E+00
in127	.00E+00	.00E+00	.00E+00	.00E+00

in127m	.00E+00	.00E+00	.00E+00	.00E+00
sn127	.00E+00	.00E+00	.00E+00	.00E+00
sn127m	.00E+00	.00E+00	.00E+00	.00E+00
sb127	.00E+00	.00E+00	.00E+00	.00E+00
te127	.00E+00	.00E+00	.00E+00	.00E+00
te127m	.00E+00	.00E+00	.00E+00	.00E+00
i127	2.21E+01	2.21E+01	2.21E+01	2.21E+01
xe127	.00E+00	.00E+00	.00E+00	.00E+00
ag128	.00E+00	.00E+00	.00E+00	.00E+00
cd128	.00E+00	.00E+00	.00E+00	.00E+00
in128	.00E+00	.00E+00	.00E+00	.00E+00
sn128	.00E+00	.00E+00	.00E+00	.00E+00
sb128	.00E+00	.00E+00	.00E+00	.00E+00
sb128m	.00E+00	.00E+00	.00E+00	.00E+00
te128	5.81E+01	5.81E+01	5.81E+01	5.81E+01
i128	.00E+00	.00E+00	.00E+00	.00E+00
xe128	3.17E-02	3.17E-02	3.17E-02	3.17E-02
cd129	.00E+00	.00E+00	.00E+00	.00E+00
in129	.00E+00	.00E+00	.00E+00	.00E+00
sn129	.00E+00	.00E+00	.00E+00	.00E+00
sn129m	.00E+00	.00E+00	.00E+00	.00E+00
sb129	.00E+00	.00E+00	.00E+00	.00E+00
te129	.00E+00	.00E+00	.00E+00	.00E+00
te129m	.00E+00	.00E+00	.00E+00	.00E+00
i129	1.22E+02	1.22E+02	1.21E+02	1.18E+02
xe129	1.60E+00	1.87E+00	2.94E+00	5.58E+00
xe129m	.00E+00	.00E+00	.00E+00	.00E+00
cd130	.00E+00	.00E+00	.00E+00	.00E+00
in130	.00E+00	.00E+00	.00E+00	.00E+00
sn130	.00E+00	.00E+00	.00E+00	.00E+00
sb130	.00E+00	.00E+00	.00E+00	.00E+00
sb130m	.00E+00	.00E+00	.00E+00	.00E+00
te130	2.79E+02	2.79E+02	2.79E+02	2.79E+02
i130	.00E+00	.00E+00	.00E+00	.00E+00
i130m	.00E+00	.00E+00	.00E+00	.00E+00
xe130	5.45E-01	5.45E-01	5.45E-01	5.45E-01
cd131	.00E+00	.00E+00	.00E+00	.00E+00
in131	.00E+00	.00E+00	.00E+00	.00E+00
sn131	.00E+00	.00E+00	.00E+00	.00E+00
sb131	.00E+00	.00E+00	.00E+00	.00E+00
te131	.00E+00	.00E+00	.00E+00	.00E+00
te131m	.00E+00	.00E+00	.00E+00	.00E+00
i131	.00E+00	.00E+00	.00E+00	.00E+00
xe131	4.50E+02	4.50E+02	4.50E+02	4.50E+02
xe131m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B*8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide concentrations, grams
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
cd132	.00E+00	.00E+00	.00E+00	.00E+00
in132	.00E+00	.00E+00	.00E+00	.00E+00
sn132	.00E+00	.00E+00	.00E+00	.00E+00
sb132	.00E+00	.00E+00	.00E+00	.00E+00
sb132m	.00E+00	.00E+00	.00E+00	.00E+00
te132	.00E+00	.00E+00	.00E+00	.00E+00
i132	.00E+00	.00E+00	.00E+00	.00E+00
xe132	7.09E+02	7.09E+02	7.09E+02	7.09E+02
cs132	.00E+00	.00E+00	.00E+00	.00E+00
ba132	4.87E-06	4.87E-06	4.87E-06	4.87E-06

-fn133	.00E+00	.00E+00	.00E+00	.00E+00
sn133	.00E+00	.00E+00	.00E+00	.00E+00
sb133	.00E+00	.00E+00	.00E+00	.00E+00
te133	.00E+00	.00E+00	.00E+00	.00E+00
te133m	.00E+00	.00E+00	.00E+00	.00E+00
i133	.00E+00	.00E+00	.00E+00	.00E+00
i133m	.00E+00	.00E+00	.00E+00	.00E+00
xe133	.00E+00	.00E+00	.00E+00	.00E+00
xe133m	.00E+00	.00E+00	.00E+00	.00E+00
cs133	1.06E+03	1.06E+03	1.06E+03	1.06E+03
ba133	.00E+00	.00E+00	.00E+00	.00E+00
in134	.00E+00	.00E+00	.00E+00	.00E+00
sn134	.00E+00	.00E+00	.00E+00	.00E+00
sb134	.00E+00	.00E+00	.00E+00	.00E+00
sb134m	.00E+00	.00E+00	.00E+00	.00E+00
te134	.00E+00	.00E+00	.00E+00	.00E+00
i134	.00E+00	.00E+00	.00E+00	.00E+00
i134m	.00E+00	.00E+00	.00E+00	.00E+00
xe134	1.26E+03	1.26E+03	1.26E+03	1.26E+03
xe134m	.00E+00	.00E+00	.00E+00	.00E+00
cs134	.00E+00	.00E+00	.00E+00	.00E+00
cs134m	.00E+00	.00E+00	.00E+00	.00E+00
ba134	1.07E+01	1.07E+01	1.07E+01	1.07E+01
sn135	.00E+00	.00E+00	.00E+00	.00E+00
sb135	.00E+00	.00E+00	.00E+00	.00E+00
te135	.00E+00	.00E+00	.00E+00	.00E+00
i135	.00E+00	.00E+00	.00E+00	.00E+00
xe135	.00E+00	.00E+00	.00E+00	.00E+00
xe135m	.00E+00	.00E+00	.00E+00	.00E+00
cs135	9.77E+02	9.62E+02	9.06E+02	7.79E+02
cs135m	.00E+00	.00E+00	.00E+00	.00E+00
ba135	9.11E+01	1.06E+02	1.62E+02	2.89E+02
ba135m	.00E+00	.00E+00	.00E+00	.00E+00
sn136	.00E+00	.00E+00	.00E+00	.00E+00
sb136	.00E+00	.00E+00	.00E+00	.00E+00
te136	.00E+00	.00E+00	.00E+00	.00E+00
i136	.00E+00	.00E+00	.00E+00	.00E+00
i136m	.00E+00	.00E+00	.00E+00	.00E+00
xe136	1.03E+03	1.03E+03	1.03E+03	1.03E+03
cs136	.00E+00	.00E+00	.00E+00	.00E+00
ba136	4.03E+00	4.03E+00	4.03E+00	4.03E+00
ba136m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sb137	.00E+00	.00E+00	.00E+00	.00E+00
te137	.00E+00	.00E+00	.00E+00	.00E+00
i137	.00E+00	.00E+00	.00E+00	.00E+00
xe137	.00E+00	.00E+00	.00E+00	.00E+00
cs137	.00E+00	.00E+00	.00E+00	.00E+00
ba137	1.04E+03	1.04E+03	1.04E+03	1.04E+03
ba137m	.00E+00	.00E+00	.00E+00	.00E+00
sb138	.00E+00	.00E+00	.00E+00	.00E+00
te138	.00E+00	.00E+00	.00E+00	.00E+00
i138	.00E+00	.00E+00	.00E+00	.00E+00
xe138	.00E+00	.00E+00	.00E+00	.00E+00
cs138	.00E+00	.00E+00	.00E+00	.00E+00
cs138m	.00E+00	.00E+00	.00E+00	.00E+00

ba138	1.10E+03	1.10E+03	1.10E+03	1.10E+03
la138	5.84E-03	5.84E-03	5.84E-03	5.84E-03
sb139	.00E+00	.00E+00	.00E+00	.00E+00
te139	.00E+00	.00E+00	.00E+00	.00E+00
i139	.00E+00	.00E+00	.00E+00	.00E+00
xe139	.00E+00	.00E+00	.00E+00	.00E+00
cs139	.00E+00	.00E+00	.00E+00	.00E+00
ba139	.00E+00	.00E+00	.00E+00	.00E+00
la139	1.05E+03	1.05E+03	1.05E+03	1.05E+03
ce139	.00E+00	.00E+00	.00E+00	.00E+00
pr139	.00E+00	.00E+00	.00E+00	.00E+00
te140	.00E+00	.00E+00	.00E+00	.00E+00
i140	.00E+00	.00E+00	.00E+00	.00E+00
xe140	.00E+00	.00E+00	.00E+00	.00E+00
cs140	.00E+00	.00E+00	.00E+00	.00E+00
ba140	.00E+00	.00E+00	.00E+00	.00E+00
la140	.00E+00	.00E+00	.00E+00	.00E+00
ce140	1.05E+03	1.05E+03	1.05E+03	1.05E+03
pr140	.00E+00	.00E+00	.00E+00	.00E+00
te141	.00E+00	.00E+00	.00E+00	.00E+00
i141	.00E+00	.00E+00	.00E+00	.00E+00
xe141	.00E+00	.00E+00	.00E+00	.00E+00
cs141	.00E+00	.00E+00	.00E+00	.00E+00
ba141	.00E+00	.00E+00	.00E+00	.00E+00
la141	.00E+00	.00E+00	.00E+00	.00E+00
ce141	.00E+00	.00E+00	.00E+00	.00E+00
pr141	9.73E+02	9.73E+02	9.73E+02	9.73E+02
nd141	.00E+00	.00E+00	.00E+00	.00E+00
te142	.00E+00	.00E+00	.00E+00	.00E+00
i142	.00E+00	.00E+00	.00E+00	.00E+00
xe142	.00E+00	.00E+00	.00E+00	.00E+00
cs142	.00E+00	.00E+00	.00E+00	.00E+00
ba142	.00E+00	.00E+00	.00E+00	.00E+00
la142	.00E+00	.00E+00	.00E+00	.00E+00
ce142	9.88E+02	9.88E+02	9.88E+02	9.88E+02
pr142	.00E+00	.00E+00	.00E+00	.00E+00
pr142m	.00E+00	.00E+00	.00E+00	.00E+00
nd142	1.90E+00	1.90E+00	1.90E+00	1.90E+00
i143	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
xe143	.00E+00	.00E+00	.00E+00	.00E+00
cs143	.00E+00	.00E+00	.00E+00	.00E+00
ba143	.00E+00	.00E+00	.00E+00	.00E+00
la143	.00E+00	.00E+00	.00E+00	.00E+00
ce143	.00E+00	.00E+00	.00E+00	.00E+00
pr143	.00E+00	.00E+00	.00E+00	.00E+00
nd143	9.53E+02	9.53E+02	9.53E+02	9.53E+02
i144	.00E+00	.00E+00	.00E+00	.00E+00
xe144	.00E+00	.00E+00	.00E+00	.00E+00
cs144	.00E+00	.00E+00	.00E+00	.00E+00
ba144	.00E+00	.00E+00	.00E+00	.00E+00
la144	.00E+00	.00E+00	.00E+00	.00E+00
ce144	.00E+00	.00E+00	.00E+00	.00E+00
pr144	.00E+00	.00E+00	.00E+00	.00E+00
pr144m	.00E+00	.00E+00	.00E+00	.00E+00
nd144	9.70E+02	9.70E+02	9.70E+02	9.70E+02

i145	.00E+00	.00E+00	.00E+00	.00E+00
xe145	.00E+00	.00E+00	.00E+00	.00E+00
cs145	.00E+00	.00E+00	.00E+00	.00E+00
ba145	.00E+00	.00E+00	.00E+00	.00E+00
la145	.00E+00	.00E+00	.00E+00	.00E+00
ce145	.00E+00	.00E+00	.00E+00	.00E+00
pr145	.00E+00	.00E+00	.00E+00	.00E+00
nd145	6.66E+02	6.66E+02	6.66E+02	6.66E+02
pm145	.00E+00	.00E+00	.00E+00	.00E+00
sm145	.00E+00	.00E+00	.00E+00	.00E+00
xe146	.00E+00	.00E+00	.00E+00	.00E+00
cs146	.00E+00	.00E+00	.00E+00	.00E+00
ba146	.00E+00	.00E+00	.00E+00	.00E+00
la146	.00E+00	.00E+00	.00E+00	.00E+00
ce146	.00E+00	.00E+00	.00E+00	.00E+00
pr146	.00E+00	.00E+00	.00E+00	.00E+00
nd146	5.25E+02	5.25E+02	5.25E+02	5.25E+02
pm146	.00E+00	.00E+00	.00E+00	.00E+00
sm146	8.36E-04	8.35E-04	8.34E-04	8.31E-04
xe147	.00E+00	.00E+00	.00E+00	.00E+00
cs147	.00E+00	.00E+00	.00E+00	.00E+00
ba147	.00E+00	.00E+00	.00E+00	.00E+00
la147	.00E+00	.00E+00	.00E+00	.00E+00
ce147	.00E+00	.00E+00	.00E+00	.00E+00
pr147	.00E+00	.00E+00	.00E+00	.00E+00
nd147	.00E+00	.00E+00	.00E+00	.00E+00
pm147	.00E+00	.00E+00	.00E+00	.00E+00
sm147	3.89E+02	3.89E+02	3.89E+02	3.89E+02
cs148	.00E+00	.00E+00	.00E+00	.00E+00
ba148	.00E+00	.00E+00	.00E+00	.00E+00
la148	.00E+00	.00E+00	.00E+00	.00E+00
ce148	.00E+00	.00E+00	.00E+00	.00E+00
pr148	.00E+00	.00E+00	.00E+00	.00E+00
nd148	2.98E+02	2.98E+02	2.98E+02	2.98E+02
pm148	.00E+00	.00E+00	.00E+00	.00E+00
pm148m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sm148	8.64E+00	8.64E+00	8.64E+00	8.64E+00
cs149	.00E+00	.00E+00	.00E+00	.00E+00
ba149	.00E+00	.00E+00	.00E+00	.00E+00
la149	.00E+00	.00E+00	.00E+00	.00E+00
ce149	.00E+00	.00E+00	.00E+00	.00E+00
pr149	.00E+00	.00E+00	.00E+00	.00E+00
nd149	.00E+00	.00E+00	.00E+00	.00E+00
pm149	.00E+00	.00E+00	.00E+00	.00E+00
sm149	8.79E+00	8.79E+00	8.79E+00	8.79E+00
eu149	.00E+00	.00E+00	.00E+00	.00E+00
cs150	.00E+00	.00E+00	.00E+00	.00E+00
ba150	.00E+00	.00E+00	.00E+00	.00E+00
la150	.00E+00	.00E+00	.00E+00	.00E+00
ce150	.00E+00	.00E+00	.00E+00	.00E+00
pr150	.00E+00	.00E+00	.00E+00	.00E+00
nd150	1.23E+02	1.23E+02	1.23E+02	1.23E+02
pm150	.00E+00	.00E+00	.00E+00	.00E+00
sm150	1.85E+02	1.85E+02	1.85E+02	1.85E+02
eu150	.00E+00	.00E+00	.00E+00	.00E+00

ba151	.00E+00	.00E+00	.00E+00	.00E+00
la151	.00E+00	.00E+00	.00E+00	.00E+00
ce151	.00E+00	.00E+00	.00E+00	.00E+00
pr151	.00E+00	.00E+00	.00E+00	.00E+00
nd151	.00E+00	.00E+00	.00E+00	.00E+00
pm151	.00E+00	.00E+00	.00E+00	.00E+00
sm151	.00E+00	.00E+00	.00E+00	.00E+00
eu151	3.76E+01	3.76E+01	3.76E+01	3.76E+01
ba152	.00E+00	.00E+00	.00E+00	.00E+00
la152	.00E+00	.00E+00	.00E+00	.00E+00
ce152	.00E+00	.00E+00	.00E+00	.00E+00
pr152	.00E+00	.00E+00	.00E+00	.00E+00
nd152	.00E+00	.00E+00	.00E+00	.00E+00
pm152	.00E+00	.00E+00	.00E+00	.00E+00
pm152m	.00E+00	.00E+00	.00E+00	.00E+00
sm152	7.57E+01	7.57E+01	7.57E+01	7.57E+01
eu152	.00E+00	.00E+00	.00E+00	.00E+00
eu152m	.00E+00	.00E+00	.00E+00	.00E+00
gd152	2.01E+01	2.01E+01	2.01E+01	2.01E+01
la153	.00E+00	.00E+00	.00E+00	.00E+00
ce153	.00E+00	.00E+00	.00E+00	.00E+00
pr153	.00E+00	.00E+00	.00E+00	.00E+00
nd153	.00E+00	.00E+00	.00E+00	.00E+00
pm153	.00E+00	.00E+00	.00E+00	.00E+00
sm153	.00E+00	.00E+00	.00E+00	.00E+00
eu153	3.65E+01	3.65E+01	3.65E+01	3.65E+01
gd153	.00E+00	.00E+00	.00E+00	.00E+00
la154	.00E+00	.00E+00	.00E+00	.00E+00
ce154	.00E+00	.00E+00	.00E+00	.00E+00
pr154	.00E+00	.00E+00	.00E+00	.00E+00
nd154	.00E+00	.00E+00	.00E+00	.00E+00
pm154	.00E+00	.00E+00	.00E+00	.00E+00
pm154m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sm154	1.64E+01	1.64E+01	1.64E+01	1.64E+01
eu154	.00E+00	.00E+00	.00E+00	.00E+00
gd154	2.15E+00	2.15E+00	2.15E+00	2.15E+00
la155	.00E+00	.00E+00	.00E+00	.00E+00
ce155	.00E+00	.00E+00	.00E+00	.00E+00
pr155	.00E+00	.00E+00	.00E+00	.00E+00
nd155	.00E+00	.00E+00	.00E+00	.00E+00
pm155	.00E+00	.00E+00	.00E+00	.00E+00
sm155	.00E+00	.00E+00	.00E+00	.00E+00
eu155	.00E+00	.00E+00	.00E+00	.00E+00
gd155m	.00E+00	.00E+00	.00E+00	.00E+00
gd155	6.66E-01	6.66E-01	6.66E-01	6.66E-01
ce156	.00E+00	.00E+00	.00E+00	.00E+00
pr156	.00E+00	.00E+00	.00E+00	.00E+00
nd156	.00E+00	.00E+00	.00E+00	.00E+00
pm156	.00E+00	.00E+00	.00E+00	.00E+00
sm156	.00E+00	.00E+00	.00E+00	.00E+00
eu156	.00E+00	.00E+00	.00E+00	.00E+00
gd156	1.12E+01	1.12E+01	1.12E+01	1.12E+01
ce157	.00E+00	.00E+00	.00E+00	.00E+00
pr157	.00E+00	.00E+00	.00E+00	.00E+00
nd157	.00E+00	.00E+00	.00E+00	.00E+00

pm157	.00E+00	.00E+00	.00E+00	.00E+00
sm157	.00E+00	.00E+00	.00E+00	.00E+00
eu157	.00E+00	.00E+00	.00E+00	.00E+00
gd157	5.42E-02	5.42E-02	5.42E-02	5.42E-02
pr158	.00E+00	.00E+00	.00E+00	.00E+00
nd158	.00E+00	.00E+00	.00E+00	.00E+00
pm158	.00E+00	.00E+00	.00E+00	.00E+00
sm158	.00E+00	.00E+00	.00E+00	.00E+00
eu158	.00E+00	.00E+00	.00E+00	.00E+00
gd158	3.07E+00	3.07E+00	3.07E+00	3.07E+00
pr159	.00E+00	.00E+00	.00E+00	.00E+00
nd159	.00E+00	.00E+00	.00E+00	.00E+00
pm159	.00E+00	.00E+00	.00E+00	.00E+00
sm159	.00E+00	.00E+00	.00E+00	.00E+00
eu159	.00E+00	.00E+00	.00E+00	.00E+00
gd159	.00E+00	.00E+00	.00E+00	.00E+00
tb159	4.41E-01	4.41E-01	4.41E-01	4.41E-01
nd160	.00E+00	.00E+00	.00E+00	.00E+00
pm160	.00E+00	.00E+00	.00E+00	.00E+00
sm160	.00E+00	.00E+00	.00E+00	.00E+00
eu160	.00E+00	.00E+00	.00E+00	.00E+00
gd160	1.79E-01	1.79E-01	1.79E-01	1.79E-01
tb160	.00E+00	.00E+00	.00E+00	.00E+00
dy160	2.30E-03	2.30E-03	2.30E-03	2.30E-03
nd161	.00E+00	.00E+00	.00E+00	.00E+00
pm161	.00E+00	.00E+00	.00E+00	.00E+00
sm161	.00E+00	.00E+00	.00E+00	.00E+00
eu161	.00E+00	.00E+00	.00E+00	.00E+00
gd161	.00E+00	.00E+00	.00E+00	.00E+00
tb161	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide concentrations, grams
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
dy161	7.00E-02	7.00E-02	7.00E-02	7.00E-02
pm162	.00E+00	.00E+00	.00E+00	.00E+00
sm162	.00E+00	.00E+00	.00E+00	.00E+00
eu162	.00E+00	.00E+00	.00E+00	.00E+00
gd162	.00E+00	.00E+00	.00E+00	.00E+00
tb162	.00E+00	.00E+00	.00E+00	.00E+00
tb162m	.00E+00	.00E+00	.00E+00	.00E+00
dy162	3.62E-02	3.62E-02	3.62E-02	3.62E-02
sm163	.00E+00	.00E+00	.00E+00	.00E+00
eu163	.00E+00	.00E+00	.00E+00	.00E+00
gd163	.00E+00	.00E+00	.00E+00	.00E+00
tb163	.00E+00	.00E+00	.00E+00	.00E+00
tb163m	.00E+00	.00E+00	.00E+00	.00E+00
dy163	1.35E-02	1.35E-02	1.35E-02	1.35E-02
sm164	.00E+00	.00E+00	.00E+00	.00E+00
eu164	.00E+00	.00E+00	.00E+00	.00E+00
gd164	.00E+00	.00E+00	.00E+00	.00E+00
tb164	.00E+00	.00E+00	.00E+00	.00E+00
dy164	3.85E-03	3.85E-03	3.85E-03	3.85E-03
sm165	.00E+00	.00E+00	.00E+00	.00E+00
eu165	.00E+00	.00E+00	.00E+00	.00E+00
gd165	.00E+00	.00E+00	.00E+00	.00E+00
tb165	.00E+00	.00E+00	.00E+00	.00E+00
dy165	.00E+00	.00E+00	.00E+00	.00E+00
dy165m	.00E+00	.00E+00	.00E+00	.00E+00

ho165	2.94E-03	2.94E-03	2.94E-03	2.94E-03
dy166	.00E+00	.00E+00	.00E+00	.00E+00
ho166	.00E+00	.00E+00	.00E+00	.00E+00
ho166m	.00E+00	.00E+00	.00E+00	.00E+00
er166	3.07E-04	3.07E-04	3.07E-04	3.07E-04
er167	1.25E-06	1.25E-06	1.25E-06	1.25E-06
er167m	.00E+00	.00E+00	.00E+00	.00E+00
er168	3.38E-07	3.38E-07	3.38E-07	3.38E-07
yb168	.00E+00	.00E+00	.00E+00	.00E+00
er169	.00E+00	.00E+00	.00E+00	.00E+00
tm169	4.80E-07	4.80E-07	4.80E-07	4.80E-07
yb169	.00E+00	.00E+00	.00E+00	.00E+00
er170	5.06E-07	5.06E-07	5.06E-07	5.06E-07
tm170	.00E+00	.00E+00	.00E+00	.00E+00
tm170m	.00E+00	.00E+00	.00E+00	.00E+00
yb170	2.88E-09	2.88E-09	2.88E-09	2.88E-09
er171	.00E+00	.00E+00	.00E+00	.00E+00
tm171	.00E+00	.00E+00	.00E+00	.00E+00
yb171	7.02E-07	7.02E-07	7.02E-07	7.02E-07
er172	.00E+00	.00E+00	.00E+00	.00E+00
tm172	.00E+00	.00E+00	.00E+00	.00E+00
yb172	4.57E-07	4.57E-07	4.57E-07	4.57E-07
total	2.78E+04	2.78E+04	2.78E+04	2.78E+04

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
h 3	.00E+00	.00E+00	.00E+00	.00E+00
li 6	.00E+00	.00E+00	.00E+00	.00E+00
li 7	.00E+00	.00E+00	.00E+00	.00E+00
be 9	.00E+00	.00E+00	.00E+00	.00E+00
be 10	2.13E-06	2.08E-06	1.91E-06	1.54E-06
c 14	4.10E-19	9.68E-22	2.28E-32	.00E+00
ni 66	.00E+00	.00E+00	.00E+00	.00E+00
cu 66	.00E+00	.00E+00	.00E+00	.00E+00
zn 66	.00E+00	.00E+00	.00E+00	.00E+00
cu 67	.00E+00	.00E+00	.00E+00	.00E+00
zn 67	.00E+00	.00E+00	.00E+00	.00E+00
zn 68	.00E+00	.00E+00	.00E+00	.00E+00
zn 69	.00E+00	.00E+00	.00E+00	.00E+00
zn 69m	.00E+00	.00E+00	.00E+00	.00E+00
ga 69	.00E+00	.00E+00	.00E+00	.00E+00
zn 70	.00E+00	.00E+00	.00E+00	.00E+00
ga 70	.00E+00	.00E+00	.00E+00	.00E+00
ge 70	.00E+00	.00E+00	.00E+00	.00E+00
zn 71	.00E+00	.00E+00	.00E+00	.00E+00
zn 71m	.00E+00	.00E+00	.00E+00	.00E+00
ga 71	.00E+00	.00E+00	.00E+00	.00E+00
ge 71	.00E+00	.00E+00	.00E+00	.00E+00
ge 71m	.00E+00	.00E+00	.00E+00	.00E+00
co 72	.00E+00	.00E+00	.00E+00	.00E+00
ni 72	.00E+00	.00E+00	.00E+00	.00E+00
cu 72	.00E+00	.00E+00	.00E+00	.00E+00
zn 72	.00E+00	.00E+00	.00E+00	.00E+00
ga 72	.00E+00	.00E+00	.00E+00	.00E+00
ge 72	.00E+00	.00E+00	.00E+00	.00E+00
co 73	.00E+00	.00E+00	.00E+00	.00E+00
ni 73	.00E+00	.00E+00	.00E+00	.00E+00
cu 73	.00E+00	.00E+00	.00E+00	.00E+00

zn 73	.00E+00	.00E+00	.00E+00	.00E+00
ga 73	.00E+00	.00E+00	.00E+00	.00E+00
ge 73	.00E+00	.00E+00	.00E+00	.00E+00
ge 73m	.00E+00	.00E+00	.00E+00	.00E+00
co 74	.00E+00	.00E+00	.00E+00	.00E+00
ni 74	.00E+00	.00E+00	.00E+00	.00E+00
cu 74	.00E+00	.00E+00	.00E+00	.00E+00
zn 74	.00E+00	.00E+00	.00E+00	.00E+00
ga 74	.00E+00	.00E+00	.00E+00	.00E+00
ge 74	.00E+00	.00E+00	.00E+00	.00E+00
co 75	.00E+00	.00E+00	.00E+00	.00E+00
ni 75	.00E+00	.00E+00	.00E+00	.00E+00
cu 75	.00E+00	.00E+00	.00E+00	.00E+00
zn 75	.00E+00	.00E+00	.00E+00	.00E+00
ga 75	.00E+00	.00E+00	.00E+00	.00E+00
ge 75	.00E+00	.00E+00	.00E+00	.00E+00
ge 75m	.00E+00	.00E+00	.00E+00	.00E+00
as 75	.00E+00	.00E+00	.00E+00	.00E+00
ni 76	.00E+00	.00E+00	.00E+00	.00E+00
cu 76	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
zn 76	.00E+00	.00E+00	.00E+00	.00E+00
ga 76	.00E+00	.00E+00	.00E+00	.00E+00
ge 76	.00E+00	.00E+00	.00E+00	.00E+00
as 76	.00E+00	.00E+00	.00E+00	.00E+00
se 76	.00E+00	.00E+00	.00E+00	.00E+00
ni 77	.00E+00	.00E+00	.00E+00	.00E+00
cu 77	.00E+00	.00E+00	.00E+00	.00E+00
zn 77	.00E+00	.00E+00	.00E+00	.00E+00
ga 77	.00E+00	.00E+00	.00E+00	.00E+00
ge 77	.00E+00	.00E+00	.00E+00	.00E+00
ge 77m	.00E+00	.00E+00	.00E+00	.00E+00
as 77	.00E+00	.00E+00	.00E+00	.00E+00
se 77	.00E+00	.00E+00	.00E+00	.00E+00
se 77m	.00E+00	.00E+00	.00E+00	.00E+00
ni 78	.00E+00	.00E+00	.00E+00	.00E+00
cu 78	.00E+00	.00E+00	.00E+00	.00E+00
zn 78	.00E+00	.00E+00	.00E+00	.00E+00
ga 78	.00E+00	.00E+00	.00E+00	.00E+00
ge 78	.00E+00	.00E+00	.00E+00	.00E+00
as 78	.00E+00	.00E+00	.00E+00	.00E+00
se 78	.00E+00	.00E+00	.00E+00	.00E+00
cu 79	.00E+00	.00E+00	.00E+00	.00E+00
zn 79	.00E+00	.00E+00	.00E+00	.00E+00
ga 79	.00E+00	.00E+00	.00E+00	.00E+00
ge 79	.00E+00	.00E+00	.00E+00	.00E+00
as 79	.00E+00	.00E+00	.00E+00	.00E+00
se 79	3.09E-02	2.78E-02	1.83E-02	6.38E-03
se 79m	.00E+00	.00E+00	.00E+00	.00E+00
br 79	.00E+00	.00E+00	.00E+00	.00E+00
br 79m	.00E+00	.00E+00	.00E+00	.00E+00
kr 79	.00E+00	.00E+00	.00E+00	.00E+00
cu 80	.00E+00	.00E+00	.00E+00	.00E+00
zn 80	.00E+00	.00E+00	.00E+00	.00E+00
ga 80	.00E+00	.00E+00	.00E+00	.00E+00
ge 80	.00E+00	.00E+00	.00E+00	.00E+00

as 80	.00E+00	.00E+00	.00E+00	.00E+00
se 80	.00E+00	.00E+00	.00E+00	.00E+00
br 80	.00E+00	.00E+00	.00E+00	.00E+00
br 80m	.00E+00	.00E+00	.00E+00	.00E+00
kr 80	.00E+00	.00E+00	.00E+00	.00E+00
cu 81	.00E+00	.00E+00	.00E+00	.00E+00
zn 81	.00E+00	.00E+00	.00E+00	.00E+00
ga 81	.00E+00	.00E+00	.00E+00	.00E+00
ge 81	.00E+00	.00E+00	.00E+00	.00E+00
as 81	.00E+00	.00E+00	.00E+00	.00E+00
se 81	.00E+00	.00E+00	.00E+00	.00E+00
se 81m	.00E+00	.00E+00	.00E+00	.00E+00
br 81	.00E+00	.00E+00	.00E+00	.00E+00
kr 81	7.38E-09	6.27E-09	3.27E-09	6.43E-10
kr 81m	.00E+00	.00E+00	.00E+00	.00E+00
zn 82	.00E+00	.00E+00	.00E+00	.00E+00
ga 82	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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initial300000. yr500000. yr999999. yr				
ge 82	.00E+00	.00E+00	.00E+00	.00E+00
as 82	.00E+00	.00E+00	.00E+00	.00E+00
as 82m	.00E+00	.00E+00	.00E+00	.00E+00
se 82	.00E+00	.00E+00	.00E+00	.00E+00
br 82	.00E+00	.00E+00	.00E+00	.00E+00
br 82m	.00E+00	.00E+00	.00E+00	.00E+00
kr 82	.00E+00	.00E+00	.00E+00	.00E+00
zn 83	.00E+00	.00E+00	.00E+00	.00E+00
ga 83	.00E+00	.00E+00	.00E+00	.00E+00
ge 83	.00E+00	.00E+00	.00E+00	.00E+00
as 83	.00E+00	.00E+00	.00E+00	.00E+00
se 83	.00E+00	.00E+00	.00E+00	.00E+00
se 83m	.00E+00	.00E+00	.00E+00	.00E+00
br 83	.00E+00	.00E+00	.00E+00	.00E+00
kr 83	.00E+00	.00E+00	.00E+00	.00E+00
kr 83m	.00E+00	.00E+00	.00E+00	.00E+00
ga 84	.00E+00	.00E+00	.00E+00	.00E+00
ge 84	.00E+00	.00E+00	.00E+00	.00E+00
as 84	.00E+00	.00E+00	.00E+00	.00E+00
se 84	.00E+00	.00E+00	.00E+00	.00E+00
br 84	.00E+00	.00E+00	.00E+00	.00E+00
br 84m	.00E+00	.00E+00	.00E+00	.00E+00
kr 84	.00E+00	.00E+00	.00E+00	.00E+00
ga 85	.00E+00	.00E+00	.00E+00	.00E+00
ge 85	.00E+00	.00E+00	.00E+00	.00E+00
as 85	.00E+00	.00E+00	.00E+00	.00E+00
se 85	.00E+00	.00E+00	.00E+00	.00E+00
se 85m	.00E+00	.00E+00	.00E+00	.00E+00
br 85	.00E+00	.00E+00	.00E+00	.00E+00
kr 85	.00E+00	.00E+00	.00E+00	.00E+00
kr 85m	.00E+00	.00E+00	.00E+00	.00E+00
rb 85	.00E+00	.00E+00	.00E+00	.00E+00
ge 86	.00E+00	.00E+00	.00E+00	.00E+00
as 86	.00E+00	.00E+00	.00E+00	.00E+00
se 86	.00E+00	.00E+00	.00E+00	.00E+00
br 86	.00E+00	.00E+00	.00E+00	.00E+00
br 86m	.00E+00	.00E+00	.00E+00	.00E+00
kr 86	.00E+00	.00E+00	.00E+00	.00E+00

rb 86	.00E+00	.00E+00	.00E+00	.00E+00
rb 86m	.00E+00	.00E+00	.00E+00	.00E+00
sr 86	.00E+00	.00E+00	.00E+00	.00E+00
ge 87	.00E+00	.00E+00	.00E+00	.00E+00
as 87	.00E+00	.00E+00	.00E+00	.00E+00
se 87	.00E+00	.00E+00	.00E+00	.00E+00
br 87	.00E+00	.00E+00	.00E+00	.00E+00
kr 87	.00E+00	.00E+00	.00E+00	.00E+00
rb 87	2.18E-05	2.18E-05	2.18E-05	2.18E-05
sr 87	.00E+00	.00E+00	.00E+00	.00E+00
sr 87m	.00E+00	.00E+00	.00E+00	.00E+00
ge 88	.00E+00	.00E+00	.00E+00	.00E+00
as 88	.00E+00	.00E+00	.00E+00	.00E+00
se 88	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
br 88	.00E+00	.00E+00	.00E+00	.00E+00
kr 88	.00E+00	.00E+00	.00E+00	.00E+00
rb 88	.00E+00	.00E+00	.00E+00	.00E+00
sr 88	.00E+00	.00E+00	.00E+00	.00E+00
as 89	.00E+00	.00E+00	.00E+00	.00E+00
se 89	.00E+00	.00E+00	.00E+00	.00E+00
br 89	.00E+00	.00E+00	.00E+00	.00E+00
kr 89	.00E+00	.00E+00	.00E+00	.00E+00
rb 89	.00E+00	.00E+00	.00E+00	.00E+00
sr 89	.00E+00	.00E+00	.00E+00	.00E+00
y 89	.00E+00	.00E+00	.00E+00	.00E+00
y 89m	.00E+00	.00E+00	.00E+00	.00E+00
as 90	.00E+00	.00E+00	.00E+00	.00E+00
se 90	.00E+00	.00E+00	.00E+00	.00E+00
br 90	.00E+00	.00E+00	.00E+00	.00E+00
kr 90	.00E+00	.00E+00	.00E+00	.00E+00
rb 90	.00E+00	.00E+00	.00E+00	.00E+00
rb 90m	.00E+00	.00E+00	.00E+00	.00E+00
sr 90	.00E+00	.00E+00	.00E+00	.00E+00
y 90	.00E+00	.00E+00	.00E+00	.00E+00
y 90m	.00E+00	.00E+00	.00E+00	.00E+00
zr 90	.00E+00	.00E+00	.00E+00	.00E+00
zr 90m	.00E+00	.00E+00	.00E+00	.00E+00
se 91	.00E+00	.00E+00	.00E+00	.00E+00
br 91	.00E+00	.00E+00	.00E+00	.00E+00
kr 91	.00E+00	.00E+00	.00E+00	.00E+00
rb 91	.00E+00	.00E+00	.00E+00	.00E+00
sr 91	.00E+00	.00E+00	.00E+00	.00E+00
y 91	.00E+00	.00E+00	.00E+00	.00E+00
y 91m	.00E+00	.00E+00	.00E+00	.00E+00
zr 91	.00E+00	.00E+00	.00E+00	.00E+00
nb 91	.00E+00	.00E+00	.00E+00	.00E+00
se 92	.00E+00	.00E+00	.00E+00	.00E+00
br 92	.00E+00	.00E+00	.00E+00	.00E+00
kr 92	.00E+00	.00E+00	.00E+00	.00E+00
rb 92	.00E+00	.00E+00	.00E+00	.00E+00
sr 92	.00E+00	.00E+00	.00E+00	.00E+00
y 92	.00E+00	.00E+00	.00E+00	.00E+00
zr 92	.00E+00	.00E+00	.00E+00	.00E+00
nb 92	4.37E-11	4.37E-11	4.35E-11	4.31E-11
se 93	.00E+00	.00E+00	.00E+00	.00E+00

br 93	.00E+00	.00E+00	.00E+00	.00E+00
kr 93	.00E+00	.00E+00	.00E+00	.00E+00
rb 93	.00E+00	.00E+00	.00E+00	.00E+00
sr 93	.00E+00	.00E+00	.00E+00	.00E+00
y 93	.00E+00	.00E+00	.00E+00	.00E+00
zr 93	1.01E+00	9.85E-01	8.99E-01	7.17E-01
nb 93	.00E+00	.00E+00	.00E+00	.00E+00
nb 93m	1.01E+00	9.85E-01	8.99E-01	7.17E-01
br 94	.00E+00	.00E+00	.00E+00	.00E+00
kr 94	.00E+00	.00E+00	.00E+00	.00E+00
rb 94	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000.	yr500000.	yr999999.	yr
sr 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 94	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 94	2.02E-08	3.65E-09	3.95E-12	1.52E-19	
nb 94m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
br 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 95m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 95	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
br 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 96	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 97m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 97	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
kr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rb 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 98m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
mo 98	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tc 98	1.68E-07	1.66E-07	1.61E-07	1.48E-07	
rb 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sr 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
y 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
zr 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nb 99	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

-nb 99m	.00E+00	.00E+00	.00E+00	.00E+00
mo 99	.00E+00	.00E+00	.00E+00	.00E+00
tc 99	4.67E+00	3.97E+00	2.06E+00	3.98E-01
tc 99m	.00E+00	.00E+00	.00E+00	.00E+00
ru 99	.00E+00	.00E+00	.00E+00	.00E+00
rb100	.00E+00	.00E+00	.00E+00	.00E+00
sr100	.00E+00	.00E+00	.00E+00	.00E+00
y100	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
zr100	.00E+00	.00E+00	.00E+00	.00E+00
nb100	.00E+00	.00E+00	.00E+00	.00E+00
nb100m	.00E+00	.00E+00	.00E+00	.00E+00
mo100	.00E+00	.00E+00	.00E+00	.00E+00
tc100	.00E+00	.00E+00	.00E+00	.00E+00
ru100	.00E+00	.00E+00	.00E+00	.00E+00
rb101	.00E+00	.00E+00	.00E+00	.00E+00
sr101	.00E+00	.00E+00	.00E+00	.00E+00
y101	.00E+00	.00E+00	.00E+00	.00E+00
zr101	.00E+00	.00E+00	.00E+00	.00E+00
nb101	.00E+00	.00E+00	.00E+00	.00E+00
mo101	.00E+00	.00E+00	.00E+00	.00E+00
tc101	.00E+00	.00E+00	.00E+00	.00E+00
ru101	.00E+00	.00E+00	.00E+00	.00E+00
sr102	.00E+00	.00E+00	.00E+00	.00E+00
y102	.00E+00	.00E+00	.00E+00	.00E+00
zr102	.00E+00	.00E+00	.00E+00	.00E+00
nb102	.00E+00	.00E+00	.00E+00	.00E+00
mo102	.00E+00	.00E+00	.00E+00	.00E+00
tc102	.00E+00	.00E+00	.00E+00	.00E+00
tc102m	.00E+00	.00E+00	.00E+00	.00E+00
ru102	.00E+00	.00E+00	.00E+00	.00E+00
rh102	.00E+00	.00E+00	.00E+00	.00E+00
pd102	.00E+00	.00E+00	.00E+00	.00E+00
sr103	.00E+00	.00E+00	.00E+00	.00E+00
y103	.00E+00	.00E+00	.00E+00	.00E+00
zr103	.00E+00	.00E+00	.00E+00	.00E+00
nb103	.00E+00	.00E+00	.00E+00	.00E+00
mo103	.00E+00	.00E+00	.00E+00	.00E+00
tc103	.00E+00	.00E+00	.00E+00	.00E+00
ru103	.00E+00	.00E+00	.00E+00	.00E+00
rh103	.00E+00	.00E+00	.00E+00	.00E+00
rh103m	.00E+00	.00E+00	.00E+00	.00E+00
sr104	.00E+00	.00E+00	.00E+00	.00E+00
y104	.00E+00	.00E+00	.00E+00	.00E+00
zr104	.00E+00	.00E+00	.00E+00	.00E+00
nb104	.00E+00	.00E+00	.00E+00	.00E+00
mo104	.00E+00	.00E+00	.00E+00	.00E+00
tc104	.00E+00	.00E+00	.00E+00	.00E+00
ru104	.00E+00	.00E+00	.00E+00	.00E+00
rh104	.00E+00	.00E+00	.00E+00	.00E+00
rh104m	.00E+00	.00E+00	.00E+00	.00E+00
pd104	.00E+00	.00E+00	.00E+00	.00E+00
y105	.00E+00	.00E+00	.00E+00	.00E+00
zr105	.00E+00	.00E+00	.00E+00	.00E+00
nb105	.00E+00	.00E+00	.00E+00	.00E+00
mo105	.00E+00	.00E+00	.00E+00	.00E+00

tc105	.00E+00	.00E+00	.00E+00	.00E+00
ru105	.00E+00	.00E+00	.00E+00	.00E+00
rh105	.00E+00	.00E+00	.00E+00	.00E+00
rh105m	.00E+00	.00E+00	.00E+00	.00E+00
pd105	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products page 230

	initial	300000. yr	500000. yr	999999. yr
y106	.00E+00	.00E+00	.00E+00	.00E+00
zr106	.00E+00	.00E+00	.00E+00	.00E+00
nb106	.00E+00	.00E+00	.00E+00	.00E+00
mo106	.00E+00	.00E+00	.00E+00	.00E+00
tc106	.00E+00	.00E+00	.00E+00	.00E+00
ru106	.00E+00	.00E+00	.00E+00	.00E+00
rh106	.00E+00	.00E+00	.00E+00	.00E+00
rh106m	.00E+00	.00E+00	.00E+00	.00E+00
pd106	.00E+00	.00E+00	.00E+00	.00E+00
ag106	.00E+00	.00E+00	.00E+00	.00E+00
y107	.00E+00	.00E+00	.00E+00	.00E+00
zr107	.00E+00	.00E+00	.00E+00	.00E+00
nb107	.00E+00	.00E+00	.00E+00	.00E+00
mo107	.00E+00	.00E+00	.00E+00	.00E+00
tc107	.00E+00	.00E+00	.00E+00	.00E+00
ru107	.00E+00	.00E+00	.00E+00	.00E+00
rh107	.00E+00	.00E+00	.00E+00	.00E+00
pd107	2.27E-02	2.26E-02	2.21E-02	2.10E-02
pd107m	.00E+00	.00E+00	.00E+00	.00E+00
ag107	.00E+00	.00E+00	.00E+00	.00E+00
zr108	.00E+00	.00E+00	.00E+00	.00E+00
nb108	.00E+00	.00E+00	.00E+00	.00E+00
mo108	.00E+00	.00E+00	.00E+00	.00E+00
tc108	.00E+00	.00E+00	.00E+00	.00E+00
ru108	.00E+00	.00E+00	.00E+00	.00E+00
rh108	.00E+00	.00E+00	.00E+00	.00E+00
rh108m	.00E+00	.00E+00	.00E+00	.00E+00
pd108	.00E+00	.00E+00	.00E+00	.00E+00
ag108	.00E+00	.00E+00	.00E+00	.00E+00
ag108m	.00E+00	.00E+00	.00E+00	.00E+00
cd108	.00E+00	.00E+00	.00E+00	.00E+00
zr109	.00E+00	.00E+00	.00E+00	.00E+00
nb109	.00E+00	.00E+00	.00E+00	.00E+00
mo109	.00E+00	.00E+00	.00E+00	.00E+00
tc109	.00E+00	.00E+00	.00E+00	.00E+00
ru109	.00E+00	.00E+00	.00E+00	.00E+00
rh109	.00E+00	.00E+00	.00E+00	.00E+00
rh109m	.00E+00	.00E+00	.00E+00	.00E+00
pd109	.00E+00	.00E+00	.00E+00	.00E+00
pd109m	.00E+00	.00E+00	.00E+00	.00E+00
ag109	.00E+00	.00E+00	.00E+00	.00E+00
ag109m	.00E+00	.00E+00	.00E+00	.00E+00
cd109	.00E+00	.00E+00	.00E+00	.00E+00
nb110	.00E+00	.00E+00	.00E+00	.00E+00
mo110	.00E+00	.00E+00	.00E+00	.00E+00
tc110	.00E+00	.00E+00	.00E+00	.00E+00
ru110	.00E+00	.00E+00	.00E+00	.00E+00
rh110	.00E+00	.00E+00	.00E+00	.00E+00
rh110m	.00E+00	.00E+00	.00E+00	.00E+00
pd110	.00E+00	.00E+00	.00E+00	.00E+00

ag110 .00E+00 .00E+00 .00E+00 .00E+00
 ag110m .00E+00 .00E+00 .00E+00 .00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
cd110	.00E+00	.00E+00	.00E+00	.00E+00
nb111	.00E+00	.00E+00	.00E+00	.00E+00
mo111	.00E+00	.00E+00	.00E+00	.00E+00
tc111	.00E+00	.00E+00	.00E+00	.00E+00
ru111	.00E+00	.00E+00	.00E+00	.00E+00
rh111	.00E+00	.00E+00	.00E+00	.00E+00
pd111	.00E+00	.00E+00	.00E+00	.00E+00
pd111m	.00E+00	.00E+00	.00E+00	.00E+00
ag111	.00E+00	.00E+00	.00E+00	.00E+00
ag111m	.00E+00	.00E+00	.00E+00	.00E+00
cd111	.00E+00	.00E+00	.00E+00	.00E+00
cd111m	.00E+00	.00E+00	.00E+00	.00E+00
nb112	.00E+00	.00E+00	.00E+00	.00E+00
mo112	.00E+00	.00E+00	.00E+00	.00E+00
tc112	.00E+00	.00E+00	.00E+00	.00E+00
ru112	.00E+00	.00E+00	.00E+00	.00E+00
rh112	.00E+00	.00E+00	.00E+00	.00E+00
pd112	.00E+00	.00E+00	.00E+00	.00E+00
ag112	.00E+00	.00E+00	.00E+00	.00E+00
cd112	.00E+00	.00E+00	.00E+00	.00E+00
mo113	.00E+00	.00E+00	.00E+00	.00E+00
tc113	.00E+00	.00E+00	.00E+00	.00E+00
ru113	.00E+00	.00E+00	.00E+00	.00E+00
rh113	.00E+00	.00E+00	.00E+00	.00E+00
pd113	.00E+00	.00E+00	.00E+00	.00E+00
ag113	.00E+00	.00E+00	.00E+00	.00E+00
ag113m	.00E+00	.00E+00	.00E+00	.00E+00
cd113	6.67E-14	6.67E-14	6.67E-14	6.67E-14
cd113m	.00E+00	.00E+00	.00E+00	.00E+00
in113	.00E+00	.00E+00	.00E+00	.00E+00
in113m	.00E+00	.00E+00	.00E+00	.00E+00
mo114	.00E+00	.00E+00	.00E+00	.00E+00
tc114	.00E+00	.00E+00	.00E+00	.00E+00
ru114	.00E+00	.00E+00	.00E+00	.00E+00
rh114	.00E+00	.00E+00	.00E+00	.00E+00
pd114	.00E+00	.00E+00	.00E+00	.00E+00
ag114	.00E+00	.00E+00	.00E+00	.00E+00
cd114	.00E+00	.00E+00	.00E+00	.00E+00
in114	.00E+00	.00E+00	.00E+00	.00E+00
in114m	.00E+00	.00E+00	.00E+00	.00E+00
sn114	.00E+00	.00E+00	.00E+00	.00E+00
mo115	.00E+00	.00E+00	.00E+00	.00E+00
tc115	.00E+00	.00E+00	.00E+00	.00E+00
ru115	.00E+00	.00E+00	.00E+00	.00E+00
rh115	.00E+00	.00E+00	.00E+00	.00E+00
pd115	.00E+00	.00E+00	.00E+00	.00E+00
ag115	.00E+00	.00E+00	.00E+00	.00E+00
ag115m	.00E+00	.00E+00	.00E+00	.00E+00
cd115	.00E+00	.00E+00	.00E+00	.00E+00
cd115m	.00E+00	.00E+00	.00E+00	.00E+00
in115	1.18E-11	1.18E-11	1.18E-11	1.18E-11
in115m	.00E+00	.00E+00	.00E+00	.00E+00

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0 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 232
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

	initial	300000. yr	500000. yr	999999. yr
sn115	.00E+00	.00E+00	.00E+00	.00E+00
tc116	.00E+00	.00E+00	.00E+00	.00E+00
ru116	.00E+00	.00E+00	.00E+00	.00E+00
rh116	.00E+00	.00E+00	.00E+00	.00E+00
pd116	.00E+00	.00E+00	.00E+00	.00E+00
ag116	.00E+00	.00E+00	.00E+00	.00E+00
ag116m	.00E+00	.00E+00	.00E+00	.00E+00
cd116	.00E+00	.00E+00	.00E+00	.00E+00
in116	.00E+00	.00E+00	.00E+00	.00E+00
in116m	.00E+00	.00E+00	.00E+00	.00E+00
sn116	.00E+00	.00E+00	.00E+00	.00E+00
tc117	.00E+00	.00E+00	.00E+00	.00E+00
ru117	.00E+00	.00E+00	.00E+00	.00E+00
rh117	.00E+00	.00E+00	.00E+00	.00E+00
pd117	.00E+00	.00E+00	.00E+00	.00E+00
ag117	.00E+00	.00E+00	.00E+00	.00E+00
ag117m	.00E+00	.00E+00	.00E+00	.00E+00
cd117	.00E+00	.00E+00	.00E+00	.00E+00
cd117m	.00E+00	.00E+00	.00E+00	.00E+00
in117	.00E+00	.00E+00	.00E+00	.00E+00
in117m	.00E+00	.00E+00	.00E+00	.00E+00
sn117	.00E+00	.00E+00	.00E+00	.00E+00
sn117m	.00E+00	.00E+00	.00E+00	.00E+00
tc118	.00E+00	.00E+00	.00E+00	.00E+00
ru118	.00E+00	.00E+00	.00E+00	.00E+00
rh118	.00E+00	.00E+00	.00E+00	.00E+00
pd118	.00E+00	.00E+00	.00E+00	.00E+00
ag118	.00E+00	.00E+00	.00E+00	.00E+00
ag118m	.00E+00	.00E+00	.00E+00	.00E+00
cd118	.00E+00	.00E+00	.00E+00	.00E+00
in118	.00E+00	.00E+00	.00E+00	.00E+00
in118m	.00E+00	.00E+00	.00E+00	.00E+00
sn118	.00E+00	.00E+00	.00E+00	.00E+00
ru119	.00E+00	.00E+00	.00E+00	.00E+00
rh119	.00E+00	.00E+00	.00E+00	.00E+00
pd119	.00E+00	.00E+00	.00E+00	.00E+00
ag119	.00E+00	.00E+00	.00E+00	.00E+00
cd119	.00E+00	.00E+00	.00E+00	.00E+00
cd119m	.00E+00	.00E+00	.00E+00	.00E+00
in119	.00E+00	.00E+00	.00E+00	.00E+00
in119m	.00E+00	.00E+00	.00E+00	.00E+00
sn119	.00E+00	.00E+00	.00E+00	.00E+00
sn119m	.00E+00	.00E+00	.00E+00	.00E+00
ru120	.00E+00	.00E+00	.00E+00	.00E+00
rh120	.00E+00	.00E+00	.00E+00	.00E+00
pd120	.00E+00	.00E+00	.00E+00	.00E+00
ag120	.00E+00	.00E+00	.00E+00	.00E+00
cd120	.00E+00	.00E+00	.00E+00	.00E+00
in120	.00E+00	.00E+00	.00E+00	.00E+00
in120m	.00E+00	.00E+00	.00E+00	.00E+00
sn120	.00E+00	.00E+00	.00E+00	.00E+00
rh121	.00E+00	.00E+00	.00E+00	.00E+00

1 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle fission products page 233
0 nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

	initial	300000.	yr500000.	yr999999.	yr
pd121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in121m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn121m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb121	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in122m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb122m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te122	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rh123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in123m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn123m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb123	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te123	3.96E-16	3.96E-16	3.96E-16	3.96E-16	3.96E-16
te123m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb124m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te124	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in125m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn125m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sb125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te125	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
te125m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pd126	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ag126	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cd126	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
in126	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sn126	3.05E-02	2.16E-02	5.39E-03	1.69E-04	

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products page 234

	initial	300000.	yr500000.	yr999999.	yr
sb126	4.27E-03	3.02E-03	7.55E-04	2.36E-05	
sb126m	3.05E-02	2.16E-02	5.39E-03	1.69E-04	

te126	.00E+00	.00E+00	.00E+00	.00E+00
xe126	.00E+00	.00E+00	.00E+00	.00E+00
ag127	.00E+00	.00E+00	.00E+00	.00E+00
cd127	.00E+00	.00E+00	.00E+00	.00E+00
in127	.00E+00	.00E+00	.00E+00	.00E+00
in127m	.00E+00	.00E+00	.00E+00	.00E+00
sn127	.00E+00	.00E+00	.00E+00	.00E+00
sn127m	.00E+00	.00E+00	.00E+00	.00E+00
sb127	.00E+00	.00E+00	.00E+00	.00E+00
te127	.00E+00	.00E+00	.00E+00	.00E+00
te127m	.00E+00	.00E+00	.00E+00	.00E+00
i127	.00E+00	.00E+00	.00E+00	.00E+00
xe127	.00E+00	.00E+00	.00E+00	.00E+00
ag128	.00E+00	.00E+00	.00E+00	.00E+00
cd128	.00E+00	.00E+00	.00E+00	.00E+00
in128	.00E+00	.00E+00	.00E+00	.00E+00
sn128	.00E+00	.00E+00	.00E+00	.00E+00
sb128	.00E+00	.00E+00	.00E+00	.00E+00
sb128m	.00E+00	.00E+00	.00E+00	.00E+00
te128	.00E+00	.00E+00	.00E+00	.00E+00
i128	.00E+00	.00E+00	.00E+00	.00E+00
xe128	.00E+00	.00E+00	.00E+00	.00E+00
cd129	.00E+00	.00E+00	.00E+00	.00E+00
in129	.00E+00	.00E+00	.00E+00	.00E+00
sn129	.00E+00	.00E+00	.00E+00	.00E+00
sn129m	.00E+00	.00E+00	.00E+00	.00E+00
sb129	.00E+00	.00E+00	.00E+00	.00E+00
te129	.00E+00	.00E+00	.00E+00	.00E+00
te129m	.00E+00	.00E+00	.00E+00	.00E+00
i129	2.15E-02	2.15E-02	2.13E-02	2.08E-02
xe129	.00E+00	.00E+00	.00E+00	.00E+00
xe129m	.00E+00	.00E+00	.00E+00	.00E+00
cd130	.00E+00	.00E+00	.00E+00	.00E+00
in130	.00E+00	.00E+00	.00E+00	.00E+00
sn130	.00E+00	.00E+00	.00E+00	.00E+00
sb130	.00E+00	.00E+00	.00E+00	.00E+00
sb130m	.00E+00	.00E+00	.00E+00	.00E+00
te130	.00E+00	.00E+00	.00E+00	.00E+00
i130	.00E+00	.00E+00	.00E+00	.00E+00
i130m	.00E+00	.00E+00	.00E+00	.00E+00
xe130	.00E+00	.00E+00	.00E+00	.00E+00
cd131	.00E+00	.00E+00	.00E+00	.00E+00
in131	.00E+00	.00E+00	.00E+00	.00E+00
sn131	.00E+00	.00E+00	.00E+00	.00E+00
sb131	.00E+00	.00E+00	.00E+00	.00E+00
te131	.00E+00	.00E+00	.00E+00	.00E+00
te131m	.00E+00	.00E+00	.00E+00	.00E+00
i131	.00E+00	.00E+00	.00E+00	.00E+00
xe131	.00E+00	.00E+00	.00E+00	.00E+00
xe131m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
cd132	.00E+00	.00E+00	.00E+00	.00E+00
in132	.00E+00	.00E+00	.00E+00	.00E+00
sn132	.00E+00	.00E+00	.00E+00	.00E+00
sb132	.00E+00	.00E+00	.00E+00	.00E+00
sb132m	.00E+00	.00E+00	.00E+00	.00E+00

te132	.00E+00	.00E+00	.00E+00	.00E+00
i132	.00E+00	.00E+00	.00E+00	.00E+00
xe132	.00E+00	.00E+00	.00E+00	.00E+00
cs132	.00E+00	.00E+00	.00E+00	.00E+00
ba132	.00E+00	.00E+00	.00E+00	.00E+00
in133	.00E+00	.00E+00	.00E+00	.00E+00
sn133	.00E+00	.00E+00	.00E+00	.00E+00
sb133	.00E+00	.00E+00	.00E+00	.00E+00
te133	.00E+00	.00E+00	.00E+00	.00E+00
te133m	.00E+00	.00E+00	.00E+00	.00E+00
i133	.00E+00	.00E+00	.00E+00	.00E+00
i133m	.00E+00	.00E+00	.00E+00	.00E+00
xe133	.00E+00	.00E+00	.00E+00	.00E+00
xe133m	.00E+00	.00E+00	.00E+00	.00E+00
cs133	.00E+00	.00E+00	.00E+00	.00E+00
ba133	.00E+00	.00E+00	.00E+00	.00E+00
in134	.00E+00	.00E+00	.00E+00	.00E+00
sn134	.00E+00	.00E+00	.00E+00	.00E+00
sb134	.00E+00	.00E+00	.00E+00	.00E+00
sb134m	.00E+00	.00E+00	.00E+00	.00E+00
te134	.00E+00	.00E+00	.00E+00	.00E+00
i134	.00E+00	.00E+00	.00E+00	.00E+00
i134m	.00E+00	.00E+00	.00E+00	.00E+00
xe134	.00E+00	.00E+00	.00E+00	.00E+00
xe134m	.00E+00	.00E+00	.00E+00	.00E+00
cs134	.00E+00	.00E+00	.00E+00	.00E+00
cs134m	.00E+00	.00E+00	.00E+00	.00E+00
ba134	.00E+00	.00E+00	.00E+00	.00E+00
sn135	.00E+00	.00E+00	.00E+00	.00E+00
sb135	.00E+00	.00E+00	.00E+00	.00E+00
te135	.00E+00	.00E+00	.00E+00	.00E+00
i135	.00E+00	.00E+00	.00E+00	.00E+00
xe135	.00E+00	.00E+00	.00E+00	.00E+00
xe135m	.00E+00	.00E+00	.00E+00	.00E+00
cs135	1.13E+00	1.11E+00	1.04E+00	8.97E-01
cs135m	.00E+00	.00E+00	.00E+00	.00E+00
ba135	.00E+00	.00E+00	.00E+00	.00E+00
ba135m	.00E+00	.00E+00	.00E+00	.00E+00
sn136	.00E+00	.00E+00	.00E+00	.00E+00
sb136	.00E+00	.00E+00	.00E+00	.00E+00
te136	.00E+00	.00E+00	.00E+00	.00E+00
i136	.00E+00	.00E+00	.00E+00	.00E+00
i136m	.00E+00	.00E+00	.00E+00	.00E+00
xe136	.00E+00	.00E+00	.00E+00	.00E+00
cs136	.00E+00	.00E+00	.00E+00	.00E+00
ba136	.00E+00	.00E+00	.00E+00	.00E+00
ba136m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sb137	.00E+00	.00E+00	.00E+00	.00E+00
te137	.00E+00	.00E+00	.00E+00	.00E+00
i137	.00E+00	.00E+00	.00E+00	.00E+00
xe137	.00E+00	.00E+00	.00E+00	.00E+00
cs137	.00E+00	.00E+00	.00E+00	.00E+00
ba137	.00E+00	.00E+00	.00E+00	.00E+00
ba137m	.00E+00	.00E+00	.00E+00	.00E+00
sb138	.00E+00	.00E+00	.00E+00	.00E+00

te138	.00E+00	.00E+00	.00E+00	.00E+00
i138	.00E+00	.00E+00	.00E+00	.00E+00
xe138	.00E+00	.00E+00	.00E+00	.00E+00
cs138	.00E+00	.00E+00	.00E+00	.00E+00
cs138m	.00E+00	.00E+00	.00E+00	.00E+00
ba138	.00E+00	.00E+00	.00E+00	.00E+00
la138	1.44E-10	1.44E-10	1.44E-10	1.44E-10
sb139	.00E+00	.00E+00	.00E+00	.00E+00
te139	.00E+00	.00E+00	.00E+00	.00E+00
i139	.00E+00	.00E+00	.00E+00	.00E+00
xe139	.00E+00	.00E+00	.00E+00	.00E+00
cs139	.00E+00	.00E+00	.00E+00	.00E+00
ba139	.00E+00	.00E+00	.00E+00	.00E+00
la139	.00E+00	.00E+00	.00E+00	.00E+00
ce139	.00E+00	.00E+00	.00E+00	.00E+00
pr139	.00E+00	.00E+00	.00E+00	.00E+00
te140	.00E+00	.00E+00	.00E+00	.00E+00
i140.	.00E+00	.00E+00	.00E+00	.00E+00
xe140	.00E+00	.00E+00	.00E+00	.00E+00
cs140	.00E+00	.00E+00	.00E+00	.00E+00
ba140	.00E+00	.00E+00	.00E+00	.00E+00
la140	.00E+00	.00E+00	.00E+00	.00E+00
ce140	.00E+00	.00E+00	.00E+00	.00E+00
pr140	.00E+00	.00E+00	.00E+00	.00E+00
te141	.00E+00	.00E+00	.00E+00	.00E+00
i141	.00E+00	.00E+00	.00E+00	.00E+00
xe141	.00E+00	.00E+00	.00E+00	.00E+00
cs141	.00E+00	.00E+00	.00E+00	.00E+00
ba141	.00E+00	.00E+00	.00E+00	.00E+00
la141	.00E+00	.00E+00	.00E+00	.00E+00
ce141	.00E+00	.00E+00	.00E+00	.00E+00
pr141	.00E+00	.00E+00	.00E+00	.00E+00
nd141	.00E+00	.00E+00	.00E+00	.00E+00
te142	.00E+00	.00E+00	.00E+00	.00E+00
i142	.00E+00	.00E+00	.00E+00	.00E+00
xe142	.00E+00	.00E+00	.00E+00	.00E+00
cs142	.00E+00	.00E+00	.00E+00	.00E+00
ba142	.00E+00	.00E+00	.00E+00	.00E+00
la142	.00E+00	.00E+00	.00E+00	.00E+00
ce142	2.37E-05	2.37E-05	2.37E-05	2.37E-05
pr142	.00E+00	.00E+00	.00E+00	.00E+00
pr142m	.00E+00	.00E+00	.00E+00	.00E+00
nd142	.00E+00	.00E+00	.00E+00	.00E+00
i143	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
xe143	.00E+00	.00E+00	.00E+00	.00E+00
cs143	.00E+00	.00E+00	.00E+00	.00E+00
ba143	.00E+00	.00E+00	.00E+00	.00E+00
la143	.00E+00	.00E+00	.00E+00	.00E+00
ce143	.00E+00	.00E+00	.00E+00	.00E+00
pr143	.00E+00	.00E+00	.00E+00	.00E+00
nd143	.00E+00	.00E+00	.00E+00	.00E+00
i144	.00E+00	.00E+00	.00E+00	.00E+00
xe144	.00E+00	.00E+00	.00E+00	.00E+00
cs144	.00E+00	.00E+00	.00E+00	.00E+00
ba144	.00E+00	.00E+00	.00E+00	.00E+00

la144	.00E+00	.00E+00	.00E+00	.00E+00
ce144	.00E+00	.00E+00	.00E+00	.00E+00
pr144	.00E+00	.00E+00	.00E+00	.00E+00
pr144m	.00E+00	.00E+00	.00E+00	.00E+00
nd144	1.15E-09	1.15E-09	1.15E-09	1.15E-09
i145	.00E+00	.00E+00	.00E+00	.00E+00
xe145	.00E+00	.00E+00	.00E+00	.00E+00
cs145	.00E+00	.00E+00	.00E+00	.00E+00
ba145	.00E+00	.00E+00	.00E+00	.00E+00
la145	.00E+00	.00E+00	.00E+00	.00E+00
ce145	.00E+00	.00E+00	.00E+00	.00E+00
pr145	.00E+00	.00E+00	.00E+00	.00E+00
nd145	.00E+00	.00E+00	.00E+00	.00E+00
pm145	.00E+00	.00E+00	.00E+00	.00E+00
sm145	.00E+00	.00E+00	.00E+00	.00E+00
xe146	.00E+00	.00E+00	.00E+00	.00E+00
cs146	.00E+00	.00E+00	.00E+00	.00E+00
ba146	.00E+00	.00E+00	.00E+00	.00E+00
la146	.00E+00	.00E+00	.00E+00	.00E+00
ce146	.00E+00	.00E+00	.00E+00	.00E+00
pr146	.00E+00	.00E+00	.00E+00	.00E+00
nd146	.00E+00	.00E+00	.00E+00	.00E+00
pm146	.00E+00	.00E+00	.00E+00	.00E+00
sm146	1.99E-08	1.99E-08	1.98E-08	1.98E-08
xe147	.00E+00	.00E+00	.00E+00	.00E+00
cs147	.00E+00	.00E+00	.00E+00	.00E+00
ba147	.00E+00	.00E+00	.00E+00	.00E+00
la147	.00E+00	.00E+00	.00E+00	.00E+00
ce147	.00E+00	.00E+00	.00E+00	.00E+00
pr147	.00E+00	.00E+00	.00E+00	.00E+00
nd147	.00E+00	.00E+00	.00E+00	.00E+00
pm147	.00E+00	.00E+00	.00E+00	.00E+00
sm147	8.92E-06	8.92E-06	8.92E-06	8.92E-06
cs148	.00E+00	.00E+00	.00E+00	.00E+00
ba148	.00E+00	.00E+00	.00E+00	.00E+00
la148	.00E+00	.00E+00	.00E+00	.00E+00
ce148	.00E+00	.00E+00	.00E+00	.00E+00
pr148	.00E+00	.00E+00	.00E+00	.00E+00
nd148	.00E+00	.00E+00	.00E+00	.00E+00
pm148	.00E+00	.00E+00	.00E+00	.00E+00
pm148m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000	yr500000	yr999999	yr
sm148	2.64E-12	2.64E-12	2.64E-12	2.64E-12	2.64E-12
cs149	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba149	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
la149	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ce149	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pr149	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
nd149	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pm149	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sm149	2.11E-12	2.11E-12	2.11E-12	2.11E-12	2.11E-12
eu149	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cs150	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ba150	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
la150	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ce150	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

pr150	.00E+00	.00E+00	.00E+00	.00E+00
nd150	.00E+00	.00E+00	.00E+00	.00E+00
pm150	.00E+00	.00E+00	.00E+00	.00E+00
sm150	.00E+00	.00E+00	.00E+00	.00E+00
eu150	.00E+00	.00E+00	.00E+00	.00E+00
ba151	.00E+00	.00E+00	.00E+00	.00E+00
la151	.00E+00	.00E+00	.00E+00	.00E+00
ce151	.00E+00	.00E+00	.00E+00	.00E+00
pr151	.00E+00	.00E+00	.00E+00	.00E+00
nd151	.00E+00	.00E+00	.00E+00	.00E+00
pm151	.00E+00	.00E+00	.00E+00	.00E+00
sm151	.00E+00	.00E+00	.00E+00	.00E+00
eu151	.00E+00	.00E+00	.00E+00	.00E+00
ba152	.00E+00	.00E+00	.00E+00	.00E+00
la152	.00E+00	.00E+00	.00E+00	.00E+00
ce152	.00E+00	.00E+00	.00E+00	.00E+00
pr152	.00E+00	.00E+00	.00E+00	.00E+00
nd152	.00E+00	.00E+00	.00E+00	.00E+00
pm152	.00E+00	.00E+00	.00E+00	.00E+00
pm152m	.00E+00	.00E+00	.00E+00	.00E+00
sm152	.00E+00	.00E+00	.00E+00	.00E+00
eu152	.00E+00	.00E+00	.00E+00	.00E+00
eu152m	.00E+00	.00E+00	.00E+00	.00E+00
gd152	4.39E-10	4.39E-10	4.39E-10	4.39E-10
la153	.00E+00	.00E+00	.00E+00	.00E+00
ce153	.00E+00	.00E+00	.00E+00	.00E+00
pr153	.00E+00	.00E+00	.00E+00	.00E+00
nd153	.00E+00	.00E+00	.00E+00	.00E+00
pm153	.00E+00	.00E+00	.00E+00	.00E+00
sm153	.00E+00	.00E+00	.00E+00	.00E+00
eu153	.00E+00	.00E+00	.00E+00	.00E+00
gd153	.00E+00	.00E+00	.00E+00	.00E+00
la154	.00E+00	.00E+00	.00E+00	.00E+00
ce154	.00E+00	.00E+00	.00E+00	.00E+00
pr154	.00E+00	.00E+00	.00E+00	.00E+00
nd154	.00E+00	.00E+00	.00E+00	.00E+00
pm154	.00E+00	.00E+00	.00E+00	.00E+00
pm154m	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
 nuclide radioactivity, curies
 basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000. yr	500000. yr	999999. yr
sm154	.00E+00	.00E+00	.00E+00	.00E+00
eu154	.00E+00	.00E+00	.00E+00	.00E+00
gd154	.00E+00	.00E+00	.00E+00	.00E+00
la155	.00E+00	.00E+00	.00E+00	.00E+00
ce155	.00E+00	.00E+00	.00E+00	.00E+00
pr155	.00E+00	.00E+00	.00E+00	.00E+00
nd155	.00E+00	.00E+00	.00E+00	.00E+00
pm155	.00E+00	.00E+00	.00E+00	.00E+00
sm155	.00E+00	.00E+00	.00E+00	.00E+00
eu155	.00E+00	.00E+00	.00E+00	.00E+00
gd155m	.00E+00	.00E+00	.00E+00	.00E+00
gd155	.00E+00	.00E+00	.00E+00	.00E+00
ce156	.00E+00	.00E+00	.00E+00	.00E+00
pr156	.00E+00	.00E+00	.00E+00	.00E+00
nd156	.00E+00	.00E+00	.00E+00	.00E+00
pm156	.00E+00	.00E+00	.00E+00	.00E+00
sm156	.00E+00	.00E+00	.00E+00	.00E+00

eu156	.00E+00	.00E+00	.00E+00	.00E+00
gd156	.00E+00	.00E+00	.00E+00	.00E+00
ce157	.00E+00	.00E+00	.00E+00	.00E+00
pr157	.00E+00	.00E+00	.00E+00	.00E+00
nd157	.00E+00	.00E+00	.00E+00	.00E+00
pm157	.00E+00	.00E+00	.00E+00	.00E+00
sm157	.00E+00	.00E+00	.00E+00	.00E+00
eu157	.00E+00	.00E+00	.00E+00	.00E+00
gd157	.00E+00	.00E+00	.00E+00	.00E+00
pr158	.00E+00	.00E+00	.00E+00	.00E+00
nd158	.00E+00	.00E+00	.00E+00	.00E+00
pm158	.00E+00	.00E+00	.00E+00	.00E+00
sm158	.00E+00	.00E+00	.00E+00	.00E+00
eu158	.00E+00	.00E+00	.00E+00	.00E+00
gd158	.00E+00	.00E+00	.00E+00	.00E+00
pr159	.00E+00	.00E+00	.00E+00	.00E+00
nd159	.00E+00	.00E+00	.00E+00	.00E+00
pm159	.00E+00	.00E+00	.00E+00	.00E+00
sm159	.00E+00	.00E+00	.00E+00	.00E+00
eu159	.00E+00	.00E+00	.00E+00	.00E+00
gd159	.00E+00	.00E+00	.00E+00	.00E+00
tb159	.00E+00	.00E+00	.00E+00	.00E+00
nd160	.00E+00	.00E+00	.00E+00	.00E+00
pm160	.00E+00	.00E+00	.00E+00	.00E+00
sm160	.00E+00	.00E+00	.00E+00	.00E+00
eu160	.00E+00	.00E+00	.00E+00	.00E+00
gd160	.00E+00	.00E+00	.00E+00	.00E+00
tb160	.00E+00	.00E+00	.00E+00	.00E+00
dy160	.00E+00	.00E+00	.00E+00	.00E+00
nd161	.00E+00	.00E+00	.00E+00	.00E+00
pm161	.00E+00	.00E+00	.00E+00	.00E+00
sm161	.00E+00	.00E+00	.00E+00	.00E+00
eu161	.00E+00	.00E+00	.00E+00	.00E+00
gd161	.00E+00	.00E+00	.00E+00	.00E+00
tb161	.00E+00	.00E+00	.00E+00	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
nuclide radioactivity, curies
basis =per critical mass 10.1 MT UO2

fission products

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	initial	300000	yr500000	yr999999	yr
dy161	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pm162	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sm162	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
eu162	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
gd162	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb162	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb162m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy162	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sm163	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
eu163	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
gd163	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb163	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb163m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy163	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sm164	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
eu164	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
gd164	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tb164	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
dy164	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
sm165	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

```

eu165 .00E+00 .00E+00 .00E+00 .00E+00
gd165 .00E+00 .00E+00 .00E+00 .00E+00
tb165 .00E+00 .00E+00 .00E+00 .00E+00
dy165 .00E+00 .00E+00 .00E+00 .00E+00
dy165m .00E+00 .00E+00 .00E+00 .00E+00
ho165 .00E+00 .00E+00 .00E+00 .00E+00
dy166 .00E+00 .00E+00 .00E+00 .00E+00
ho166 .00E+00 .00E+00 .00E+00 .00E+00
ho166m .00E+00 .00E+00 .00E+00 .00E+00
er166 .00E+00 .00E+00 .00E+00 .00E+00
er167 .00E+00 .00E+00 .00E+00 .00E+00
er167m .00E+00 .00E+00 .00E+00 .00E+00
er168 .00E+00 .00E+00 .00E+00 .00E+00
yb168 .00E+00 .00E+00 .00E+00 .00E+00
er169 .00E+00 .00E+00 .00E+00 .00E+00
tm169 .00E+00 .00E+00 .00E+00 .00E+00
yb169 .00E+00 .00E+00 .00E+00 .00E+00
er170 .00E+00 .00E+00 .00E+00 .00E+00
tm170 .00E+00 .00E+00 .00E+00 .00E+00
tm170m .00E+00 .00E+00 .00E+00 .00E+00
yb170 .00E+00 .00E+00 .00E+00 .00E+00
er171 .00E+00 .00E+00 .00E+00 .00E+00
tm171 .00E+00 .00E+00 .00E+00 .00E+00
yb171 .00E+00 .00E+00 .00E+00 .00E+00
er172 .00E+00 .00E+00 .00E+00 .00E+00
tm172 .00E+00 .00E+00 .00E+00 .00E+00
yb172 .00E+00 .00E+00 .00E+00 .00E+00
total 7.95E+00 7.16E+00 4.97E+00 2.78E+00
    
```

1 * normal termination of execution *
0
0

table of contents for material tables
case or subcase printed page

1	1
2	41
3	81
4	121
5	161
6	201

Ondset	33										
	21	4	1	27	6	0	0	0	0	0	0
	0	0	0	0	0	0	-1	1698	690	130	
	880	7935	0	5	99	3	13	96	18	18	
	18	0	71								

```

0 35$ array 1 entries read
0 0t
54$$ a8 1 e
56$$ 0 7 a5 1 a13 -1 a15 3 0 4 e 5t
0 56$ array 20 entries read
0 5t
l90 97344
l116 60787
l32 33663 nadata (library) storage size
l44 33734
l103 75921
61** f1-20
65$$ a4 1 2z 1 2z 1 5z 1 2z 1
a25 1 2z 1 2z 1 5z 1 2z 1
a46 1 2z 1 2z 1 5z 1 2z 1 e
0 60* array 7 entries read
0 65$ array 63 entries read
    
```

```

0 6t
  l140 66851
  used 100723 in size 150000
0jopt
  0 12
  0 0 0 0 0 0 0 0 0 0 0
  0 0
Otherm
  5.272101E-01 4
  3.663942E-01 2.909018E+00 1.000000E-25
0non
  5
  7935 20 6 18 1697
0mmn
  0 19 7 0 0 1 1 0 0 0 0
  21 100 -1 4 3 0 4 0 0
0tconst
  5
  8.640000E+04 .000000E+00 .000000E+00 .000000E+00 5.000000E-02
0mzero
  4
  0 689 129 879
0pow
  3
  .000000E+00 .000000E+00 .000000E+00
0 linp
  9
  6 0 51 26 2 3000 1000 1697 5
0 case or subcase 1 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
  56$$ 0 -6 a10 1 e t
0 56$ array 20 entries read
0 57* array 5 entries read
0 5t
  l90 102444
  l116 66199
  l32 33663 nudata (library) storage size
  l44 33734
  l103 81099
  61** f1-20
  65$$ a4 1 2z 1 2z 1 5z 1 2z 1
  a25 1 2z 1 2z 1 5z 1 2z 1
  a46 1 2z 1 2z 1 5z 1 2z 1 e
0 60* array 10 entries read
0 65$ array 63 entries read
0 6t
  l140 71957
  used 107068 in size 150000
0jopt
  0 12
  0 0 0 0 0 0 0 0 0 0 0
  0 0
Otherm
  5.272101E-01 4
  3.663942E-01 2.909018E+00 1.000000E-25
0non
  5
  7935 20 6 18 1697
0mmn
  0 19 10 0 0 1 1 0 0 0 0
  21 100 0 5 0 0 4 0 0
0tconst
  5
  3.156000E+07 1.000000E+01 2.300000E+01 .000000E+00 5.000000E-02
0mzero
  4
  18 689 129 879
0pow
  3
  .000000E+00 .000000E+00 .000000E+00
0 linp
  9
  6 0 51 26 2 3000 1000 1697 5
0 case or subcase 2 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ array 20 entries read

```

```

0 57* array      5 entries read
0 5t
  l90 102444
  l116 66199
  l32 33663 nudata (library) storage size
  l44 33734
  l103 81099
  61** f1-20
0 60* array      10 entries read
0 65$ array      63 entries read
0 6t
  l140 71957
  used 107068 in size 150000
0jopt
  0 12
  0 0 0 0 0 0 0 0 0 0 0
0therm
  5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non
  7935 5 20 6 18 1697
0mmn
  0 19 10 0 0 1 1 0 0 0 10
  21 100 0 5 0 0 4 0 0
0tconst
  3.156000E+07 4.000000E+02 2.800000E+01 .000000E+00 5.000000E-02
0mzero
  21 4 689 129 879
0pow
  .000000E+00 .000000E+00 .000000E+00
0 lnp
  6 9 0 51 26 2 3000 1000 1697 5
0 case or subcase 3 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ array      20 entries read
0 57* array      5 entries read
0 5t
  l90 102444
  l116 66199
  l32 33663 nudata (library) storage size
  l44 33734
  l103 81099
  61** f1-20
0 60* array      10 entries read
0 65$ array      63 entries read
0 6t
  l140 71957
  used 107068 in size 150000
0jopt
  0 12
  0 0 0 0 0 0 0 0 0 0 0
0therm
  5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non
  7935 5 20 6 18 1697
0mmn
  0 19 10 0 0 1 1 0 0 0 10
  21 100 0 5 0 0 4 0 0
0tconst
  3.156000E+07 1.600000E+04 2.500000E+01 .000000E+00 5.000000E-02
0mzero
  21 4 689 129 879

```

```

Opow      3
.000000E+00 .000000E+00 .000000E+00
0 lnp      9
      6      0      51      26      2      3000      1000      1697      5
0 case or subcase 4 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ array      20 entries read
0 57* array      5 entries read
0 5t
  190 102444
  1116 66199
  132 33663 nudata (library) storage size
  144 33734
  1103 81099
  61** f1-20
0 60* array      10 entries read
0 65$ array      63 entries read
0 6t
  1140 71957
  used 107068 in size 150000
0jopt      12
      0      0      0      0      0      0      0      0      0
      0      0
0therm      4
5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non      5
      7935      20      6      18      1697
0mmn      19
      0      10      0      0      1      0      0      0      10
      21      100      0      5      0      4      0
0tconst      5
3.156000E+07 3.800000E+04 2.500000E+01 .000000E+00 5.000000E-02
0mzero      4
      21      689      129      879
Opow      3
.000000E+00 .000000E+00 .000000E+00
0 lnp      9
      6      0      51      26      2      3000      1000      1697      5
0 case or subcase 5 Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 100k year cycle
0 56$ array      20 entries read
0 57* array      5 entries read
0 5t
  190 90544
  1116 53571
  132 33663 nudata (library) storage size
  144 33734
  1103 69017
  61** f1-20
0 60* array      3 entries read
0 65$ array      63 entries read
0 6t
  1140 60057
  used 92263 in size 150000
0jopt      12
      0      0      0      0      0      0      0      0      0
      0      0
0therm      4
5.272101E-01 3.663942E-01 2.909018E+00 1.000000E-25
0non      5
      7935      20      6      18      1697
0mmn      19

```


1mcpn version 4a ld=10/01/93 08/29/96 17:16:39

probid = 08/29/96 17:16:39

inp=sp40e1 outp=sp40e10

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1) 1000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 7.48784-2 -1 IMP:N=1
7- 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c 1000 yr critical
23- m1 62149.50c 2.0302E-09
24- 62151.50c 1.9060E-10
25- 60143.50c 2.0165E-08
26- 45103.50c 1.0845E-08
27- 63151.55c 1.2151E-09
28- 64157.50c 1.1152E-11
29- 64155.50c 9.4362E-11
30- 48000.50c 3.2119E-10
31- 54131.50c 9.9667E-09
32- 55133.50c 2.3024E-08
33- 43099.50c 2.0926E-08
34- 62147.50c 7.7393E-09
35- 62152.50c 1.0071E-09
36- 60145.50c 1.3415E-08
37- 42095.50c 2.2139E-08
38- 92233.50c 7.1050E-10
39- 92234.50c 4.8749E-07
40- 92235.53c 3.8398E-05
41- 92236.50c 9.3098E-06
42- 92238.53c 1.9289E-03
43- 93237.50c 2.2324E-06
44- 94239.50c 1.2260E-09
45- 94239.55c 2.5206E-07
46- 94240.50c 1.1983E-09
47- 1001.53c 1.6549-2
48- 8016.53c 4.0446-2
49- 11023.50c 3.9366-4
50- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
51- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
52- mt1 lwtr.03t
53- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
54- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
55- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
56- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
    
```

```

57-      mt2      lwtr.02t
58-      PRINT
1  initial source from file  srctp

original number of points          4109
points not in any cell              0
points in cells of zero importance  0
points in void cells                 0
points in ambiguous cells            0
total points rejected                0
points remaining                     4109
points after expansion or contraction 3998
nominal source size                  4000

initial guess for k(eff.)           1.000000

cycles to skip before tallying       30

number of keff cycles that can be stored 260

total fission nubar data are being used.

```

warning. lwtr.02t and lwtr.03t are both called for.
material composition

print table 40

material number	component nuclide, atom fraction								
1	62149,	.00000	62151,	.00000	60143,	.00000	45103,	.00000	
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000	
	54131,	.00000	55133,	.00000	43099,	.00000	62147,	.00000	
	62152,	.00000	60145,	.00000	42095,	.00000	92233,	.00000	
	92234,	.00001	92235,	.00051	92236,	.00012	92238,	.02576	
	93237,	.00003	94238,	.00000	94239,	.00000	94240,	.00000	
	1001,	.22101	8016,	.54016	11023,	.00526	12000,	.00309	
	13027,	.03482	14000,	.15233	19000,	.00742	20000,	.00761	
	26000,	.00187							
	associated thermal s(a,b) data sets: lwtr.03t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
13027,		.03110	14000,	.13606	19000,	.00663	20000,	.00679	
26000,		.00167							
associated thermal s(a,b) data sets: lwtr.02t									

material number	component nuclide, mass fraction								
1	62149,	.00000	62151,	.00000	60143,	.00000	45103,	.00000	
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000	
	54131,	.00000	55133,	.00000	43099,	.00000	62147,	.00000	
	62152,	.00000	60145,	.00000	42095,	.00000	92233,	.00000	
	92234,	.00007	92235,	.00567	92236,	.00138	92238,	.28834	
	93237,	.00033	94238,	.00000	94239,	.00004	94240,	.00000	
	1001,	.01047	8016,	.40624	11023,	.00568	12000,	.00353	
	13027,	.04417	14000,	.20116	19000,	.01365	20000,	.01433	
	26000,	.00492							
	2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490

13027, .06130 14000, .27919 19000, .01894 20000, .01989
 26000, .00683
 1cell volumes and masses print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	7.48784E-02	2.64442E+00	.00000E+00	1.14940E+07	3.03951E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0 infinite

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1) 1000 Years 600K
 0 probid = 08/29/96 20:06:20
 08/29/96 17:16:39

neutron creation	tracks	weight (per source particle)	energy (per source particle)	neutron loss	tracks	weight (per source particle)	energy (per source particle)
source	519674	1.0006E+00	2.0326E+00	escape	126	1.3718E-04	1.2736E-04
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.3380E-02	4.4399E-05	weight cutoff	519843	6.3632E-02	1.6609E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	3.3583E-07	downscattering	0	0.	1.9288E+00
(n,xn)	588	8.6112E-04	6.6018E-04	capture	0	6.1749E-01	6.3069E-02
fission	0	0.	0.	loss to (n,xn)	293	4.2907E-04	3.6224E-03
total	520262	1.0649E+00	2.0333E+00	loss to fission	0	3.8318E-01	3.7712E-02
				total	520262	1.0649E+00	2.0333E+00

number of neutrons banked 295
 neutron tracks per source particle 1.0011E+00
 neutron collisions per source particle 7.9251E+01
 total neutron collisions 41184790
 net multiplication 1.0004E+00 .0000
 average lifetime, shakes
 escape 2.9292E+04
 capture 9.4549E+03
 capture or escape 9.4576E+03
 any termination 1.0298E+04
 cutoffs
 tco 1.0000E+34
 eco .0000E+00
 wc1 -5.0000E-01
 wc2 -2.5000E-01
 computer time so far in this run 169.26 minutes
 computer time in mcrun 169.20 minutes
 source particles per minute 3.0714E+03
 random numbers generated 477387773
 maximum number ever in bank 2
 bank overflows to backup file 0
 field length 0
 most random numbers used was 11632 in history 510173

range of sampled source weights = 9.3633E-01 to 1.0667E+00
 1neutron activity in each cell print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	602498	519969	33779469	4.7696E+01	3.1733E-04	5.1024E-01	8.0498E-01
2	2	106614	50337	7405321	7.5479E+00	4.6489E-05	2.0115E-01	2.5168E+00
total		709112	570306	41184790	5.5244E+01			1.3153E+00

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1) 1000 Years 600K probid = 08/29/96 17:16:39

the initial fission neutron source distribution was read from the srctp file named srctp .
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 119522 neutron histories and 100 active cycles with 400152 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 519674 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .93949 with an estimated standard deviation of .00097
 the estimated 68, 95, & 99 percent keff confidence intervals are .93852 to .94046, .93756 to .94142, and .93693 to .94205
 the estimated collision/absorption neutron removal lifetime = 9.46E-05 seconds with an estimated standard deviation of 2.00E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.93888	.00149	.93739 to .94037	.93591 to .94184	.93495 to .94281	
absorption	.94002	.00117	.93884 to .94119	.93768 to .94235	.93692 to .94311	
track length	.93915	.00153	.93762 to .94068	.93610 to .94220	.93511 to .94319	
col/absorp	.93959	.00096	.93863 to .94055	.93768 to .94150	.93706 to .94213	.0735
abs/trk len	.93970	.00097	.93873 to .94068	.93777 to .94164	.93714 to .94227	.0761
col/trk len	.93868	.00150	.93719 to .94018	.93570 to .94167	.93473 to .94264	.9889
col/abs/trk len	.93949	.00097	.93852 to .94046	.93756 to .94142	.93693 to .94205	

1mcpn version 4a ld=10/01/93 08/16/96 10:52:15

 inp=sp40f1 outp=sp40f10

probid = 08/16/96 10:52:15

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40f1) 5000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 1 7.48597-2 -1 IMP:N=1
7- 2 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c 5000 yr critical
23- m1 62149.50c 2.7761E-09
24- 62150.50c 1.5868E-08
25- 60143.50c 9.8994E-08
26- 45103.50c 5.5500E-08
27- 63151.55c 5.7285E-09
28- 64157.50c 1.8097E-11
29- 64155.50c 2.3641E-10
30- 48000.50c 1.8479E-09
31- 54131.50c 4.9633E-08
32- 55133.50c 1.1472E-07
33- 43099.50c 1.0383E-07
34- 62147.50c 3.8518E-08
35- 62152.50c 5.8288E-09
36- 60145.50c 6.6530E-08
37- 42095.50c 1.0987E-07
38- 92233.50c 3.4401E-09
39- 92234.50c 5.4119E-07
40- 92235.53c 3.8842E-05
41- 92236.50c 1.0034E-05
42- 92238.53c 2.0287E-03
43- 93237.50c 2.3313E-06
44- 94238.50c 1.2084E-09
45- 94239.55c 1.1354E-06
46- 94240.50c 2.3573E-08
47- 1001.53c 1.6331-2
48- 8016.53c 4.0542-2
49- 11023.50c 3.9366-4
50- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
51- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
52- mt1 lwtr.03t
53- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
54- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
55- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
56- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
  
```

```

57-      . mt2      lwtr.02t
58-      PRINT
1 initial source from file srctp

original number of points          3860
  points not in any cell            0
  points in cells of zero importance 0
  points in void cells              0
  points in ambiguous cells         0
total points rejected              0
points remaining                    3860
points after expansion or contraction 4006
nominal source size                 4000

initial guess for k(eff.)          1.000000

cycles to skip before tallying      30

number of keff cycles that can be stored 260

total fission nubar data are being used.
  
```

warning. lwtr.02t and lwtr.03t are both called for.
 1 material composition

print table 40

material number	component nuclide, atom fraction								
1	62149,	.00000	62150,	.00000	60143,	.00000	45103,	.00000	
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000	
	54131,	.00000	55133,	.00000	43099,	.00000	62147,	.00000	
	62152,	.00000	60145,	.00000	42095,	.00000	92233,	.00000	
	92234,	.00001	92235,	.00052	92236,	.00013	92238,	.02710	
	93237,	.00003	94238,	.00000	94239,	.00002	94240,	.00000	
	1001,	.21816	8016,	.54158	11023,	.00526	12000,	.00309	
	13027,	.03483	14000,	.15237	19000,	.00743	20000,	.00761	
	26000,	.00188							
	associated thermal s(a,b) data sets: lwtr.03t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
		13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
		26000,	.00167						
associated thermal s(a,b) data sets: lwtr.02t									

material number	component nuclide, mass fraction								
1	62149,	.00000	62150,	.00000	60143,	.00001	45103,	.00000	
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000	
	54131,	.00000	55133,	.00001	43099,	.00001	62147,	.00000	
	62152,	.00000	60145,	.00001	42095,	.00001	92233,	.00000	
	92234,	.00008	92235,	.00564	92236,	.00146	92238,	.29845	
	93237,	.00034	94238,	.00000	94239,	.00017	94240,	.00000	
	1001,	.01017	8016,	.40075	11023,	.00559	12000,	.00347	
	13027,	.04347	14000,	.19797	19000,	.01343	20000,	.01411	
	26000,	.00484							
	2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490

13027, .06130 14000, .27919 19000, .01894 20000, .01989
 26000, .00683

1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1 7.48597E-02	2.68707E+00	.00000E+00	1.14940E+07	3.08853E+07	1	
2	2 8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1	
3	3 .00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0	infinite

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40f1) 5000 Years 600K probid = 08/16/96 14:21:45
 0 08/16/96 10:52:15

neutron creation	tracks	weight (per source particle)	energy (per source particle)	neutron loss	tracks	weight (per source particle)	energy (per source particle)
source	520705	9.9865E-01	2.0325E+00	escape	121	1.3371E-04	9.7630E-05
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.1894E-02	4.9069E-05	weight cutoff	520907	6.2184E-02	3.9745E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	3.1523E-07	downscattering	0	0.	1.9268E+00
(n,xn)	645	9.1944E-04	6.9393E-04	capture	0	6.1880E-01	6.3175E-02
fission	0	0.	0.	loss to (n,xn)	322	4.5905E-04	3.8266E-03
total	521350	1.0615E+00	2.0333E+00	loss to fission	0	3.7988E-01	3.9383E-02
				total	521350	1.0615E+00	2.0333E+00

number of neutrons banked 323
 neutron tracks per source particle 1.0012E+00
 neutron collisions per source particle 7.6491E+01
 total neutron collisions 39829078
 net multiplication 1.0005E+00 .0000

average lifetime, shakes
 escape 2.3624E+04
 capture 8.9475E+03
 capture or escape 8.9494E+03
 any termination 9.7475E+03

cutoffs
 tco 1.0000E+34
 eco .0000E+00
 wc1 -5.0000E-01
 wc2 -2.5000E-01

computer time so far in this run 173.12 minutes
 computer time in mcrun 173.05 minutes
 source particles per minute 3.0089E+03
 random numbers generated 463070842

maximum number ever in bank 2
 bank overflows to backup file 0
 field length 0
 most random numbers used was 11052 in history 430100

range of sampled source weights = 9.2039E-01 to 1.0678E+00
 1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1 601198	521028	32483446	4.6105E+01	3.3875E-04	5.1710E-01	8.0892E-01	2.5438E+00
2	2 104094	50166	7345632	7.4852E+00	4.6897E-05	2.0123E-01	5.7986E-01	1.3187E+00
total	705292	571194	39829078	5.3590E+01				

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40f1) 5000 Years 600K

probid = 08/16/96 10:52:15

the initial fission neutron source distribution was read from the srctp file named srctp
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 119861 neutron histories and 100 active cycles with 400844 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 520705 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .94166 with an estimated standard deviation of .00081
 the estimated 68, 95, & 99 percent keff confidence intervals are .94084 to .94247, .94003 to .94328, and .93950 to .94381
 the estimated collision/absorption neutron removal lifetime = 8.94E-05 seconds with an estimated standard deviation of 1.90E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.94222	.00130	.94092 to .94352	.93963 to .94481	.93878 to .94566	
absorption	.94125	.00109	.94016 to .94234	.93909 to .94342	.93838 to .94412	
track length	.94223	.00134	.94089 to .94358	.93956 to .94491	.93868 to .94578	
col/absorp	.94166	.00081	.94084 to .94247	.94004 to .94327	.93952 to .94380	-.0713
abs/trk len	.94165	.00082	.94083 to .94247	.94002 to .94328	.93949 to .94381	-.0762
col/trk len	.94222	.00130	.94091 to .94352	.93962 to .94481	.93877 to .94566	.9843
col/abs/trk len	.94166	.00081	.94084 to .94247	.94003 to .94328	.93950 to .94381	

1mcnp version 4a ld=10/01/93 08/29/96 12:31:20

 inp=sp40g1 outp=sp40g10

probid = 08/29/96 12:31:20

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1) 10000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 1 7.48343-2 -1 IMP:N=1
7- 2 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c 10000 yr critical
23- m1 62149.50c 2.8219E-09
24- 63151.55c 9.6170E-09
25- 60143.50c 1.9432E-07
26- 45103.50c 1.1304E-07
27- 54131.50c 9.9667E-08
28- 55133.50c 2.2906E-07
29- 62147.50c 7.6323E-08
30- 43099.50c 2.0502E-07
31- 64155.50c 2.9053E-10
32- 60145.50c 1.3161E-07
33- 62152.50c 1.3106E-08
34- 42095.50c 2.1753E-07
35- 48000.50c 4.2020E-09
36- 62150.50c 3.4356E-08
37- 36083.50c 1.7568E-08
38- 92233.50c 6.6328E-09
39- 92234.50c 6.0552E-07
40- 92235.53c 3.9787E-05
41- 92236.50c 1.0899E-05
42- 92238.53c 2.1513E-03
43- 93237.50c 2.4587E-06
44- 94238.50c 1.1952E-09
45- 94239.55c 1.9793E-06
46- 94240.50c 7.0065E-08
47- 1001.53c 1.6059-2
48- 8016.53c 4.0662-2
49- 11023.50c 3.9366-4
50- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
51- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
52- mt1 lwtr.03t
53- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
54- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
55- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
56- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
  
```

```

57-      mt2      lwtr.02t
58-      PRINT
1  initial source from file srctp

original number of points          3911
  points not in any cell           0
  points in cells of zero importance 0
  points in void cells              0
  points in ambiguous cells         0
total points rejected              0
points remaining                   3911
points after expansion or contraction 3997
nominal source size                4000

initial guess for k(eff.)          1.000000

cycles to skip before tallying     30

number of keff cycles that can be stored 260

total fission nubar data are being used.

```

warning. lwtr.02t and lwtr.03t are both called for.
 1material composition

print table 40

the sum of the fractions of material 1 was 7.483317E-02

material number	component nuclide, atom fraction								
1	62149,	.00000	63151,	.00000	60143,	.00000	45103,	.00000	
	54131,	.00000	55133,	.00000	62147,	.00000	43099,	.00000	
	64155,	.00000	60145,	.00000	62152,	.00000	42095,	.00000	
	48000,	.00000	62150,	.00000	36083,	.00000	92233,	.00000	
	92234,	.00001	92235,	.00053	92236,	.00015	92238,	.02875	
	93237,	.00003	94238,	.00000	94239,	.00003	94240,	.00000	
	1001,	.21460	8016,	.54337	11023,	.00526	12000,	.00309	
	13027,	.03484	14000,	.15242	19000,	.00743	20000,	.00761	
	26000,	.00188							
	associated thermal s(a,b) data sets: lwtr.03t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
		13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
		26000,	.00167						
associated thermal s(a,b) data sets: lwtr.02t									

material number	component nuclide, mass fraction							
1	62149,	.00000	63151,	.00000	60143,	.00002	45103,	.00001
	54131,	.00001	55133,	.00002	62147,	.00001	43099,	.00001
	64155,	.00000	60145,	.00001	62152,	.00000	42095,	.00001
	48000,	.00000	62150,	.00000	36083,	.00000	92233,	.00000
	92234,	.00009	92235,	.00567	92236,	.00156	92238,	.31042
	93237,	.00035	94238,	.00000	94239,	.00029	94240,	.00001
	1001,	.00981	8016,	.39423	11023,	.00549	12000,	.00341
	13027,	.04264	14000,	.19418	19000,	.01317	20000,	.01383

2	26000, .00475						
	1001, .02326	8016, .57779	11023, .00789	12000, .00490			
	13027, .06130	14000, .27919	19000, .01894	20000, .01989			
	26000, .00683						

warning. 1 of the materials had unnormalized fractions.
1 cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1 7.48343E-02	2.73956E+00	.00000E+00	1.14940E+07	3.14886E+07	1	
2	2 8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1	
3	3 .00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0	infinite

1 problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1) 10000 Years 600K probid = 08/29/96 15:14:42
08/29/96 12:31:20

neutron creation	tracks	weight (per source particle)	energy (per source particle)	neutron loss	tracks	weight (per source particle)	energy (per source particle)
source	520436	9.9916E-01	2.0352E+00	escape	153	1.6128E-04	1.1441E-04
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.0983E-02	2.7101E-05	weight cutoff	520613	6.1096E-02	6.6854E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	2.9577E-07	downscattering	0	0.	1.9255E+00
(n,xn)	659	9.6723E-04	6.5978E-04	capture	0	6.2055E-01	6.4128E-02
fission	0	0.	0.	loss to (n,xn)	329	4.8289E-04	3.9434E-03
total	521095	1.0611E+00	2.0358E+00	loss to fission	0	3.7882E-01	4.2055E-02
				total	521095	1.0611E+00	2.0358E+00

number of neutrons banked 330
neutron tracks per source particle 1.0013E+00
neutron collisions per source particle 7.4256E+01
total neutron collisions 38645372
net multiplication 1.0005E+00 .0000

average lifetime, shakes
escape 3.1172E+04
capture 8.5120E+03
capture or escape 8.5157E+03
any termination 9.2837E+03
cutoffs
tco 1.0000E+34
eco .0000E+00
wc1 -5.0000E-01
wc2 -2.5000E-01

computer time so far in this run 163.31 minutes
computer time in mcrun 163.24 minutes
source particles per minute 3.1882E+03
random numbers generated 449866891
maximum number ever in bank 2
bank overflows to backup file 0
field length 0
most random numbers used was 10990 in history 491523

range of sampled source weights = 9.4540E-01 to 1.0782E+00

print table 126

1 neutron activity in each cell

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1 602874	520766	31088264	4.4549E+01	3.6530E-04	5.2725E-01	8.1428E-01	2.5766E+00
2	2 106605	51877	7557108	7.7142E+00	4.7815E-05	2.0459E-01	5.8117E-01	1.3267E+00

total 709479 572643 38645372 5.2263E+01
 1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1) 10000 Years 600K probid = 08/29/96 12:31:20

the initial fission neutron source distribution was read from the srctp file named srctp
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 119705 neutron histories and 100 active cycles with 400731 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 520436 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

- the k(collision) cycle values appear normally distributed at the 95 percent confidence level
- the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
- the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .94531 with an estimated standard deviation of .00095
 the estimated 68, 95, & 99 percent keff confidence intervals are .94436 to .94626, .94341 to .94721, and .94279 to .94783
 the estimated collision/absorption neutron removal lifetime = 8.49E-05 seconds with an estimated standard deviation of 1.77E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.94621	.00133	.94488 to .94755	.94356 to .94887	.94270 to .94973	
absorption	.94452	.00112	.94340 to .94565	.94228 to .94676	.94155 to .94749	
track length	.94663	.00133	.94530 to .94797	.94398 to .94929	.94311 to .95016	
col/absorp	.94520	.00094	.94426 to .94614	.94333 to .94706	.94273 to .94767	.1675
abs/trk len	.94537	.00094	.94443 to .94630	.94350 to .94723	.94289 to .94784	.1608
col/trk len	.94639	.00135	.94504 to .94775	.94370 to .94908	.94282 to .94996	.9819
col/abs/trk len	.94531	.00095	.94436 to .94626	.94341 to .94721	.94279 to .94783	

1mcnp- version 4a ld=10/01/93 08/29/96 20:06:21

probid = 08/29/96 20:06:21

inp=sp40e1n outp=sp40e1n0

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1n) 1000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 1 7.48831-2 -1 IMP:N=1
7- 2 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c no UO2 infiltration after criticality initiation
23- c 1000 yr critical
24- m1 62149.50c 2.0302E-09
25- 62151.50c 1.9060E-10
26- 60143.50c 2.0165E-08
27- 45103.50c 1.0845E-08
28- 63151.55c 1.2151E-09
29- 64157.50c 1.1152E-11
30- 64155.50c 9.4362E-11
31- 48000.50c 3.2119E-10
32- 54131.50c 9.9667E-09
33- 55133.50c 2.3024E-08
34- 43099.50c 2.0926E-08
35- 62147.50c 7.7393E-09
36- 62152.50c 1.0071E-09
37- 60145.50c 1.3415E-08
38- 42095.50c 2.2139E-08
39- 92233.50c 7.1050E-10
40- 92234.50c 4.8134E-07
41- 92235.53c 3.7897E-05
42- 92236.50c 9.1899E-06
43- 92238.53c 1.9039E-03
44- 93237.50c 2.2038E-06
45- 94238.50c 1.2260E-09
46- 94239.55c 2.5206E-07
47- 94240.50c 1.1983E-09
48- 1001.53c 1.6603-2
49- 8016.53c 4.0422-2
50- 11023.50c 3.9366-4
51- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
52- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
53- mt1 lwtr.03t
54- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
55- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
56- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2

```

57- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
 58- mt2 lwtr.02t
 59- PRINT

1 initial source from file srctp
 original number of points 3931
 points not in any cell 0
 points in cells of zero importance 0
 points in void cells 0
 points in ambiguous cells 0
 total points rejected 0
 points remaining 3931
 points after expansion or contraction 3996
 nominal source size 4000
 initial guess for k(eff.) 1.000000
 cycles to skip before tallying 30
 number of keff cycles that can be stored 260
 total fission nubar data are being used.

warning. lwtr.02t and lwtr.03t are both called for.
 1material composition

print table 40

material number	component nuclide, atom fraction								
1	62149,	.00000	62151,	.00000	60143,	.00000	45103,	.00000	
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000	
	54131,	.00000	55133,	.00000	43099,	.00000	62147,	.00000	
	62152,	.00000	60145,	.00000	42095,	.00000	92233,	.00000	
	92234,	.00001	92235,	.00051	92236,	.00012	92238,	.02543	
	93237,	.00003	94238,	.00000	94239,	.00000	94240,	.00000	
	1001,	.22172	8016,	.53980	11023,	.00526	12000,	.00309	
	13027,	.03481	14000,	.15232	19000,	.00742	20000,	.00761	
	26000,	.00187							
	associated thermal s(a,b) data sets: lwtr.03t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
		13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
		26000,	.00167						
associated thermal s(a,b) data sets: lwtr.02t									

material number	component nuclide, mass fraction							
1	62149,	.00000	62151,	.00000	60143,	.00000	45103,	.00000
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000
	54131,	.00000	55133,	.00000	43099,	.00000	62147,	.00000
	62152,	.00000	60145,	.00000	42095,	.00000	92233,	.00000
	92234,	.00007	92235,	.00562	92236,	.00137	92238,	.28576
	93237,	.00033	94238,	.00000	94239,	.00004	94240,	.00000
	1001,	.01055	8016,	.40765	11023,	.00571	12000,	.00354
	13027,	.04435	14000,	.20198	19000,	.01370	20000,	.01439
	26000,	.00494						

2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490
	13027,	.06130	14000,	.27919	19000,	.01894	20000,	.01989
	26000,	.00683						

1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	7.48831E-02	2.63375E+00	.00000E+00	1.14940E+07	3.02724E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1n) 1000 Years 600K

08/29/96 23:06:12
 probid = 08/29/96 20:06:21

neutron creation	tracks	weight (per source particle)	energy	neutron loss	tracks	weight (per source particle)	energy
source	520500	9.9904E-01	2.0312E+00	escape	115	1.2670E-04	7.8653E-05
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.3912E-02	4.5884E-05	weight cutoff	520675	6.3774E-02	2.7366E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	3.3925E-07	downscattering	0	0.	1.9282E+00
				capture	0	6.1767E-01	6.2789E-02
(n,xn)	578	8.5082E-04	6.3997E-04	loss to (n,xn)	288	4.2410E-04	3.5549E-03
fission	0	0.	0.	loss to fission	0	3.8181E-01	3.7167E-02
total	521078	1.0638E+00	2.0319E+00	total	521078	1.0638E+00	2.0319E+00

number of neutrons banked 290
 neutron tracks per source particle 1.0011E+00
 neutron collisions per source particle 7.9615E+01
 total neutron collisions 41439809
 net multiplication 1.0004E+00 .0000

average lifetime, shakes

escape 3.0491E+04
 capture 9.5352E+03
 capture or escape 9.5378E+03
 any termination 1.0389E+04

cutoffs

tco 1.0000E+34
 eco .0000E+00
 wc1 -5.0000E-01
 wc2 -2.5000E-01

computer time so far in this run 179.70 minutes
 computer time in mcrun 179.64 minutes
 source particles per minute 2.8975E+03
 random numbers generated 480204045

maximum number ever in bank 2
 bank overflows to backup file 0
 field length 0
 most random numbers used was 12386 in history 367999

range of sampled source weights = 9.3963E-01 to 1.0627E+00
 1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	601923	34078462	4.7927E+01	3.1328E-04	5.0746E-01	8.0331E-01	2.5104E+00
2	2	105122	7361347	7.4518E+00	4.5637E-05	1.9556E-01	5.7585E-01	1.3083E+00
total		707045	41439809	5.5379E+01				

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1n) 1000 Years 600K

probid = 08/29/96 20:06:21

the initial fission neutron source distribution was read from the srctp file named srctp .
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 119728 neutron histories and 100 active cycles with 400772 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 520500 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .93731 with an estimated standard deviation of .00088
 the estimated 68, 95, & 99 percent keff confidence intervals are .93642 to .93819, .93555 to .93907, and .93497 to .93964
 the estimated collision/absorption neutron removal lifetime = 9.54E-05 seconds with an estimated standard deviation of 1.78E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.93689	.00133	.93556 to .93822	.93424 to .93954	.93338 to .94040	
absorption	.93762	.00120	.93643 to .93832	.93524 to .94001	.93446 to .94079	
track length	.93681	.00136	.93545 to .93818	.93410 to .93953	.93321 to .94042	
col/absorp	.93729	.00088	.93641 to .93817	.93554 to .93905	.93497 to .93962	-.0346
abs/trk len	.93727	.00089	.93638 to .93816	.93550 to .93904	.93492 to .93962	-.0343
col/trk len	.93692	.00133	.93559 to .93826	.93427 to .93958	.93340 to .94044	.9868
col/abs/trk len	.93731	.00088	.93642 to .93819	.93555 to .93907	.93497 to .93964	

1mcpn version 4a ld=10/01/93 08/20/96 10:58:26

probid = 08/20/96 10:58:26

inp=sp40f1n outp=sp40f1nP

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40f1n) 5000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 7.48833-2 -1 IMP:N=1
7- 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c no UO2 infiltration after criticality initiation
23- c 5000 yr critical
24- m1 62149.50c 2.7761E-09
25- 62150.50c 1.5868E-08
26- 60143.50c 9.8994E-08
27- 45103.50c 5.5500E-08
28- 63151.55c 5.7285E-09
29- 64157.50c 1.8097E-11
30- 64155.50c 2.3641E-10
31- 48000.50c 1.8479E-09
32- 54131.50c 4.9633E-08
33- 55133.50c 1.1472E-07
34- 43099.50c 1.0383E-07
35- 62147.50c 3.8518E-08
36- 62152.50c 5.8288E-09
37- 60145.50c 6.6530E-08
38- 42095.50c 1.0987E-07
39- 92233.50c 3.4401E-09
40- 92234.50c 5.1045E-07
41- 92235.53c 3.6337E-05
42- 92236.50c 9.4341E-06
43- 92238.53c 1.9039E-03
44- 93237.50c 2.1883E-06
45- 94238.50c 1.2084E-09
46- 94239.55c 1.1354E-06
47- 94240.50c 2.3573E-08
48- 1001.53c 1.6603-2
49- 8016.53c 4.0422-2
50- 11023.50c 3.9366-4
51- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
52- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
53- mt1 lwtr.03t
54- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
55- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
56- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2

```

57- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
 58- mt2 lwtr.02t
 59- PRINT

1 initial source from file srctp

original number of points	4006
points not in any cell	0
points in cells of zero importance	0
points in void cells	0
points in ambiguous cells	0
total points rejected	0
points remaining	4006
points after expansion or contraction	4002
nominal source size	4000
initial guess for k(eff.)	1.000000
cycles to skip before tallying	30
number of keff cycles that can be stored	260
total fission nubar data are being used.	

warning. lwtr.02t and lwtr.03t are both called for.
 1material composition

print table 40

material number	component nuclide, atom fraction							
1	62149,	.00000	62150,	.00000	60143,	.00000	45103,	.00000
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000
	54131,	.00000	55133,	.00000	43099,	.00000	62147,	.00000
	62152,	.00000	60145,	.00000	42095,	.00000	92233,	.00000
	92234,	.00001	92235,	.00049	92236,	.00013	92238,	.02543
	93237,	.00003	94238,	.00000	94239,	.00002	94240,	.00000
	1001,	.22172	8016,	.53980	11023,	.00526	12000,	.00309
	13027,	.03481	14000,	.15232	19000,	.00742	20000,	.00761
	26000,	.00187						
	associated thermal s(a,b) data sets:	lwtr.03t						
2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
	13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
	26000,	.00167						
	associated thermal s(a,b) data sets:	lwtr.02t						

material number	component nuclide, mass fraction							
1	62149,	.00000	62150,	.00000	60143,	.00001	45103,	.00000
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000
	54131,	.00000	55133,	.00001	43099,	.00001	62147,	.00000
	62152,	.00000	60145,	.00001	42095,	.00001	92233,	.00000
	92234,	.00008	92235,	.00539	92236,	.00140	92238,	.28576
	93237,	.00033	94238,	.00000	94239,	.00017	94240,	.00000
	1001,	.01055	8016,	.40765	11023,	.00571	12000,	.00354
	13027,	.04435	14000,	.20198	19000,	.01370	20000,	.01439
	26000,	.00494						

2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490
	13027,	.06130	14000,	.27919	19000,	.01894	20000,	.01989
	26000,	.00683						

1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	7.48833E-02	2.63371E+00	.00000E+00	1.14940E+07	3.02720E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0 infinite

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40f1n) 5000 Years 600K probid = 08/20/96 13:45:45
 0 probid = 08/20/96 10:58:26

neutron creation	tracks	weight (per source particle)	energy	neutron loss	tracks	weight (per source particle)	energy
source	520250	9.9952E-01	2.0350E+00	escape	125	1.2726E-04	8.5181E-05
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.2529E-02	4.9763E-05	weight cutoff	520416	6.2465E-02	3.5211E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	3.3445E-07	downscattering	0	0.	1.9318E+00
(n,xn)	580	8.4475E-04	6.2405E-04	capture	0	6.2192E-01	6.3293E-02
fission	0	0.	0.	loss to (n,xn)	289	4.2076E-04	3.5019E-03
total	520830	1.0629E+00	2.0357E+00	loss to fission	0	3.7796E-01	3.6996E-02
				total	520830	1.0629E+00	2.0357E+00

number of neutrons banked 291
 neutron tracks per source particle 1.0011E+00
 neutron collisions per source particle 7.8798E+01
 total neutron collisions 40994695
 net multiplication 1.0004E+00 .0000

average lifetime, shakes
 escape 3.2770E+04
 capture 9.4023E+03
 capture or escape 9.4052E+03
 any termination 1.0237E+04
 cutoffs
 tco 1.0000E+34
 eco .0000E+00
 wc1 -5.0000E-01
 wc2 -2.5000E-01

computer time so far in this run 166.98 minutes
 computer time in mcrun 166.91 minutes
 source particles per minute 3.1169E+03
 random numbers generated 475422461

maximum number ever in bank 2
 bank overflows to backup file 0
 field length 0
 most random numbers used was 13087 in history 218100

range of sampled source weights = 9.4340E-01 to 1.0823E+00
 1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	601804	520541	33709616	4.7579E+01	3.1834E-04	5.1046E-01	8.0540E-01
2	2	104929	49527	7285079	7.4097E+00	4.6737E-05	2.0187E-01	5.7843E-01
total		706733	570068	40994695	5.4988E+01			2.5162E+00

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40f1n) 5000 Years 600K

probid = 08/20/96 10:58:26

the initial fission neutron source distribution was read from the srctp file named srctp
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 120117 neutron histories and 100 active cycles with 400133 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 520250 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .93482 with an estimated standard deviation of .00081
 the estimated 68, 95, & 99 percent keff confidence intervals are .93401 to .93563, .93320 to .93643, and .93267 to .93696
 the estimated collision/absorption neutron removal lifetime = 9.40E-05 seconds with an estimated standard deviation of 1.90E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.93517	.00121	.93396 to .93638	.93276 to .93758	.93198 to .93836	
absorption	.93456	.00104	.93352 to .93561	.93249 to .93664	.93181 to .93731	
track length	.93519	.00125	.93393 to .93645	.93269 to .93769	.93187 to .93850	
col/absorp	.93482	.00081	.93401 to .93563	.93321 to .93643	.93268 to .93696	.0423
abs/trk len	.93482	.00082	.93399 to .93564	.93318 to .93645	.93265 to .93699	.0392
col/trk len	.93516	.00120	.93395 to .93636	.93276 to .93755	.93198 to .93833	.9870
col/abs/trk len	.93482	.00081	.93401 to .93563	.93320 to .93643	.93267 to .93696	

1mcpn version 4a ld=10/01/93 08/29/96 16:44:37

probid = 08/29/96 16:44:37

inp=sp40g1n outp=sp40g1n0

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1n) 10000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 7.48814-2 -1 IMP:N=1
7- 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c no UO2 infiltration after criticality initiation
23- c 10000 yr critical
24- m1 62149.50c 2.8219E-09
25- 63151.55c 9.6170E-09
26- 60143.50c 1.9432E-07
27- 45103.50c 1.1304E-07
28- 54131.50c 9.9667E-08
29- 55133.50c 2.2906E-07
30- 62147.50c 7.6323E-08
31- 43099.50c 2.0502E-07
32- 64155.50c 2.9053E-10
33- 60145.50c 1.3161E-07
34- 62152.50c 1.3106E-08
35- 42095.50c 2.1753E-07
36- 48000.50c 4.2020E-09
37- 62150.50c 3.4356E-08
38- 36083.50c 1.7568E-08
39- 92233.50c 6.6328E-09
40- 92234.50c 5.4403E-07
41- 92235.53c 3.4776E-05
42- 92236.50c 9.7005E-06
43- 92238.53c 1.9017E-03
44- 93237.50c 2.1728E-06
45- 94238.50c 1.1952E-09
46- 94239.55c 1.9793E-06
47- 94240.50c 7.0065E-08
48- 1001.53c 1.6603-2
49- 8016.53c 4.0422-2
50- 11023.50c 3.9366-4
51- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
52- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
53- mt1 lwtr.03t
54- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
55- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
56- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2

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57- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
 58- mt2 lwtr.02t
 59- PRINT

1 initial source from file srctp

original number of points	4129
points not in any cell	0
points in cells of zero importance	0
points in void cells	0
points in ambiguous cells	0
total points rejected	0
points remaining	4129
points after expansion or contraction	3992
nominal source size	4000
initial guess for k(eff.)	1.000000
cycles to skip before tallying	30
number of keff cycles that can be stored	260
total fission nubar data are being used.	

warning. lwtr.02t and lwtr.03t are both called for.
 1material composition

print table 40

material number	component nuclide, atom fraction							
1	62149,	.00000	63151,	.00000	60143,	.00000	45103,	.00000
	54131,	.00000	55133,	.00000	62147,	.00000	43099,	.00000
	64155,	.00000	60145,	.00000	62152,	.00000	42095,	.00000
	48000,	.00000	62150,	.00000	36083,	.00000	92233,	.00000
	92234,	.00001	92235,	.00046	92236,	.00013	92238,	.02540
	93237,	.00003	94238,	.00000	94239,	.00003	94240,	.00000
	1001,	.22173	8016,	.53982	11023,	.00526	12000,	.00309
	13027,	.03482	14000,	.15232	19000,	.00742	20000,	.00761
	26000,	.00187						
	associated thermal s(a,b) data sets: lwtr.03t							
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,
13027,		.03110	14000,	.13606	19000,	.00663	20000,	.00679
26000,		.00167						
associated thermal s(a,b) data sets: lwtr.02t								

material number	component nuclide, mass fraction							
1	62149,	.00000	63151,	.00000	60143,	.00002	45103,	.00001
	54131,	.00001	55133,	.00002	62147,	.00001	43099,	.00001
	64155,	.00000	60145,	.00001	62152,	.00000	42095,	.00001
	48000,	.00000	62150,	.00000	36083,	.00000	92233,	.00000
	92234,	.00008	92235,	.00516	92236,	.00144	92238,	.28553
	93237,	.00032	94238,	.00000	94239,	.00030	94240,	.00001
	1001,	.01055	8016,	.40779	11023,	.00571	12000,	.00355
	13027,	.04437	14000,	.20205	19000,	.01371	20000,	.01440
	26000,	.00494						

2 1001, .02326 8016, .57779 11023, .00789 12000, .00490
 13027, .06130 14000, .27919 19000, .01894 20000, .01989
 26000, .00683

1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	7.48814E-02	2.63284E+00	.00000E+00	1.14940E+07	3.02619E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0 infinite

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1n) 10000 Years 600K

08/29/96 19:39:01
 probid = 08/29/96 16:44:37

neutron creation	tracks	weight (per source particle)	energy	neutron loss	tracks	weight (per source particle)	energy
source	521885	9.9639E-01	2.0383E+00	escape	141	1.4277E-04	9.9555E-05
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.1410E-02	3.3499E-05	weight cutoff	522038	6.1355E-02	2.3321E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	3.3139E-07	downscattering	0	0.	1.9352E+00
				capture	0	6.2353E-01	6.3113E-02
(n,xn)	585	8.5591E-04	6.1523E-04	loss to (n,xn)	291	4.2578E-04	3.5293E-03
fission	0	0.	0.	loss to fission	0	3.7320E-01	3.6983E-02
total	522470	1.0587E+00	2.0390E+00	total	522470	1.0587E+00	2.0390E+00

number of neutrons banked 294
 neutron tracks per source particle 1.0011E+00
 neutron collisions per source particle 7.8305E+01
 total neutron collisions 40866179
 net multiplication 1.0004E+00 .0000

average lifetime, shakes
 escape 3.6578E+04
 capture 9.3155E+03
 capture or escape 9.3194E+03
 any termination 1.0148E+04

cutoffs
 tco 1.0000E+34
 eco .0000E+00
 wc1 -5.0000E-01
 wc2 -2.5000E-01

computer time so far in this run 174.17 minutes
 computer time in mcrun 174.10 minutes
 source particles per minute 2.9977E+03
 random numbers generated 473703477

maximum number ever in bank 2
 bank overflows to backup file 0
 field length 0
 most random numbers used was 13212 in history 186740

range of sampled source weights = 9.1701E-01 to 1.1145E+00
 1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	604475	33444686	4.7067E+01	3.2383E-04	5.1426E-01	8.0512E-01	2.5256E+00
2	2	106309	7421493	7.5249E+00	4.6654E-05	2.0128E-01	5.7820E-01	1.3178E+00
total		710784	40866179	5.4592E+01				

1neutron weight balance in each cell -- external events

print table 130

cell	entering	source	energy cutoff	time cutoff	exiting	total	
1	1	1.0592E-01	9.9639E-01	.0000E+00	.0000E+00	-1.5379E-01	9.4852E-01
2	2	1.5379E-01	.0000E+00	.0000E+00	.0000E+00	-1.0606E-01	4.7728E-02
total		2.5971E-01	9.9639E-01	.0000E+00	.0000E+00	-2.5986E-01	9.9625E-01

print table 130

1neutron weight balance in each cell -- variance reduction events

cell	weight window	cell importance	weight cutoff	energy importance	dxtran	forced collision	exponential transform	total
1	1	.0000E+00	.0000E+00	-4.3948E-05	.0000E+00	.0000E+00	.0000E+00	-4.3948E-05
2	2	.0000E+00	.0000E+00	9.9491E-05	.0000E+00	.0000E+00	.0000E+00	9.9491E-05
total		.0000E+00	.0000E+00	5.5543E-05	.0000E+00	.0000E+00	.0000E+00	5.5543E-05

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1n) 10000 Years 600K
 probid = 08/29/96 16:44:37

the initial fission neutron source distribution was read from the srctp file named srctp .
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 120052 neutron histories and 100 active cycles with 401833 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 521885 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .93357 with an estimated standard deviation of .00080
 the estimated 68, 95, & 99 percent keff confidence intervals are .93277 to .93437, .93197 to .93517, and .93145 to .93569
 the estimated collision/absorption neutron removal lifetime = 9.33E-05 seconds with an estimated standard deviation of 2.08E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.93359	.00119	.93240 to .93477	.93122 to .93595	.93045 to .93672	
absorption	.93356	.00108	.93248 to .93465	.93141 to .93572	.93070 to .93642	
track length	.93358	.00118	.93240 to .93477	.93122 to .93594	.93045 to .93671	
col/absorp	.93357	.00081	.93276 to .93439	.93196 to .93519	.93143 to .93572	
abs/trk len	.93357	.00080	.93277 to .93437	.93198 to .93517	.93146 to .93569	-.0189
col/trk len	.93358	.00119	.93240 to .93477	.93122 to .93595	.93045 to .93672	.9826
col/abs/trk len	.93357	.00080	.93277 to .93437	.93197 to .93517	.93145 to .93569	

1mcpn version 4a ld=10/01/93 08/29/96 23:06:12

probid = 08/29/96 23:06:12

inp=sp40e1y outp=sp40e1y0

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1y) 1000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k no fp
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 7.48783-2 -1 IMP:N=1
7- 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c 1000 yr critical
23- m1 92233.50c 7.1050E-10
24- 92234.50c 4.8749E-07
25- 92235.53c 3.8398E-05
26- 92236.50c 9.3098E-06
27- 92238.53c 1.9289E-03
28- 93237.50c 2.2324E-06
29- 94238.50c 1.2260E-09
30- 94239.55c 2.5206E-07
31- 94240.50c 1.1983E-09
32- 1001.53c 1.6549-2
33- 8016.53c 4.0446-2
34- 11023.50c 3.9366-4
35- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
36- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
37- mt1 lwtr.03t
38- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
39- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
40- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
41- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
42- mt2 lwtr.02t
43- PRINT

```

1 initial source from file srctp

```

original number of points          3886
points not in any cell              0
points in cells of zero importance  0
points in void cells                0
points in ambiguous cells           0
total points rejected                0
points remaining                     3886
points after expansion or contraction 4000
nominal source size                  4000

initial guess for k( eff. )         1.000000

```

cycles to skip before tallying 30
 number of keff cycles that can be stored 260
 total fission nubar data are being used.

warning. lwtr.02t and lwtr.03t are both called for.
 1material composition

print table 40

material number	component nuclide, atom fraction							
1	92233,	.00000	92234,	.00001	92235,	.00051	92236,	.00012
	92238,	.02576	93237,	.00003	94238,	.00000	94239,	.00000
	94240,	.00000	1001,	.22101	8016,	.54016	11023,	.00526
	12000,	.00309	13027,	.03482	14000,	.15233	19000,	.00742
	20000,	.00761	26000,	.00187				
associated thermal s(a,b) data sets: lwtr.03t								
2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
	13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
	26000,	.00167						
	associated thermal s(a,b) data sets: lwtr.02t							

material number	component nuclide, mass fraction							
1	92233,	.00000	92234,	.00007	92235,	.00567	92236,	.00138
	92238,	.28834	93237,	.00033	94238,	.00000	94239,	.00004
	94240,	.00000	1001,	.01047	8016,	.40624	11023,	.00568
	12000,	.00353	13027,	.04417	14000,	.20116	19000,	.01365
	20000,	.01433	26000,	.00492				
2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490
	13027,	.06130	14000,	.27919	19000,	.01894	20000,	.01989
	26000,	.00683						

1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	7.48783E-02	2.64439E+00	.00000E+00	1.14940E+07	3.03948E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0 infinite

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1y) 1000 Years 600K

08/30/96 01:03:50
 08/29/96 23:06:12

neutron creation	tracks	weight (per source particle)	energy (per source particle)	neutron loss	tracks	weight (per source particle)	energy (per source particle)
source	519879	1.0002E+00	2.0295E+00	escape	143	1.4537E-04	1.3409E-04
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.

cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.3554E-02	4.0956E-05	weight cutoff	520045	6.3956E-02	3.4808E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	3.3603E-07	downscattering	0	0.	1.9260E+00
				capture	0	6.1583E-01	6.2745E-02
(n,xn)	617	9.1000E-04	6.6890E-04	loss to (n,xn)	308	4.5424E-04	3.7825E-03
fission	0	0.	0.	loss to fission	0	3.8431E-01	3.7476E-02
total	520496	1.0647E+00	2.0302E+00	total	520496	1.0647E+00	2.0302E+00

number of neutrons banked 309
 neutron tracks per source particle 1.0012E+00
 neutron collisions per source particle 7.9209E+01
 total neutron collisions 41179192
 net multiplication 1.0005E+00 .0000

average lifetime, shakes
 escape 3.4660E+04
 capture 9.4506E+03
 capture or escape 9.4543E+03
 any termination 1.0292E+04

cutoffs
 tco 1.0000E+34
 eco .0000E+00
 wc1 -5.0000E-01
 wc2 -2.5000E-01

computer time so far in this run 117.53 minutes
 computer time in mcrun 117.48 minutes
 source particles per minute 4.4253E+03
 random numbers generated 477822584

maximum number ever in bank 2
 bank overflows to backup file 0
 field length 0
 most random numbers used was 10822 in history 272095

range of sampled source weights = 9.3414E-01 to 1.0689E+00
 1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	600222	520188	33940512	4.7813E+01	3.1479E-04	5.0778E-01	8.0371E-01
2	2	103684	49573	7238680	7.3886E+00	4.6662E-05	2.0187E-01	5.7994E-01
total		703906	569761	41179192	5.5202E+01			

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1y) 1000 Years 600K

probid = 08/29/96 23:06:12

the initial fission neutron source distribution was read from the srctp file named srctp .
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 120410 neutron histories and 100 active cycles with 399469 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 519879 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .94399 with an estimated standard deviation of .00088
 the estimated 68, 95, & 99 percent keff confidence intervals are .94311 to .94487, .94224 to .94574, and .94167 to .94632
 the estimated collision/absorption neutron removal lifetime = 9.44E-05 seconds with an estimated standard deviation of 1.91E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.94424	.00128	.94296 to .94552	.94170 to .94679	.94087 to .94762	
absorption	.94381	.00113	.94268 to .94494	.94155 to .94607	.94082 to .94680	
track length	.94420	.00129	.94291 to .94550	.94163 to .94678	.94079 to .94762	
col/absorp	.94400	.00088	.94312 to .94488	.94225 to .94574	.94168 to .94631	.0573
abs/trk len	.94398	.00088	.94310 to .94486	.94223 to .94573	.94166 to .94630	.0497
col/trk len	.94424	.00128	.94295 to .94552	.94168 to .94679	.94084 to .94763	.9858
col/abs/trk len	.94399	.00088	.94311 to .94487	.94224 to .94574	.94167 to .94632	

1mcpn version 4a ld=10/01/93 08/29/96 23:27:14

probid = 08/29/96 23:27:14

inp=sp40e1z outp=sp40e1z

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1z) 1000 Years 600K
 2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
 3- C Water and UO2 offset each other in porous space / H2O @ 500k no Pu239,U233
 4- C CELL SPECIFICATIONS
 5- C INNER WATER REGION
 6- 1 1 7.48781-2 -1 IMP:N=1
 7- 2 2 8.38290-2 1 -2 IMP:N=1
 8- C OUTSIDE WORLD
 9- 3 0 2 IMP:N=0

10-
 11- C SURFACE SPECIFICATIONS
 12- 1 SO 140 \$ INNER FUEL ZONE
 13- 2 SO 200 \$ TUFF REFLECTOR

14-
 15- MODE N
 16- KCODE 4000 1. 30 130
 17- C KSRG 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
 18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
 19- C MATERIAL SPECIFICATIONS
 20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
 21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
 22- c 1000 yr critical
 23- m1 62149.50c 2.0302E-09
 24- 62151.50c 1.9060E-10
 25- 60143.50c 2.0165E-08
 26- 45103.50c 1.0845E-08
 27- 63151.55c 1.2151E-09
 28- 64157.50c 1.1152E-11
 29- 64155.50c 9.4362E-11
 30- 48000.50c 3.2119E-10
 31- 54131.50c 9.9667E-09
 32- 55133.50c 2.3024E-08
 33- 43099.50c 2.0926E-08
 34- 62147.50c 7.7393E-09
 35- 62152.50c 1.0071E-09
 36- 60145.50c 1.3415E-08
 37- 42095.50c 2.2139E-08
 38- 92234.50c 4.8749E-07
 39- 92235.53c 3.8398E-05
 40- 92236.50c 9.3098E-06
 41- 92238.53c 1.9289E-03
 42- 93237.50c 2.2324E-06
 43- 94240.50c 1.1983E-09
 44- 1001.53c 1.6549-2
 45- 8016.53c 4.0446-2
 46- 11023.50c 3.9366-4
 47- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
 48- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
 49- mt1 lwtr.03t
 50- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
 51- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
 52- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
 53- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
 54- mt2 lwtr.02t
 55- PRINT

1 initial source from file srctp

original number of points 4072
 points not in any cell 0
 points in cells of zero importance 0
 points in void cells 0
 points in ambiguous cells 0
 total points rejected 0
 points remaining 4072
 points after expansion or contraction 3995
 nominal source size 4000

initial guess for k(eff.) 1.000000
 cycles to skip before tallying 30
 number of keff cycles that can be stored 260
 total fission nubar data are being used.

warning. lwtr.02t and lwtr.03t are both called for.
 material composition

print table 40

material number	component nuclide, atom fraction								
1	62149,	.00000	62151,	.00000	60143,	.00000	45103,	.00000	
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000	
	54131,	.00000	55133,	.00000	43099,	.00000	62147,	.00000	
	62152,	.00000	60145,	.00000	42095,	.00000	92234,	.00001	
	92235,	.00051	92236,	.00012	92238,	.02576	93237,	.00003	
	94240,	.00000	1001,	.22101	8016,	.54016	11023,	.00526	
	12000,	.00309	13027,	.03482	14000,	.15233	19000,	.00742	
	20000,	.00761	26000,	.00187					
	associated thermal s(a,b) data sets: lwtr.03t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
		13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
26000,		.00167							
associated thermal s(a,b) data sets: lwtr.02t									

material number	component nuclide, mass fraction								
1	62149,	.00000	62151,	.00000	60143,	.00000	45103,	.00000	
	63151,	.00000	64157,	.00000	64155,	.00000	48000,	.00000	
	54131,	.00000	55133,	.00000	43099,	.00000	62147,	.00000	
	62152,	.00000	60145,	.00000	42095,	.00000	92234,	.00007	
	92235,	.00567	92236,	.00138	92238,	.28835	93237,	.00033	
	94240,	.00000	1001,	.01047	8016,	.40626	11023,	.00568	
	12000,	.00353	13027,	.04417	14000,	.20117	19000,	.01365	
	20000,	.01433	26000,	.00492					
	2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490
		13027,	.06130	14000,	.27919	19000,	.01894	20000,	.01989
		26000,	.00683						

1 cell volumes and masses

print table 50

cell atom gram input calculated reason volume

		density	density	volume	volume	mass	pieces	not calculated
1	1	7.48781E-02	2.64432E+00	.00000E+00	1.14940E+07	3.03939E+07	1	
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1	
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0	infinite

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1z) 1000 Years 600K probid = 08/30/96 02:07:57
08/29/96 23:27:14

neutron creation	tracks	weight (per source particle)	energy (per source particle)	neutron loss	tracks	weight (per source particle)	energy (per source particle)
source	520651	9.9875E-01	2.0338E+00	escape	121	1.3229E-04	9.5317E-05
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.4212E-02	3.6000E-05	weight cutoff	520815	6.4324E-02	2.9960E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	3.3894E-07	downscattering	0	0.	1.9301E+00
(n,xn)	570	8.4918E-04	6.1622E-04	capture	0	6.1794E-01	6.3167E-02
fission	0	0.	0.	loss to (n,xn)	285	4.2459E-04	3.4855E-03
total	521221	1.0638E+00	2.0345E+00	loss to fission	0	3.8099E-01	3.7578E-02
				total	521221	1.0638E+00	2.0345E+00

number of neutrons banked 285
neutron tracks per source particle 1.0011E+00
neutron collisions per source particle 7.9735E+01
total neutron collisions 41514025
net multiplication 1.0004E+00 .0000

average lifetime, shakes
escape 3.2924E+04
capture 9.5362E+03
capture or escape 9.5393E+03
any termination 1.0394E+04

cutoffs
tco 1.0000E+34
eco .0000E+00
wc1 -5.0000E-01
wc2 -2.5000E-01

computer time so far in this run 160.64 minutes
computer time in mcrun 160.58 minutes
source particles per minute 3.2424E+03
random numbers generated 481148074

maximum number ever in bank 1
bank overflows to backup file 0
field length 0
most random numbers used was 11622 in history 491370

range of sampled source weights = 9.3197E-01 to 1.0750E+00
1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	602847	520936	34127072	4.7895E+01	3.1399E-04	5.0852E-01	8.0207E-01
2	2	105896	50141	7386953	7.4968E+00	4.6151E-05	1.9946E-01	5.7737E-01
total		708743	571077	41514025	5.5391E+01			

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40e1z) 1000 Years 600K

probid = 08/29/96 23:27:14

the initial fission neutron source distribution was read from the srctp file named srctp .
the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
this problem has run 30 inactive cycles with 119671 neutron histories and 100 active cycles with 400980 neutron histories.

1mcnp version 4a ld=10/01/93 08/29/96 19:39:01

probid = 08/29/96 19:39:01

inp=sp40g1y outp=sp40g1y0

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1y) 10000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k no fp
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 1 7.48330-2 -1 IMP:N=1
7- 2 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c 10000 yr critical
23- m1 92233.50c 6.6328E-09
24- 92234.50c 6.0552E-07
25- 92235.53c 3.9787E-05
26- 92236.50c 1.0899E-05
27- 92238.53c 2.1513E-03
28- 93237.50c 2.4587E-06
29- 94238.50c 1.1952E-09
30- 94239.55c 1.9793E-06
31- 94240.50c 7.0065E-08
32- 1001.53c 1.6059-2
33- 8016.53c 4.0662-2
34- 11023.50c 3.9366-4
35- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
36- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
37- mt1 lwtr.03t
38- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
39- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
40- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
41- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
42- mt2 lwtr.02t
43- PRINT

```

1 initial source from file srctp

```

original number of points          4023
points not in any cell              0
points in cells of zero importance  0
points in void cells                0
points in ambiguous cells           0
total points rejected                0
points remaining                     4023
points after expansion or contraction 4001
nominal source size                  4000

initial guess for k(eff.)           1.000000

```


cycles to skip before tallying 30
 number of keff cycles that can be stored 260
 total fission nubar data are being used.

warning. lwtr.02t and lwtr.03t are both called for.
 1material composition

print table 40

the sum of the fractions of material 1 was 7.483182E-02

material number	component nuclide, atom fraction							
1	92233,	.00000	92234,	.00001	92235,	.00053	92236,	.00015
	92238,	.02875	93237,	.00003	94238,	.00000	94239,	.00003
	94240,	.00000	1001,	.21460	8016,	.54338	11023,	.00526
	12000,	.00309	13027,	.03484	14000,	.15242	19000,	.00743
	20000,	.00761	26000,	.00188				
associated thermal s(a,b) data sets: lwtr.03t								
2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
	13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
	26000,	.00167						
associated thermal s(a,b) data sets: lwtr.02t								

material number	component nuclide, mass fraction							
1	92233,	.00000	92234,	.00009	92235,	.00567	92236,	.00156
	92238,	.31045	93237,	.00035	94238,	.00000	94239,	.00029
	94240,	.00001	1001,	.00981	8016,	.39427	11023,	.00549
	12000,	.00341	13027,	.04264	14000,	.19420	19000,	.01318
	20000,	.01384	26000,	.00475				
2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490
	13027,	.06130	14000,	.27919	19000,	.01894	20000,	.01989
	26000,	.00683						

warning. 1 of the materials had unnormalized fractions.
 1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	7.48330E-02	2.73928E+00	.00000E+00	1.14940E+07	3.14854E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0 infinite

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1y) 10000 Years 600K probid = 08/29/96 21:26:32
 0 08/29/96 19:39:01

neutron creation	tracks	weight (per source particle)	energy	neutron loss	tracks	weight (per source particle)	energy
------------------	--------	------------------------------	--------	--------------	--------	------------------------------	--------

source	520281	9.9946E-01	2.0382E+00	escape	149	1.6730E-04	1.4604E-04
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.1396E-02	3.5204E-05	weight cutoff	520441	6.1227E-02	2.4254E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	2.9787E-07	downscattering	0	0.	1.9292E+00
				capture	0	6.1647E-01	6.3851E-02
(n,xn)	615	9.0114E-04	6.0068E-04	loss to (n,xn)	306	4.4829E-04	3.7092E-03
fission	0	0.	0.	loss to fission	0	3.8345E-01	4.1915E-02
total	520896	1.0618E+00	2.0388E+00	total	520896	1.0618E+00	2.0388E+00

number of neutrons banked	309	average lifetime, shakes	cutoffs
neutron tracks per source particle	1.0012E+00	escape	tco 1.0000E+34
neutron collisions per source particle	7.4518E+01	capture	eco .0000E+00
total neutron collisions	38770499	capture or escape	wc1 -5.0000E-01
net multiplication	1.0005E+00 .0000	any termination	wc2 -2.5000E-01

computer time so far in this run	107.38 minutes	maximum number ever in bank	2
computer time in mcrun	107.32 minutes	bank overflows to backup file	0
source particles per minute	4.8477E+03	field length	0
random numbers generated	451369347	most random numbers used was	13557 in history 65329

range of sampled source weights = 9.2357E-01 to 1.0675E+00
 1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	601228	520590	31280058	4.4781E+01	3.6133E-04	5.2618E-01	8.1350E-01
2	2	104805	51172	7490441	7.6401E+00	4.7485E-05	2.0377E-01	5.8027E-01
total		706033	571762	38770499	5.2421E+01			

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1y) 10000 Years 600K probid = 08/29/96 19:39:01

the initial fission neutron source distribution was read from the srctp file named srctp .
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 119593 neutron histories and 100 active cycles with 400688 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 520281 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 99 percent confidence level, but not at 95 percent
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .95562 with an estimated standard deviation of .00095

the estimated 68, 95, & 99 percent keff confidence intervals are .95467 to .95657, .95373 to .95751, and .95311 to .95813
 the estimated collision/absorption neutron removal lifetime = 8.59E-05 seconds with an estimated standard deviation of 1.92E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.95629	.00141	.95488 to .95770	.95348 to .95910	.95257 to .96001	
absorption	.95516	.00113	.95403 to .95630	.95290 to .95742	.95217 to .95816	
track length	.95613	.00147	.95466 to .95761	.95321 to .95906	.95225 to .96002	
col/absorp	.95559	.00094	.95464 to .95653	.95371 to .95747	.95310 to .95808	.1287
abs/trk len	.95551	.00095	.95456 to .95646	.95361 to .95741	.95299 to .95803	.1162
col/trk len	.95641	.00140	.95501 to .95782	.95362 to .95921	.95270 to .96012	.9841
col/abs/trk len	.95562	.00095	.95467 to .95657	.95373 to .95751	.95311 to .95813	

1mcnp version 4a ld=10/01/93 08/29/96 15:14:43

probid = 08/29/96 15:14:43

inp=sp40g1z outp=sp40g1z0

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1z) 10000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k no pu239,u233
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 1 7.48323-2 -1 IMP:N=1
7- 2 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0

10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 \$ INNER FUEL ZONE
13- 2 SO 200 \$ TUFF REFLECTOR
14-

15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS

20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c 10000 yr critical

23- m1 62149.50c 2.8219E-09
24- 63151.55c 9.6170E-09
25- 60143.50c 1.9432E-07
26- 45103.50c 1.1304E-07
27- 54131.50c 9.9667E-08
28- 55133.50c 2.2906E-07
29- 62147.50c 7.6323E-08
30- 43099.50c 2.0502E-07
31- 64155.50c 2.9053E-10
32- 60145.50c 1.3161E-07
33- 62152.50c 1.3106E-08
34- 42095.50c 2.1753E-07
35- 48000.50c 4.2020E-09
36- 62150.50c 2.3522E-08
37- 36083.50c 1.7568E-08
38- 92234.50c 6.0552E-07
39- 92235.53c 3.9787E-05
40- 92236.50c 1.0899E-05
41- 92238.53c 2.1513E-03
42- 93237.50c 2.4587E-06
43- 94240.50c 7.0065E-08
44- 1001.53c 1.6059-2
45- 8016.53c 4.0662-2
46- 11023.50c 3.9366-4
47- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
48- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
49- mt1 lwtr.03t
50- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
51- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
52- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
53- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
54- mt2 lwtr.02t
55- PRINT

1 initial source from file srctp

original number of points 3929
 points not in any cell 0
 points in cells of zero importance 0
 points in void cells 0
 points in ambiguous cells 0
 total points rejected 0
 points remaining 3929
 points after expansion or contraction 3996
 nominal source size 4000

initial guess for k(eff.) 1.000000
 cycles to skip before tallying 30
 number of keff cycles that can be stored 260
 total fission nubar data are being used.

warning. lwtr.02t and lwtr.03t are both called for.
 material composition

print table 40

the sum of the fractions of material 1 was 7.483117E-02

material number	component nuclide, atom fraction								
1	62149,	.00000	63151,	.00000	60143,	.00000	45103,	.00000	
	54131,	.00000	55133,	.00000	62147,	.00000	43099,	.00000	
	64155,	.00000	60145,	.00000	62152,	.00000	42095,	.00000	
	48000,	.00000	62150,	.00000	36083,	.00000	92234,	.00001	
	92235,	.00053	92236,	.00015	92238,	.02875	93237,	.00003	
	94240,	.00000	1001,	.21460	8016,	.54338	11023,	.00526	
	12000,	.00309	13027,	.03484	14000,	.15242	19000,	.00743	
	20000,	.00761	26000,	.00188					
	associated thermal s(a,b) data sets: lwtr.03t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
		13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
26000,		.00167							
associated thermal s(a,b) data sets: lwtr.02t									

material number	component nuclide, mass fraction								
1	62149,	.00000	63151,	.00000	60143,	.00002	45103,	.00001	
	54131,	.00001	55133,	.00002	62147,	.00001	43099,	.00001	
	64155,	.00000	60145,	.00001	62152,	.00000	42095,	.00001	
	48000,	.00000	62150,	.00000	36083,	.00000	92234,	.00009	
	92235,	.00567	92236,	.00156	92238,	.31051	93237,	.00035	
	94240,	.00001	1001,	.00981	8016,	.39435	11023,	.00549	
	12000,	.00341	13027,	.04265	14000,	.19423	19000,	.01318	
	20000,	.01384	26000,	.00475					
	2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490
		13027,	.06130	14000,	.27919	19000,	.01894	20000,	.01989
		26000,	.00683						

warning. 1 of the materials had unnormalized fractions.
 1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	7.48323E-02	2.73877E+00	.00000E+00	1.14940E+07	3.14795E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1z) 10000 Years 600K probid = 08/29/96 17:52:51
 0 08/29/96 15:14:43

neutron creation	tracks	weight (per source particle)	energy	neutron loss	tracks	weight (per source particle)	energy
source	520709	9.9864E-01	2.0320E+00	escape	126	1.4674E-04	1.8263E-04
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.5427E-02	3.9852E-05	weight cutoff	520897	6.5405E-02	4.4389E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	3.1466E-07	downscattering	0	0.	1.9232E+00
				capture	0	6.2837E-01	6.3662E-02
(n,xn)	626	9.0213E-04	6.7489E-04	loss to (n,xn)	312	4.4990E-04	3.8210E-03
fission	0	0.	0.	loss to fission	0	3.7060E-01	4.1847E-02
total	521335	1.0650E+00	2.0327E+00	total	521335	1.0650E+00	2.0327E+00

number of neutrons banked	314	average lifetime, shakes	cutoffs
neutron tracks per source particle	1.0012E+00	escape	tco 1.0000E+34
neutron collisions per source particle	7.7377E+01	capture	eco .0000E+00
total neutron collisions	40290887	capture or escape	wc1 -5.0000E-01
net multiplication	1.0005E+00 .0000	any termination	wc2 -2.5000E-01

computer time so far in this run 158.10 minutes maximum number ever in bank 2
 computer time in mcrun 158.04 minutes bank overflows to backup file 0
 source particles per minute 3.2948E+03 field length 0
 random numbers generated 468265673 most random numbers used was 12747 in history 380287

range of sampled source weights = 9.4719E-01 to 1.1001E+00
 1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	604960	521023	32711757	4.6078E+01	3.3838E-04	5.1509E-01	8.0376E-01
2	2	108819	52131	7579130	7.7076E+00	4.6983E-05	2.0137E-01	5.7908E-01
total		713779	573154	40290887	5.3786E+01			2.5463E+00

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1z) 10000 Years 600K probid = 08/29/96 15:14:43

the initial fission neutron source distribution was read from the srctp file named srctp .

the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle. this problem has run 30 inactive cycles with 120373 neutron histories and 100 active cycles with 400336 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 520709 fission neutron source histories. all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 99 percent confidence level, but not at 95 percent
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 warning. the k(trk length) cycle values do not appear normally distributed at the 99 percent confidence level

the final estimated combined collision/absorption/track-length keff = .90902 with an estimated standard deviation of .00090
 the estimated 68, 95, & 99 percent keff confidence intervals are .90813 to .90992, .90724 to .91081, and .90665 to .91140
 the estimated collision/absorption neutron removal lifetime = 9.04E-05 seconds with an estimated standard deviation of 2.10E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.90969	.00123	.90846 to .91092	.90724 to .91214	.90645 to .91293	
absorption	.90829	.00115	.90714 to .90944	.90600 to .91058	.90526 to .91132	
track length	.90945	.00128	.90816 to .91073	.90689 to .91200	.90605 to .91284	
col/absorp	.90394	.00089	.90205 to .90983	.90716 to .91071	.90658 to .91129	.1073
abs/trk len	.90880	.00091	.90789 to .90970	.90699 to .91060	.90640 to .91119	.1026
col/trk len	.90986	.00123	.90863 to .91109	.90741 to .91231	.90662 to .91311	.9827
col/abs/trk len	.90902	.00090	.90813 to .90992	.90724 to .91081	.90665 to .91140	

1mcnp version 4a ld=10/01/93 08/29/96 13:42:02

probid = 08/29/96 13:42:02

inp=sp40g1x outp=sp40g1x0

```
1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1x) 10000 Years 600K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 500k / extended iso
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 1 7.48351-2 -1 IMP:N=1
7- 2 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .776 at 265 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c 10000 yr critical
23- m1 62149.50c 2.8219E-09
24- 63151.55c 9.6170E-09
25- 60143.50c 1.9432E-07
26- 45103.50c 1.1304E-07
27- 54131.50c 9.9667E-08
28- 55133.50c 2.2906E-07
29- 62147.50c 7.6323E-08
30- 43099.50c 2.0502E-07
31- 64155.50c 2.9053E-10
32- 60145.50c 1.3161E-07
33- 62152.50c 1.3106E-08
34- 42095.50c 2.1753E-07
35- 48000.50c 4.2020E-09
36- 62150.50c 3.4356E-08
37- 36083.50c 1.7568E-08
38- 55135.50c 2.2566E-07
39- 64157.50c 2.3440E-11
40- 44101.50c 1.7655E-07
41- 63153.55c 6.5102E-09
42- 59141.50c 1.9708E-07
43- 62151.50c 2.1202E-10
44- 47109.50c 5.0512E-09
45- 46105.50c 4.5152E-08
46- 40093.50c 1.4043E-07
47- 64152.50c 2.4488E-09
48- 46108.50c 7.0411E-09
49- 92233.50c 6.6328E-09
50- 92234.50c 6.0552E-07
51- 92235.53c 3.9787E-05
52- 92236.50c 1.0899E-05
53- 92238.53c 2.1513E-03
54- 93237.50c 2.4587E-06
55- 94238.50c 1.1952E-09
56- 94239.55c 1.9793E-06
```



```

57-          94240.50c 7.0065E-08
58-          1001.53c 1.6059-2
59-          8016.53c 4.0662-2
60-          11023.50c 3.9366-4
61-          12000.50c 2.3128-4
62-          19000.50c 5.5591-4 13027.50c 2.6070-3 14000.50c 1.1406-2
63-          mt1 lwtr.03t 20000.50c 5.6949-4 26000.55c 1.4037-4
64-          c 40 (x .99 at 50 C) vol% water in calico Hills tuff
65-          m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
66-          12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
67-          19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
68-          mt2 lwtr.02t
69-          PRINT

```

```

1 initial source from file srctp
original number of points 3974
points not in any cell 0
points in cells of zero importance 0
points in void cells 0
points in ambiguous cells 0
total points rejected 0
points remaining 3974
points after expansion or contraction 3996
nominal source size 4000
initial guess for k(eff.) 1.000000
cycles to skip before tallying 30
number of keff cycles that can be stored 260
total fission nubar data are being used.

```

warning. lwtr.02t and lwtr.03t are both called for.
material composition

the sum of the fractions of material 1 was 7.483397E-02

print table 40

material number	component nuclide, atom fraction								
1	62149,	.00000	63151,	.00000	60143,	.00000	45103,	.00000	
	54131,	.00000	55133,	.00000	62147,	.00000	43099,	.00000	
	64155,	.00000	60145,	.00000	67152,	.00000	42095,	.00000	
	48000,	.00000	62150,	.00000	35083,	.00000	55155,	.00000	
	64157,	.00000	44101,	.00000	65153,	.00000	57141,	.00000	
	62151,	.00000	47109,	.00000	46105,	.00000	40093,	.00000	
	64152,	.00000	46103,	.00000	92223,	.00000	92233,	.00000	
	92235,	.00053	92238,	.00015	92238,	.00075	92237,	.00003	
	94238,	.00000	94239,	.00003	94240,	.00000	1001,	.21460	
	8016,	.54336	11023,	.00526	12000,	.00309	13027,	.03484	
	14000,	.15242	19000,	.00743	20000,	.00761	26000,	.00188	
	associated thermal s(a,b) data sets: lwtr.03t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
		13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
		26000,	.00167						
associated thermal s(a,b) data sets: lwtr.02t									

material number	component nuclide, mass fraction								
1	62149,	.00000	63151,	.00000	60143,	.00002	45103,	.00001	
	54131,	.00001	55133,	.00002	62147,	.00001	43099,	.00001	
	64155,	.00000	60145,	.00001	62152,	.00000	42095,	.00001	
	48000,	.00000	62150,	.00000	36083,	.00000	55135,	.00002	
	64157,	.00000	44101,	.00001	63153,	.00000	59141,	.00002	
	62151,	.00000	47109,	.00000	46105,	.00000	40093,	.00001	
	64152,	.00000	46108,	.00000	92233,	.00000	92234,	.00009	
	92235,	.00567	92236,	.00156	92238,	.31040	93237,	.00035	
	94238,	.00000	94239,	.00029	94240,	.00001	1001,	.00981	
	8016,	.39421	11023,	.00549	12000,	.00341	13027,	.04263	
	14000,	.19417	19000,	.01317	20000,	.01383	26000,	.00475	
	2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490
		13027,	.06130	14000,	.27919	19000,	.01894	20000,	.01989
		26000,	.00683						

warning. 1 of the materials had unnormalized fractions.
1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	7.48351E-02	2.73972E+00	.00000E+00	1.14940E+07	3.14904E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1x) 10000 Years 600K probid = 08/29/96 16:44:36
0 08/29/96 13:42:02

neutron creation	tracks	weight (per source particle)	energy	neutron loss	tracks	weight (per source particle)	energy
source	520005	9.9999E-01	2.0413E+00	escape	129	1.3901E-04	8.1805E-05
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	6.0598E-02	4.5024E-05	weight cutoff	520214	6.0935E-02	4.5386E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	2.9393E-07	downscattering	0	0.	1.9316E+00
				capture	0	6.2071E-01	6.4193E-02
(n,xn)	675	9.8269E-04	7.2896E-04	loss to (n,xn)	337	4.9053E-04	4.1077E-03
fission	0	0.	0.	loss to fission	0	3.7940E-01	4.1973E-02
total	520680	1.0616E+00	2.0420E+00	total	520680	1.0616E+00	2.0420E+00

number of neutrons banked 338
neutron tracks per source particle 1.0013E+00
neutron collisions per source particle 7.3819E+01
total neutron collisions 38386204
net multiplication 1.0005E+00 .0000

average lifetime, shakes
escape 3.0649E+04
capture 8.4525E+03
capture or escape 8.4556E+03
any termination 9.2083E+03
cutoffs
tco 1.0000E+34
eco .0000E+00
wc1 -5.0000E-01
wc2 -2.5000E-01

computer time so far in this run 182.24 minutes maximum number ever in bank 2
 computer time in mcrun 182.15 minutes bank overflows to backup file 0
 source particles per minute 2.8548E+03 field length 0
 random numbers generated 447516742 most random numbers used was 11451 in history 37782

range of sampled source weights = 9.2421E-01 to 1.0616E+00
 1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)	
1	1	599533	520343	31039933	4.4569E+01	3.6657E-04	5.2925E-01	8.1518E-01	2.5788E+00
2	2	102910	50260	7346271	7.5177E+00	4.7754E-05	2.0354E-01	5.8211E-01	1.3261E+00
total	702443	570603	38386204	5.2086E+01					

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40g1x) 10000 Years 600K probid = 08/29/96 13:42:02

the initial fission neutron source distribution was read from the srctp file named srctp
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 119677 neutron histories and 100 active cycles with 400328 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 520005 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .94482 with an estimated standard deviation of .00089
 the estimated 68, 95, & 99 percent keff confidence intervals are .94393 to .94571, .94305 to .94659, and .94247 to .94717
 the estimated collision/absorption neutron removal lifetime = 8.46E-05 seconds with an estimated standard deviation of 1.79E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.94541	.00142	.94399 to .94683	.94259 to .94824	.94166 to .94916	
absorption	.94460	.00111	.94349 to .94571	.94239 to .94682	.94167 to .94754	
track length	.94528	.00138	.94390 to .94666	.94254 to .94802	.94164 to .94892	
col/absorp	.94490	.00091	.94400 to .94581	.94310 to .94671	.94251 to .94730	.0616
abs/trk len	.94487	.00089	.94398 to .94576	.94309 to .94664	.94252 to .94721	.0455
col/trk len	.94524	.00138	.94385 to .94662	.94248 to .94799	.94158 to .94889	.9818
col/abs/trk len	.94482	.00089	.94393 to .94571	.94305 to .94659	.94247 to .94717	

57- PRINT
 1 initial source from file srctp

original number of points 4244
 points not in any cell 0
 points in cells of zero importance 0
 points in void cells 0
 points in ambiguous cells 0
 total points rejected 0
 points remaining 4244
 points after expansion or contraction 3989
 nominal source size 4000

initial guess for k(eff.) 1.000000

cycles to skip before tallying 30

number of keff cycles that can be stored 260

total fission nubar data are being used.

warning. 1001.50c and 1001.53c are both called for.

warning. 8016.50c and 8016.53c are both called for.
 1material composition

print table 40

material

number	component nuclide, atom fraction								
1	62149,	.00000	62150,	.00000	60143,	.00000	45103,	.00000	
	63151,	.00000	36083,	.00000	64155,	.00000	55135,	.00001	
	54131,	.00000	55133,	.00001	43099,	.00000	62147,	.00000	
	62152,	.00000	60145,	.00000	42095,	.00000	92233,	.00000	
	92234,	.00001	92235,	.000074	92236,	.00020	92238,	.03915	
	93237,	.00004	94239,	.00002	94240,	.00000	1001,	.22036	
	8016,	.54161	11023,	.00490	12000,	.00288	13027,	.03243	
	14000,	.14189	19000,	.00692	20000,	.00708	26000,	.00175	
	associated thermal s(a,b) data sets: lwtr.01t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
13027,		.03110	14000,	.13606	19000,	.00663	20000,	.00679	
26000,		.00167							
associated thermal s(a,b) data sets: lwtr.01t									

material

number	component nuclide, mass fraction								
1	62149,	.00000	62150,	.00000	60143,	.00003	45103,	.00001	
	63151,	.00000	36083,	.00000	64155,	.00000	55135,	.00003	
	54131,	.00001	55133,	.00003	43099,	.00002	62147,	.00001	
	62152,	.00000	60145,	.00002	42095,	.00002	92233,	.00001	
	92234,	.00010	92235,	.00719	92236,	.00198	92238,	.38606	
	93237,	.00043	94239,	.00016	94240,	.00000	1001,	.00920	
	8016,	.35883	11023,	.00466	12000,	.00290	13027,	.03624	
	14000,	.16506	19000,	.01120	20000,	.01176	26000,	.00404	
	associated thermal s(a,b) data sets: lwtr.01t								
	2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490
13027,		.06130	14000,	.27919	19000,	.01894	20000,	.01989	

26000, .00683
1cell volumes and masses

print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	8.03881E-02	3.22272E+00	.00000E+00	1.14940E+07	3.70421E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40l) 100000 Year Cycle 350K probid = 08/29/96 16:52:06
0 08/29/96 13:28:41

neutron creation	tracks	weight (per source particle)	energy	neutron loss	tracks	weight (per source particle)	energy
source	519841	1.0003E+00	2.0322E+00	escape	79	9.4926E-05	8.1702E-05
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	5.6159E-02	5.7333E-05	weight cutoff	520196	5.6046E-02	5.6827E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dxtran	0	0.	0.	dxtran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	1.2102E-07	downscattering	0	0.	1.9109E+00
(n,xn)	865	1.2543E-03	9.5469E-04	capture	0	5.9664E-01	6.1951E-02
fission	0	0.	0.	less to (n,xn)	431	6.2505E-04	5.2194E-03
total	520706	1.0577E+00	2.0332E+00	loss to fission	0	4.0431E-01	5.5048E-02
				total	520706	1.0577E+00	2.0332E+00

number of neutrons banked	434	average lifetime, shakes	cutoffs
neutron tracks per source particle	1.0017E+00	escape	tco 1.0000E+34
neutron collisions per source particle	6.1255E+01	capture	eco .0000E+00
total neutron collisions	31842908	capture or escape	wc1 -5.0000E-01
net multiplication	1.0006E+00 .0000	any termination	wc2 -2.5000E-01
computer time so far in this run	133.81 minutes	maximum number ever in bank	2
computer time in mcrun	133.74 minutes	bank overflows to backup file	0
source particles per minute	3.8868E+03	field length	0
random numbers generated	378177980	most random numbers used was	10251 in history 399633

range of sampled source weights = 9.1137E-01 to 1.0585E+00
1neutron activity in each cell

print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mip (cm)
1	1	576696	520274	26313447	3.9104E+01	4.4851E-04	5.7279E-01	8.4039E-01
2	2	75645	40265	5529461	5.7291E+00	4.9395E-05	2.2792E-01	2.4409E+00
total		652341	560539	31842908	4.4834E+01			1.3616E+00

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40l) 100000 Year Cycle 350K probid = 08/29/96 13:28:41

the initial fission neutron source distribution was read from the srctp file named srctp .

the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle. this problem has run 30 inactive cycles with 120152 neutron histories and 100 active cycles with 399689 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 519841 fission neutron source histories. all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .99942 with an estimated standard deviation of .00093
 the estimated 68, 95, & 99 percent keff confidence intervals are .99849 to 1.00035, .99756 to 1.00127, and .99696 to 1.00188
 the estimated collision/absorption neutron removal lifetime = 6.32E-05 seconds with an estimated standard deviation of 1.90E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	1.00228	.00146	1.00082 to 1.00375	.99937 to 1.00520	.99842 to 1.00615	
absorption	.99783	.00111	.99672 to .99894	.99563 to 1.00003	.99491 to 1.00075	
track length	1.00239	.00148	1.00091 to 1.00388	.99944 to 1.00535	.99847 to 1.00631	
col/absorp	.99940	.00095	.99845 to 1.00035	.99752 to 1.00129	.99693 to 1.00190	.0741
abs/trk len	.99944	.00093	.99851 to 1.00037	.99759 to 1.00129	.99699 to 1.00190	.0249
col/trk len	1.00231	.00147	1.00084 to 1.00378	.99933 to 1.00524	.99842 to 1.00619	.9753
col/abs/trk len	.99942	.00093	.99849 to 1.00035	.99756 to 1.00127	.99696 to 1.00188	

1mcpn version 4a ld=10/01/93 08/29/96 16:57:28

probid = 08/29/96 16:57:28

inp=sp40ln outp=sp40ln0

```

1- Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40ln) 100000 Year Cycle 350K
2- C Calico Hills Tuff 1.5095 g/cc .40 porosity - sphere surrounded by tuff
3- C Water and UO2 offset each other in porous space / H2O @ 300k no UO2 infil
4- C CELL SPECIFICATIONS
5- C INNER WATER REGION
6- 1 1 8.17479-2 -1 IMP:N=1
7- 2 2 8.38290-2 1 -2 IMP:N=1
8- C OUTSIDE WORLD
9- 3 0 2 IMP:N=0
10-
11- C SURFACE SPECIFICATIONS
12- 1 SO 140 $ INNER FUEL ZONE
13- 2 SO 200 $ TUFF REFLECTOR
14-
15- MODE N
16- KCODE 4000 1. 30 130
17- C KSRC 0 0 1 0 0 10 0 0 -20 0 0 29 0 20 5 0 0 -5 -10 0 -10
18- C 0 -5 -20 -10 0 -13 0 -10 14 0 0 -15 -10 -5 -16 5 5 0 10 10 17
19- C MATERIAL SPECIFICATIONS
20- c 32 (x .99 at 50 C) vol% water in calico Hills tuff - 8 vol% UO2
21- c 3.0% Original Enrichment/ 20 GWD/MT decayed to Uranium isotopes
22- c no UO2 infiltration
23- c 10000 yr critical
24- m1 62149.50c 3.0928E-09
25- 62150.50c 3.4659E-8
26- 60143.50c 3.4941E-07
27- 45103.50c 2.0316E-07
28- 63151.55c 1.3054E-08
29- 36083.50c 3.1787E-08
30- 64155.50c 2.2525E-10
31- 55135.50c 4.0782E-07
32- 54131.50c 1.8012E-07
33- 55133.50c 4.1790E-07
34- 43099.50c 3.2898E-07
35- 62147.50c 1.3874E-07
36- 62152.50c 2.6109E-8
37- 60145.50c 2.4081E-07
38- 42095.50c 3.9916E-07
39- 92233.50c 4.2045E-08
40- 92234.50c 5.3283E-07
41- 92235.50c 3.4330E-05
42- 92236.50c 1.0255E-05
43- 92238.50c 1.8995E-03
44- 93237.50c 2.1065E-06
45- 94239.55c 1.2735E-06
46- 94240.50c 1.2813E-08
47- 1001.50c 2.1182-2
48- 8016.50c 4.2711-2
49- 11023.50c 3.9366-4
50- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
51- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4
52- mt1 lwtr.01t
53- c 40 (x .99 at 50 C) vol% water in calico Hills tuff
54- m2 1001.53c 2.6477-2 8016.53c 4.1448-2 11023.50c 3.9366-4
55- 12000.50c 2.3128-4 13027.50c 2.6070-3 14000.50c 1.1406-2
56- 19000.50c 5.5591-4 20000.50c 5.6949-4 26000.55c 1.4037-4

```

```

57-      mt2      lwtr.01t
58-      PRINT
1  initial source from file  srctp

original number of points          4031
  points not in any cell           0
  points in cells of zero importance 0
  points in void cells              0
  points in ambiguous cells         0
total points rejected              0
points remaining                   4031
points after expansion or contraction 4003
nominal source size                4000

initial guess for k(eff.)          1.000000

cycles to skip before tallying     30

number of keff cycles that can be stored 260

```

total fission nubar data are being used.

warning. 1001.50c and 1001.53c are both called for.

warning. 8016.50c and 8016.53c are both called for.

material composition

print table 40

material number	component nuclide, atom fraction								
1	62149,	.00000	62150,	.00000	60143,	.00000	45103,	.00000	
	63151,	.00000	36083,	.00000	64155,	.00000	55135,	.00000	
	54131,	.00000	55133,	.00001	43099,	.00000	62147,	.00000	
	62152,	.00000	60145,	.00000	42095,	.00000	92233,	.00000	
	92234,	.00001	92235,	.00042	92236,	.00013	92238,	.02324	
	93237,	.00003	94239,	.00002	94240,	.00000	1001,	.25911	
	8016,	.52247	11023,	.00482	12000,	.00283	13027,	.03189	
	14000,	.13953	19000,	.00680	20000,	.00697	26000,	.00172	
	associated thermal s(a,b) data sets: lwtr.01t								
	2	1001,	.31585	8016,	.49444	11023,	.00470	12000,	.00276
		13027,	.03110	14000,	.13606	19000,	.00663	20000,	.00679
26000,		.00167							
associated thermal s(a,b) data sets: lwtr.01t									

material number	component nuclide, mass fraction								
1	62149,	.00000	62150,	.00000	60143,	.00003	45103,	.00001	
	63151,	.00000	36083,	.00000	64155,	.00000	55135,	.00003	
	54131,	.00001	55133,	.00003	43099,	.00002	62147,	.00001	
	62152,	.00000	60145,	.00002	42095,	.00002	92233,	.00001	
	92234,	.00008	92235,	.00496	92236,	.00149	92238,	.27806	
	93237,	.00031	94239,	.00019	94240,	.00000	1001,	.01313	
	8016,	.42009	11023,	.00557	12000,	.00346	13027,	.04325	
	14000,	.19699	19000,	.01337	20000,	.01404	26000,	.00482	
	2	1001,	.02326	8016,	.57779	11023,	.00789	12000,	.00490

13027, .06130 14000, .27919 19000, .01894 20000, .01989
 26000, .00683
 1cell volumes and masses print table 50

cell	atom density	gram density	input volume	calculated volume	mass	pieces	reason volume not calculated
1	1	8.17479E-02	2.70045E+00	.00000E+00	1.14940E+07	3.10390E+07	1
2	2	8.38290E-02	1.90533E+00	.00000E+00	2.20163E+07	4.19483E+07	1
3	3	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	0 infinite

1problem summary

run terminated when 130 kcode cycles were done.

+ Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40ln) 100000 Year Cycle 350K probid = 08/29/96 21:03:46
 0 08/29/96 16:57:28

neutron creation	tracks	weight (per source particle)	energy	neutron loss	tracks	weight (per source particle)	energy
source	519515	1.0009E+00	2.0355E+00	escape	75	8.9205E-05	7.2207E-05
				energy cutoff	0	0.	0.
				time cutoff	0	0.	0.
weight window	0	0.	0.	weight window	0	0.	0.
cell importance	0	0.	0.	cell importance	0	0.	0.
weight cutoff	0	5.8365E-02	1.1475E-05	weight cutoff	519716	5.8677E-02	2.1037E-05
energy importance	0	0.	0.	energy importance	0	0.	0.
dextran	0	0.	0.	dextran	0	0.	0.
forced collisions	0	0.	0.	forced collisions	0	0.	0.
exp. transform	0	0.	0.	exp. transform	0	0.	0.
upscattering	0	0.	1.9639E-07	downscattering	0	0.	1.9410E+00
				capture	0	6.1661E-01	5.8656E-02
(n,xn)	552	8.3282E-04	6.6934E-04	loss to (n,xn)	276	4.1641E-04	3.5466E-03
fission	0	0.	0.	loss to fission	0	3.8434E-01	3.2951E-02
total	520067	1.0601E+00	2.0362E+00	total	520067	1.0601E+00	2.0362E+00

number of neutrons banked	276	average lifetime, shakes	cutoffs
neutron tracks per source particle	1.0011E+00	escape	tco 1.0000E+34
neutron collisions per source particle	7.7813E+01	capture	eco .0000E+00
total neutron collisions	40425165	capture or escape	wc1 -5.0000E-01
net multiplication	1.0004E+00 .0000	any termination	wc2 -2.5000E-01

computer time so far in this run	163.20 minutes	maximum number ever in bank	1
computer time in mcrun	163.13 minutes	bank overflows to backup file	0
source particles per minute	3.1846E+03	field length	0
random numbers generated	466085512	most random numbers used was	13224 in history 48043

range of sampled source weights = 9.3002E-01 to 1.0652E+00
 1neutron activity in each cell print table 126

cell	tracks entering	population	collisions	collisions * weight (per history)	number weighted energy	flux weighted energy	average track weight (relative)	average track mfp (cm)
1	1	576159	519791	35393076	4.9758E+01	2.6001E-04	5.2591E-01	8.1420E-01
2	2	74196	36211	5032089	5.1829E+00	4.6889E-05	2.2497E-01	2.2047E+00
total		650355	556002	40425165	5.4941E+01			1.3423E+00

1keff results for: Far-Field Consequence Study - 32% H2O/ 8% UO2 (sp40ln) 100000 Year Cycle 350K probid = 08/29/96 16:57:28

the initial fission neutron source distribution was read from the srctp file named srctp
 the criticality problem was scheduled to skip 30 cycles and run a total of 130 cycles with nominally 4000 neutrons per cycle.
 this problem has run 30 inactive cycles with 119683 neutron histories and 100 active cycles with 399832 neutron histories.

this calculation has completed the requested number of keff cycles using a total of 519515 fission neutron source histories.
 all cells with fissionable material were sampled and had fission neutron source points.

the results of the w test for normality applied to the individual collision, absorption, and track-length keff cycle values are:

the k(collision) cycle values appear normally distributed at the 95 percent confidence level
 the k(absorption) cycle values appear normally distributed at the 95 percent confidence level
 the k(trk length) cycle values appear normally distributed at the 95 percent confidence level

the final estimated combined collision/absorption/track-length keff = .94767 with an estimated standard deviation of .00087
 the estimated 68, 95, & 99 percent keff confidence intervals are .94680 to .94853, .94594 to .94939, and .94537 to .94996
 the estimated collision/absorption neutron removal lifetime = 9.36E-05 seconds with an estimated standard deviation of 1.93E-07

the estimated average keffs, one standard deviations, and 68, 95, and 99 percent confidence intervals are:

keff estimator	keff	standard deviation	68% confidence	95% confidence	99% confidence	corr
collision	.94652	.00131	.94520 to .94783	.94391 to .94912	.94306 to .94998	
absorption	.94858	.00119	.94739 to .94977	.94622 to .95094	.94545 to .95171	
track length	.94636	.00134	.94502 to .94771	.94369 to .94904	.94282 to .94991	
col/absorp	.94764	.00086	.94678 to .94851	.94593 to .94936	.94537 to .94992	-.0602
abs/trk len	.94760	.00087	.94673 to .94848	.94586 to .94934	.94529 to .94991	-.0574
col/trk len	.94656	.00132	.94524 to .94788	.94394 to .94918	.94308 to .95004	.9843
col/abs/trk len	.94767	.00087	.94680 to .94853	.94594 to .94939	.94537 to .94996	

Participant MO

Yucca Mtn. Site Char. Project-Planning & Control System
PACS Participant Work Station (PPWS)
Participant Planning Sheet (PSA03)

01-Sep-95

Prepared - 11/16/95:13:46:53

Inc. Dollars in Thousands

P&S Account No. - 1.2.2.3.3 TR

BASELINE Start Date - 10/01/95

P&S Account Title - Uncanistered Spent Fuel

BASELINE Finish Date - 09/30/96

WBS No. - 1.2.2.3.3

WBS Title - Uncanistered Spent Fuel

Element ID - TR233

		Fiscal Year Distribution											At
	Prior	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	Future	Complete
Annual Budget	0	1467	0	0	0	0	0	0	0	0	0	0	1467

Statement of Work:

The following quality affecting work shall be controlled in accordance with approved implementing procedures identified on the current OCRWM-accepted Requirements Traceability Network Matrix.

QARD applies to this effort.

OBJECTIVE:

Design waste packages to accommodate spent nuclear fuel that may arrive at the repository in an uncanistered form or fuel that must be repackaged. Produce drawings and specifications for Advanced Conceptual Design (ACD) and Investment Analysis (IAD). Conduct analyses to support waste package design development.

DESCRIPTION:

All efforts required to:

- Perform analyses of waste package components, including alternative concepts or features required to support the design process. Technical and economic analyses will be performed using models and computer codes. Technical analyses will include structural, shielding, criticality, thermal, and component performance analyses to determine the adequacy of various design concepts.
- Develop the waste package design drawings and specifications documents for both ACD and IAD. Participate in design reviews necessary for each design phase.
- Develop interface drawings and specifications in support of the subsurface and surface design efforts.

FY 1996 Scope of Work:

Continue to develop waste package designs to accommodate uncanistered spent nuclear fuel and non-fuel bearing waste stream forms. Evaluate the waste package uncanistered spent fuels using industry standards and processes including high and low thermal loads, spent nuclear fuel temperatures, shielding (source development), structural, and criticality. Investigate different waste streams generated at utilities (fuel and non-fuel bearing spent nuclear fuel). Develop design mitigation solutions (i.e., filler material and supplemental neutron absorber materials). Prepare initial Investment Analysis drawings/sketches for the uncanistered spent fuel waste package. Update, verify and validate, and maintain analytical computers and computer codes.

Initiate the calculation of keff for a family of spent nuclear fuel age, and for burn-up and enrichments for boiling water reactor and pressurized water reactor fuel. Establish keff for the family of waste package designs.

Prepared - 11/16/95:13:46:53

P&S Account No. - 1.2.2.3.3 TR

-Unregistered Spent Fuel

Statement of Work (cont.):

Prepare and support design review documentation and presentation materials describing waste package design features to support review of the Mined Geologic Disposal System Advanced Conceptual Design. Design three cut-away waste package models, an unregistered waste package model, a small multi-purpose canister disposal container with multi-purpose canister, and a high-level waste package model as appropriate.

Apply probabilistic methods to evaluate compliance of engineered Barrier Segment designs with regulatory requirements. Provide guidance for waste package design based on evaluations of direct hazards to the waste package. Provide guidance for the design of backfill, invert, and other non-waste package components of the Engineered Barrier Segment. Identify/define design basis accidents and events that affect the waste package or engineered barrier system, in coordination with Systems Engineering, Performance Assessment and Repository Design.

Perfect and use: (1) failure modes and effects analysis for each waste package and Engineered Barrier Segment design to identify credible failure modes for each component, the mechanisms and conditions necessary to produce the identified failure modes, and the effects of the failure on other components of the waste package; (2) comprehensive configuration generator for the evaluation of the probability associated with all credible event sequences that can lead to configurations likely to cause waste package system failures. All probabilities associated with environmental parameters will be obtained from models developed by, or in association with, CRWMS M&O Performance Assessment.

The configurations identified will be evaluated deterministically with respect to the appropriate waste package system failures. For criticality, additional probabilistic evaluations will be applied to the determination of consequences reflecting the uncertainty of environmental parameters that affect the duration of the criticality.

Develop and use probabilistic models of fuel dissolution, fuel transport by ground water, and re-precipitation. All activities will be coordinated with CRWMS M&O Performance Assessment and will use the Waste Forms Characteristics Report as a reference.

Support the development of acceptance criteria for DOE spent nuclear fuel. Identify potential problems with respect to the appropriate acceptance criteria. Perform analyses to determine waste package parameter modifications necessary to meet these criteria. All activities will be performed in coordination with appropriate staff at Idaho National Engineering Laboratory and under the auspices of the repository task team of the DOE Spent Fuel Steering Committee.

Investigate disposal criticality issues and evaluate the draft technical report issued in September 1995 relating to the Engineered Barrier Segment. Prepare and submit the second draft of the Disposal Criticality Technical Report. Support technical exchanges with the Nuclear Regulatory Commission to solicit comments regarding criticality issues.

Monitor the ongoing testing programs, including the 29 principal isotopes required for disposal criticality, and participate in the decision process directing the isotopic testing program. Seek out reactor restart reactor core neutronic data to benchmark the neutronics computers codes.

DELIVERABLES

Deliv ID	Description/Completion criteria	Due Date

Participant MO

Yucca Mtn. Site Char. Project-Planning & Control System
PACS Participant Work Station (PPWS)
Participant Planning Sheet (PSA03)

01-Sep-95 to 30-Sep-95
Page - 7
Inc. Dollars in Thousands

Prepared - 11/16/95:13:46:53

P&S Account No. - 1.2.2.3.3 TR -Uncanistered Spent Fuel

DELIVERABLES

Deliv ID	Description/Completion criteria	Due Date
ALT6225		
ALT6227	<p>Probabalistic Criticality Consequence Evaluation</p> <p>Criteria - Documents the estimate of criticality consequence (duration of criticality, energy, and radionuclide inventory additions) for both internal and external criticality. Cases reported will be representative of the criticalities identified in the internal and external evaluations.</p> <p>The due date will be met, and 90% of earned value applied, upon submittal to the M&O Plans and Procedures Department. The remaining 10% of earned value will be applied upon review and acceptance by YMSCO. If no review comments are received from DOE within 30 days of receipt of the document by DOE, the remaining 10% earned value may be applied.</p>	04-Sep-96

Participant MO

Yucca Mtn. Site Char. Project-Planning & Control System
PACS Participant Work Station (PPWS)
Participant Planning Sheet (PSA03)

01-Sep-95

Prepared - 11/16/95:13:46:53

Inc. Dollars in \$

P&S Account No. - 1.2.2.3.3 TR

-Unregistered Spent Fuel

Approvals

Preparer - print name

Date

Technical Reviewer - print name

Date

QA Reviewer - print name

Date

Preparer - Signature

Technical Reviewer - Signature

QA Reviewer - Signature

Date

R.D. Speck 11/16/95

R.L. Crann

Richard A. Kettell 11/24/95

[Signature]

[Signature]

11/17/95

Richard A. Kettell 11/24/95