ag	3.77E-02	4.98E-05	2.14E-05	9.20E-06	3.96E-06	1.70E-06	7.33E-07
sn	1.22E+00	9.64E-05	9.60E-05	9.59E-05	9.58E-05	9.58E-05	9.58E-05
sb	5.13E+00	4.14E-03	3.62E-03	3.20E-03	2.86E-03	2.59E-03	2.37E-03
te	5.43E+00	7.24E-05	4.60E-05	3.60E-05	2.89E-05	2.34E-05	1.89E-05
i	1.35E+01	1.74E-06	1.74E-06	1.74E-06	1.74E-06	1.74E-06	1.74E-06
cs	8.52E+00	1.69E-02	1.28E-02	9.66E-03	7.30E-03	5.52E-03	4.17E-03
ba	5.24E+00	7.00E-01	6.87E-01	6.74E-01	6.61E-01	6.48E-01	6.36E-01
ce	2.03E+00	9.65E-03	4.54E-03	2.16E-03	1.03E-03	4.92E-04	2.35E-04
pr	1.78E+00	1.46E-02	6.95E-03	3.31E-03	1.58E-03	7.54E-04	3.59E-04
pm	1.01E-01	1.66E-06	1.28E-06	1.02E-06	8.22E-07	6.59E-07	5.29E-07
sm	6.82E-03	1.35E-06	1.34E-06	1.33E-06	1.32E-06	1.31E-06	1.31E-06
eu	6.38E-02	4.59E-02	4.38E-02	4.19E-02	4.00E-02	3.82E-02	3.65E-02
gd	1.74E-04	1.66E-05	6.94E-06	2.90E-06	1.21E-06	5.05E-07	2.11E-07
ho	2.68E-08	1.10E-08	1.10E-08	1.10E-08	1.10E-08	1.10E-08	1.10E-08
totals	1.26E+02	9.23E-01	7.75E-01	7.41E-01	7.18E-01	6.98E-01	6.81E-01

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photon spectrum as a function of time for light elements, cladding and structural materials

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
power= .00 mw, burnup= 14610.mwd, flux= 2.71E+08 n**2-sec

0 spectrum of photon release rates, photons/sec
basis = single reactor assembly

0

emean	time after discharge						
(mev)	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
1.00E-02	5.17E+11	5.79E+04	4.64E+04	3.71E+04	2.97E+04	2.38E+04	1.91E+04
3.00E-02	1.70E+11	1.84E+04	1.48E+04	1.18E+04	9.46E+03	7.58E+03	6.07E+03
5.50E-02	1.19E+11	1.24E+04	9.96E+03	7.98E+03	6.39E+03	5.12E+03	4.10E+03
8.50E-02	6.93E+10	7.00E+03	5.61E+03	4.49E+03	3.60E+03	2.88E+03	2.31E+03
1.20E-01	4.93E+10	4.79E+03	3.83E+03	3.07E+03	2.46E+03	1.97E+03	1.58E+03
1.70E-01	5.15E+10	4.70E+03	3.76E+03	3.01E+03	2.41E+03	1.93E+03	1.55E+03
3.00E-01	5.91E+10	4.68E+03	3.75E+03	3.00E+03	2.40E+03	1.92E+03	1.54E+03
6.50E-01	2.91E+10	2.50E+05	2.00E+05	1.60E+05	1.28E+05	1.03E+05	8.23E+04
1.13E+00	5.00E+09	1.99E+05	1.59E+05	1.28E+05	1.02E+05	8.19E+04	6.56E+04
1.58E+00	9.09E+11	4.99E-01	3.99E-01	3.20E-01	2.56E-01	2.05E-01	1.64E-01
2.00E+00	1.80E+08	4.44E-02	3.55E-02	2.85E-02	2.28E-02	1.83E-02	1.46E-02
2.40E+00	3.65E+07	9.94E-03	7.96E-03	6.38E-03	5.11E-03	4.09E-03	3.28E-03
2.80E+00	2.15E+11	1.56E-04	1.25E-04	9.99E-05	8.00E-05	6.41E-05	5.13E-05
3.25E+00	1.40E+04	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
3.75E+00	1.40E+08	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
4.25E+00	1.83E+06	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
4.75E+00	6.05E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
5.50E+00	1.02E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
0 total	2.19E+12	5.59E+05	4.48E+05	3.59E+05	2.87E+05	2.30E+05	1.84E+05
0 mev/sec	2.11E+12	3.92E+05	3.14E+05	2.51E+05	2.01E+05	1.61E+05	1.29E+05

0 spectrum of energy release rates, mev/watt-sec
basis = single reactor assembly

0

emean	time after discharge						
(mev)	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
1.00E-02	1.29E+06	1.45E-01	1.16E-01	9.28E-02	7.44E-02	5.96E-02	4.77E-02
3.00E-02	1.28E+06	1.38E-01	1.11E-01	8.86E-02	7.10E-02	5.68E-02	4.55E-02
5.50E-02	1.63E+06	1.71E-01	1.37E-01	1.10E-01	8.79E-02	7.04E-02	5.64E-02
8.50E-02	1.47E+06	1.49E-01	1.19E-01	9.54E-02	7.64E-02	6.12E-02	4.90E-02
1.20E-01	1.48E+06	1.44E-01	1.15E-01	9.21E-02	7.38E-02	5.91E-02	4.73E-02
1.70E-01	2.19E+06	2.00E-01	1.60E-01	1.28E-01	1.03E-01	8.22E-02	6.58E-02
3.00E-01	4.43E+06	3.51E-01	2.81E-01	2.25E-01	1.80E-01	1.44E-01	1.16E-01
6.50E-01	4.73E+06	4.06E+01	3.25E+01	2.60E+01	2.09E+01	1.67E+01	1.34E+01
1.13E+00	1.41E+06	5.60E+01	4.49E+01	3.59E+01	2.88E+01	2.30E+01	1.85E+01
1.58E+00	3.58E+08	1.96E-04	1.57E-04	1.26E-04	1.01E-04	8.08E-05	6.47E-05

	2.00E+00	9.00E+04	2.22E-05	1.78E-05	1.42E-05	1.14E-05	9.13E-06	7.31E-06
	2.40E+00	2.19E+04	5.97E-06	4.78E-06	3.83E-06	3.07E-06	2.45E-06	1.97E-06
	2.80E+00	1.50E+08	1.09E-07	8.73E-08	6.99E-08	5.60E-08	4.48E-08	3.59E-08
	3.25E+00	1.14E+01	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	3.75E+00	1.31E+05	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	4.25E+00	1.94E+03	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	4.75E+00	7.19E-13	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	5.50E+00	1.40E-13	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
0	total	5.28E+08	9.79E+01	7.84E+01	6.28E+01	5.03E+01	4.03E+01	3.23E+01
0	gamma watts	3.39E-01	6.28E-08	5.03E-08	4.03E-08	3.23E-08	2.58E-08	2.07E-08

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photon spectrum as a function of time for fission products

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
power= .00 mw, burnup= 14610.mwd, flux= 2.71E+08 n**2-sec

0 spectrum of photon release rates, photons/sec
basis = single reactor assembly

0

	emean	time after discharge						
	(mev)	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
	1.00E-02	2.55E+14	8.20E+12	6.52E+12	5.70E+12	5.24E+12	4.96E+12	4.78E+12
	3.00E-02	1.12E+14	3.64E+12	2.89E+12	2.52E+12	2.31E+12	2.19E+12	2.10E+12
	5.50E-02	5.95E+13	1.86E+12	1.46E+12	1.27E+12	1.16E+12	1.09E+12	1.05E+12
	8.50E-02	4.11E+13	1.06E+12	8.10E+11	6.86E+11	6.18E+11	5.79E+11	5.53E+11
	1.20E-01	3.36E+13	1.13E+12	7.75E+11	6.03E+11	5.15E+11	4.66E+11	4.37E+11
	1.70E-01	5.39E+13	6.79E+11	5.18E+11	4.41E+11	3.99E+11	3.74E+11	3.58E+11
	3.00E-01	1.10E+14	8.30E+11	6.45E+11	5.51E+11	5.00E+11	4.69E+11	4.48E+11
	6.50E-01	2.28E+14	8.55E+12	7.16E+12	6.87E+12	6.66E+12	6.49E+12	6.34E+12
	1.13E+00	7.64E+13	1.70E+11	1.44E+11	1.29E+11	1.18E+11	1.11E+11	1.05E+11
	1.58E+00	3.95E+13	6.65E+10	5.52E+10	4.86E+10	4.44E+10	4.14E+10	3.91E+10
	2.00E+00	1.19E+13	2.88E+10	1.39E+10	6.78E+09	3.34E+09	1.69E+09	8.89E+08
	2.40E+00	1.02E+13	9.03E+08	4.89E+08	2.66E+08	1.45E+08	7.99E+07	4.41E+07
	2.80E+00	4.10E+12	1.29E+08	7.15E+07	3.96E+07	2.20E+07	1.23E+07	6.87E+06
	3.25E+00	2.35E+12	1.87E+07	1.06E+07	6.00E+06	3.40E+06	1.93E+06	1.09E+06
	3.75E+00	1.18E+12	8.23E+03	4.66E+03	2.64E+03	1.50E+03	8.49E+02	4.82E+02
	4.25E+00	1.29E+12	1.99E-05	1.99E-05	1.99E-05	1.99E-05	1.99E-05	1.99E-05
	4.75E+00	3.77E+11	9.99E-06	9.99E-06	9.99E-06	9.99E-06	9.99E-06	9.99E-06
	5.50E+00	2.82E+11	7.41E-06	7.41E-06	7.41E-06	7.41E-06	7.41E-06	7.41E-06
0	total	1.04E+15	2.62E+13	2.10E+13	1.88E+13	1.76E+13	1.68E+13	1.62E+13
0	mev/sec	4.36E+14	6.80E+12	5.61E+12	5.27E+12	5.06E+12	4.90E+12	4.77E+12

0 spectrum of energy release rates, mev/watt-sec
basis = single reactor assembly

0

	emean	time after discharge						
	(mev)	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
	1.00E-02	6.38E+08	2.05E+07	1.63E+07	1.43E+07	1.31E+07	1.24E+07	1.19E+07
	3.00E-02	8.41E+08	2.73E+07	2.17E+07	1.89E+07	1.74E+07	1.64E+07	1.58E+07
	5.50E-02	8.18E+08	2.55E+07	2.01E+07	1.74E+07	1.59E+07	1.50E+07	1.44E+07
	8.50E-02	8.73E+08	2.26E+07	1.72E+07	1.46E+07	1.31E+07	1.23E+07	1.18E+07
	1.20E-01	1.01E+09	3.38E+07	2.33E+07	1.81E+07	1.54E+07	1.40E+07	1.31E+07
	1.70E-01	2.29E+09	2.89E+07	2.20E+07	1.87E+07	1.69E+07	1.59E+07	1.52E+07
	3.00E-01	8.23E+09	6.22E+07	4.83E+07	4.14E+07	3.75E+07	3.51E+07	3.36E+07
	6.50E-01	3.71E+10	1.39E+09	1.16E+09	1.12E+09	1.08E+09	1.06E+09	1.03E+09
	1.13E+00	2.15E+10	4.80E+07	4.05E+07	3.62E+07	3.33E+07	3.12E+07	2.95E+07
	1.58E+00	1.55E+10	2.62E+07	2.17E+07	1.91E+07	1.75E+07	1.63E+07	1.54E+07
	2.00E+00	5.96E+09	1.44E+07	6.96E+06	3.39E+06	1.67E+06	8.44E+05	4.44E+05
	2.40E+00	6.13E+09	5.42E+05	2.93E+05	1.60E+05	8.72E+04	4.80E+04	2.65E+04
	2.80E+00	2.87E+09	9.06E+04	5.01E+04	2.77E+04	1.54E+04	8.60E+03	4.81E+03
	3.25E+00	1.91E+09	1.52E+04	8.60E+03	4.87E+03	2.76E+03	1.57E+03	8.87E+02
	3.75E+00	1.11E+09	7.71E+00	4.37E+00	2.48E+00	1.40E+00	7.96E-01	4.51E-01

	4.25E+00	1.37E+09	2.12E-08	2.12E-08	2.12E-08	2.12E-08	2.12E-08	2.12E-08
	4.75E+00	4.47E+08	1.19E-08	1.19E-08	1.19E-08	1.19E-08	1.19E-08	1.19E-08
	5.50E+00	3.87E+08	1.02E-08	1.02E-08	1.02E-08	1.02E-08	1.02E-08	1.02E-08
0	total	1.09E+11	1.70E+09	1.40E+09	1.32E+09	1.26E+09	1.22E+09	1.19E+09
0	gamma watts	6.99E+01	1.09E+00	8.99E-01	8.45E-01	8.11E-01	7.85E-01	7.64E-01
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0 principal photon sources in group 1, photons/sec

mean energy = .0100 mev. nuclides exceeding 1.0E-03 of total group release rate (4.96E+12) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr 85	4.39E+10	4.16E+10	3.94E+10	3.73E+10	3.54E+10	3.35E+10	3.17E+10
sr 90	7.43E+11	7.28E+11	7.13E+11	6.99E+11	6.85E+11	6.71E+11	6.57E+11
y 90	3.65E+12	3.58E+12	3.51E+12	3.43E+12	3.36E+12	3.30E+12	3.23E+12
tc 99	1.10E+10	1.10E+10	1.10E+10	1.10E+10	1.10E+10	1.10E+10	1.10E+10
rh106	8.77E+11	4.97E+11	2.82E+11	1.60E+11	9.06E+10	5.13E+10	2.91E+10
cs137	7.51E+11	7.37E+11	7.23E+11	7.09E+11	6.96E+11	6.82E+11	6.69E+11
ba137m	3.52E+10	3.46E+10	3.39E+10	3.33E+10	3.26E+10	3.20E+10	3.14E+10
ce144	3.41E+11	1.63E+11	7.76E+10	3.70E+10	1.76E+10	8.42E+09	4.01E+09
pr144	4.52E+12	2.16E+12	1.03E+12	4.90E+11	2.34E+11	1.12E+11	5.32E+10
pm147	8.77E+10	7.12E+10	5.71E+10	4.58E+10	3.68E+10	2.95E+10	2.37E+10
eu152	2.37E+10	2.27E+10	2.17E+10	2.08E+10	1.99E+10	1.91E+10	1.83E+10

0 principal photon sources in group 2, photons/sec

mean energy = .0300 mev. nuclides exceeding 1.0E-03 of total group release rate (2.19E+12) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr 85	1.28E+10	1.21E+10	1.15E+10	1.09E+10	1.03E+10	9.76E+09	9.25E+09
sr 90	2.10E+11	2.06E+11	2.02E+11	1.97E+11	1.93E+11	1.90E+11	1.86E+11
y 90	1.19E+12	1.17E+12	1.14E+12	1.12E+12	1.10E+12	1.07E+12	1.05E+12
tc 99	2.65E+09	2.65E+09	2.65E+09	2.65E+09	2.65E+09	2.65E+09	2.65E+09
rh106	2.93E+11	1.66E+11	9.41E+10	5.34E+10	3.02E+10	1.71E+10	9.72E+09
sb125	2.39E+10	1.94E+10	1.57E+10	1.27E+10	1.03E+10	8.32E+09	6.73E+09
te125m	1.28E+10	1.10E+10	8.94E+09	7.23E+09	5.85E+09	4.74E+09	3.83E+09
cs137	2.09E+11	2.05E+11	2.01E+11	1.98E+11	1.94E+11	1.90E+11	1.87E+11
ba137m	6.06E+11	5.94E+11	5.83E+11	5.71E+11	5.61E+11	5.50E+11	5.39E+11
ce144	7.92E+11	3.78E+11	1.80E+11	8.59E+10	4.10E+10	1.95E+10	9.32E+09
pr144	1.50E+12	7.13E+11	3.40E+11	1.62E+11	7.74E+10	3.69E+10	1.76E+10
pm147	1.93E+10	1.56E+10	1.26E+10	1.01E+10	8.08E+09	6.49E+09	5.20E+09
eu152	9.40E+10	9.00E+10	8.62E+10	8.25E+10	7.90E+10	7.57E+10	7.25E+10

0 principal photon sources in group 3, photons/sec

mean energy = .0550 mev. nuclides exceeding 1.0E-03 of total group release rate (1.09E+12) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr 85	7.84E+09	7.43E+09	7.04E+09	6.67E+09	6.32E+09	5.99E+09	5.67E+09
sr 90	1.24E+11	1.22E+11	1.19E+11	1.17E+11	1.14E+11	1.12E+11	1.10E+11
y 90	8.22E+11	8.06E+11	7.89E+11	7.73E+11	7.58E+11	7.42E+11	7.27E+11
tc 99	1.28E+09	1.28E+09	1.28E+09	1.28E+09	1.28E+09	1.28E+09	1.28E+09
rh106	2.08E+11	1.18E+11	6.67E+10	3.78E+10	2.14E+10	1.21E+10	6.88E+09
cs137	1.22E+11	1.20E+11	1.17E+11	1.15E+11	1.13E+11	1.11E+11	1.09E+11
ce144	1.15E+11	5.46E+10	2.61E+10	1.24E+10	5.93E+09	2.83E+09	1.35E+09
pr144	1.05E+12	5.01E+11	2.39E+11	1.14E+11	5.43E+10	2.59E+10	1.24E+10
pm147	8.10E+09	6.57E+09	5.28E+09	4.23E+09	3.40E+09	2.73E+09	2.19E+09
eu152	8.17E+10	7.82E+10	7.49E+10	7.17E+10	6.87E+10	6.58E+10	6.30E+10
eu154	3.50E+09	3.27E+09	3.06E+09	2.86E+09	2.67E+09	2.50E+09	2.34E+09
eu155	1.28E+10	1.13E+10	9.99E+09	8.83E+09	7.80E+09	6.90E+09	6.10E+09

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0 principal photon sources in group 4, photons/sec

mean energy = .0850 mev. nuclides exceeding 1.0E-03 of total group release rate (5.79E+11) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr 85	3.92E+09	3.72E+09	3.52E+09	3.34E+09	3.16E+09	3.00E+09	2.84E+09

sr 90	5.92E+10	5.80E+10	5.68E+10	5.56E+10	5.45E+10	5.34E+10	5.23E+10
y 90	4.76E+11	4.66E+11	4.57E+11	4.47E+11	4.38E+11	4.29E+11	4.21E+11
rh106	1.23E+11	6.99E+10	3.96E+10	2.25E+10	1.27E+10	7.21E+09	4.09E+09
sn126	2.17E+09	2.17E+09	2.17E+09	2.17E+09	2.17E+09	2.17E+09	2.17E+09
cs137	5.71E+10	5.60E+10	5.49E+10	5.39E+10	5.28E+10	5.18E+10	5.08E+10
ce144	1.62E+11	7.72E+10	3.68E+10	1.76E+10	8.37E+09	3.99E+09	1.90E+09
pr144	6.18E+11	2.95E+11	1.41E+11	6.70E+10	3.20E+10	1.52E+10	7.27E+09
pm147	2.30E+09	1.87E+09	1.50E+09	1.20E+09	9.66E+08	7.75E+08	6.22E+08
eu155	1.94E+10	1.72E+10	1.52E+10	1.34E+10	1.18E+10	1.05E+10	9.26E+09

0 principal photon sources in group 5, photons/sec

mean energy = .1200 mev. nuclides exceeding 1.0E-03 of total group release rate (4.66E+11) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr 85	2.37E+09	2.24E+09	2.12E+09	2.01E+09	1.91E+09	1.81E+09	1.71E+09
sr 90	3.37E+10	3.30E+10	3.23E+10	3.17E+10	3.10E+10	3.04E+10	2.98E+10
y 90	3.35E+11	3.28E+11	3.21E+11	3.15E+11	3.08E+11	3.02E+11	2.96E+11
rh106	8.91E+10	5.05E+10	2.86E+10	1.62E+10	9.19E+09	5.21E+09	2.95E+09
cs137	3.20E+10	3.14E+10	3.08E+10	3.02E+10	2.96E+10	2.90E+10	2.85E+10
ce144	7.93E+11	3.78E+11	1.80E+11	8.61E+10	4.10E+10	1.96E+10	9.34E+09
pr144	4.42E+11	2.11E+11	1.01E+11	4.80E+10	2.29E+10	1.09E+10	5.20E+09
eu152	6.88E+10	6.59E+10	6.31E+10	6.04E+10	5.78E+10	5.54E+10	5.30E+10
eu154	6.50E+09	6.08E+09	5.68E+09	5.31E+09	4.97E+09	4.65E+09	4.34E+09
eu155	1.11E+10	9.80E+09	8.66E+09	7.65E+09	6.76E+09	5.98E+09	5.29E+09

0 principal photon sources in group 6, photons/sec

mean energy = .1700 mev. nuclides exceeding 1.0E-03 of total group release rate (3.74E+11) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr 85	1.88E+09	1.78E+09	1.69E+09	1.60E+09	1.51E+09	1.44E+09	1.36E+09
sr 90	2.40E+10	2.35E+10	2.31E+10	2.26E+10	2.21E+10	2.17E+10	2.12E+10
y 90	3.45E+11	3.38E+11	3.31E+11	3.24E+11	3.18E+11	3.11E+11	3.05E+11
rh106	9.55E+10	5.41E+10	3.07E+10	1.74E+10	9.86E+09	5.59E+09	3.17E+09
sb125	3.60E+09	2.92E+09	2.36E+09	1.91E+09	1.55E+09	1.25E+09	1.01E+09
cs137	2.26E+10	2.22E+10	2.17E+10	2.13E+10	2.09E+10	2.05E+10	2.01E+10
pr144	4.67E+11	2.23E+11	1.06E+11	5.07E+10	2.42E+10	1.15E+10	5.50E+09

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0 principal photon sources in group 7, photons/sec

mean energy = .3000 mev. nuclides exceeding 1.0E-03 of total group release rate (4.69E+11) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr 85	1.13E+09	1.08E+09	1.02E+09	9.65E+08	9.15E+08	8.67E+08	8.21E+08
sr 90	1.09E+10	1.07E+10	1.05E+10	1.02E+10	1.00E+10	9.83E+09	9.63E+09
y 90	3.83E+11	3.75E+11	3.68E+11	3.60E+11	3.53E+11	3.46E+11	3.39E+11
rh106	1.15E+11	6.53E+10	3.70E+10	2.10E+10	1.19E+10	6.74E+09	3.82E+09
sb125	1.36E+09	1.11E+09	8.95E+08	7.24E+08	5.86E+08	4.74E+08	3.84E+08
sb126m	3.13E+09	2.82E+09	2.82E+09	2.82E+09	2.82E+09	2.82E+09	2.82E+09
cs137	1.14E+10	1.12E+10	1.10E+10	1.08E+10	1.06E+10	1.04E+10	1.02E+10
pr144	5.47E+11	2.61E+11	1.24E+11	5.94E+10	2.83E+10	1.35E+10	6.44E+09
eu152	9.54E+10	9.13E+10	8.74E+10	8.37E+10	8.02E+10	7.68E+10	7.35E+10
eu154	9.94E+08	9.29E+08	8.69E+08	8.12E+08	7.59E+08	7.10E+08	6.64E+08

0 principal photon sources in group 8, photons/sec

mean energy = .6500 mev. nuclides exceeding 1.0E-03 of total group release rate (6.49E+12) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
y 90	1.62E+11	1.59E+11	1.55E+11	1.52E+11	1.49E+11	1.46E+11	1.43E+11
rh106	3.56E+11	2.02E+11	1.14E+11	6.48E+10	3.67E+10	2.08E+10	1.18E+10
sb125	2.92E+10	2.37E+10	1.92E+10	1.55E+10	1.26E+10	1.02E+10	8.24E+09
sb126m	1.04E+10	9.39E+09	9.39E+09	9.39E+09	9.39E+09	9.39E+09	9.39E+09
cs134	2.05E+11	1.55E+11	1.17E+11	8.84E+10	6.68E+10	5.05E+10	3.81E+10
ba137m	6.81E+12	6.68E+12	6.55E+12	6.42E+12	6.30E+12	6.18E+12	6.06E+12
pr144	3.74E+11	1.78E+11	8.50E+10	4.05E+10	1.93E+10	9.22E+09	4.40E+09

eu152	6.73E+10	6.45E+10	6.17E+10	5.91E+10	5.66E+10	5.42E+10	5.19E+10

0 principal photon sources in group 9, photons/sec
mean energy = 1.1250 mev. nuclides exceeding 1.0E-03 of total group release rate (1.11E+11) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
y 90	2.11E+10	2.07E+10	2.03E+10	1.99E+10	1.95E+10	1.91E+10	1.87E+10
rh106	3.31E+10	1.88E+10	1.06E+10	6.03E+09	3.42E+09	1.94E+09	1.10E+09
sb126m	1.65E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08
cs134	2.51E+09	1.90E+09	1.43E+09	1.08E+09	8.18E+08	6.18E+08	4.67E+08
pr144	4.78E+10	2.28E+10	1.09E+10	5.18E+09	2.47E+09	1.18E+09	5.62E+08
eu152	1.00E+11	9.57E+10	9.17E+10	8.78E+10	8.40E+10	8.05E+10	7.71E+10
eu154	1.03E+10	9.65E+09	9.02E+09	8.43E+09	7.89E+09	7.37E+09	6.89E+09

0 principal photon sources in group 10, photons/sec
mean energy = 1.5750 mev. nuclides exceeding 1.0E-03 of total group release rate (4.14E+10) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
y 90	2.70E+09	2.64E+09	2.59E+09	2.54E+09	2.48E+09	2.43E+09	2.38E+09
rh106	6.25E+09	3.54E+09	2.01E+09	1.14E+09	6.45E+08	3.66E+08	2.07E+08
cs134	2.37E+09	1.79E+09	1.35E+09	1.02E+09	7.72E+08	5.83E+08	4.41E+08
pr144	2.97E+10	1.42E+10	6.76E+09	3.23E+09	1.54E+09	7.34E+08	3.50E+08
eu152	4.59E+10	4.40E+10	4.21E+10	4.03E+10	3.86E+10	3.70E+10	3.54E+10
eu154	3.73E+08	3.49E+08	3.26E+08	3.05E+08	2.85E+08	2.67E+08	2.49E+08

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0 principal photon sources in group 11, photons/sec
mean energy = 2.0000 mev. nuclides exceeding 1.0E-03 of total group release rate (1.69E+09) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
y 90	1.61E+08	1.58E+08	1.55E+08	1.52E+08	1.49E+08	1.46E+08	1.43E+08
rh106	2.03E+09	1.15E+09	6.52E+08	3.70E+08	2.10E+08	1.19E+08	6.73E+07
pr144	5.77E+10	2.75E+10	1.31E+10	6.26E+09	2.98E+09	1.42E+09	6.79E+08

0 principal photon sources in group 12, photons/sec
mean energy = 2.4000 mev. nuclides exceeding 1.0E-03 of total group release rate (7.99E+07) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
y 90	9.41E+04	9.22E+04	9.04E+04	8.85E+04	8.67E+04	8.50E+04	8.32E+04
rh106	1.13E+09	6.43E+08	3.65E+08	2.07E+08	1.17E+08	6.64E+07	3.76E+07
pr144	5.45E+08	2.60E+08	1.24E+08	5.91E+07	2.82E+07	1.34E+07	6.41E+06

0 principal photon sources in group 13, photons/sec
mean energy = 2.8000 mev. nuclides exceeding 1.0E-03 of total group release rate (1.23E+07) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
rh106	1.91E+08	1.09E+08	6.15E+07	3.49E+07	1.98E+07	1.12E+07	6.35E+06
pr144	4.39E+07	2.09E+07	9.98E+06	4.76E+06	2.27E+06	1.08E+06	5.16E+05

0 principal photon sources in group 14, photons/sec
mean energy = 3.2500 mev. nuclides exceeding 1.0E-03 of total group release rate (1.93E+06) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
rh106	3.29E+07	1.87E+07	1.06E+07	6.00E+06	3.40E+06	1.93E+06	1.09E+06

0 principal photon sources in group 15, photons/sec
mean energy = 3.7500 mev. nuclides exceeding 1.0E-03 of total group release rate (8.49E+02) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
rh106	1.45E+04	8.23E+03	4.66E+03	2.64E+03	1.50E+03	8.49E+02	4.82E+02

0 principal photon sources in group 16, photons/sec
mean energy = 4.2500 mev. nuclides exceeding 1.0E-03 of total group release rate (1.99E-05) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
ce142	1.44E-05	1.44E-05	1.44E-05	1.44E-05	1.44E-05	1.44E-05	1.44E-05
sm147	5.48E-06	5.48E-06	5.48E-06	5.48E-06	5.48E-06	5.48E-06	5.48E-06

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principal photon sources in group 17, photons/sec
mean energy = 4.7500 mev. nuclides exceeding 1.0E-03 of total group release rate (9.99E-06) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
ce142	7.24E-06	7.24E-06	7.24E-06	7.24E-06	7.24E-06	7.24E-06	7.24E-06
sm147	2.75E-06	2.75E-06	2.75E-06	2.75E-06	2.75E-06	2.75E-06	2.75E-06

principal photon sources in group 18, photons/sec
mean energy = 5.5000 mev. nuclides exceeding 1.0E-03 of total group release rate (7.41E-06) at 1521.9 d

nuclide	time after discharge						
	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
ce142	5.37E-06	5.37E-06	5.37E-06	5.37E-06	5.37E-06	5.37E-06	5.37E-06
sm147	2.04E-06	2.04E-06	2.04E-06	2.04E-06	2.04E-06	2.04E-06	2.04E-06

photon spectrum as a function of time for heavy metals and their daughters

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
power= .00 mw, burnup= 14610.mwd, flux= 2.71E+08 n**2-sec
actinide photon release rates, photons/sec
basis = single reactor assembly

emean	time after discharge						
(mev)	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
1.00E-02	1.35E+14	2.83E+12	2.83E+12	2.82E+12	2.82E+12	2.82E+12	2.81E+12
3.00E-02	8.47E+12	6.75E+10	6.75E+10	6.75E+10	6.75E+10	6.75E+10	6.75E+10
5.50E-02	1.11E+13	2.10E+11	2.10E+11	2.10E+11	2.10E+11	2.10E+11	2.10E+11
8.50E-02	5.26E+13	1.64E+11	1.64E+11	1.64E+11	1.64E+11	1.64E+11	1.64E+11
1.20E-01	5.42E+13	3.35E+10	3.35E+10	3.35E+10	3.35E+10	3.35E+10	3.35E+10
1.70E-01	1.72E+12	2.23E+10	2.23E+10	2.23E+10	2.23E+10	2.23E+10	2.23E+10
3.00E-01	2.87E+13	1.60E+11	1.60E+11	1.60E+11	1.60E+11	1.60E+11	1.60E+11
6.50E-01	1.47E+12	2.91E+10	2.91E+10	2.91E+10	2.91E+10	2.91E+10	2.91E+10
1.13E+00	1.82E+12	1.16E+10	1.16E+10	1.16E+10	1.16E+10	1.16E+10	1.16E+10
1.58E+00	1.24E+10	1.24E+10	1.24E+10	1.24E+10	1.24E+10	1.24E+10	1.25E+10
2.00E+00	2.61E+09	2.61E+09	2.61E+09	2.61E+09	2.61E+09	2.61E+09	2.61E+09
2.40E+00	1.52E+09	1.52E+09	1.52E+09	1.52E+09	1.52E+09	1.52E+09	1.53E+09
2.80E+00	2.00E+08	2.00E+08	2.00E+08	1.99E+08	1.98E+08	1.98E+08	1.97E+08
3.25E+00	1.22E+07	1.22E+07	1.22E+07	1.22E+07	1.22E+07	1.22E+07	1.22E+07
3.75E+00	2.25E+04	2.25E+04	2.25E+04	2.24E+04	2.24E+04	2.24E+04	2.24E+04
4.25E+00	1.29E+04	1.29E+04	1.29E+04	1.29E+04	1.29E+04	1.29E+04	1.29E+04
4.75E+00	7.41E+03	7.41E+03	7.40E+03	7.40E+03	7.40E+03	7.40E+03	7.39E+03
5.50E+00	6.64E+03	6.63E+03	6.63E+03	6.63E+03	6.62E+03	6.62E+03	6.62E+03
total	2.95E+14	3.55E+12	3.54E+12	3.54E+12	3.54E+12	3.53E+12	3.53E+12
mev/sec	2.51E+13	1.73E+11	1.73E+11	1.73E+11	1.73E+11	1.73E+11	1.73E+11

actinide energy release rates, mev/watt-sec
basis = single reactor assembly

emean	time after discharge						
(mev)	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
1.00E-02	3.38E+08	7.08E+06	7.07E+06	7.06E+06	7.05E+06	7.04E+06	7.03E+06
3.00E-02	6.35E+07	5.06E+05	5.06E+05	5.06E+05	5.06E+05	5.06E+05	5.06E+05
5.50E-02	1.53E+08	2.89E+06	2.89E+06	2.89E+06	2.89E+06	2.89E+06	2.89E+06
8.50E-02	1.12E+09	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06
1.20E-01	1.63E+09	1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06	1.00E+06
1.70E-01	7.33E+07	9.47E+05	9.47E+05	9.47E+05	9.47E+05	9.47E+05	9.47E+05
3.00E-01	2.15E+09	1.20E+07	1.20E+07	1.20E+07	1.20E+07	1.20E+07	1.20E+07
6.50E-01	2.39E+08	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06
1.13E+00	5.12E+08	3.27E+06	3.27E+06	3.27E+06	3.27E+06	3.27E+06	3.27E+06
1.58E+00	4.90E+06	4.90E+06	4.90E+06	4.90E+06	4.90E+06	4.90E+06	4.90E+06
2.00E+00	1.31E+06	1.31E+06	1.31E+06	1.31E+06	1.31E+06	1.31E+06	1.31E+06
2.40E+00	9.14E+05	9.15E+05	9.15E+05	9.15E+05	9.15E+05	9.15E+05	9.15E+05
2.80E+00	1.40E+05	1.40E+05	1.40E+05	1.39E+05	1.39E+05	1.38E+05	1.38E+05

	3.25E+00	9.91E+03	9.91E+03	9.92E+03	9.92E+03	9.92E+03	9.92E+03	9.92E+03
	3.75E+00	2.11E+01	2.11E+01	2.10E+01	2.10E+01	2.10E+01	2.10E+01	2.10E+01
	4.25E+00	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01
	4.75E+00	8.80E+00	8.80E+00	8.79E+00	8.79E+00	8.79E+00	8.78E+00	8.78E+00
	5.50E+00	9.13E+00	9.12E+00	9.12E+00	9.11E+00	9.11E+00	9.11E+00	9.10E+00
0	total	6.28E+09	4.32E+07	4.32E+07	4.32E+07	4.32E+07	4.32E+07	4.32E+07
0	gamma watts	4.03E+00	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02

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neutron source intensity as a function of time

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
alpha-n neutron source, neutrons/sec/basis
basis = single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
pb210	2.31E-06	2.31E-06	2.31E-06	2.31E-06	2.31E-06	2.31E-06	2.31E-06
bi210	5.88E-04	5.89E-04	5.89E-04	5.89E-04	5.89E-04	5.89E-04	5.89E-04
bi211	1.28E+02	1.28E+02	1.28E+02	1.28E+02	1.28E+02	1.28E+02	1.28E+02
bi212	5.41E+00	5.42E+00	5.40E+00	5.38E+00	5.35E+00	5.32E+00	5.28E+00
bi213	2.25E+00	2.25E+00	2.25E+00	2.25E+00	2.25E+00	2.25E+00	2.25E+00
bi214	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01	2.67E-01
po210	7.25E+02	7.18E+02	7.16E+02	7.16E+02	7.16E+02	7.16E+02	7.16E+02
po211	5.05E-01	5.07E-01	5.07E-01	5.07E-01	5.07E-01	5.07E-01	5.07E-01
po212	2.77E+01	2.78E+01	2.77E+01	2.75E+01	2.74E+01	2.72E+01	2.70E+01
po213	2.97E+02	2.97E+02	2.97E+02	2.97E+02	2.97E+02	2.97E+02	2.97E+02
po214	2.38E+03	2.38E+03	2.38E+03	2.38E+03	2.38E+03	2.38E+03	2.38E+03
po215	1.80E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02
po216	2.16E+01	2.17E+01	2.16E+01	2.15E+01	2.14E+01	2.12E+01	2.11E+01
po218	1.13E+03	1.13E+03	1.13E+03	1.13E+03	1.13E+03	1.13E+03	1.13E+03
at217	1.93E+02	1.93E+02	1.93E+02	1.93E+02	1.93E+02	1.93E+02	1.93E+02
rn218	4.03E-10	1.59E-14	6.23E-19	2.45E-23	9.25E-28	.00E+00	.00E+00
rn219	1.43E+02	1.44E+02	1.44E+02	1.44E+02	1.44E+02	1.44E+02	1.44E+02
rn220	1.71E+01	1.72E+01	1.71E+01	1.70E+01	1.69E+01	1.68E+01	1.67E+01
rn222	8.26E+02	8.26E+02	8.27E+02	8.27E+02	8.27E+02	8.27E+02	8.27E+02
fr221	1.41E+02	1.41E+02	1.41E+02	1.41E+02	1.41E+02	1.41E+02	1.41E+02
fr223	5.44E-05	5.44E-05	5.44E-05	5.44E-05	5.44E-05	5.44E-05	5.44E-05
ra222	3.11E-10	1.23E-14	4.82E-19	1.90E-23	7.51E-28	.00E+00	.00E+00
ra223	8.31E+01	8.32E+01	8.32E+01	8.32E+01	8.32E+01	8.32E+01	8.32E+01
ra224	1.21E+01	1.21E+01	1.21E+01	1.20E+01	1.20E+01	1.19E+01	1.18E+01
ra226	4.83E+02	4.83E+02	4.83E+02	4.83E+02	4.83E+02	4.83E+02	4.83E+02
ac225	1.01E+02	1.01E+02	1.01E+02	1.01E+02	1.01E+02	1.01E+02	1.01E+02
ac227	6.12E-01	6.12E-01	6.12E-01	6.12E-01	6.12E-01	6.12E-01	6.12E-01
ac228	2.36E-11	2.37E-11	2.37E-11	2.37E-11	2.37E-11	2.37E-11	2.37E-11
th226	2.81E-10	1.11E-14	4.35E-19	1.71E-23	6.78E-28	.00E+00	.00E+00
th227	9.16E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01	9.18E+01
th228	1.02E+01	1.02E+01	1.02E+01	1.01E+01	1.01E+01	9.99E+00	9.93E+00
th229	5.90E+01	5.90E+01	5.90E+01	5.90E+01	5.91E+01	5.91E+01	5.91E+01
th230	5.79E+02	5.79E+02	5.79E+02	5.79E+02	5.79E+02	5.80E+02	5.80E+02
th232	3.01E-04	3.01E-04	3.01E-04	3.01E-04	3.01E-04	3.02E-04	3.02E-04
pa231	4.88E+01	4.88E+01	4.88E+01	4.88E+01	4.88E+01	4.88E+01	4.88E+01
u230	2.21E-10	8.71E-15	3.42E-19	1.35E-23	5.34E-28	.00E+00	.00E+00
u231	1.41E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u232	9.50E+00	9.42E+00	9.35E+00	9.27E+00	9.20E+00	9.12E+00	9.05E+00
u233	1.51E+02	1.51E+02	1.51E+02	1.51E+02	1.51E+02	1.51E+02	1.51E+02
u234	7.61E+03	7.61E+03	7.61E+03	7.61E+03	7.61E+03	7.61E+03	7.61E+03
u235	1.25E+02	1.25E+02	1.25E+02	1.25E+02	1.25E+02	1.25E+02	1.25E+02
u236	1.11E+03	1.11E+03	1.11E+03	1.11E+03	1.11E+03	1.11E+03	1.11E+03
u238	8.31E+02	8.31E+02	8.31E+02	8.31E+02	8.31E+02	8.31E+02	8.31E+02
np235	2.46E-08	1.45E-08	8.50E-09	4.99E-09	2.93E-09	1.72E-09	1.01E-09

np237	3.30E+03	3.30E+03	3.30E+03	3.30E+03	3.30E+03	3.30E+03	3.30E+03
pu236	1.45E-01	1.19E-01	9.74E-02	7.99E-02	6.56E-02	5.38E-02	4.42E-02
pu237	5.51E-08	5.16E-10	4.84E-12	4.53E-14	4.25E-16	3.98E-18	3.73E-20
pu238	8.06E+04	8.01E+04	7.96E+04	7.90E+04	7.85E+04	7.80E+04	7.75E+04

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neutron source intensity as a function of time

0

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
alpha-n neutron source, neutrons/sec/basis
basis = single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
pu239	3.82E+05	3.82E+05	3.82E+05	3.82E+05	3.82E+05	3.82E+05	3.82E+05
pu240	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
pu241	1.81E-01	1.74E-01	1.67E-01	1.60E-01	1.54E-01	1.48E-01	1.42E-01
pu242	8.46E-02	8.46E-02	8.46E-02	8.46E-02	8.46E-02	8.46E-02	8.46E-02
pu244	3.95E-24	3.95E-24	3.96E-24	3.96E-24	3.96E-24	3.97E-24	3.97E-24
am239	1.13E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am240	1.78E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am241	1.04E+04	1.05E+04	1.05E+04	1.05E+04	1.05E+04	1.05E+04	1.04E+04
am242m	5.79E-02	5.77E-02	5.74E-02	5.72E-02	5.70E-02	5.67E-02	5.65E-02
am243	5.18E-02	5.18E-02	5.18E-02	5.18E-02	5.18E-02	5.18E-02	5.18E-02
cm241	1.58E-12	2.54E-15	4.09E-18	6.59E-21	1.06E-23	1.71E-26	2.74E-29
cm242	1.16E+02	4.48E+01	2.52E+01	1.98E+01	1.82E+01	1.78E+01	1.76E+01
cm243	1.28E-09	1.25E-09	1.23E-09	1.20E-09	1.18E-09	1.16E-09	1.13E-09
cm244	3.54E-03	3.43E-03	3.33E-03	3.22E-03	3.12E-03	3.02E-03	2.93E-03
cm245	1.19E-08	1.19E-08	1.19E-08	1.19E-08	1.19E-08	1.19E-08	1.19E-08
cm246	1.82E-10	1.82E-10	1.82E-10	1.82E-10	1.82E-10	1.82E-10	1.82E-10
cm247	6.96E-18	6.96E-18	6.96E-18	6.96E-18	6.96E-18	6.96E-18	6.96E-18
cm248	5.64E-19	5.64E-19	5.64E-19	5.64E-19	5.64E-19	5.64E-19	5.64E-19
bk249	9.66E-25	5.00E-25	2.58E-25	1.34E-25	6.91E-26	3.58E-26	1.85E-26
cf249	6.63E-20	6.63E-20	6.62E-20	6.61E-20	6.60E-20	6.59E-20	6.58E-20
cf250	2.44E-22	2.33E-22	2.23E-22	2.13E-22	2.04E-22	1.95E-22	1.87E-22
cf251	6.64E-26	6.63E-26	6.63E-26	6.63E-26	6.62E-26	6.62E-26	6.61E-26
cf252	4.18E-27	3.37E-27	2.69E-27	2.16E-27	1.74E-27	1.40E-27	1.12E-27
0 total	5.44E+05	5.43E+05	5.43E+05	5.42E+05	5.41E+05	5.41E+05	5.40E+05

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neutron source intensity as a function of time

0

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
spontaneous fission neutron source, neutrons/sec/basis
basis = single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
th230	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02	1.49E-02
pa231	6.11E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03	6.12E-03
u232	5.84E-04	5.79E-04	5.74E-04	5.70E-04	5.65E-04	5.60E-04	5.56E-04
u234	1.64E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01
u235	1.53E+00	1.53E+00	1.53E+00	1.53E+00	1.53E+00	1.53E+00	1.53E+00
u236	1.67E+02	1.67E+02	1.67E+02	1.67E+02	1.67E+02	1.67E+02	1.67E+02
u237	1.29E-09	6.37E-15	6.12E-15	5.88E-15	5.64E-15	5.42E-15	5.21E-15
u238	1.17E+05	1.17E+05	1.17E+05	1.17E+05	1.17E+05	1.17E+05	1.17E+05
u239	9.65E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np236	7.21E-08	7.21E-08	7.21E-08	7.21E-08	7.21E-08	7.21E-08	7.21E-08
np238	1.96E-08	1.69E-14	1.69E-14	1.68E-14	1.67E-14	1.66E-14	1.66E-14
np239	1.97E-05	5.37E-13	5.37E-13	5.37E-13	5.37E-13	5.37E-13	5.37E-13
pu236	9.79E-03	8.04E-03	6.59E-03	5.41E-03	4.44E-03	3.64E-03	2.99E-03
pu238	1.49E+04	1.48E+04	1.47E+04	1.46E+04	1.45E+04	1.44E+04	1.43E+04

	pu239	2.04E+02	2.04E+02	2.04E+02	2.04E+02	2.04E+02	2.04E+02	2.04E+02
	pu240	3.32E+05	3.32E+05	3.32E+05	3.32E+05	3.32E+05	3.32E+05	3.32E+05
	pu241	6.51E-03	6.26E-03	6.01E-03	5.77E-03	5.55E-03	5.33E-03	5.12E-03
	pu242	6.59E+01	6.59E+01	6.59E+01	6.59E+01	6.59E+01	6.59E+01	6.59E+01
	pu243	5.37E-12	3.01E-28	3.01E-28	3.01E-28	3.01E-28	3.01E-28	3.01E-28
	pu244	9.45E-19	9.46E-19	9.46E-19	9.47E-19	9.48E-19	9.48E-19	9.49E-19
	am241	4.02E+00	4.02E+00	4.02E+00	4.02E+00	4.02E+00	4.02E+00	4.02E+00
	am242m	2.75E-01	2.74E-01	2.73E-01	2.72E-01	2.71E-01	2.70E-01	2.68E-01
	am242	1.93E-03	2.98E-04	2.96E-04	2.95E-04	2.94E-04	2.93E-04	2.92E-04
	am243	2.39E-04	2.39E-04	2.38E-04	2.38E-04	2.38E-04	2.38E-04	2.38E-04
	am244	4.81E-12	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	cm242	5.78E+02	2.24E+02	1.26E+02	9.87E+01	9.10E+01	8.86E+01	8.77E+01
	cm243	2.78E-11	2.72E-11	2.67E-11	2.62E-11	2.56E-11	2.51E-11	2.46E-11
	cm244	4.62E-01	4.48E-01	4.34E-01	4.20E-01	4.07E-01	3.94E-01	3.82E-01
	cm245	3.23E-09	3.23E-09	3.23E-09	3.23E-09	3.23E-09	3.23E-09	3.23E-09
	cm246	6.56E-06	6.56E-06	6.55E-06	6.55E-06	6.55E-06	6.55E-06	6.55E-06
	cm248	9.23E-12	9.23E-12	9.23E-12	9.23E-12	9.23E-12	9.23E-12	9.23E-12
	cm250	2.07E-24	2.07E-24	2.07E-24	2.07E-24	2.07E-24	2.07E-24	2.07E-24
	bk249	5.32E-21	2.75E-21	1.42E-21	7.37E-22	3.81E-22	1.97E-22	1.02E-22
	cf249	4.03E-20	4.03E-20	4.03E-20	4.02E-20	4.02E-20	4.01E-20	4.00E-20
	cf250	2.04E-17	1.95E-17	1.87E-17	1.79E-17	1.71E-17	1.64E-17	1.56E-17
	cf252	1.46E-20	1.18E-20	9.45E-21	7.60E-21	6.11E-21	4.91E-21	3.95E-21
0	total	4.65E+05	4.65E+05	4.64E+05	4.64E+05	4.64E+05	4.64E+05	4.64E+05
0	total	1.01E+06	1.01E+06	1.01E+06	1.01E+06	1.01E+06	1.00E+06	1.00E+06

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alpha-n neutron source spectrum as a function of time
(using reaction spectra for uranium dioxide)

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
alpha-n neutron spectra, neutrons/sec/basis
basis = single reactor assembly

	boundaries, mev	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
1	6.43E+00 - 2.00E+01	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
2	3.00E+00 - 6.43E+00	1.055E+05	1.052E+05	1.051E+05	1.050E+05	1.049E+05	1.047E+05	1.046E+05
3	1.85E+00 - 3.00E+00	2.981E+05	2.978E+05	2.975E+05	2.972E+05	2.969E+05	2.966E+05	2.964E+05
4	1.40E+00 - 1.85E+00	8.002E+04	7.997E+04	7.990E+04	7.982E+04	7.974E+04	7.967E+04	7.959E+04
5	9.00E-01 - 1.40E+00	4.500E+04	4.498E+04	4.494E+04	4.490E+04	4.485E+04	4.481E+04	4.477E+04
6	4.00E-01 - 9.00E-01	1.307E+04	1.306E+04	1.305E+04	1.304E+04	1.303E+04	1.302E+04	1.300E+04
7	1.00E-01 - 4.00E-01	2.042E+03	2.042E+03	2.040E+03	2.038E+03	2.036E+03	2.034E+03	2.032E+03
8	1.70E-02 - 1.00E-01	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
9	3.00E-03 - 1.70E-02	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
10	5.50E-04 - 3.00E-03	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
11	1.00E-04 - 5.50E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
12	3.00E-05 - 1.00E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
13	1.00E-05 - 3.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
14	3.05E-06 - 1.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
15	1.77E-06 - 3.05E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
16	1.30E-06 - 1.77E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
17	1.13E-06 - 1.30E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
18	1.00E-06 - 1.13E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
19	8.00E-07 - 1.00E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
20	4.00E-07 - 8.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
21	3.25E-07 - 4.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
22	2.25E-07 - 3.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
23	1.00E-07 - 2.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
24	5.00E-08 - 1.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
25	3.00E-08 - 5.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00

26	1.00E-08 - 3.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
27	1.00E-11 - 1.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
0		5.437E+05	5.431E+05	5.425E+05	5.420E+05	5.414E+05	5.409E+05	5.404E+05

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spontaneous fission neutron source spectrum as a function of time

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
spontaneous fission neutron spectra, neutrons/sec/basis
basis = single reactor assembly

	boundaries, mev	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
1	6.43E+00 - 2.00E+01	8.884E+03	8.874E+03	8.870E+03	8.867E+03	8.864E+03	8.862E+03	8.860E+03
2	3.00E+00 - 6.43E+00	9.737E+04	9.727E+04	9.722E+04	9.719E+04	9.716E+04	9.714E+04	9.711E+04
3	1.85E+00 - 3.00E+00	1.061E+05	1.060E+05	1.059E+05	1.059E+05	1.059E+05	1.059E+05	1.058E+05
4	1.40E+00 - 1.85E+00	6.013E+04	6.007E+04	6.004E+04	6.002E+04	6.000E+04	5.999E+04	5.997E+04
5	9.00E-01 - 1.40E+00	8.253E+04	8.245E+04	8.241E+04	8.238E+04	8.236E+04	8.234E+04	8.231E+04
6	4.00E-01 - 9.00E-01	9.196E+04	9.187E+04	9.182E+04	9.179E+04	9.176E+04	9.174E+04	9.172E+04
7	1.00E-01 - 4.00E-01	1.816E+04	1.814E+04	1.813E+04	1.812E+04	1.812E+04	1.811E+04	1.811E+04
8	1.70E-02 - 1.00E-01	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
9	3.00E-03 - 1.70E-02	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
10	5.50E-04 - 3.00E-03	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
11	1.00E-04 - 5.50E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
12	3.00E-05 - 1.00E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
13	1.00E-05 - 3.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
14	3.05E-06 - 1.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
15	1.77E-06 - 3.05E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
16	1.30E-06 - 1.77E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
17	1.13E-06 - 1.30E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
18	1.00E-06 - 1.13E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
19	8.00E-07 - 1.00E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
20	4.00E-07 - 8.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
21	3.25E-07 - 4.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
22	2.25E-07 - 3.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
23	1.00E-07 - 2.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
24	5.00E-08 - 1.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
25	3.00E-08 - 5.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
26	1.00E-08 - 3.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
27	1.00E-11 - 1.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
0		4.651E+05	4.647E+05	4.644E+05	4.643E+05	4.642E+05	4.640E+05	4.639E+05

1

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total (alpha-n plus spon. fission) neutron source spectrum as a function of time
(using reaction spectra for uranium dioxide)

0

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
neutron spectra, neutrons/sec/basis
basis = single reactor assembly

	boundaries, mev	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
1	6.43E+00 - 2.00E+01	8.884E+03	8.874E+03	8.870E+03	8.867E+03	8.864E+03	8.862E+03	8.860E+03
2	3.00E+00 - 6.43E+00	2.028E+05	2.025E+05	2.023E+05	2.022E+05	2.020E+05	2.019E+05	2.018E+05
3	1.85E+00 - 3.00E+00	4.042E+05	4.038E+05	4.035E+05	4.031E+05	4.028E+05	4.025E+05	4.022E+05
4	1.40E+00 - 1.85E+00	1.401E+05	1.400E+05	1.399E+05	1.398E+05	1.397E+05	1.397E+05	1.396E+05
5	9.00E-01 - 1.40E+00	1.275E+05	1.274E+05	1.273E+05	1.273E+05	1.272E+05	1.271E+05	1.271E+05
6	4.00E-01 - 9.00E-01	1.050E+05	1.049E+05	1.049E+05	1.048E+05	1.048E+05	1.048E+05	1.047E+05
7	1.00E-01 - 4.00E-01	2.020E+04	2.018E+04	2.017E+04	2.016E+04	2.015E+04	2.015E+04	2.014E+04
8	1.70E-02 - 1.00E-01	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
9	3.00E-03 - 1.70E-02	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
10	5.50E-04 - 3.00E-03	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00

```
 11 1.00E-04 - 5.50E-04  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 12 3.00E-05 - 1.00E-04  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 13 1.00E-05 - 3.00E-05  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 14 3.05E-06 - 1.00E-05  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 15 1.77E-06 - 3.05E-06  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 16 1.30E-06 - 1.77E-06  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 17 1.13E-06 - 1.30E-06  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 18 1.00E-06 - 1.13E-06  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 19 8.00E-07 - 1.00E-06  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 20 4.00E-07 - 8.00E-07  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 21 3.25E-07 - 4.00E-07  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 22 2.25E-07 - 3.25E-07  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 23 1.00E-07 - 2.25E-07  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 24 5.00E-08 - 1.00E-07  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 25 3.00E-08 - 5.00E-08  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 26 1.00E-08 - 3.00E-08  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
 27 1.00E-11 - 1.00E-08  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00  .000E+00
0                       1.009E+06 1.008E+06 1.007E+06 1.006E+06 1.006E+06 1.005E+06 1.004E+06
1
1                        * gamma sources determined *
0case applies the following photon data base
                        master photon library
                        in binary mode
0    the sources include photons of nuclides for...

       light elements
       actinides
       fission products
1                       gamma source spectrum for gamma lines (sas2)
0                                        1826.25  day time of the requested nuclides
0                            energy interval in mev       photons / second      mev / second
0
                        1.0000E-02 to       5.0000E-02        4.8566E+12        1.4570E+11
                        5.0000E-02 to       1.0000E-01        1.3861E+12        1.0396E+11
                        1.0000E-01 to       2.0000E-01        8.0684E+11        1.2103E+11
                        2.0000E-01 to       3.0000E-01        2.6815E+11        6.7037E+10
                        3.0000E-01 to       4.0000E-01        3.2436E+11        1.1353E+11
                        4.0000E-01 to       6.0000E-01        1.6178E+11        8.0890E+10
                        6.0000E-01 to       8.0000E-01        5.7639E+12        4.0347E+12
                        8.0000E-01 to       1.0000E+00        7.2819E+10        6.5537E+10
                        1.0000E+00 to       1.3300E+00        7.9188E+10        9.2254E+10
                        1.3300E+00 to       1.6600E+00        4.5611E+10        6.8188E+10
                        1.6600E+00 to       2.0000E+00        8.4544E+09        1.5472E+10
                        2.0000E+00 to       2.5000E+00        3.6691E+09        8.2556E+09
                        2.5000E+00 to       3.0000E+00        2.0964E+08        5.7652E+08
                        3.0000E+00 to       4.0000E+00        1.2362E+07        4.3268E+07
                        4.0000E+00 to       5.0000E+00        1.9958E+04        8.9810E+04
                        5.0000E+00 to       6.5000E+00        7.8676E+03        4.5239E+04
                        6.5000E+00 to       8.0000E+00        1.5184E+03        1.1009E+04
                        8.0000E+00 to       1.0000E+01        3.1876E+02        2.8689E+03
0                       totals                                1.3778E+13        4.9172E+12
0
0                       total energy from nuclides with spectrum data     =   4.9172E+12
0                       total energy from nuclides with no spectrum data  =   1.3011E+06
1
0  .results on logical unit no. 71, position  2, for time step  6, subcase12. (run position 1, case position 2)
   title: sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
0     .terminated logical unit no. 71 with zero flag record.
1  * normal termination of execution *
```

DESIGN ANALYSIS

Title: **Probabilistic Criticality Consequence Evaluation (SCPB: N/A)**

Document Identifier: BBA000000-01717-0200-00021 REV 00

Originators: J.W.Davis/P.Gottlieb/J.R. Massari

Checkers: D.A.Thomas/J.R.Massari/Z.Ceylan

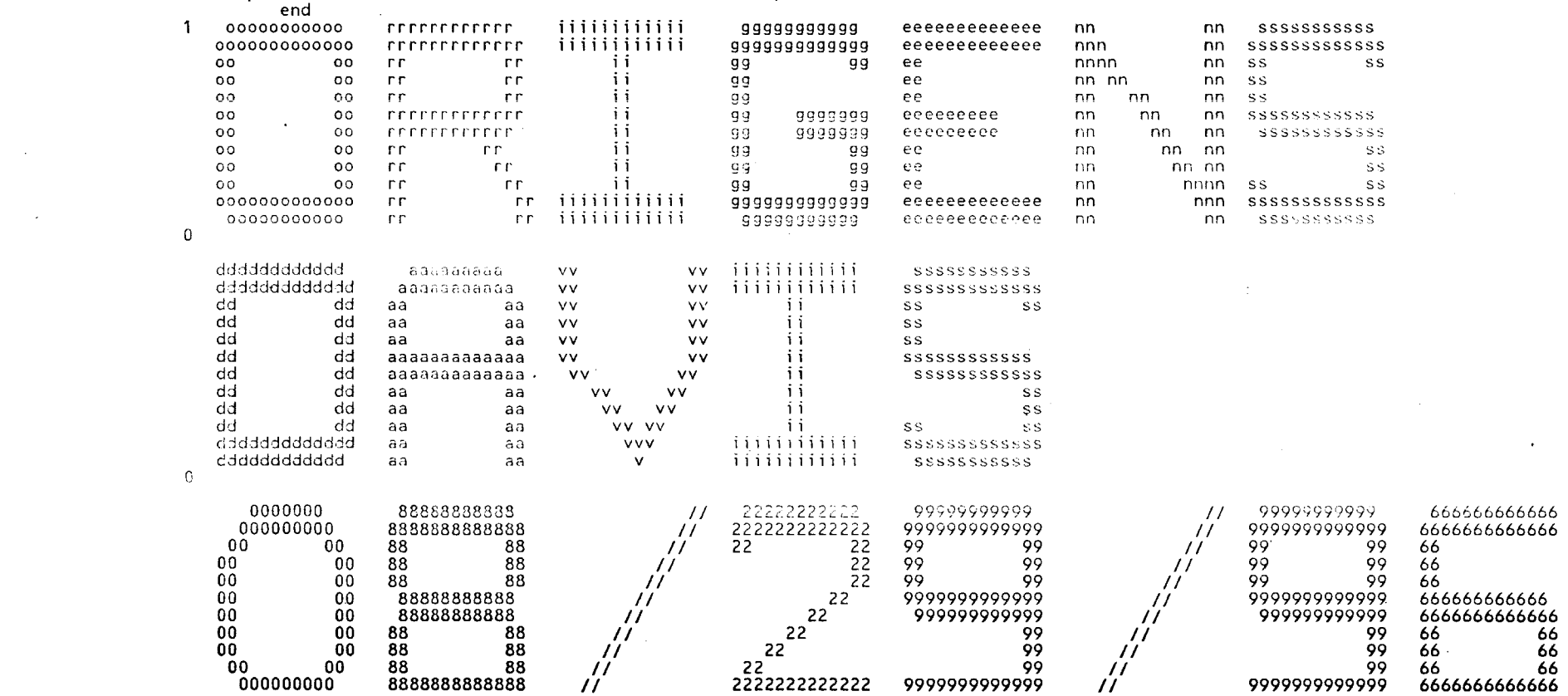
Lead Design Engineer: P. Gottlieb

Department Manager: Hugh A. Benton

Attachments Volume II

```
1          primary module access and input record ( scale driver - 95/03/29 - 09:06:37 )
-   module sas2h     will be called
      SAS2H: Far-Field Crit based on B&W 15x15, 3.00wt%, 20gwd/mtu 40% H2O/ 8% UO2
      44group    latticecell
      '
      '  mixtures of tuff infinite slabs:
      arbm-ftuff  2.6344 14 0 0 0 1001 1.055 8016 40.755 11023 0.570 12000 0.354
                               13027 4.434 14000 20.193 19000 1.370 20000 1.439
                               26000 0.494 92235 0.567 92234 0.007 92236 0.136
                               92238 28.593 93237 0.033 1 1.0 538   end
      kr-83      1 0 1-20 538 end
      kr-85      1 0 1-20 538 end
      sr-90      1 0 1-20 538 end
       y-89      1 0 1-20 538 end
      mo-95      1 0 1-20 538 end
      zr-93      1 0 1-20 538 end
      zr-94      1 0 1-20 538 end
      zr-95      1 0 1-20 538 end
      nb-94      1 0 1-20 538 end
      tc-99      1 0 1-20 538 end
      rh-103     1 0 1-20 538 end
      rh-105     1 0 1-20 538 end
      ru-101     1 0 1-20 538 end
      ru-106     1 0 1-20 538 end
      pd-105     1 0 1-20 538 end
      pd-108     1 0 1-20 538 end
      ag-109     1 0 1-20 538 end
      sb-124     1 0 1-20 538 end
      xe-131     1 0 1-20 538 end
      xe-132     1 0 1-20 538 end
      xe-135     1 0 1-20 538 end
      xe-136     1 0 1-20 538 end
      cs-134     1 0 1-20 538 end
      cs-135     1 0 1-20 538 end
      cs-137     1 0 1-20 538 end
      ba-136     1 0 1-20 538 end
      la-139     1 0 1-20 538 end
      pr-141     1 0 1-20 538 end
      pr-143     1 0 1-20 538 end
      ce-144     1 0 1-20 538 end
      nd-143     1 0 1-20 538 end
      nd-145     1 0 1-20 538 end
      pm-147     1 0 1-20 538 end
      pm-148     1 0 1-20 538 end
      nd-147     1 0 1-20 538 end
      sm-147     1 0 1-20 538 end
      sm-149     1 0 1-20 538 end
      sm-150     1 0 1-20 538 end
      sm-151     1 0 1-20 538 end
      sm-152     1 0 1-20 538 end
      gd-155     1 0 1-20 538 end
      eu-153     1 0 1-20 538 end
      eu-154     1 0 1-20 538 end
      eu-155     1 0 1-20 538 end
      arbm-tuff1  1.90533 9 0 0 0 1001 2.326 8016 57.779 11023 0.789 12000 0.490
                               13027 6.130 14000 27.919 19000 1.894 20000 1.989
                               26000 0.683 2 1.0 323.   end
      arbm-tuff2  1.90533 9 0 0 0 1001 2.326 8016 57.779 11023 0.789 12000 0.490
                               13027 6.130 14000 27.919 19000 1.894 20000 1.989
                               26000 0.683 3 1.0 323.   end
```

```
'
' - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
end comp
' - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
'
'  fuel-pin-cell geometry:
'
symmslabcell  340.  280. 1 3 281. 2 end
' - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
'
'
'  assembly and cycle parameters:
'
npin/assm=1 fuelngth=280. ncycles=3 nlib/cyc=10 volfueltot=1.1494E7
printlevel=6 inplevel=0 end
power=1.468E-3 burn=9.13125e6 down=0 temkcyc=398
power=9.79E-4 burn=9.13125e6 down=0. temkcyc=372
power=4.89E-4 burn=9.13125e6 down=9.13125e6 temkcyc=346
   end
```



****
****
****
***** *****
***** program verification information *****
***** *****
***** code system: scale version: 4.3 *****
***** *****
****
****
***** *****
***** *****
***** program: o0o004 *****
***** *****
***** creation date: 03/13/96 *****
***** *****
***** library: /usr1/ornl/Scale/bin *****
***** *****
***** *****
***** test code: origens *****
***** *****
***** version: 3.0 *****
***** *****
***** jobname: davis *****
***** *****
***** date of execution: 08/29/96 *****
***** *****

```
                        *****    time of execution:  10:30:26                                    *****
                        *****                                                                    *****
                        *****                                                                    *****
                        ************************************************************************************
                        ************************************************************************************
                        ************************************************************************************
1
0       -1q array has       1 entries.
0        0q array has       1 entries.
0        0q array has       1 entries.
0        0q array has       1 entries.
0        0q array has       1 entries.
0         dbl. prec. machine word applied has, at least, a 16 significant figure accuracy.
0             short-lived split test fraction, qxn =    9.1188E-04
0             half-norm of matrix used, axn =    7.0000E+00
0             4-place-accuracy-retention ratio, ratio4 =    6.4516E-13
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number  1 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr origen-s binary working library--id = 1143             *
          *         made from modified card-image-origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *       neutron flux spectrum factors and cross sections were produced from    *
          *      the "presas2" case updating all nuclides on the scale "burnup" library  *
          *                                                                              *
          *                   fission product yields are from endf/b-v                   *
          *                                                                              *
          *              photon libraries use an 18-energy-group structure               *
          *             the photon data are from the master photon data base,            *
          *              produced to include bremsstrahlung from uo2 matrix              *
          *                                                                              *
          *        see information above this box (if present) for later updates         *
          *                                                                              *
          ********************************************************************************
```

```
          *                                                                      *
0         ************************************************************************
0                  .other identification and sizes of library.
0                   data set name:  ft33f001
0                8/29/1996    date library was produced
0                    1697    total number of nuclides in library
                      689    number of light-element nuclides
                      129    number of actinide nuclides
                      879    number of fission product nuclides
0                    7993    number of nonzero off-diagonal matrix elements
0         ************************************************************************
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2              light elements        page    1
0                                        nuclide concentrations, grams
                                         basis =single reactor assembly
               initial  1E-18 d
     na 23   1.73E+05  1.73E+05
     al 27   1.35E+06  1.35E+06
   total     1.52E+06  1.52E+06
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                  actinides         page    2
0                                        nuclide concentrations, grams
                                         basis =single reactor assembly
               initial  1E-18 d
      u234   2.12E+03  2.12E+03
      u235   1.72E+05  1.72E+05
      u236   4.12E+04  4.12E+04
      u238   8.66E+06  8.66E+06
     np237   9.99E+03  9.99E+03
   total     8.88E+06  8.88E+06
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                          page    3
        power=    .00mw, burnup=   1340.mwd, flux= 1.07E+08n/cm**2-sec
0                                    basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                    initial      228281. d      456563. d      684844. d      913125. d      913125. d
     productions   1.048802E+06   1.049862E+06   1.050874E+06   1.051840E+06   1.052761E+06   1.052761E+06
     absorptions   8.541503E+05   8.561003E+05   8.577262E+05   8.591095E+05   8.603048E+05   8.603048E+05
     k infinity    1.227889E+00   1.226330E+00   1.225186E+00   1.224337E+00   1.223707E+00   1.223707E+00
0                    initial      228281. d      456563. d      684844. d      913125. d      913125. d
     actinide
     absorptions   8.502696E+05   8.508874E+05   8.514795E+05   8.520488E+05 . 8.525959E+05   8.525959E+05
     non-actinide
     abs. fracs.   4.543424E-03   6.089091E-03   7.282853E-03   8.218706E-03   8.960545E-03   8.960545E-03
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                fission products        page    4
0                                fraction of total absorption rate
        power=    .00mw, burnup=   1340.mwd, flux= 1.07E+08n/cm**2-sec
0              initial 228281. d 456563. d 684844. d 913125. d 913125. d

     sm149      .00E+00  1.34E-03  2.35E-03  3.10E-03  3.67E-03  3.67E-03
     eu151      .00E+00  4.09E-05  9.12E-05  1.40E-04  1.88E-04  1.88E-04
     nd143      .00E+00  3.36E-05  6.71E-05  1.00E-04  1.34E-04  1.34E-04
     gd155      .00E+00  2.33E-05  4.39E-05  6.20E-05  7.78E-05  7.78E-05
     rh103      .00E+00  1.57E-05  3.13E-05  4.69E-05  6.26E-05  6.26E-05
     xe131      .00E+00  1.09E-05  2.18E-05  3.26E-05  4.34E-05  4.34E-05
     cd113      .00E+00  1.35E-05  2.49E-05  3.46E-05  4.29E-05  4.29E-05
     cs133      .00E+00  8.49E-06  1.69E-05  2.54E-05  3.38E-05  3.38E-05
     gd157      .00E+00  1.38E-05  2.27E-05  2.86E-05  3.25E-05  3.25E-05
     sm147      .00E+00  6.28E-06  1.26E-05  1.88E-05  2.51E-05  2.51E-05
     tc 99      .00E+00  6.26E-06  1.25E-05  1.87E-05  2.48E-05  2.48E-05
     nd145      .00E+00  4.79E-06  9.56E-06  1.43E-05  1.90E-05  1.90E-05
```

sm151	.00E+00	1.66E-05	1.67E-05	1.67E-05	1.68E-05	1.68E-05
mo 95	.00E+00	3.34E-06	6.66E-06	9.97E-06	1.33E-05	1.33E-05
sm152	.00E+00	2.60E-06	5.26E-06	7.96E-06	1.07E-05	1.07E-05
kr 83	.00E+00	2.05E-06	4.10E-06	6.13E-06	8.15E-06	8.15E-06
cs135	.00E+00	1.90E-06	3.79E-06	5.68E-06	7.56E-06	7.56E-06
ru101	.00E+00	1.50E-06	2.99E-06	4.48E-06	5.97E-06	5.97E-06
pr141	.00E+00	1.40E-06	2.79E-06	4.17E-06	5.55E-06	5.55E-06
eu153	.00E+00	1.31E-06	2.62E-06	3.94E-06	5.26E-06	5.26E-06
la139	.00E+00	1.14E-06	2.27E-06	3.41E-06	4.53E-06	4.53E-06
sm150	.00E+00	3.38E-07	1.24E-06	2.55E-06	4.18E-06	4.18E-06
ba137	.00E+00	5.04E-07	1.04E-06	1.58E-06	2.12E-06	2.12E-06
pd105	.00E+00	4.93E-07	9.89E-07	1.49E-06	1.99E-06	1.99E-06
zr 93	.00E+00	4.73E-07	9.43E-07	1.41E-06	1.88E-06	1.88E-06
i129	.00E+00	3.52E-07	7.04E-07	1.06E-06	1.41E-06	1.41E-06
nd144	.00E+00	3.40E-07	6.80E-07	1.02E-06	1.36E-06	1.36E-06
mo 97	.00E+00	2.59E-07	5.18E-07	7.75E-07	1.03E-06	1.03E-06
ag109	.00E+00	1.96E-07	4.14E-07	6.52E-07	9.11E-07	9.11E-07
xe135	.00E+00	8.36E-07	8.34E-07	8.33E-07	8.32E-07	8.14E-07
zr 91	.00E+00	1.22E-07	2.43E-07	3.64E-07	4.84E-07	4.84E-07
y 89	.00E+00	1.16E-07	2.32E-07	3.47E-07	4.62E-07	4.62E-07
ru102	.00E+00	1.05E-07	2.10E-07	3.15E-07	4.19E-07	4.19E-07
ce142	.00E+00	9.43E-08	1.88E-07	2.82E-07	3.75E-07	3.75E-07
nd148	.00E+00	9.16E-08	1.83E-07	2.74E-07	3.65E-07	3.65E-07
nd146	.00E+00	7.63E-08	1.52E-07	2.28E-07	3.04E-07	3.04E-07
pd108	.00E+00	6.53E-08	1.35E-07	2.08E-07	2.85E-07	2.85E-07
ba138	.00E+00	6.50E-08	1.30E-07	1.94E-07	2.58E-07	2.58E-07
in115	.00E+00	6.37E-08	1.27E-07	1.91E-07	2.55E-07	2.55E-07
ce140	.00E+00	6.08E-08	1.21E-07	1.82E-07	2.42E-07	2.42E-07
xe132	.00E+00	5.56E-08	1.11E-07	1.66E-07	2.22E-07	2.22E-07
pd107	.00E+00	3.74E-08	7.65E-08	1.17E-07	1.59E-07	1.59E-07
mo 98	.00E+00	3.89E-08	7.77E-08	1.16E-07	1.55E-07	1.55E-07
mo100	.00E+00	3.72E-08	7.43E-08	1.11E-07	1.48E-07	1.48E-07
xe134	.00E+00	3.60E-08	7.19E-08	1.08E-07	1.43E-07	1.43E-07
zr 92	.00E+00	2.93E-08	5.85E-08	8.75E-08	1.16E-07	1.16E-07
pm147	.00E+00	1.02E-07	1.02E-07	1.01E-07	1.01E-07	1.01E-07
i127	.00E+00	2.42E-08	4.85E-08	7.29E-08	9.74E-08	9.74E-08
zr 96	.00E+00	2.40E-08	4.79E-08	7.17E-08	9.54E-08	9.54E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 5
0 fraction of total absorption rate
power= .00mw, burnup= .1340.mwd, flux= 1.07E+08n/cm**2-sec
0 initial 228281. d 456563. d 684844. d 913125. d 913125. d

gd152	.00E+00	4.47E-09	2.16E-08	5.16E-08	9.42E-08	9.42E-08
ru104	.00E+00	2.29E-08	4.58E-08	6.87E-08	9.18E-08	9.18E-08
nd150	.00E+00	2.04E-08	4.08E-08	6.11E-08	8.14E-08	8.14E-08
xe136	.00E+00	1.95E-08	3.89E-08	5.82E-08	7.75E-08	7.75E-08
br 81	.00E+00	1.48E-08	2.96E-08	4.44E-08	5.90E-08	5.90E-08
rb 85	.00E+00	1.44E-08	2.88E-08	4.31E-08	5.74E-08	5.74E-08
eu155	.00E+00	5.57E-08	5.61E-08	5.65E-08	5.70E-08	5.70E-08
zr 94	.00E+00	1.27E-08	2.52E-08	3.78E-08	5.03E-08	5.03E-08
zr 90	.00E+00	1.08E-08	2.23E-08	3.37E-08	4.50E-08	4.50E-08
cd111	.00E+00	9.59E-09	1.95E-08	2.97E-08	4.01E-08	4.01E-08
te130	.00E+00	8.83E-09	1.76E-08	2.64E-08	3.52E-08	3.52E-08
sm154	.00E+00	8.64E-09	1.73E-08	2.60E-08	3.47E-08	3.47E-08
rb 87	.00E+00	8.38E-09	1.67E-08	2.50E-08	3.33E-08	3.33E-08
se 77	.00E+00	5.84E-09	1.17E-08	1.75E-08	2.32E-08	2.32E-08
eu152	.00E+00	3.89E-09	8.66E-09	1.33E-08	1.78E-08	1.78E-08
pd106	.00E+00	4.31E-09	8.70E-09	1.32E-08	1.77E-08	1.77E-08
ru 99	.00E+00	1.03E-09	4.05E-09	9.04E-09	1.60E-08	1.60E-08
kr 84	.00E+00	4.00E-09	7.98E-09	1.19E-08	1.59E-08	1.59E-08

se 79	.00E+00	2.99E-09	5.97E-09	8.93E-09	1.19E-08	1.19E-08
sb121	.00E+00	2.92E-09	5.85E-09	8.78E-09	1.17E-08	1.17E-08
gd156	.00E+00	1.78E-09	4.04E-09	6.70E-09	9.74E-09	9.74E-09
sb123	.00E+00	2.37E-09	4.75E-09	7.13E-09	9.51E-09	9.51E-09
kr 86	.00E+00	2.17E-09	4.33E-09	6.48E-09	8.62E-09	8.62E-09
te128	.00E+00	1.96E-09	3.92E-09	5.89E-09	7.85E-09	7.85E-09
sr 90	.00E+00	6.22E-09	6.20E-09	6.18E-09	6.16E-09	6.16E-09
dy161	.00E+00	1.28E-09	2.67E-09	4.18E-09	5.80E-09	5.80E-09
se 80	.00E+00	1.40E-09	2.79E-09	4.18E-09	5.57E-09	5.57E-09
te125	.00E+00	1.24E-09	2.48E-09	3.74E-09	4.99E-09	4.99E-09
tb159	.00E+00	8.55E-10	1.74E-09	2.66E-09	3.62E-09	3.62E-09
cd112	.00E+00	8.05E-10	1.62E-09	2.45E-09	3.29E-09	3.29E-09
gd154	.00E+00	2.01E-10	8.04E-10	1.81E-09	3.21E-09	3.21E-09
li 6	.00E+00	7.93E-10	1.58E-09	2.36E-09	3.14E-09	3.14E-09
rh105	.00E+00	3.06E-09	3.09E-09	3.12E-09	3.15E-09	3.13E-09
sn117	.00E+00	6.36E-10	1.28E-09	1.92E-09	2.57E-09	2.57E-09
gd158	.00E+00	3.80E-10	9.40E-10	1.62E-09	2.38E-09	2.38E-09
sn119	.00E+00	5.19E-10	1.04E-09	1.56E-09	2.08E-09	2.08E-09
sn115	.00E+00	4.74E-10	9.49E-10	1.42E-09	1.90E-09	1.90E-09
sr 88	.00E+00	4.00E-10	7.98E-10	1.19E-09	1.59E-09	1.59E-09
ba135	.00E+00	9.52E-11	3.80E-10	8.53E-10	1.51E-09	1.51E-09
cd114	.00E+00	3.11E-10	6.71E-10	1.07E-09	1.51E-09	1.51E-09
cs137	.00E+00	1.39E-09	1.39E-09	1.39E-09	1.38E-09	1.38E-09
pd110	.00E+00	2.97E-10	6.06E-10	9.27E-10	1.26E-09	1.26E-09
se 82	.00E+00	2.71E-10	5.41E-10	8.10E-10	1.08E-09	1.08E-09
ru100	.00E+00	6.65E-11	2.59E-10	5.77E-10	1.02E-09	1.02E-09
pr143	.00E+00	9.76E-10	9.73E-10	9.71E-10	9.69E-10	9.68E-10
dy162	.00E+00	1.75E-10	3.81E-10	6.16E-10	8.80E-10	8.80E-10
sn126	.00E+00	2.17E-10	4.35E-10	6.54E-10	8.75E-10	8.75E-10
dy164	.00E+00	1.62E-10	3.62E-10	5.98E-10	8.70E-10	8.70E-10
eu154	.00E+00	2.15E-10	4.27E-10	6.39E-10	8.52E-10	8.52E-10

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% us? fission products page 6
0 fraction of total absorption rate
power= .00mw, burnup= 1340.mwd, flux= 1.07E+08n/cm**2-sec
0 initial 228281. d 456563. d 684844. d 913125. d 913125. d

se 78	.00E+00	2.08E-10	4.15E-10	6.21E-10	8.28E-10	8.28E-10
xe133	.00E+00	7.32E-10	7.30E-10	7.29E-10	7.28E-10	7.28E-10
ba134	.00E+00	4.37E-11	1.74E-10	3.89E-10	6.90E-10	6.90E-10
nd142	.00E+00	4.34E-11	1.73E-10	3.89E-10	6.89E-10	6.89E-10
sn124	.00E+00	1.70E-10	3.41E-10	5.12E-10	6.83E-10	6.83E-10
sm148	.00E+00	4.08E-11	1.61E-10	3.59E-10	6.36E-10	6.36E-10
ce141	.00E+00	5.79E-10	5.78E-10	5.76E-10	5.75E-10	5.75E-10
as 75	.00E+00	1.24E-10	2.47E-10	3.70E-10	4.93E-10	4.93E-10
pd104	.00E+00	2.94E-11	1.17E-10	2.64E-10	4.68E-10	4.68E-10
in113	.00E+00	9.04E-11	1.84E-10	2.78E-10	3.73E-10	3.73E-10
pm149	.00E+00	3.54E-10	3.53E-10	3.55E-10	3.52E-10	3.49E-10
nd147	.00E+00	3.48E-10	3.47E-10	3.47E-10	3.46E-10	3.45E-10
ba136	.00E+00	6.98E-11	1.47E-10	2.30E-10	3.21E-10	3.21E-10
sn118	.00E+00	6.98E-11	1.40E-10	2.10E-10	2.80E-10	2.80E-10
nb 93	.00E+00	1.48E-11	6.01E-11	1.36E-10	2.42E-10	2.42E-10
cd116	.00E+00	5.88E-11	1.18E-10	1.77E-10	2.36E-10	2.36E-10
sn122	.00E+00	5.73E-11	1.15E-10	1.72E-10	2.30E-10	2.30E-10
ce144	.00E+00	2.20E-10	2.19E-10	2.19E-10	2.18E-10	2.18E-10
mo 96	.00E+00	2.55E-11	7.04E-11	1.35E-10	2.18E-10	2.18E-10
kr 85	.00E+00	2.09E-10	2.08E-10	2.07E-10	2.07E-10	2.07E-10
dy163	.00E+00	3.93E-11	8.67E-11	1.42E-10	2.05E-10	2.05E-10
kr 82	.00E+00	3.94E-11	8.58E-11	1.39E-10	1.99E-10	1.99E-10
sn120	.00E+00	4.32E-11	8.64E-11	1.30E-10	1.73E-10	1.73E-10
xe130	.00E+00	2.63E-11	6.13E-11	1.05E-10	1.57E-10	1.57E-10

ge 73	.00E+00	3.35E-11	6.69E-11	1.00E-10	1.34E-10	1.34E-10
ru103	.00E+00	1.31E-10	1.31E-10	1.32E-10	1.32E-10	1.32E-10
br 79	.00E+00	7.73E-12	3.09E-11	6.93E-11	1.23E-10	1.23E-10
cs134	.00E+00	2.32E-11	4.60E-11	6.88E-11	9.15E-11	9.15E-11
cd110	.00E+00	4.04E-12	1.66E-11	3.86E-11	7.08E-11	7.08E-11
xe129	.00E+00	4.38E-12	1.75E-11	3.94E-11	6.99E-11	6.99E-11
ag107	.00E+00	4.12E-12	1.67E-11	3.81E-11	6.87E-11	6.87E-11
te126	.00E+00	8.30E-12	2.13E-11	3.90E-11	6.15E-11	6.15E-11
zr 95	.00E+00	6.17E-11	6.15E-11	6.14E-11	6.12E-11	6.12E-11
nb 95	.00E+00	5.64E-11	5.62E-11	5.61E-11	5.60E-11	5.60E-11
y 91	.00E+00	5.20E-11	5.18E-11	5.17E-11	5.15E-11	5.15E-11
ge 76	.00E+00	1.22E-11	2.44E-11	3.65E-11	4.86E-11	4.86E-11
pm151	.00E+00	4.00E-11	4.00E-11	4.01E-11	4.01E-11	3.82E-11
gd160	.00E+00	7.98E-12	1.64E-11	2.53E-11	3.46E-11	3.46E-11
ba140	.00E+00	1.73E-11	1.73E-11	1.73E-11	1.72E-11	1.71E-11
ho165	.00E+00	2.72E-12	6.04E-12	9.97E-12	1.45E-11	1.45E-11
sm153	.00E+00	1.40E-11	1.41E-11	1.42E-11	1.42E-11	1.38E-11
eu156	.00E+00	1.26E-11	1.28E-11	1.31E-11	1.33E-11	1.33E-11
sr 89	.00E+00	1.11E-11	1.11E-11	1.11E-11	1.10E-11	1.10E-11
ru106	.00E+00	9.69E-12	9.88E-12	1.01E-11	1.02E-11	1.02E-11
te124	.00E+00	1.45E-12	2.97E-12	4.56E-12	6.23E-12	6.23E-12
ce143	.00E+00	6.40E-12	6.38E-12	6.36E-12	6.35E-12	6.10E-12
y 90	.00E+00	5.91E-12	5.89E-12	5.87E-12	5.85E-12	5.85E-12
sr 87	.00E+00	1.40E-12	2.81E-12	4.23E-12	5.66E-12	5.66E-12
sb125	.00E+00	5.56E-12	5.59E-12	5.61E-12	5.64E-12	5.64E-12

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 7
0 fraction of total absorption rate
power= .00mw, burnup= 1340.mwd, flux= 1.07E+08n/cm**2-sec
0 initial 228281. d 456563. d 684844. d 913125. d 913125. d

la140	.00E+00	5.67E-12	5.66E-12	5.65E-12	5.64E-12	5.64E-12
mo 99	.00E+00	4.85E-12	4.84E-12	4.83E-12	4.82E-12	4.71E-12
dy160	.00E+00	2.54E-13	9.18E-13	2.00E-12	3.52E-12	3.52E-12
nb 94	.00E+00	8.05E-13	1.60E-12	2.39E-12	3.19E-12	3.19E-12
sr 86	.00E+00	4.70E-13	1.09E-12	1.86E-12	2.78E-12	2.78E-12
te127m	.00E+00	2.73E-12	2.74E-12	2.76E-12	2.77E-12	2.77E-12
xe128	.00E+00	2.17E-13	7.41E-13	1.57E-12	2.71E-12	2.71E-12
ge 74	.00E+00	6.74E-13	1.35E-12	2.02E-12	2.69E-12	2.69E-12
i131	.00E+00	2.49E-12	2.49E-12	2.49E-12	2.48E-12	2.47E-12
kr 87	.00E+00	8.30E-12	8.27E-12	8.24E-12	8.22E-12	2.40E-12
ge 72	.00E+00	4.53E-13	9.08E-13	1.36E-12	1.82E-12	1.82E-12
se 76	.00E+00	2.80E-13	5.95E-13	9.46E-13	1.33E-12	1.33E-12
pm148m	.00E+00	1.30E-12	1.31E-12	1.31E-12	1.32E-12	1.31E-12
sn116	.00E+00	6.37E-14	2.53E-13	5.68E-13	1.01E-12	1.01E-12
te129m	.00E+00	6.56E-13	6.57E-13	6.57E-13	6.58E-13	6.58E-13
er166	.00E+00	8.39E-14	2.10E-13	3.76E-13	5.82E-13	5.82E-13
te122	.00E+00	2.54E-14	1.09E-13	2.41E-13	4.24E-13	4.24E-13
ag111	.00E+00	1.22E-13	1.26E-13	1.30E-13	1.33E-13	1.33E-13
eu157	.00E+00	1.11E-13	1.14E-13	1.16E-13	1.16E-13	1.08E-13
kr 80	.00E+00	1.96E-14	4.10E-14	6.49E-14	9.20E-14	9.20E-14
cd115m	.00E+00	8.70E-14	8.74E-14	8.77E-14	8.81E-14	8.80E-14
pm148	.00E+00	5.10E-14	5.10E-14	5.10E-14	5.10E-14	5.04E-14
cs136	.00E+00	2.29E-14	2.51E-14	2.72E-14	2.94E-14	2.93E-14
sn125	.00E+00	1.09E-14	1.09E-14	1.09E-14	1.10E-14	1.09E-14
ru105	.00E+00	1.12E-14	1.13E-14	1.14E-14	1.15E-14	8.29E-15
te123	.00E+00	1.49E-15	3.29E-15	5.50E-15	8.23E-15	8.23E-15
er167	.00E+00	5.97E-16	2.01E-15	4.40E-15	7.94E-15	7.94E-15
be 9	.00E+00	1.58E-15	3.15E-15	4.71E-15	6.27E-15	6.27E-15
sn123	.00E+00	3.82E-15	3.82E-15	3.82E-15	3.82E-15	3.82E-15
tb160	.00E+00	9.56E-16	1.83E-15	2.72E-15	3.64E-15	3.63E-15

te132	.00E+00	3.49E-15	3.49E-15	3.48E-15	3.48E-15	3.41E-15
rb 88	.00E+00	4.67E-15	4.65E-15	4.64E-15	4.62E-15	2.90E-15
i135	.00E+00	3.68E-15	3.67E-15	3.67E-15	3.66E-15	2.88E-15
li 7	.00E+00	6.11E-16	1.22E-15	1.83E-15	2.43E-15	2.43E-15
sb126	.00E+00	1.40E-15	1.69E-15	1.99E-15	2.29E-15	2.28E-15
pr142	.00E+00	5.77E-16	1.15E-15	1.72E-15	2.29E-15	2.11E-15
sb124	.00E+00	8.16E-16	8.58E-16	9.00E-16	9.41E-16	9.40E-16
in117m	.00E+00	7.66E-16	7.72E-16	7.78E-16	7.84E-16	6.59E-16
i130	.00E+00	3.65E-16	4.67E-16	5.69E-16	6.70E-16	5.92E-16
cd108	.00E+00	2.44E-17	9.59E-17	2.50E-16	5.26E-16	5.26E-16
sn114	.00E+00	1.47E-17	5.95E-17	1.34E-16	2.40E-16	2.40E-16
rb 86	.00E+00	1.22E-16	1.56E-16	1.90E-16	2.23E-16	2.22E-16
te134	.00E+00	2.12E-15	2.11E-15	2.11E-15	2.10E-15	2.18E-16
in117	.00E+00	2.25E-16	2.27E-16	2.29E-16	2.31E-16	1.97E-16
dy165	.00E+00	9.59E-17	1.15E-16	1.34E-16	1.53E-16	7.98E-17
ge 75	.00E+00	3.13E-17	3.12E-17	3.12E-17	3.11E-17	1.02E-17
cs134m	.00E+00	4.29E-18	8.56E-18	1.28E-17	1.70E-17	9.91E-18
cd118	.00E+00	4.39E-17	4.41E-17	4.42E-17	4.44E-17	6.77E-18
cd109	.00E+00	1.93E-19	3.12E-19	4.31E-19	5.49E-19	5.49E-19

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 8
0 fraction of total absorption rate
power= .00mw, burnup= 1340.mwd, flux= 1.07E+08n/cm**2-sec
0 initial 228281. d 456563. d 684844. d 913125. d 913125. d

in119m	.00E+00	1.10E-17	1.10E-17	1.10E-17	1.11E-17	6.41E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 9
power= 1.468E-03mw, burnup=1.3405E+03mwd, flux= 1.07E+08n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge 228281. d	456563. d	684844. d	913125. d	913125. d
h 1	.00E+00	2.05E-05	4.09E-05	6.14E-05	8.18E-05	8.18E-05
h 2	.00E+00	6.08E-08	1.21E-07	1.82E-07	2.43E-07	2.43E-07
h 3	.00E+00	1.29E-11	1.31E-11	1.33E-11	1.36E-11	1.36E-11
h 4	.00E+00	1.89E-35	1.92E-35	1.95E-35	1.98E-35	.00E+00
he 3	.00E+00	4.41E-10	8.87E-10	1.33E-09	1.76E-09	1.76E-09
he 4	.00E+00	3.38E-06	6.77E-06	1.01E-05	1.35E-05	1.35E-05
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	.00E+00	4.06E-07	8.13E-07	1.22E-06	1.62E-06	1.62E-06
ne 21	.00E+00	3.32E-12	1.33E-11	2.98E-11	5.30E-11	5.30E-11
ne 22	.00E+00	2.66E-09	5.33E-09	8.00E-09	1.07E-08	1.07E-08
ne 23	.00E+00	2.71E-15	2.71E-15	2.70E-15	2.70E-15	2.70E-30
na 22	.00E+00	1.60E-11	1.59E-11	1.59E-11	1.59E-11	1.59E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	.00E+00	1.34E-08	1.34E-08	1.34E-08	1.34E-08	1.21E-08
na 24m	.00E+00	2.21E-15	2.21E-15	2.21E-15	2.21E-15	2.21E-30
na 25	.00E+00	8.34E-27	2.36E-26	4.57E-26	7.47E-26	7.47E-41
mg 24	.00E+00	3.48E-03	6.97E-03	1.04E-02	1.39E-02	1.39E-02
mg 25	.00E+00	7.62E-10	2.16E-09	4.18E-09	6.83E-09	6.83E-09
mg 26	.00E+00	6.07E-08	1.21E-07	1.82E-07	2.43E-07	2.43E-07
mg 27	.00E+00	8.09E-13	8.08E-13	8.08E-13	8.07E-13	3.66E-17
mg 28	.00E+00	5.94E-25	5.94E-25	5.93E-25	5.92E-25	5.49E-25
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	.00E+00	9.97E-11	9.97E-11	9.96E-11	9.96E-11	1.01E-25
al 29	.00E+00	2.89E-25	1.15E-24	2.60E-24	4.61E-24	2.54E-30
al 30	.00E+00	1.20E-36	9.61E-36	3.24E-35	7.67E-35	.00E+00
si 28	.00E+00	1.01E-02	2.03E-02	3.04E-02	4.05E-02	4.05E-02
si 29	.00E+00	2.95E-09	1.18E-08	2.65E-08	4.71E-08	4.71E-08
si 30	.00E+00	9.18E-16	7.34E-15	2.48E-14	5.86E-14	5.86E-14
si 31	.00E+00	2.38E-28	1.90E-27	6.42E-27	1.52E-26	8.32E-27

si 32	.00E+00	6.21E-35	7.19E-34	2.83E-33	7.29E-33	7.29E-33
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E-07

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 10
power= 1.468E-03mw, burnup=1.3405E+03mwd, flux= 1.07E+08n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge 228281. d	456563. d	684844. d	913125. d	913125. d
he 4	.00E+00 7.58E-02	1.80E-01	3.05E-01	4.49E-01	4.49E-01
pb206	.00E+00 3.69E-06	2.83E-05	9.05E-05	2.03E-04	2.03E-04
pb207	.00E+00 2.82E-06	1.15E-05	2.61E-05	4.65E-05	4.65E-05
pb208	.00E+00 1.77E-07	6.93E-07	1.54E-06	2.73E-06	2.73E-06
pb209	.00E+00 5.36E-13	2.10E-12	4.63E-12	8.08E-12	8.13E-12
pb210	.00E+00 5.84E-07	2.14E-06	4.45E-06	7.31E-06	7.31E-06
pb211	.00E+00 9.38E-13	1.87E-12	2.80E-12	3.71E-12	3.71E-12
pb212	.00E+00 9.71E-13	1.91E-12	2.84E-12	3.76E-12	3.76E-12
pb214	.00E+00 1.34E-12	4.90E-12	1.02E-11	1.67E-11	1.62E-11
bi208	.00E+00 .00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	.00E+00 2.09E-07	1.65E-06	5.49E-06	1.28E-05	1.28E-05
bi210m	.00E+00 .00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	.00E+00 3.60E-10	1.32E-09	2.74E-09	4.50E-09	4.50E-09
bi211	.00E+00 5.56E-14	1.11E-13	1.66E-13	2.20E-13	2.21E-13
bi212	.00E+00 9.21E-14	1.81E-13	2.69E-13	3.57E-13	3.57E-13
bi213	.00E+00 1.25E-13	4.91E-13	1.08E-12	1.89E-12	1.83E-12
bi214	.00E+00 9.91E-13	3.64E-12	7.55E-12	1.24E-11	1.22E-11
po210	.00E+00 9.93E-09	3.65E-08	7.56E-08	1.24E-07	1.24E-07
po211m	.00E+00 .00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	.00E+00 6.15E-19	1.23E-18	1.83E-18	2.43E-18	2.44E-18
po212	.00E+00 4.84E-24	9.51E-24	1.41E-23	1.87E-23	1.88E-23
po213	.00E+00 1.88E-22	7.38E-22	1.63E-21	2.84E-21	2.75E-21
po214	.00E+00 1.36E-19	5.01E-19	1.04E-18	1.71E-18	1.67E-18
po215	.00E+00 7.71E-19	1.54E-18	2.30E-18	3.05E-18	3.05E-18
po216	.00E+00 3.68E-18	7.23E-18	1.07E-17	1.42E-17	1.42E-17
po218	.00E+00 1.54E-13	5.67E-13	1.18E-12	1.93E-12	1.93E-12
rn218	.00E+00 5.40E-30	1.06E-29	1.58E-29	2.09E-29	2.08E-29
rn219	.00E+00 1.72E-15	3.42E-15	5.11E-15	6.79E-15	6.79E-15
rn220	.00E+00 1.41E-15	2.77E-15	4.12E-15	5.46E-15	5.46E-15
rn222	.00E+00 2.74E-10	1.01E-09	2.09E-09	3.43E-09	3.43E-09
ra222	.00E+00 5.86E-27	1.15E-26	1.71E-26	2.27E-26	2.26E-26
ra223	.00E+00 4.28E-10	8.53E-10	1.28E-09	1.69E-09	1.69E-09
ra224	.00E+00 8.02E-12	1.58E-11	2.34E-11	3.11E-11	3.11E-11
ra225	.00E+00 5.85E-11	2.29E-10	5.06E-10	8.83E-10	8.83E-10
ra226	.00E+00 4.19E-05	1.54E-04	3.19E-04	5.25E-04	5.25E-04
ra228	.00E+00 1.32E-12	2.64E-12	3.97E-12	5.30E-12	5.30E-12
ac225	.00E+00 3.95E-11	1.55E-10	3.42E-10	5.96E-10	5.96E-10
ac227	.00E+00 2.98E-07	5.93E-07	8.87E-07	1.18E-06	1.18E-06
ac228	.00E+00 1.61E-16	3.23E-16	4.84E-16	6.46E-16	6.46E-16
th226	.00E+00 2.86E-25	5.62E-25	8.35E-25	1.11E-24	1.10E-24
th227	.00E+00 6.91E-10	1.38E-09	2.06E-09	2.74E-09	2.74E-09
th228	.00E+00 1.53E-09	3.01E-09	4.47E-09	5.93E-09	5.93E-09
th229	.00E+00 1.14E-05	4.46E-05	9.84E-05	1.72E-04	1.72E-04
th230	.00E+00 1.59E-02	3.18E-02	4.76E-02	6.34E-02	6.34E-02
th231	.00E+00 3.04E-09	3.06E-09	3.08E-09	3.10E-09	3.09E-09
th232	.00E+00 3.23E-03	6.46E-03	9.70E-03	1.29E-02	1.29E-02
th233	.00E+00 1.09E-14	2.17E-14	3.26E-14	4.34E-14	6.23E-16
th234	.00E+00 5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	.00E+00 4.48E-04	8.93E-04	1.33E-03	1.77E-03	1.77E-03
pa232	.00E+00 2.79E-12	5.56E-12	8.30E-12	1.10E-11	1.05E-11

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 11
power= 1.468E-03mw, burnup=1.3405E+03mwd, flux= 1.07E+08n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge 228281. d	456563. d	684844. d	913125. d	913125. d
pa233	.00E+00	1.46E-06	1.45E-06	1.45E-06	1.45E-06	1.45E-06
pa234m	.00E+00	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	.00E+00	8.09E-12	8.09E-12	8.09E-12	8.09E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	.00E+00	2.77E-22	5.45E-22	8.09E-22	1.07E-21	1.07E-21
u231	.00E+00	2.47E-18	4.92E-18	7.36E-18	9.78E-18	9.62E-18
u232	.00E+00	5.58E-08	1.10E-07	1.63E-07	2.16E-07	2.16E-07
u233	.00E+00	8.51E-03	1.70E-02	2.54E-02	3.38E-02	3.38E-02
u234	9.06E+00	9.07E+00	9.10E+00	9.12E+00	9.14E+00	9.14E+00
u235	7.30E+02	7.29E+02	7.27E+02	7.25E+02	7.24E+02	7.24E+02
u236	1.74E+02	1.75E+02	1.75E+02	1.75E+02	1.75E+02	1.75E+02
u237	.00E+00	1.18E-06	1.18E-06	1.18E-06	1.18E-06	1.17E-06
u238	3.64E+04	3.64E+04	3.64E+04	3.64E+04	3.64E+04	3.64E+04
u239	.00E+00	1.16E-07	1.16E-07	1.16E-07	1.16E-07	2.06E-09
u240	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	1.40E-45
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	.00E+00	3.30E-12	3.30E-12	3.29E-12	3.29E-12	3.29E-12
np236m	.00E+00	7.85E-13	7.84E-13	7.83E-13	7.82E-13	7.29E-13
np236	.00E+00	4.65E-08	9.27E-08	1.39E-07	1.85E-07	1.85E-07
np237	4.22E+01	4.21E+01	4.21E+01	4.21E+01	4.21E+01	4.21E+01
np238	.00E+00	5.67E-07	5.66E-07	5.65E-07	5.65E-07	5.48E-07
np239	.00E+00	1.68E-05	1.68E-05	1.68E-05	1.68E-05	1.64E-05
np240m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np240	.00E+00	1.25E-15	1.25E-15	1.25E-15	1.25E-15	2.70E-16
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	.00E+00	4.26E-10	4.25E-10	4.25E-10	4.25E-10	4.25E-10
pu237	.00E+00	3.51E-14	3.88E-14	4.23E-14	4.56E-14	4.55E-14
pu238	.00E+00	8.51E-03	8.57E-03	8.56E-03	8.55E-03	8.55E-03
pu239	.00E+00	1.12E+00	2.21E+00	3.27E+00	4.31E+00	4.31E+00
pu240	.00E+00	1.01E-03	3.92E-03	8.56E-03	1.47E-02	1.47E-02
pu241	.00E+00	1.55E-07	6.01E-07	1.31E-06	2.26E-06	2.26E-06
pu242	.00E+00	2.44E-10	2.94E-09	1.22E-08	3.25E-08	3.25E-08
pu243	.00E+00	1.95E-19	2.34E-18	9.69E-18	2.59E-17	1.88E-17
pu244	.00E+00	8.66E-40	6.78E-37	3.00E-35	4.22E-34	4.22E-34
pu245	.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
am239	.00E+00	1.26E-22	8.08E-22	2.23E-21	4.41E-21	3.86E-21
am240	.00E+00	5.77E-20	3.70E-19	1.02E-18	2.02E-18	1.96E-18
am241	.00E+00	1.20E-06	7.72E-06	2.13E-05	4.22E-05	4.22E-05
am242m	.00E+00	9.98E-11	9.07E-10	2.87E-09	6.09E-09	6.09E-09
am242	.00E+00	1.53E-14	1.02E-13	2.86E-13	5.71E-13	5.25E-13
am243	.00E+00	1.61E-13	3.32E-12	1.75E-11	5.41E-11	5.41E-11
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	.00E+00	4.58E-22	9.44E-21	4.96E-20	1.54E-19	1.31E-19
am245	.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
cm241	.00E+00	3.41E-25	2.26E-24	6.35E-24	1.27E-23	1.26E-23
cm242	.00E+00	3.10E-12	2.06E-11	5.77E-11	1.15E-10	1.15E-10
cm243	.00E+00	2.64E-17	1.75E-16	4.91E-16	9.79E-16	9.79E-16
cm244	.00E+00	7.20E-18	1.48E-16	7.79E-16	2.41E-15	2.41E-15

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 12
power= 1.468E-03mw, burnup=1.3405E+03mwd, flux= 1.07E+08n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

```
          charge 228281. d 456563. d 684844. d 913125. d 913125. d
     cm245    .00E+00  3.16E-22  1.36E-20  1.11E-19  4.67E-19  4.67E-19
     cm246    .00E+00  6.24E-26  5.57E-24  6.93E-23  3.92E-22  3.92E-22
     cm247    .00E+00  2.12E-31  3.92E-29  7.50E-28  5.76E-27  5.76E-27
     cm248    .00E+00  7.12E-36  2.72E-33  7.92E-32  8.23E-31  8.23E-31
     cm249    .00E+00   .00E+00   .00E+00   .00E+00  7.78E-42  1.78E-42
     cm250    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              1.07E+08  1.07E+08  1.07E+08  1.07E+08  1.07E-07
0       1q array has      20 entries.
0       3q array has       1 entries.
0       3q array has       1 entries.
0       3q array has       1 entries.
0       4q array has       1 entries.
0      54q array has      12 entries.
1library information...

          cross-section data taken from position number  2 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *           prelim lwr origen-s binary working library--id = 1143              *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *       neutron flux spectrum factors and cross sections were produced from    *
          *      the "presas2" case updating all nuclides on the scale "burnup" library  *
          *                                                                              *
          *                    fission product yields are from endf/b-v                  *
          *                                                                              *
          *              photon libraries use an 18-energy-group structure               *
          *             the photon data are from the [illegible] tape,                   *
          *              produced to include bremsstrahlung from us2 matrix              *
          *                                                                              *
          *        see information above this box (if present) for later updates         *
          *                                                                              *
          ********************************************************************************
          *                                                                              *
0         ********************************************************************************
0                   .other identification and sizes of library.
0                    data set name:  ft33f001
0                  8/29/1996    date library was produced
0                       1697    total number of nuclides in library
0                        689    number of light-element nuclides
```

```
                    129    number of actinide nuclides
                    879    number of fission product nuclides
0                  7993    number of nonzero off-diagonal matrix elements
0       ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                  page   13
        power=     .00mw, burnup=   2681.mwd, flux= 9.84E+07n/cm**2-sec
0                                      basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                  initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions  1.147176E+06  1.148034E+06  1.148847E+06  1.149617E+06  1.150344E+06  1.150344E+06
     absorptions  9.285851E+05  9.296731E+05  9.306356E+05  9.314987E+05  9.322818E+05  9.322817E+05
     k infinity   1.235402E+00  1.234879E+00  1.234476E+00  1.234158E+00  1.233901E+00  1.233902E+00
0                  initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions  9.209394E+05  9.214599E+05  9.219582E+05  9.224346E+05  9.228896E+05  9.228896E+05
     non-actinide
     abs. fracs.  8.233726E-03  8.834422E-03  9.324193E-03  9.730697E-03  1.007444E-02  1.007432E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2          fission products      page   14
0                              fraction of total absorption rate
        power=     .00mw, burnup=   2681.mwd, flux= 9.84E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d ******* d
```

sm149	3.72E-03	4.14E-03	4.46E-03	4.71E-03	4.89E-03	4.89E-03
eu151	1.90E-04	2.38E-04	2.84E-04	3.29E-04	3.74E-04	3.74E-04
nd143	1.35E-04	1.68E-04	2.02E-04	2.35E-04	2.68E-04	2.68E-04
gd155	7.90E-05	9.30E-05	1.05E-04	1.16E-04	1.26E-04	1.26E-04
rh103	6.24E-05	7.79E-05	9.35E-05	1.09E-04	1.25E-04	1.25E-04
xe131	4.31E-05	5.38E-05	6.45E-05	7.51E-05	8.58E-05	8.58E-05
cs133	3.35E-05	4.18E-05	5.01E-05	5.84E-05	6.67E-05	6.67E-05
cd113	4.35E-05	5.06E-05	5.66E-05	6.18E-05	6.63E-05	6.63E-05
sm147	2.48E-05	3.10E-05	3.72E-05	4.33E-05	4.94E-05	4.94E-05
tc 99	2.46E-05	3.06E-05	3.67E-05	4.27E-05	4.87E-05	4.87E-05
gd157	3.30E-05	3.57E-05	3.76E-05	3.91E-05	4.04E-05	4.04E-05
nd145	1.90E-05	2.37E-05	2.84E-05	3.31E-05	3.78E-05	3.78E-05
mo 95	1.32E-05	1.65E-05	1.97E-05	2.30E-05	2.62E-05	2.62E-05
sm152	1.06E-05	1.34E-05	1.62E-05	1.90E-05	2.19E-05	2.19E-05
sm151	1.70E-05	1.70E-05	1.70E-05	1.71E-05	1.71E-05	1.71E-05
kr 83	8.23E-06	1.03E-05	1.23E-05	1.43E-05	1.63E-05	1.63E-05
cs135	7.52E-06	9.39E-06	1.13E-05	1.31E-05	1.50E-05	1.50E-05
sm150	4.19E-06	6.06E-06	8.10E-06	1.03E-05	1.26E-05	1.26E-05
ru101	5.87E-06	7.33E-06	8.79E-06	1.02E-05	1.17E-05	1.17E-05
pr141	5.59E-06	6.97E-06	8.36E-06	9.74E-06	1.11E-05	1.11E-05
eu153	5.25E-06	6.57E-06	7.89E-06	9.22E-06	1.06E-05	1.06E-05
la139	4.57E-06	5.70E-06	6.85E-06	7.96E-06	9.09E-06	9.09E-06
ba137	2.14E-06	2.69E-06	3.23E-06	3.77E-06	4.31E-06	4.31E-06
pd105	1.98E-06	2.49E-06	3.00E-06	3.51E-06	4.02E-06	4.02E-06
zr 93	1.86E-06	2.32E-06	2.78E-06	3.24E-06	3.69E-06	3.69E-06
i129	1.51E-06	1.91E-06	2.30E-06	2.68E-06	2.95E-06	2.95E-06
nd144	1.37E-06	1.71E-06	2.05E-06	2.39E-06	2.73E-06	2.73E-06
ag109	9.01E-07	1.10E-06	1.47E-06	1.78E-06	2.11E-06	2.11E-06
mo 97	1.04E-06	1.29E-06	1.55E-06	1.81E-06	2.06E-06	2.06E-06
zr 91	4.87E-07	6.08E-07	7.28E-07	8.48E-07	9.68E-07	9.68E-07
y 89	4.66E-07	5.82E-07	6.97E-07	8.12E-07	9.26E-07	9.26E-07
ru102	4.23E-07	5.28E-07	6.33E-07	7.39E-07	8.44E-07	8.44E-07
xe135	8.26E-07	8.44E-07	8.43E-07	8.43E-07	8.42E-07	7.83E-07
ce142	3.79E-07	4.74E-07	5.68E-07	6.62E-07	7.55E-07	7.55E-07
nd148	3.66E-07	4.57E-07	5.48E-07	6.38E-07	7.29E-07	7.29E-07
pd108	2.81E-07	3.61E-07	4.44E-07	5.30E-07	6.20E-07	6.20E-07
nd146	3.06E-07	3.83E-07	4.59E-07	5.34E-07	6.10E-07	6.10E-07
ba138	2.62E-07	3.26E-07	3.91E-07	4.56E-07	5.21E-07	5.21E-07

in115	2.55E-07	3.19E-07	3.84E-07	4.48E-07	5.13E-07	5.13E-07
ce140	2.45E-07	3.06E-07	3.67E-07	4.27E-07	4.88E-07	4.88E-07
xe132	2.21E-07	2.76E-07	3.31E-07	3.86E-07	4.41E-07	4.41E-07
gd152	9.55E-08	1.51E-07	2.19E-07	2.99E-07	3.90E-07	3.90E-07
pd107	1.60E-07	2.04E-07	2.50E-07	2.96E-07	3.45E-07	3.45E-07
mo 98	1.53E-07	1.91E-07	2.29E-07	2.67E-07	3.05E-07	3.05E-07
mo100	1.48E-07	1.84E-07	2.21E-07	2.57E-07	2.94E-07	2.94E-07
xe134	1.45E-07	1.81E-07	2.17E-07	2.52E-07	2.88E-07	2.88E-07
zr 92	1.17E-07	1.46E-07	1.75E-07	2.04E-07	2.33E-07	2.33E-07
i127	9.70E-08	1.22E-07	1.46E-07	1.71E-07	1.96E-07	1.96E-07
zr 96	9.33E-08	1.16E-07	1.40E-07	1.63E-07	1.86E-07	1.86E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 15
0 fraction of total absorption rate
power= .00mw, burnup= 2681.mwd, flux= 9.84E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

ru104	9.16E-08	1.15E-07	1.38E-07	1.61E-07	1.84E-07	1.84E-07
nd150	8.14E-08	1.02E-07	1.22E-07	1.42E-07	1.62E-07	1.62E-07
xe136	7.82E-08	9.76E-08	1.17E-07	1.36E-07	1.56E-07	1.56E-07
br 81	5.89E-08	7.35E-08	8.81E-08	1.03E-07	1.17E-07	1.17E-07
rb 85	5.73E-08	7.16E-08	8.57E-08	9.99E-08	1.14E-07	1.14E-07
pm147	1.00E-07	1.00E-07	1.00E-07	1.00E-07	9.99E-08	9.99E-08
zr 94	4.99E-08	6.23E-08	7.46E-08	8.69E-08	9.92E-08	9.92E-08
zr 90	4.53E-08	5.67E-08	6.81E-08	7.95E-08	9.08E-08	9.08E-08
cd111	4.05E-08	5.14E-08	6.25E-08	7.39E-08	8.55E-08	8.55E-08
te130	3.56E-08	4.44E-08	5.33E-08	6.21E-08	7.10E-08	7.10E-08
sm154	3.49E-08	4.38E-08	5.26E-08	6.15E-08	7.04E-08	7.04E-08
rb 87	3.32E-08	4.14E-08	4.96E-08	5.78E-08	6.59E-08	6.59E-08
ru 99	1.59E-08	2.48E-08	3.56E-08	4.83E-08	6.30E-08	6.30E-08
eu155	5.68E-08	5.71E-08	5.75E-08	5.79E-08	5.84E-08	5.83E-08
se 77	2.35E-08	2.94E-08	3.52E-08	4.10E-08	4.68E-08	4.68E-08
pd106	1.76E-08	2.22E-08	2.68E-08	3.16E-08	3.64E-08	3.64E-08
eu152	1.80E-08	2.26E-08	2.70E-08	3.12E-08	3.54E-08	3.54E-08
kr 84	1.57E-08	1.96E-08	2.35E-08	2.74E-08	3.13E-08	3.13E-08
gd156	9.59E-09	1.29E-08	1.65E-08	2.03E-08	2.44E-08	2.44E-08
se 79	1.20E-08	1.50E-08	1.80E-08	2.10E-08	2.39E-08	2.39E-08
sb121	1.17E-08	1.46E-08	1.75E-08	2.04E-08	2.34E-08	2.34E-08
sb123	9.46E-09	1.18E-08	1.42E-08	1.66E-08	1.90E-08	1.90E-08
kr 86	8.70E-09	1.09E-08	1.30E-08	1.52E-08	1.73E-08	1.73E-08
te128	7.85E-09	9.81E-09	1.18E-08	1.37E-08	1.57E-08	1.57E-08
dy161	5.87E-09	7.61E-09	9.45E-09	1.14E-08	1.34E-08	1.34E-08
gd154	3.25E-09	5.05E-09	7.26E-09	9.87E-09	1.29E-08	1.29E-08
se 80	5.62E-09	7.02E-09	8.42E-09	9.81E-09	1.12E-08	1.12E-08
te125	4.99E-09	6.25E-09	7.52E-09	8.79E-09	1.01E-08	1.01E-08
tb159	3.61E-09	4.59E-09	5.60E-09	6.63E-09	7.70E-09	7.70E-09
cd112	3.31E-09	4.16E-09	5.03E-09	5.90E-09	6.79E-09	6.79E-09
li 6	3.18E-09	3.96E-09	4.74E-09	5.52E-09	6.29E-09	6.29E-09
sr 90	6.22E-09	6.21E-09	6.19E-09	6.17E-09	6.16E-09	6.16E-09
ba135	1.51E-09	2.36E-09	3.39E-09	4.61E-09	6.02E-09	6.02E-09
gd158	2.37E-09	3.18E-09	4.03E-09	4.92E-09	5.83E-09	5.83E-09
sn117	2.58E-09	3.24E-09	3.90E-09	4.57E-09	5.24E-09	5.24E-09
sn119	2.11E-09	2.63E-09	3.17E-09	3.70E-09	4.23E-09	4.23E-09
ru100	1.03E-09	1.59E-09	2.28E-09	3.08E-09	4.01E-09	4.01E-09
sn115	1.93E-09	2.41E-09	2.90E-09	3.38E-09	3.87E-09	3.87E-09
cd114	1.49E-09	1.95E-09	2.44E-09	2.94E-09	3.47E-09	3.47E-09
rh105	3.16E-09	3.19E-09	3.22E-09	3.24E-09	3.27E-09	3.20E-09
sr 88	1.60E-09	2.00E-09	2.39E-09	2.79E-09	3.18E-09	3.18E-09
nd142	6.98E-10	1.09E-09	1.56E-09	2.12E-09	2.77E-09	2.77E-09
ba134	6.91E-10	1.07E-09	1.53E-09	2.08E-09	2.71E-09	2.71E-09
pd110	1.25E-09	1.59E-09	1.94E-09	2.30E-09	2.68E-09	2.68E-09

sm148	6.37E-10	9.86E-10	1.41E-09	1.91E-09	2.49E-09	2.49E-09
dy164	8.81E-10	1.19E-09	1.53E-09	1.90E-09	2.30E-09	2.30E-09
dy162	8.82E-10	1.17E-09	1.49E-09	1.83E-09	2.20E-09	2.20E-09
se 82	1.09E-09	1.36E-09	1.63E-09	1.89E-09	2.16E-09	2.16E-09
pd104	4.62E-10	7.19E-10	1.03E-09	1.40E-09	1.83E-09	1.83E-09

0 fraction of total absorption rate

power= .00mw, burnup= 2681.mwd, flux= 9.84E+07n/cm**2-sec

	initial	******* d	******* d	******* d	******* d
sn126	8.85E-10	1.11E-09	1.34E-09	1.56E-09	1.79E-09	1.79E-09
eu154	8.59E-10	1.06E-09	1.28E-09	1.49E-09	1.70E-09	1.70E-09
se 78	8.29E-10	1.04E-09	1.24E-09	1.45E-09	1.65E-09	1.65E-09
cs137	1.38E-09	1.38E-09	1.38E-09	1.38E-09	1.38E-09	1.38E-09
sn124	6.75E-10	8.45E-10	1.02E-09	1.19E-09	1.36E-09	1.36E-09
as 75	4.93E-10	6.16E-10	7.39E-10	8.61E-10	9.83E-10	9.83E-10
nb 93	2.43E-10	3.79E-10	5.46E-10	7.43E-10	9.69E-10	9.69E-10
pr143	9.73E-10	9.72E-10	9.71E-10	9.69E-10	9.67E-10	9.67E-10
in113	3.72E-10	4.67E-10	5.63E-10	6.58E-10	7.55E-10	7.55E-10
ba136	3.20E-10	4.17E-10	5.21E-10	6.31E-10	7.48E-10	7.48E-10
mo 96	2.17E-10	3.18E-10	4.38E-10	5.77E-10	7.34E-10	7.34E-10
xe133	7.36E-10	7.36E-10	7.35E-10	7.34E-10	7.33E-10	7.32E-10
ce141	5.82E-10	5.82E-10	5.81E-10	5.80E-10	5.80E-10	5.79E-10
sn118	2.76E-10	3.45E-10	4.15E-10	4.85E-10	5.55E-10	5.55E-10
dy163	2.06E-10	2.76E-10	3.53E-10	4.37E-10	5.29E-10	5.29E-10
kr 82	2.00E-10	2.67E-10	3.39E-10	4.19E-10	5.04E-10	5.04E-10
br 79	1.23E-10	1.92E-10	2.76E-10	3.76E-10	4.90E-10	4.90E-10
cd116	2.33E-10	2.92E-10	3.51E-10	4.10E-10	4.69E-10	4.69E-10
sn122	2.32E-10	2.90E-10	3.49E-10	4.07E-10	4.66E-10	4.66E-10
xe130	1.59E-10	2.21E-10	2.92E-10	3.71E-10	4.59E-10	4.59E-10
sn120	1.73E-10	2.17E-10	2.61E-10	3.04E-10	3.48E-10	3.48E-10
pm149	3.53E-10	3.56E-10	3.56E-10	3.56E-10	3.55E-10	3.45E-10
nd147	3.41E-10	3.43E-10	3.42E-10	3.42E-10	3.41E-10	3.38E-10
cd110	7.14E-11	1.14E-10	1.68E-10	2.35E-10	3.15E-10	3.15E-10
ag107	6.94E-11	1.10E-10	1.60E-10	2.21E-10	2.92E-10	2.92E-10
xe129	7.01E-11	1.09E-10	1.58E-10	2.14E-10	2.80E-10	2.80E-10
ge 73	1.35E-10	1.69E-10	2.02E-10	2.36E-10	2.70E-10	2.70E-10
ce144	2.19E-10	2.19E-10	2.18E-10	2.18E-10	2.18E-10	2.18E-10
kr 85	2.08E-10	2.08E-10	2.07E-10	2.07E-10	2.07E-10	2.07E-10
te126	6.16E-11	8.89E-11	1.21E-10	1.58E-10	1.99E-10	1.99E-10
cs134	9.22E-11	1.13E-10	1.35E-10	1.58E-10	1.80E-10	1.80E-10
ru103	1.32E-10	1.33E-10	1.33E-10	1.33E-10	1.33E-10	1.33E-10
ge 76	4.88E-11	6.09E-11	7.29E-11	8.50E-11	9.70E-11	9.70E-11
gd160	3.46E-11	4.43E-11	5.44E-11	6.49E-11	7.58E-11	7.58E-11
zr 95	6.05E-11	6.05E-11	6.04E-11	6.03E-11	6.02E-11	6.01E-11
nb 95	5.59E-11	5.58E-11	5.57E-11	5.56E-11	5.56E-11	5.56E-11
y 91	5.21E-11	5.20E-11	5.19E-11	5.18E-11	5.16E-11	5.16E-11
ho165	1.45E-11	1.96E-11	2.53E-11	3.16E-11	3.84E-11	3.84E-11
pm151	3.86E-11	4.05E-11	4.05E-11	4.06E-11	4.06E-11	3.66E-11
ba140	1.72E-11	1.73E-11	1.73E-11	1.72E-11	1.72E-11	1.70E-11
eu156	1.34E-11	1.35E-11	1.37E-11	1.39E-11	1.41E-11	1.41E-11
dy160	3.50E-12	5.43E-12	7.81E-12	1.06E-11	1.39E-11	1.39E-11
te124	6.30E-12	8.05E-12	9.88E-12	1.18E-11	1.38E-11	1.38E-11
sm153	1.39E-11	1.43E-11	1.44E-11	1.45E-11	1.46E-11	1.36E-11
sr 87	5.70E-12	7.15E-12	8.60E-12	1.01E-11	1.15E-11	1.15E-11
sr 89	1.11E-11	1.11E-11	1.11E-11	1.11E-11	1.10E-11	1.10E-11
ru106	1.01E-11	1.03E-11	1.04E-11	1.06E-11	1.07E-11	1.07E-11
xe128	2.74E-12	4.18E-12	5.93E-12	7.99E-12	1.04E-11	1.04E-11
sr 86	2.80E-12	3.88E-12	5.09E-12	6.46E-12	7.97E-12	7.97E-12

0 fraction of total absorption rate

power= .00mw, burnup= 2681.mwd, flux= 9.84E+07n/cm**2-sec

0

	initial ******* d	******* d	******* d	******* d	******* d	******* d
nb 94	3.17E-12	3.96E-12	4.75E-12	5.55E-12	6.37E-12	6.37E-12
y 90	5.91E-12	5.90E-12	5.89E-12	5.87E-12	5.86E-12	5.86E-12
ce143	6.13E-12	6.37E-12	6.36E-12	6.35E-12	6.34E-12	5.81E-12
sb125	5.63E-12	5.65E-12	5.68E-12	5.71E-12	5.74E-12	5.74E-12
la140	5.61E-12	5.61E-12	5.60E-12	5.59E-12	5.58E-12	5.58E-12
ge 74	2.72E-12	3.40E-12	4.07E-12	4.75E-12	5.43E-12	5.43E-12
mo 99	4.70E-12	4.81E-12	4.80E-12	4.80E-12	4.79E-12	4.57E-12
sn116	9.92E-13	1.54E-12	2.22E-12	3.02E-12	3.94E-12	3.94E-12
ge 72	1.84E-12	2.31E-12	2.78E-12	3.25E-12	3.72E-12	3.72E-12
se 76	1.35E-12	1.78E-12	2.24E-12	2.74E-12	3.27E-12	3.27E-12
te127m	2.80E-12	2.81E-12	2.83E-12	2.84E-12	2.86E-12	2.86E-12
i131	2.48E-12	2.49E-12	2.48E-12	2.48E-12	2.48E-12	2.46E-12
er166	5.87E-13	8.33E-13	1.12E-12	1.44E-12	1.79E-12	1.79E-12
te122	4.22E-13	6.53E-13	9.34E-13	1.27E-12	1.65E-12	1.65E-12
pm148m	1.33E-12	1.31E-12	1.32E-12	1.33E-12	1.33E-12	1.33E-12
kr 87	2.43E-12	8.31E-12	8.29E-12	8.27E-12	8.25E-12	6.98E-13
te129m	6.62E-13	6.63E-13	6.64E-13	6.65E-13	6.66E-13	6.65E-13
kr 80	9.27E-14	1.24E-13	1.60E-13	2.02E-13	2.49E-13	2.49E-13
ag111	1.31E-13	1.35E-13	1.39E-13	1.42E-13	1.45E-13	1.43E-13
eu157	1.09E-13	1.21E-13	1.23E-13	1.26E-13	1.28E-13	1.05E-13
cd115m	8.85E-14	8.88E-14	8.92E-14	8.96E-14	8.99E-14	8.97E-14
pm148	4.98E-14	4.95E-14	4.96E-14	4.96E-14	4.96E-14	4.85E-14
cs136	2.91E-14	3.12E-14	3.33E-14	3.54E-14	3.74E-14	3.70E-14
er167	8.01E-15	1.29E-14	1.92E-14	2.71E-14	3.68E-14	3.68E-14
te123	8.24E-15	1.16E-14	1.56E-14	2.04E-14	2.61E-14	2.61E-14
be 9	6.15E-15	7.68E-15	9.21E-15	1.07E-14	1.23E-14	1.23E-14
sn125	1.08E-14	1.09E-14	1.10E-14	1.10E-14	1.10E-14	1.09E-14
tb160	3.67E-15	4.57E-15	5.53E-15	6.50E-15	7.50E-15	7.48E-15
ru105	8.20E-15	1.14E-14	1.15E-14	1.16E-14	1.17E-14	5.92E-15
li 7	2.46E-15	3.08E-15	3.69E-15	4.30E-15	4.91E-15	4.91E-15
pr142	2.12E-15	2.87E-15	3.43E-15	4.00E-15	4.57E-15	3.87E-15
sn123	3.76E-15	3.76E-15	3.77E-15	3.77E-15	3.77E-15	3.77E-15
cd108	5.29E-16	9.66E-16	1.60E-15	2.48E-15	3.65E-15	3.65E-15
sb126	2.29E-15	2.60E-15	2.90E-15	3.20E-15	3.50E-15	3.49E-15
te132	3.43E-15	3.50E-15	3.50E-15	3.50E-15	3.49E-15	3.36E-15
i135	2.91E-15	3.70E-15	3.70E-15	3.69E-15	3.69E-15	2.28E-15
rb 88	2.94E-15	4.67E-15	4.66E-15	4.65E-15	4.64E-15	1.67E-15
sb124	9.40E-16	9.80E-16	1.02E-15	1.06E-15	1.10E-15	1.10E-15
sn114	2.43E-16	3.79E-16	5.45E-16	7.42E-16	9.69E-16	9.69E-16
i130	5.94E-16	7.74E-16	8.74E-16	9.74E-16	1.07E-15	8.36E-16
in117m	6.68E-16	7.99E-16	8.05E-16	8.10E-16	8.16E-16	4.76E-16
rb 86	2.24E-16	2.57E-16	2.90E-16	3.23E-16	3.56E-16	3.53E-16
in117	2.00E-16	2.36E-16	2.38E-16	2.39E-16	2.41E-16	1.46E-16
dy165	8.08E-17	1.73E-16	1.92E-16	2.10E-16	2.29E-16	6.05E-17
te134	2.21E-16	2.15E-15	2.12E-15	2.12E-15	2.11E-15	2.28E-17
cs134m	1.00E-17	2.12E-17	2.54E-17	2.95E-17	3.37E-17	1.14E-17
ge 75	1.03E-17	3.16E-17	3.15E-17	3.15E-17	3.15E-17	3.29E-18
cd118	6.86E-18	4.51E-17	4.52E-17	4.54E-17	4.56E-17	1.06E-18
cd109	5.55E-19	6.65E-19	7.85E-19	9.04E-19	1.01E-18	1.01E-18

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 18

0 fraction of total absorption rate

power= .00mw, burnup= 2681.mwd, flux= 9.84E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 19

power= 1.468E-03mw, burnup=2.6809E+03mwd, flux= 9.84E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	8.18E-05	1.02E-04	1.21E-04	1.41E-04	1.61E-04	1.61E-04
h 2	2.43E-07	3.02E-07	3.61E-07	4.20E-07	4.79E-07	4.79E-07
h 3	1.36E-11	1.34E-11	1.36E-11	1.38E-11	1.40E-11	1.40E-11
h 4	.00E+00	1.97E-35	2.00E-35	2.03E-35	2.06E-35	.00E+00
he 3	1.76E-09	2.17E-09	2.57E-09	2.96E-09	3.35E-09	3.35E-09
he 4	1.35E-05	1.68E-05	2.01E-05	2.34E-05	2.66E-05	2.66E-05
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.62E-06	2.02E-06	2.41E-06	2.81E-06	3.20E-06	3.20E-06
ne 21	5.30E-11	8.12E-11	1.15E-10	1.53E-10	1.97E-10	1.97E-10
ne 22	1.07E-08	1.33E-08	1.59E-08	1.84E-08	2.10E-08	2.10E-08
ne 23	2.70E-30	2.62E-15	2.62E-15	2.62E-15	2.62E-15	2.62E-30
na 22	1.59E-11	1.55E-11	1.55E-11	1.55E-11	1.55E-11	1.55E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	1.21E-08	1.10E-08	1.10E-08	1.10E-08	1.10E-08	8.85E-09
na 24m	2.21E-30	1.81E-15	1.81E-15	1.80E-15	1.80E-15	1.80E-30
na 25	7.47E-41	1.06E-25	1.46E-25	1.90E-25	2.41E-25	2.40E-40
mg 24	1.39E-02	1.68E-02	1.96E-02	2.25E-02	2.53E-02	2.53E-02
mg 25	6.83E-09	1.01E-08	1.38E-08	1.80E-08	2.28E-08	2.28E-08
mg 26	2.43E-07	3.02E-07	3.61E-07	4.20E-07	4.78E-07	4.78E-07
mg 27	3.66E-17	7.84E-13	7.83E-13	7.83E-13	7.83E-13	1.61E-21
mg 28	5.49E-25	5.77E-25	5.77E-25	5.76E-25	5.76E-25	4.95E-25
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	1.01E-25	8.15E-11	8.15E-11	8.14E-11	8.14E-11	8.23E-26
al 29	2.54E-30	6.91E-24	9.82E-24	1.32E-23	1.70E-23	5.17E-36
al 30	.00E+00	1.45E-34	2.49E-34	3.92E-34	5.80E-34	.00E+00
si 28	4.05E-02	4.88E-02	5.71E-02	6.54E-02	7.37E-02	7.37E-02
si 29	4.71E-08	7.31E-08	1.04E-07	1.40E-07	1.80E-07	1.80E-07
si 30	5.86E-14	1.14E-13	1.97E-13	3.10E-13	4.59E-13	4.59E-13
si 31	8.32E-27	2.97E-26	5.11E-26	8.05E-26	1.19E-25	3.58E-26
si 32	7.29E-33	1.51E-32	2.69E-32	4.36E-32	6.58E-32	6.58E-32
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.84E+07	9.84E+07	9.83E+07	9.83E+07	9.83E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 20

power= 1.468E-03mw, burnup=2.6809E+03mwd, flux= 9.84E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	4.49E-01	6.12E-01	7.93E-01	9.93E-01	1.21E+00	1.21E+00
pb206	2.03E-04	3.76E-04	6.16E-04	9.29E-04	1.32E-03	1.32E-03
pb207	4.69E-05	7.27E-05	1.05E-04	1.42E-04	1.85E-04	1.85E-04
pb208	2.75E-06	4.24E-06	6.07E-06	8.23E-06	1.07E-05	1.07E-05
pb209	8.15E-12	1.24E-11	1.75E-11	2.34E-11	2.99E-11	2.99E-11
pb210	7.30E-06	1.06E-05	1.42E-05	1.81E-05	2.21E-05	2.21E-05
pb211	5.71E-12	4.65E-12	5.55E-12	6.43E-12	7.32E-12	7.32E-12
pb212	3.76E-12	4.67E-12	5.58E-12	6.48E-12	7.37E-12	7.37E-12
pb214	1.62E-11	2.42E-11	3.25E-11	4.13E-11	5.05E-11	5.06E-11
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	1.28E-05	2.47E-05	4.20E-05	6.58E-05	9.68E-05	9.68E-05
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	4.50E-09	6.52E-09	8.74E-09	1.11E-08	1.36E-08	1.36E-08
bi211	2.21E-13	2.74E-13	3.28E-13	3.81E-13	4.34E-13	4.34E-13
bi212	3.57E-13	4.43E-13	5.29E-13	6.14E-13	6.99E-13	6.99E-13
bi213	1.83E-12	2.89E-12	4.08E-12	5.45E-12	6.99E-12	6.83E-12
bi214	1.22E-11	1.80E-11	2.41E-11	3.06E-11	3.75E-11	3.76E-11
po210	1.24E-07	1.80E-07	2.41E-07	3.07E-07	3.75E-07	3.75E-07

po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	2.44E-18	3.03E-18	3.62E-18	4.21E-18	4.80E-18	4.80E-18
po212	1.88E-23	2.33E-23	2.78E-23	3.23E-23	3.67E-23	3.67E-23
po213	2.75E-21	4.35E-21	6.14E-21	8.20E-21	1.05E-20	1.03E-20
po214	1.67E-18	2.47E-18	3.32E-18	4.22E-18	5.16E-18	5.18E-18
po215	3.05E-18	3.80E-18	4.55E-18	5.28E-18	6.02E-18	6.02E-18
po216	1.42E-17	1.77E-17	2.11E-17	2.45E-17	2.79E-17	2.79E-17
po218	1.93E-12	2.80E-12	3.76E-12	4.77E-12	5.84E-12	5.84E-12
rn218	2.08E-29	2.50E-29	2.99E-29	3.47E-29	3.95E-29	3.93E-29
rn219	6.79E-15	8.46E-15	1.01E-14	1.18E-14	1.34E-14	1.34E-14
rn220	5.46E-15	6.78E-15	8.10E-15	9.40E-15	1.07E-14	1.07E-14
rn222	3.43E-09	4.98E-09	6.67E-09	8.48E-09	1.04E-08	1.04E-08
ra222	2.26E-26	2.72E-26	3.25E-26	3.77E-26	4.29E-26	4.26E-26
ra223	1.69E-09	2.11E-09	2.52E-09	2.93E-09	3.34E-09	3.34E-09
ra224	3.11E-11	3.86E-11	4.60E-11	5.35E-11	6.08E-11	6.08E-11
ra225	8.83E-10	1.35E-09	1.91E-09	2.55E-09	3.27E-09	3.27E-09
ra226	5.25E-04	7.61E-04	1.02E-03	1.30E-03	1.59E-03	1.59E-03
ra228	5.30E-12	6.62E-12	7.95E-12	9.29E-12	1.06E-11	1.06E-11
ac225	5.96E-10	9.14E-10	1.29E-09	1.72E-09	2.21E-09	2.21E-09
ac227	1.18E-06	1.47E-06	1.75E-06	2.04E-06	2.32E-06	2.32E-06
ac228	6.46E-16	8.08E-16	9.71E-16	1.13E-15	1.30E-15	1.30E-15
th226	1.10E-24	1.33E-24	1.58E-24	1.84E-24	2.09E-24	2.08E-24
th227	2.74E-09	3.41E-09	4.07E-09	4.73E-09	5.39E-09	5.39E-09
th228	5.93E-09	7.36E-09	8.79E-09	1.02E-08	1.16E-08	1.16E-08
th229	1.72E-04	2.63E-04	3.71E-04	4.96E-04	6.36E-04	6.36E-04
th230	6.34E-02	7.91E-02	9.48E-02	1.10E-01	1.26E-01	1.26E-01
th231	3.09E-09	3.12E-09	3.14E-09	3.16E-09	3.18E-09	3.15E-09
th232	1.29E-02	1.62E-02	1.94E-02	2.27E-02	2.60E-02	2.60E-02
th233	6.23E-16	5.39E-14	6.47E-14	7.55E-14	8.63E-14	1.78E-17
th234	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	1.77E-03	2.21E-03	2.64E-03	3.07E-03	3.49E-03	3.49E-03
pa232	1.05E-11	1.37E-11	1.64E-11	1.91E-11	2.17E-11	1.96E-11

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 21
power= 1.468E-03mw, burnup=2.6809E+03mwd, flux= 9.84E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.45E-06	1.45E-06	1.45E-06	1.45E-06	1.45E-06	1.45E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.09E-12	8.09E-12	8.09E-12	8.09E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.07E-21	1.29E-21	1.55E-21	1.78E-21	2.03E-21	2.01E-21
u231	9.62E-18	1.18E-17	1.41E-17	1.64E-17	1.87E-17	1.81E-17
u232	2.16E-07	2.69E-07	3.21E-07	3.72E-07	4.24E-07	4.24E-07
u233	3.38E-02	4.21E-02	5.04E-02	5.86E-02	6.68E-02	6.68E-02
u234	9.14E+00	9.17E+00	9.19E+00	9.22E+00	9.24E+00	9.24E+00
u235	7.34E+02	7.33E+02	7.32E+02	7.31E+02	7.17E+02	7.13E+02
u236	1.75E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02
u237	1.17E-06	1.15E-06	1.15E-06	1.15E-06	1.15E-06	1.13E-06
u238	3.64E+04	3.64E+04	3.64E+04	3.64E+04	3.64E+04	3.64E+04
u239	2.06E-09	1.14E-07	1.14E-07	1.13E-07	1.13E-07	3.56E-11
u240	1.40E-45	.00E+00	.00E+00	.00E+00	.00E+00	7.88E-43
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	3.29E-12	3.19E-12	3.18E-12	3.18E-12	3.18E-12	3.18E-12
np236m	7.29E-13	7.58E-13	7.57E-13	7.56E-13	7.56E-13	6.57E-13
np236	1.85E-07	2.29E-07	2.73E-07	3.16E-07	3.60E-07	3.60E-07
np237	4.21E+01	4.20E+01	4.20E+01	4.20E+01	4.20E+01	4.20E+01
np238	5.48E-07	5.59E-07	5.58E-07	5.57E-07	5.57E-07	5.23E-07
np239	1.64E-05	1.64E-05	1.64E-05	1.64E-05	1.64E-05	1.56E-05

np240m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np240	2.70E-16	1.21E-15	1.21E-15	1.21E-15	1.21E-15	5.68E-17
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	4.25E-10	4.11E-10	4.11E-10	4.11E-10	4.11E-10	4.11E-10
pu237	4.55E-14	4.70E-14	5.00E-14	5.30E-14	5.59E-14	5.57E-14
pu238	8.55E-03	8.45E-03	8.44E-03	8.43E-03	8.43E-03	8.43E-03
pu239	4.31E+00	5.30E+00	6.26E+00	7.21E+00	8.13E+00	8.13E+00
pu240	1.47E-02	2.23E-02	3.10E-02	4.08E-02	5.16E-02	5.16E-02
pu241	2.26E-06	3.33E-06	4.63E-06	6.10E-06	7.71E-06	7.71E-06
pu242	3.25E-08	6.76E-08	1.21E-07	1.97E-07	2.99E-07	2.99E-07
pu243	1.88E-17	5.24E-17	9.40E-17	1.53E-16	2.31E-16	1.22E-16
pu244	4.22E-34	3.15E-33	1.59E-32	6.13E-32	1.96E-31	1.96E-31
pu245	.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
am239	3.86E-21	6.95E-21	1.03E-20	1.41E-20	1.85E-20	1.42E-20
am240	1.96E-18	3.18E-18	4.70E-18	6.47E-18	8.46E-18	7.95E-18
am241	4.22E-05	6.87E-05	1.01E-04	1.40E-04	1.83E-04	1.83E-04
am242m	6.09E-09	1.03E-08	1.55E-08	2.18E-08	2.89E-08	2.89E-08
am242	5.25E-13	9.25E-13	1.37E-12	1.89E-12	2.48E-12	2.10E-12
am243	5.41E-11	1.25E-10	2.45E-10	4.27E-10	6.88E-10	6.88E-10
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.31E-19	3.48E-19	6.79E-19	1.19E-18	1.91E-18	1.40E-18
am245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	4.48E-44
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.26E-23	1.99E-23	2.95E-23	4.06E-23	5.33E-23	5.31E-23
cm242	1.15E-10	1.87E-10	2.77E-10	3.82E-10	5.01E-10	5.01E-10
cm243	9.79E-16	1.56E-15	2.31E-15	3.19E-15	4.18E-15	4.18E-15
cm244	2.41E-15	5.46E-15	1.07E-14	1.86E-14	3.00E-14	3.00E-14

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 22
power= 1.468E-03mw, burnup=2.6809E+03mwd, flux= 9.84E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge *******	d *******	d *******	d *******	d *******	d *******
cm245	4.67E-19	1.33E-18	3.12E-18	6.36E-18	1.17E-17	1.17E-17
cm246	3.92E-22	1.43E-21	4.03E-21	9.52E-21	1.99E-20	1.99E-20
cm247	5.76E-27	2.64E-26	9.00E-26	2.51E-25	6.04E-25	6.04E-25
cm248	8.23E-31	4.81E-30	1.99E-29	6.53E-29	1.81E-28	1.81E-28
cm249	1.78E-42	5.45E-41	2.33E-40	7.55E-40	2.09E-39	1.09E-40
cm250	.00E+00	.00E+00	1.40E-45	5.61E-45	1.82E-44	1.82E-44
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		9.84E+07	9.84E+07	9.83E+07	9.83E+07	9.83E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 3 of library on unit 33.

pass 1
pass 0
scale-system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densiities
pass n applies mid time densities of nth library interval
first library updated was...

```
        pass    1
        pass    0
        *scale-system control module sas2 library*
        used a time-dependent neutron spectrum, for each of the above passes
          pass 0 applies start-up fuel densiities
          pass n applies mid time densities of nth library interval
        first library updated was...
        ******************************************************************************
        *                                                                            *
        *              prelim lwr origen-s binary working library--id = 1143         *
        *           made from modified card-image origen-s libraries of scale 4.2    *
        *        data from the light element, actinide, and fission product libraries *
        *          decay data, including gamma and total energy, are from endf/b-vi  *
        *                                                                            *
        *        neutron flux spectrum factors and cross sections were produced from *
        *       the "presas2" case updating all nuclides on the scale "burnup" library *
        *                                                                            *
        *                    fission product yields are from endf/b-v                *
        *                                                                            *
        *                photon libraries use an 18-energy-group structure           *
        *               the photon data are from the master photon data base,        *
        *                produced to include bremsstrahlung from uo2 matrix          *
        *                                                                            *
        *          see information above this box (if present) for later updates     *
        *                                                                            *
        ******************************************************************************
        *                                                                            *
0       ******************************************************************************
0                 .other identification and sizes of library.
0                  data set name:  ft33f001
0              8/29/1996    date library was produced
0                   1697    total number of nuclides in library
                     689    number of light-element nuclides
                     129    number of actinide nuclides
                     879    number of fission product nuclides
0                   7993    number of nonzero off-diagonal matrix elements
0       ******************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                              page   23
         power=    .00mw, burnup=   4021.mwd, flux= 9.45E+07n/cm**2-sec
0                                         basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                  initial        ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.195375E+06   1.196047E+06   1.196678E+06   1.197269E+06   1.197821E+06   1.197820E+06
     absorptions   9.651504E+05   9.658723E+05   9.665383E+05   9.671569E+05   9.677351E+05   9.677341E+05
     k infinity    1.238537E+00   1.238308E+00   1.238108E+00   1.237927E+00   1.237757E+00   1.237758E+00
0                  initial        ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   9.556894E+05   9.561186E+05   9.565269E+05   9.569147E+05   9.572821E+05   9.572830E+05
     non-actinide
     abs. fracs.   9.802699E-03   1.009834E-02   1.035804E-02   1.059002E-02   1.080143E-02   1.080060E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2        fission products      page   24
0                                 fraction of total absorption rate
         power=    .00mw, burnup=   4021.mwd, flux= 9.45E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d ******* d

     sm149      4.91E-03  5.05E-03  5.15E-03  5.22E-03  5.28E-03  5.28E-03
     eu151      3.75E-04  4.19E-04  4.62E-04  5.03E-04  5.44E-04  5.44E-04
     nd143      2.69E-04  3.02E-04  3.36E-04  3.68E-04  4.01E-04  4.01E-04
     rh103      1.25E-04  1.40E-04  1.56E-04  1.71E-04  1.87E-04  1.87E-04
     gd155      1.27E-04  1.35E-04  1.43E-04  1.49E-04  1.55E-04  1.55E-04
```

xe131	8.55E-05	9.61E-05	1.07E-04	1.17E-04	1.28E-04	1.28E-04
cs133	6.64E-05	7.47E-05	8.29E-05	9.11E-05	9.93E-05	9.93E-05
cd113	6.66E-05	7.05E-05	7.38E-05	7.66E-05	7.91E-05	7.91E-05
sm147	4.92E-05	5.53E-05	6.14E-05	6.75E-05	7.36E-05	7.36E-05
tc 99	4.85E-05	5.44E-05	6.04E-05	6.63E-05	7.22E-05	7.22E-05
nd145	3.77E-05	4.24E-05	4.71E-05	5.17E-05	5.64E-05	5.64E-05
gd157	4.06E-05	4.16E-05	4.25E-05	4.33E-05	4.41E-05	4.41E-05
mo 95	2.62E-05	2.94E-05	3.26E-05	3.59E-05	3.91E-05	3.91E-05
sm152	2.19E-05	2.48E-05	2.78E-05	3.08E-05	3.39E-05	3.39E-05
kr 83	1.64E-05	1.84E-05	2.04E-05	2.24E-05	2.44E-05	2.44E-05
cs135	1.50E-05	1.68E-05	1.87E-05	2.05E-05	2.24E-05	2.24E-05
sm150	1.26E-05	1.49E-05	1.73E-05	1.98E-05	2.22E-05	2.22E-05
ru101	1.16E-05	1.31E-05	1.45E-05	1.60E-05	1.74E-05	1.74E-05
sm151	1.72E-05	1.72E-05	1.73E-05	1.73E-05	1.73E-05	1.72E-05
pr141	1.11E-05	1.25E-05	1.39E-05	1.53E-05	1.67E-05	1.67E-05
eu153	1.05E-05	1.19E-05	1.32E-05	1.46E-05	1.59E-05	1.59E-05
la139	9.12E-06	1.02E-05	1.14E-05	1.25E-05	1.36E-05	1.36E-05
ba137	4.33E-06	4.88E-06	5.42E-06	5.96E-06	6.50E-06	6.50E-06
pd105	4.02E-06	4.53E-06	5.06E-06	5.58E-06	6.11E-06	6.11E-06
zr 93	3.68E-06	4.14E-06	4.59E-06	5.04E-06	5.49E-06	5.49E-06
i129	2.86E-06	3.22E-06	3.58E-06	3.94E-06	4.30E-06	4.30E-06
nd144	2.75E-06	3.09E-06	3.43E-06	3.77E-06	4.11E-06	4.11E-06
ag109	2.10E-06	2.44E-06	2.80E-06	3.18E-06	3.57E-06	3.57E-06
mo 97	2.07E-06	2.33E-06	2.58E-06	2.84E-06	3.09E-06	3.09E-06
zr 91	9.70E-07	1.09E-06	1.21E-06	1.33E-06	1.45E-06	1.45E-06
y 89	9.30E-07	1.04E-06	1.16E-06	1.27E-06	1.39E-06	1.39E-06
ru102	8.47E-07	9.52E-07	1.06E-06	1.16E-06	1.27E-06	1.27E-06
ce142	7.59E-07	8.53E-07	9.47E-07	1.04E-06	1.13E-06	1.13E-06
nd148	7.30E-07	8.21E-07	9.11E-07	1.00E-06	1.09E-06	1.09E-06
pd108	6.17E-07	7.10E-07	8.06E-07	9.04E-07	1.01E-06	1.01E-06
nd146	6.12E-07	6.80E-07	7.64E-07	8.40E-07	9.16E-07	9.16E-07
gd152	3.92E-07	4.95E-07	6.10E-07	7.35E-07	8.71E-07	8.71E-07
ba138	5.23E-07	5.80E-07	6.53E-07	7.18E-07	7.82E-07	7.82E-07
in115	5.13E-07	5.77E-07	6.42E-07	7.07E-07	7.72E-07	7.72E-07
ce140	4.90E-07	5.51E-07	6.11E-07	6.72E-07	7.33E-07	7.33E-07
xe132	4.41E-07	4.96E-07	5.51E-07	6.06E-07	6.61E-07	6.61E-07
pd107	3.45E-07	3.95E-07	4.46E-07	4.98E-07	5.52E-07	5.52E-07
mo 98	3.03E-07	3.41E-07	3.78E-07	4.16E-07	4.54E-07	4.54E-07
mo100	2.94E-07	3.30E-07	3.67E-07	4.03E-07	4.39E-07	4.39E-07
xe134	2.89E-07	3.25E-07	3.61E-07	3.97E-07	4.33E-07	4.33E-07
zr 92	2.34E-07	2.63E-07	2.92E-07	3.20E-07	3.49E-07	3.49E-07
i127	1.96E-07	2.21E-07	2.46E-07	2.71E-07	2.96E-07	2.96E-07
ru104	1.84E-07	2.07E-07	2.31E-07	2.54E-07	2.78E-07	2.78E-07
zr 96	1.84E-07	2.07E-07	2.30E-07	2.52E-07	2.75E-07	2.75E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 25
0 fraction of total absorption rate
power= .00mw, burnup= 4021.mwd, flux= 9.45E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

nd150	1.62E-07	1.85E-07	2.03E-07	2.23E-07	2.43E-07	2.43E-07
xe136	1.56E-07	1.76E-07	1.95E-07	2.15E-07	2.34E-07	2.34E-07
br 81	1.17E-07	1.32E-07	1.46E-07	1.61E-07	1.75E-07	1.75E-07
rb 85	1.14E-07	1.28E-07	1.42E-07	1.56E-07	1.70E-07	1.70E-07
zr 94	9.89E-08	1.11E-07	1.23E-07	1.36E-07	1.48E-07	1.48E-07
ru 99	6.28E-08	7.94E-08	9.78E-08	1.18E-07	1.40E-07	1.40E-07
zr 90	9.10E-08	1.02E-07	1.14E-07	1.25E-07	1.36E-07	1.36E-07
cd111	8.58E-08	9.78E-08	1.10E-07	1.22E-07	1.35E-07	1.35E-07
te130	7.13E-08	8.02E-08	8.91E-08	9.79E-08	1.07E-07	1.07E-07
sm154	7.06E-08	7.96E-08	8.86E-08	9.76E-08	1.07E-07	1.07E-07
rb 87	6.59E-08	7.40E-08	8.21E-08	9.02E-08	9.82E-08	9.82E-08

pm147	9.96E-08	9.95E-08	9.94E-08	9.93E-08	9.92E-08	8.23E-08
se 77	4.70E-08	5.29E-08	5.87E-08	6.45E-08	7.03E-08	7.03E-08
pd106	3.62E-08	4.11E-08	4.60E-08	5.10E-08	5.61E-08	5.61E-08
eu155	5.83E-08	5.86E-08	5.90E-08	5.94E-08	5.98E-08	5.35E-08
eu152	3.56E-08	3.97E-08	4.38E-08	4.77E-08	5.15E-08	4.96E-08
kr 84	3.11E-08	3.50E-08	3.88E-08	4.26E-08	4.65E-08	4.65E-08
gd156	2.42E-08	2.85E-08	3.29E-08	3.75E-08	4.22E-08	4.22E-08
se 79	2.40E-08	2.70E-08	3.00E-08	3.29E-08	3.59E-08	3.59E-08
sb121	2.33E-08	2.63E-08	2.92E-08	3.22E-08	3.52E-08	3.52E-08
gd154	1.29E-08	1.64E-08	2.02E-08	2.44E-08	2.91E-08	2.91E-08
sb123	1.89E-08	2.13E-08	2.37E-08	2.61E-08	2.85E-08	2.85E-08
kr 86	1.74E-08	1.95E-08	2.16E-08	2.38E-08	2.59E-08	2.59E-08
te128	1.57E-08	1.77E-08	1.97E-08	2.16E-08	2.36E-08	2.36E-08
dy161	1.35E-08	1.57E-08	1.79E-08	2.02E-08	2.27E-08	2.27E-08
se 80	1.12E-08	1.26E-08	1.40E-08	1.54E-08	1.68E-08	1.68E-08
te125	1.01E-08	1.14E-08	1.26E-08	1.39E-08	1.52E-08	1.52E-08
ba135	6.02E-09	7.61E-09	9.39E-09	1.14E-08	1.35E-08	1.35E-08
tb159	7.69E-09	8.79E-09	9.90E-09	1.10E-08	1.22E-08	1.22E-08
cd112	6.81E-09	7.71E-09	8.62E-09	9.54E-09	1.05E-08	1.05E-08
gd158	5.82E-09	6.75E-09	7.70E-09	8.67E-09	9.66E-09	9.66E-09
li 6	6.33E-09	7.10E-09	7.87E-09	8.64E-09	9.40E-09	9.40E-09
ru100	4.02E-09	5.07E-09	6.23E-09	7.51E-09	8.91E-09	8.91E-09
sn117	5.25E-09	5.93E-09	6.61E-09	7.29E-09	7.98E-09	7.98E-09
sn119	4.25E-09	4.79E-09	5.33E-09	5.87E-09	6.41E-09	6.41E-09
nd142	2.78E-09	3.52E-09	4.34E-09	5.24E-09	6.23E-09	6.23E-09
ba134	2.71E-09	3.42E-09	4.21E-09	5.08E-09	6.03E-09	6.03E-09
sr 90	6.18E-09	6.17E-09	6.16E-09	6.14E-09	6.13E-09	6.02E-09
sn115	3.89E-09	4.38E-09	4.88E-09	5.38E-09	5.87E-09	5.87E-09
cd114	3.45E-09	4.00E-09	4.55E-09	5.12E-09	5.70E-09	5.70E-09
sm148	2.49E-09	3.14E-09	3.87E-09	4.67E-09	5.54E-09	5.54E-09
sr 88	3.19E-09	3.58E-09	3.97E-09	4.37E-09	4.76E-09	4.76E-09
pd110	2.67E-09	3.05E-09	3.44E-09	3.84E-09	4.25E-09	4.25E-09
dy164	2.31E-09	2.74E-09	3.20E-09	3.69E-09	4.20E-09	4.20E-09
pd104	1.82E-09	2.30E-09	2.83E-09	3.42E-09	4.07E-09	4.07E-09
dy162	2.21E-09	2.60E-09	3.02E-09	3.46E-09	3.93E-09	3.93E-09
se 82	2.17E-09	2.44E-09	2.70E-09	2.97E-09	3.24E-09	3.24E-09
sn126	1.80E-09	2.03E-09	2.26E-09	2.49E-09	2.72E-09	2.72E-09
se 78	1.65E-09	1.86E-09	2.07E-09	2.27E-09	2.48E-09	2.48E-09

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 26
0 fraction of total absorption rate
power= .00mw, burnup= 4021.mwd, flux= 9.45E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

eu154	1.71E-09	1.92E-09	2.13E-09	2.35E-09	2.56E-09	2.41E-09
nb 93	9.71E-10	1.23E-09	1.51E-09	1.83E-09	2.18E-09	2.18E-09
sn124	1.35E-09	1.53E-09	1.70E-09	1.87E-09	2.04E-09	2.04E-09
mo 96	7.35E-10	9.07E-10	1.10E-09	1.31E-09	1.54E-09	1.54E-09
as 75	9.93E-10	1.11E-09	1.23E-09	1.35E-09	1.47E-09	1.47E-09
cs137	1.38E-09	1.38E-09	1.37E-09	1.37E-09	1.37E-09	1.35E-09
ba136	7.47E-10	8.70E-10	9.99E-10	1.14E-09	1.28E-09	1.28E-09
in113	7.54E-10	8.51E-10	9.48E-10	1.05E-09	1.14E-09	1.14E-09
br 79	4.90E-10	6.20E-10	7.64E-10	9.24E-10	1.10E-09	1.10E-09
dy163	5.29E-10	6.27E-10	7.31E-10	8.42E-10	9.58E-10	9.58E-10
kr 82	5.05E-10	5.96E-10	6.93E-10	7.96E-10	9.04E-10	9.04E-10
xe130	4.61E-10	5.58E-10	6.63E-10	7.77E-10	9.00E-10	9.00E-10
sn118	5.51E-10	6.21E-10	6.91E-10	7.61E-10	8.32E-10	8.32E-10
cd110	3.16E-10	4.09E-10	5.17E-10	6.39E-10	7.78E-10	7.78E-10
sn122	4.67E-10	5.27E-10	5.86E-10	6.46E-10	7.06E-10	7.06E-10
cd116	4.67E-10	5.26E-10	5.85E-10	6.44E-10	7.04E-10	7.04E-10
ag107	2.93E-10	3.75E-10	4.69E-10	5.74E-10	6.91E-10	6.91E-10

xe129	2.80E-10	3.55E-10	4.38E-10	5.30E-10	6.30E-10	6.31E-10
sn120	3.49E-10	3.93E-10	4.37E-10	4.81E-10	5.26E-10	5.26E-10
te126	2.00E-10	2.46E-10	2.98E-10	3.54E-10	4.15E-10	4.15E-10
ge 73	2.71E-10	3.05E-10	3.39E-10	3.73E-10	4.07E-10	4.07E-10
cs134	1.80E-10	2.01E-10	2.23E-10	2.45E-10	2.67E-10	2.08E-10
kr 85	2.07E-10	2.07E-10	2.06E-10	2.06E-10	2.06E-10	1.96E-10
ge 76	9.71E-11	1.09E-10	1.21E-10	1.33E-10	1.45E-10	1.45E-10
gd160	7.58E-11	8.70E-11	9.86E-11	1.11E-10	1.23E-10	1.23E-10
ce144	2.18E-10	2.18E-10	2.17E-10	2.17E-10	2.17E-10	1.11E-10
ho165	3.84E-11	4.58E-11	5.38E-11	6.23E-11	7.13E-11	7.13E-11
dy160	1.39E-11	1.76E-11	2.18E-11	2.65E-11	3.17E-11	3.17E-11
xe128	1.04E-11	1.31E-11	1.61E-11	1.94E-11	2.30E-11	2.30E-11
te124	1.38E-11	1.59E-11	1.80E-11	2.02E-11	2.25E-11	2.25E-11
sr 87	1.16E-11	1.31E-11	1.46E-11	1.61E-11	1.76E-11	1.76E-11
sr 86	8.00E-12	9.66E-12	1.15E-11	1.34E-11	1.55E-11	1.55E-11
nb 94	6.35E-12	7.17E-12	8.01E-12	8.87E-12	9.74E-12	9.74E-12
sn116	3.91E-12	4.94E-12	6.10E-12	7.38E-12	8.78E-12	8.78E-12
ge 74	5.46E-12	6.14E-12	6.82E-12	7.51E-12	8.19E-12	8.19E-12
ru106	1.07E-11	1.08E-11	1.10E-11	1.11E-11	1.13E-11	6.77E-12
nb 95	5.55E-11	5.55E-11	5.54E-11	5.53E-11	5.53E-11	5.98E-12
se 76	3.29E-12	3.86E-12	4.47E-12	5.11E-12	5.79E-12	5.79E-12
y 90	5.88E-12	5.87E-12	5.86E-12	5.85E-12	5.83E-12	5.73E-12
ge 72	3.74E-12	4.22E-12	4.70E-12	5.18E-12	5.66E-12	5.66E-12
sb125	5.73E-12	5.76E-12	5.78E-12	5.81E-12	5.84E-12	4.84E-12
te122	1.65E-12	2.08E-12	2.56E-12	3.09E-12	3.68E-12	3.68E-12
er166	1.80E-12	2.19E-12	2.61E-12	3.07E-12	3.56E-12	3.56E-12
zr 95	5.99E-11	5.99E-11	5.98E-11	5.97E-11	5.97E-11	3.07E-12
y 91	5.19E-11	5.18E-11	5.17E-11	5.16E-11	5.15E-11	2.02E-12
ce141	5.82E-10	5.82E-10	5.81E-10	5.81E-10	5.80E-10	1.69E-12
ru103	1.33E-10	1.34E-10	1.34E-10	1.34E-10	1.34E-10	1.06E-12
te127m	2.87E-12	2.88E-12	2.90E-12	2.91E-12	2.93E-12	5.31E-13
kr 80	2.50E-13	3.05E-13	3.67E-13	4.38E-13	5.18E-13	5.18E-13

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 27
0 fraction of total absorption rate
power= .00mw, burnup= 4021.mwd, flux= 9.45E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sr 89	1.11E-11	1.11E-11	1.10E-11	1.10E-11	1.10E-11	2.57E-13
er167	3.69E-14	4.85E-14	6.21E-14	7.79E-14	9.59E-14	9.59E-14
te123	2.62E-14	3.29E-14	4.06E-14	4.96E-14	5.98E-14	5.98E-14
be 9	1.22E-14	1.37E-14	1.52E-14	1.67E-14	1.82E-14	1.82E-14
pm148m	1.33E-12	1.33E-12	1.34E-12	1.34E-12	1.35E-12	1.36E-14
cd108	3.66E-15	5.16E-15	7.03E-15	9.33E-15	1.21E-14	1.21E-14
li 7	4.93E-15	5.55E-15	6.16E-15	6.77E-15	7.38E-15	7.38E-15
sb126	3.49E-15	3.80E-15	4.11E-15	4.41E-15	4.71E-15	3.14E-15
te129m	6.67E-13	6.69E-13	6.70E-13	6.71E-13	6.72E-13	2.37E-15
sn114	9.75E-16	1.23E-15	1.52E-15	1.84E-15	2.20E-15	2.20E-15
cd115m	8.99E-14	9.04E-14	9.08E-14	9.11E-14	9.15E-14	1.28E-15
pr143	9.69E-10	9.68E-10	9.67E-10	9.66E-10	9.65E-10	8.91E-16
sn123	3.74E-15	3.75E-15	3.75E-15	3.76E-15	3.76E-15	8.65E-16
tb160	7.52E-15	8.52E-15	9.55E-15	1.06E-14	1.17E-14	8.44E-16
eu156	1.41E-11	1.43E-11	1.45E-11	1.47E-11	1.48E-11	5.63E-17
sb124	1.10E-15	1.14E-15	1.18E-15	1.22E-15	1.26E-15	5.37E-17
pm148	4.82E-14	4.91E-14	4.91E-14	4.92E-14	4.92E-14	2.34E-17
nd147	3.36E-10	3.40E-10	3.39E-10	3.39E-10	3.39E-10	1.04E-17
ba140	1.71E-11	1.72E-11	1.72E-11	1.72E-11	1.72E-11	5.85E-18
la140	5.57E-12	5.57E-12	5.56E-12	5.56E-12	5.55E-12	2.18E-18
cd109	1.02E-18	1.14E-18	1.26E-18	1.39E-18	1.51E-18	1.01E-18
cs136	3.69E-14	3.92E-14	4.12E-14	4.32E-14	4.52E-14	2.77E-20
rb 86	3.54E-16	3.89E-16	4.21E-16	4.54E-16	4.86E-16	1.85E-20

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 28
power= 1.468E-03mw, burnup=4.0214E+03mwd, flux= 9.45E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	1.61E-04	1.81E-04	2.00E-04	2.20E-04	2.40E-04	2.40E-04
h 2	4.79E-07	5.37E-07	5.96E-07	6.54E-07	7.13E-07	7.13E-07
h 3	1.40E-11	1.42E-11	1.43E-11	1.45E-11	1.47E-11	1.41E-11
h 4	.00E+00	2.08E-35	2.11E-35	2.13E-35	2.16E-35	.00E+00
he 3	3.35E-09	3.73E-09	4.10E-09	4.47E-09	4.83E-09	4.83E-09
he 4	2.66E-05	2.99E-05	3.32E-05	3.64E-05	3.97E-05	3.97E-05
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	3.20E-06	3.59E-06	3.98E-06	4.38E-06	4.77E-06	4.77E-06
ne 21	1.97E-10	2.45E-10	2.98E-10	3.56E-10	4.18E-10	4.18E-10
ne 22	2.10E-08	2.36E-08	2.62E-08	2.88E-08	3.13E-08	3.13E-08
ne 23	2.62E-30	2.60E-15	2.60E-15	2.60E-15	2.60E-15	2.60E-30
na 22	1.55E-11	1.54E-11	1.54E-11	1.54E-11	1.54E-11	1.26E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	8.85E-09	1.01E-08	1.00E-08	1.00E-08	1.00E-08	1.00E-23
na 24m	1.80E-30	1.65E-15	1.65E-15	1.65E-15	1.65E-15	1.65E-30
na 25	2.40E-40	2.92E-25	3.52E-25	4.16E-25	4.85E-25	4.85E-40
mg 24	2.53E-02	2.79E-02	3.05E-02	3.31E-02	3.57E-02	3.57E-02
mg 25	2.28E-08	2.81E-08	3.38E-08	4.00E-08	4.67E-08	4.67E-08
mg 26	4.78E-07	5.37E-07	5.96E-07	6.54E-07	7.13E-07	7.13E-07
mg 27	1.61E-21	7.78E-13	7.78E-13	7.77E-13	7.77E-13	7.77E-28
mg 28	4.95E-25	5.73E-25	5.73E-25	5.72E-25	5.72E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	8.23E-26	7.45E-11	7.45E-11	7.45E-11	7.45E-11	7.45E-26
al 29	5.17E-36	2.10E-23	2.56E-23	3.06E-23	3.60E-23	3.60E-38
al 30	.00E+00	8.08E-34	1.10E-33	1.45E-33	1.86E-33	.00E+00
si 28	7.37E-02	8.13E-02	8.88E-02	9.64E-02	1.04E-01	1.04E-01
si 29	1.80E-07	2.25E-07	2.74E-07	3.28E-07	3.87E-07	3.87E-07
si 30	4.59E-13	6.49E-13	8.82E-13	1.16E-12	1.50E-12	1.50E-12
si 31	3.58E-26	1.68E-25	2.29E-25	3.02E-25	3.88E-25	3.82E-40
si 32	6.58E-32	9.45E-32	1.30E-31	1.73E-31	2.25E-31	2.24E-31
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.46E+07	9.46E+07	9.45E+07	9.45E+07	9.45E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 29
power= 1.468E-03mw, burnup=4.0214E+03mwd, flux= 9.45E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	1.21E+00	1.45E+00	1.70E+00	1.97E+00	2.25E+00	2.26E+00
pb206	1.32E-03	1.79E-03	2.34E-03	2.92E-03	3.70E-03	3.70E-03
pb207	1.85E-04	2.34E-04	2.89E-04	3.49E-04	4.14E-04	4.14E-04
pb208	1.07E-05	1.55E-05	1.66E-05	2.01E-05	2.32E-05	2.38E-05
pb209	2.99E-11	3.72E-11	4.50E-11	5.35E-11	6.25E-11	6.25E-11
pb210	2.21E-05	2.62E-05	3.05E-05	3.48E-05	3.93E-05	3.92E-05
pb211	7.32E-12	8.21E-12	9.08E-12	9.96E-12	1.08E-11	1.08E-11
pb212	7.37E-12	8.25E-12	9.13E-12	1.00E-11	1.09E-11	1.09E-11
pb214	5.06E-11	6.00E-11	6.97E-11	7.96E-11	8.97E-11	8.97E-11
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	9.68E-05	1.36E-04	1.84E-04	2.41E-04	3.09E-04	3.09E-04
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.36E-08	1.62E-08	1.88E-08	2.14E-08	2.41E-08	2.42E-08
bi211	4.34E-13	4.86E-13	5.39E-13	5.90E-13	6.42E-13	6.43E-13
bi212	6.99E-13	7.83E-13	8.66E-13	9.49E-13	1.03E-12	1.03E-12
bi213	6.83E-12	8.68E-12	1.05E-11	1.25E-11	1.46E-11	1.46E-11

bi214	3.76E-11	4.45E-11	5.18E-11	5.91E-11	6.66E-11	6.66E-11
po210	3.75E-07	4.46E-07	5.19E-07	5.92E-07	6.67E-07	6.60E-07
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	4.80E-18	5.38E-18	5.95E-18	6.52E-18	7.09E-18	7.11E-18
po212	3.67E-23	4.11E-23	4.55E-23	4.99E-23	5.42E-23	5.44E-23
po213	1.03E-20	1.31E-20	1.58E-20	1.88E-20	2.19E-20	2.19E-20
po214	5.18E-18	6.13E-18	7.12E-18	8.14E-18	9.16E-18	9.16E-18
po215	6.02E-18	6.74E-18	7.47E-18	8.18E-18	8.89E-18	8.91E-18
po216	2.79E-17	3.12E-17	3.46E-17	3.79E-17	4.12E-17	4.13E-17
po218	5.84E-12	6.94E-12	8.07E-12	9.21E-12	1.04E-11	1.04E-11
rn218	3.93E-29	4.36E-29	4.82E-29	5.28E-29	5.74E-29	6.21E-33
rn219	1.34E-14	1.50E-14	1.66E-14	1.82E-14	1.98E-14	1.98E-14
rn220	1.07E-14	1.20E-14	1.33E-14	1.45E-14	1.58E-14	1.58E-14
rn222	1.04E-08	1.23E-08	1.43E-08	1.64E-08	1.84E-08	1.84E-08
ra222	4.26E-26	4.73E-26	5.24E-26	5.74E-26	6.23E-26	6.75E-30
ra223	3.34E-09	3.74E-09	4.14E-09	4.54E-09	4.94E-09	4.95E-09
ra224	6.08E-11	6.81E-11	7.54E-11	8.26E-11	8.97E-11	9.00E-11
ra225	3.27E-09	4.06E-09	4.92E-09	5.84E-09	6.83E-09	6.83E-09
ra226	1.59E-03	1.88E-03	2.19E-03	2.50E-03	2.82E-03	2.82E-03
ra228	1.06E-11	1.20E-11	1.33E-11	1.46E-11	1.60E-11	1.60E-11
ac225	2.21E-09	2.74E-09	3.32E-09	3.95E-09	4.61E-09	4.61E-09
ac227	2.32E-06	2.60E-06	2.88E-06	3.16E-06	3.43E-06	3.43E-06
ac228	1.30E-15	1.46E-15	1.62E-15	1.79E-15	1.95E-15	1.95E-15
th226	2.08E-24	2.31E-24	2.56E-24	2.80E-24	3.04E-24	3.29E-28
th227	5.39E-09	6.04E-09	6.69E-09	7.33E-09	7.97E-09	7.99E-09
th228	1.16E-08	1.30E-08	1.44E-08	1.58E-08	1.71E-08	1.71E-08
th229	6.36E-04	7.89E-04	9.57E-04	1.14E-03	1.33E-03	1.33E-03
th230	1.26E-01	1.41E-01	1.57E-01	1.72E-01	1.88E-01	1.88E-01
th231	3.15E-09	3.19E-09	3.21E-09	3.23E-09	3.25E-09	2.94E-09
th232	2.60E-02	2.92E-02	3.25E-02	3.58E-02	3.90E-02	3.90E-02
th233	1.78E-17	9.69E-14	1.08E-13	1.19E-13	1.29E-13	1.29E-28
th234	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	3.49E-03	3.91E-03	4.33E-03	4.75E-03	5.16E-03	5.16E-03
pa232	1.96E-11	2.43E-11	2.69E-11	2.95E-11	3.20E-11	3.20E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 30
power= 1.468E-03mw, burnup=4.0214E+03mwd, flux= 9.45E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.45E-06	1.45E-06	1.45E-06	1.45E-06	1.45E-06	1.45E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.09E-12	8.09E-12	8.08E-12	8.08E-12	8.09E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	2.01E-21	2.24E-21	2.48E-21	2.71E-21	2.95E-21	3.19E-25
u231	1.81E-17	2.07E-17	2.29E-17	2.51E-17	2.73E-17	2.73E-32
u232	4.24E-07	4.75E-07	5.25E-07	5.75E-07	6.25E-07	6.21E-07
u233	6.68E-02	7.50E-02	8.31E-02	9.12E-02	9.93E-02	9.92E-02
u234	9.24E-01	9.24E+00	9.29E+00	9.31E+00	9.33E+00	9.33E+00
u235	7.17E+02	7.16E+02	7.14E+02	7.13E+02	7.11E+02	7.11E+02
u236	1.76E+02	1.77E+02	1.77E+02	1.77E+02	1.77E+02	1.77E+02
u237	1.13E-06	1.14E-06	1.14E-06	1.14E-06	1.14E-06	4.49E-13
u238	3.64E+04	3.64E+04	3.64E+04	3.64E+04	3.64E+04	3.64E+04
u239	3.56E-11	1.12E-07	1.12E-07	1.12E-07	1.12E-07	1.12E-22
u240	7.88E-43	.00E+00	.00E+00	1.03E-40	1.03E-40	1.03E-40
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	3.18E-12	3.14E-12	3.14E-12	3.14E-12	3.13E-12	1.94E-12
np236m	6.57E-13	7.46E-13	7.46E-13	7.45E-13	7.45E-13	7.45E-28
np236	3.60E-07	4.03E-07	4.45E-07	4.88E-07	5.30E-07	5.30E-07
np237	4.20E+01	4.19E+01	4.19E+01	4.19E+01	4.19E+01	4.19E+01

np238	5.23E-07	5.54E-07	5.54E-07	5.53E-07	5.53E-07	1.17E-14
np239	1.56E-05	1.62E-05	1.62E-05	1.62E-05	1.62E-05	2.44E-15
np240m	.00E+00	.00E+00	.00E+00	8.76E-43	8.76E-43	8.76E-43
np240	5.68E-17	1.19E-15	1.19E-15	1.19E-15	1.19E-15	1.80E-40
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	4.11E-10	4.06E-10	4.05E-10	4.05E-10	4.05E-10	3.39E-10
pu237	5.57E-14	5.79E-14	6.06E-14	6.32E-14	6.57E-14	9.81E-16
pu238	8.43E-03	8.39E-03	8.38E-03	8.37E-03	8.37E-03	8.32E-03
pu239	8.13E+00	9.02E+00	9.89E+00	1.07E+01	1.16E+01	1.16E+01
pu240	5.16E-02	6.32E-02	7.56E-02	8.86E-02	1.02E-01	1.02E-01
pu241	7.71E-06	9.35E-06	1.12E-05	1.31E-05	1.51E-05	1.46E-05
pu242	2.99E-07	4.27E-07	5.86E-07	7.76E-07	1.00E-06	1.00E-06
pu243	1.22E-16	3.27E-16	4.49E-16	5.94E-16	7.66E-16	7.66E-31
pu244	1.96E-31	5.40E-31	1.33E-30	2.99E-30	6.23E-30	6.24E-30
pu245	.00E+00	.00E+00	.00E+00	7.64E-41	7.64E-41	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.42E-20	2.29E-20	2.79E-20	3.32E-20	3.89E-20	3.89E-35
am240	7.95E-18	1.05E-17	1.28E-17	1.52E-17	1.78E-17	1.78E-32
am241	1.83E-04	2.29E-04	2.79E-04	3.33E-04	3.89E-04	3.89E-04
am242m	2.89E-08	3.65E-08	4.48E-08	5.38E-08	6.33E-08	6.31E-08
am242	2.10E-12	3.10E-12	3.78E-12	4.51E-12	5.29E-12	8.14E-13
am243	6.88E-10	1.04E-09	1.50E-09	2.08E-09	2.79E-09	2.79E-09
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.40E-18	2.86E-18	4.11E-18	5.70E-18	7.67E-18	7.67E-33
am245	4.48E-44	.00E+00	.00E+00	1.49E-41	1.49E-41	.00E+00
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	5.31E-23	6.57E-23	8.02E-23	9.58E-23	1.12E-22	3.43E-25
cm242	5.01E-10	6.25E-10	7.63E-10	9.11E-10	1.07E-09	4.47E-10
cm243	4.18E-15	5.18E-15	6.33E-15	7.55E-15	8.85E-15	8.69E-15
cm244	3.00E-14	4.49E-14	6.46E-14	8.96E-14	1.20E-13	1.17E-13

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 31
power= 1.468E-03mw, burnup=4.0214E+03mwd, flux= 9.45E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d
cm245	1.17E-17	1.97E-17	3.14E-17	4.76E-17	6.95E-17	6.95E-17
cm246	1.99E-20	3.77E-20	6.63E-20	1.10E-19	1.74E-19	1.74E-19
cm247	6.04E-25	1.29E-24	2.54E-24	4.67E-24	8.10E-24	8.10E-24
cm248	1.81E-28	4.40E-28	9.69E-28	1.97E-27	3.74E-27	3.74E-27
cm249	1.09E-40	5.03E-39	1.10E-38	2.24E-38	4.27E-38	.00E+00
cm250	1.82E-44	4.90E-44	1.19E-43	2.66E-43	5.52E-43	5.52E-43
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux	.	9.46E+07	9.46E+07	9.45E+07	9.45E+07	9.45E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 [illegible] array has 1 entries.
0 [illegible] array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 4 of library on unit 33.

pass 1
pass 0
scale-system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densiities

```
     -    pass n applies mid time densities of nth library interval
         first library updated was...
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         ********************************************************************************
         *                                                                              *
         *            prelim lwr origen-s binary working library--id = 1143             *
         *          made from modified card-image origen-s libraries of scale 4.2       *
         *       data from the light element, actinide, and fission product libraries   *
         *         decay data, including gamma and total energy, are from endf/b-vi     *
         *                                                                              *
         *       neutron flux spectrum factors and cross sections were produced from    *
         *      the "presas2" case updating all nuclides on the scale "burnup" library  *
         *                                                                              *
         *                  fission product yields are from endf/b-v                    *
         *                                                                              *
         *              photon libraries use an 18-energy-group structure               *
         *             the photon data are from the master photon data base,            *
         *              produced to include bremsstrahlung from uo2 matrix              *
         *                                                                              *
         *         see information above this box (if present) for later updates        *
         *                                                                              *
         ********************************************************************************
         *                                                                              *
0        ********************************************************************************
0                  .other identification and sizes of library.
0                   data set name:  ft33f001
0               8/29/1996    date library was produced
0                    1697    total number of nuclides in library
                      689    number of light-element nuclides
                      129    number of actinide nuclides
                      879    number of fission product nuclides
0                    7993    number of nonzero off-diagonal matrix elements
0        ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                   page   32
         power=    .00mw, burnup=   5362.mwd, flux= 9.28E+07n/cm**2-sec
0                                               basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                      initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions    1.220108E+06   1.220614E+06   1.221082E+06   1.221515E+06   1.221911E+06   1.221910E+06
     absorptions    9.842423E+05   9.847863E+05   9.852970E+05   9.857796E+05   9.862358E+05   9.862345E+05
     k infinity     1.239641E+00   1.239471E+00   1.239304E+00   1.239136E+00   1.238964E+00   1.238965E+00
0                      initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions    9.737211E+05   9.740664E+05   9.743921E+05   9.746936E+05   9.749863E+05   9.749859E+05
     non-actinide
     abs. fracs.    1.068962E-02   1.088548E-02   1.106763E-02   1.124084E-02   1.140648E-02   1.140565E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2         fission products         page   33
0                                  fraction of total absorption rate
         power=    .00mw, burnup=   5362.mwd, flux= 9.28E+07n/cm**2-sec
0               initial ******* d ******* d ******* d ******* d ******* d

     sm149     5.29E-03  5.33E-03  5.37E-03  5.39E-03  5.41E-03  5.41E-03
     eu151     5.45E-04  5.85E-04  6.24E-04  6.62E-04  7.00E-04  7.00E-04
     nd143     4.02E-04  4.35E-04  4.68E-04  5.01E-04  5.33E-04  5.33E-04
```

rh103	1.87E-04	2.02E-04	2.18E-04	2.34E-04	2.49E-04	2.49E-04
gd155	1.56E-04	1.61E-04	1.66E-04	1.70E-04	1.74E-04	1.74E-04
xe131	1.28E-04	1.38E-04	1.49E-04	1.59E-04	1.70E-04	1.70E-04
cs133	9.92E-05	1.07E-04	1.16E-04	1.24E-04	1.32E-04	1.32E-04
sm147	7.34E-05	7.95E-05	8.55E-05	9.16E-05	9.76E-05	9.76E-05
tc 99	7.20E-05	7.79E-05	8.37E-05	8.96E-05	9.54E-05	9.54E-05
cd113	7.93E-05	8.15E-05	8.34E-05	8.50E-05	8.65E-05	8.65E-05
nd145	5.64E-05	6.10E-05	6.56E-05	7.02E-05	7.49E-05	7.49E-05
mo 95	3.91E-05	4.23E-05	4.55E-05	4.87E-05	5.19E-05	5.19E-05
gd157	4.41E-05	4.49E-05	4.55E-05	4.62E-05	4.69E-05	4.69E-05
sm152	3.38E-05	3.69E-05	4.00E-05	4.32E-05	4.64E-05	4.64E-05
kr 83	2.45E-05	2.65E-05	2.85E-05	3.05E-05	3.24E-05	3.24E-05
sm150	2.22E-05	2.47E-05	2.72E-05	2.98E-05	3.23E-05	3.23E-05
cs135	2.24E-05	2.42E-05	2.61E-05	2.79E-05	2.98E-05	2.98E-05
ru101	1.73E-05	1.88E-05	2.02E-05	2.17E-05	2.31E-05	2.31E-05
pr141	1.67E-05	1.81E-05	1.94E-05	2.08E-05	2.22E-05	2.22E-05
eu153	1.59E-05	1.73E-05	1.86E-05	2.00E-05	2.14E-05	2.14E-05
la139	1.36E-05	1.48E-05	1.59E-05	1.70E-05	1.81E-05	1.81E-05
sm151	1.73E-05	1.74E-05	1.74E-05	1.75E-05	1.75E-05	1.74E-05
ba137	6.51E-06	7.06E-06	7.60E-06	8.14E-06	8.68E-06	8.68E-06
pd105	6.11E-06	6.64E-06	7.18E-06	7.71E-06	8.26E-06	8.26E-06
zr 93	5.48E-06	5.93E-06	6.38E-06	6.83E-06	7.28E-06	7.28E-06
i129	4.30E-06	4.66E-06	5.03E-06	5.39E-06	5.75E-06	5.75E-06
nd144	4.12E-06	4.46E-06	4.80E-06	5.15E-06	5.49E-06	5.49E-06
ag109	3.56E-06	3.97E-06	4.39E-06	4.82E-06	5.27E-06	5.27E-06
mo 97	3.10E-06	3.35E-06	3.61E-06	3.86E-06	4.12E-06	4.12E-06
zr 91	1.45E-06	1.57E-06	1.69E-06	1.81E-06	1.92E-06	1.92E-06
y 89	1.39E-06	1.50E-06	1.62E-06	1.73E-06	1.84E-06	1.84E-06
ru102	1.27E-06	1.38E-06	1.48E-06	1.59E-06	1.69E-06	1.69E-06
gd152	8.73E-07	1.02E-06	1.18E-06	1.34E-06	1.52E-06	1.52E-06
ce142	1.14E-06	1.23E-06	1.32E-06	1.42E-06	1.51E-06	1.51E-06
nd148	1.09E-06	1.18E-06	1.27E-06	1.36E-06	1.45E-06	1.45E-06
pd108	1.00E-06	1.11E-06	1.22E-06	1.33E-06	1.44E-06	1.44E-06
nd146	9.17E-07	9.93E-07	1.07E-06	1.14E-06	1.22E-06	1.22E-06
ba138	7.84E-07	8.49E-07	9.13E-07	9.78E-07	1.04E-06	1.04E-06
in115	7.72E-07	8.38E-07	9.03E-07	9.69E-07	1.03E-06	1.03E-06
ce140	7.34E-07	7.95E-07	8.55E-07	9.16E-07	9.76E-07	9.76E-07
xe132	6.61E-07	7.16E-07	7.71E-07	8.26E-07	8.81E-07	8.81E-07
pd107	5.53E-07	6.07E-07	6.64E-07	7.21E-07	7.80E-07	7.80E-07
mo 98	4.53E-07	4.90E-07	5.27E-07	5.65E-07	6.02E-07	6.02E-07
mo100	4.39E-07	4.75E-07	5.12E-07	5.48E-07	5.84E-07	5.84E-07
xe134	4.33E-07	4.69E-07	5.05E-07	5.41E-07	5.76E-07	5.76E-07
zr 92	3.49E-07	3.78E-07	4.07E-07	4.35E-07	4.64E-07	4.64E-07
i127	2.96E-07	3.22E-07	3.47E-07	3.73E-07	3.99E-07	3.99E-07
ru104	2.78E-07	3.01E-07	3.25E-07	3.49E-07	3.73E-07	3.73E-07
zr 96	2.74E-07	2.97E-07	3.19E-07	3.42E-07	3.64E-07	3.64E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8 uo2 fission products page 34
0 fraction of total absorption rate
power= .00kw, burnup= 5362.mwd, flux= 9.28E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

nd150	2.43E-07	2.64E-07	2.84E-07	3.04E-07	3.24E-07	3.24E-07
xe136	2.34E-07	2.54E-07	2.73E-07	2.92E-07	3.12E-07	3.12E-07
ru 99	1.40E-07	1.64E-07	1.90E-07	2.18E-07	2.48E-07	2.48E-07
br 81	1.75E-07	1.89E-07	2.04E-07	2.18E-07	2.33E-07	2.33E-07
rb 85	1.70E-07	1.84E-07	1.98E-07	2.12E-07	2.26E-07	2.26E-07
zr 94	1.48E-07	1.60E-07	1.72E-07	1.84E-07	1.96E-07	1.96E-07
cd111	1.35E-07	1.48E-07	1.61E-07	1.75E-07	1.88E-07	1.88E-07
zr 90	1.36E-07	1.47E-07	1.59E-07	1.70E-07	1.81E-07	1.81E-07
sm154	1.07E-07	1.16E-07	1.25E-07	1.34E-07	1.44E-07	1.44E-07

te130	1.07E-07	1.16E-07	1.25E-07	1.34E-07	1.43E-07	1.43E-07
rb 87	9.82E-08	1.06E-07	1.14E-07	1.22E-07	1.30E-07	1.30E-07
se 77	7.05E-08	7.63E-08	8.21E-08	8.79E-08	9.37E-08	9.37E-08
pd106	5.60E-08	6.11E-08	6.63E-08	7.15E-08	7.68E-08	7.68E-08
pm147	8.22E-08	9.90E-08	9.89E-08	9.88E-08	9.88E-08	7.67E-08
eu152	4.97E-08	5.54E-08	5.91E-08	6.27E-08	6.63E-08	6.29E-08
gd156	4.21E-08	4.69E-08	5.19E-08	5.69E-08	6.21E-08	6.21E-08
kr 84	4.64E-08	5.02E-08	5.40E-08	5.78E-08	6.16E-08	6.16E-08
eu155	5.34E-08	6.01E-08	6.04E-08	6.08E-08	6.11E-08	5.27E-08
gd154	2.91E-08	3.41E-08	3.96E-08	4.55E-08	5.18E-08	5.18E-08
se 79	3.60E-08	3.89E-08	4.19E-08	4.48E-08	4.77E-08	4.77E-08
sb121	3.51E-08	3.81E-08	4.11E-08	4.41E-08	4.71E-08	4.71E-08
sb123	2.85E-08	3.09E-08	3.33E-08	3.58E-08	3.82E-08	3.82E-08
kr 86	2.59E-08	2.80E-08	3.02E-08	3.23E-08	3.44E-08	3.44E-08
dy161	2.27E-08	2.52E-08	2.78E-08	3.05E-08	3.32E-08	3.32E-08
te128	2.36E-08	2.56E-08	2.76E-08	2.96E-08	3.16E-08	3.16E-08
ba135	1.35E-08	1.58E-08	1.84E-08	2.11E-08	2.40E-08	2.40E-08
se 80	1.68E-08	1.82E-08	1.96E-08	2.10E-08	2.24E-08	2.24E-08
te125	1.52E-08	1.65E-08	1.79E-08	1.92E-08	2.05E-08	2.05E-08
tb159	1.22E-08	1.34E-08	1.46E-08	1.59E-08	1.71E-08	1.71E-08
ru100	8.93E-09	1.04E-08	1.21E-08	1.38E-08	1.57E-08	1.57E-08
cd112	1.05E-08	1.14E-08	1.24E-08	1.33E-08	1.43E-08	1.43E-08
gd158	9.65E-09	1.07E-08	1.17E-08	1.27E-08	1.38E-08	1.38E-08
li 6	9.42E-09	1.02E-08	1.09E-08	1.17E-08	1.25E-08	1.25E-08
nd142	6.24E-09	7.32E-09	8.48E-09	9.73E-09	1.11E-08	1.11E-08
sn117	7.99E-09	8.69E-09	9.38E-09	1.01E-08	1.08E-08	1.08E-08
ba134	6.03E-09	7.07E-09	8.18E-09	9.38E-09	1.07E-08	1.07E-08
sm148	5.54E-09	6.49E-09	7.51E-09	8.60E-09	9.77E-09	9.77E-09
sn119	6.43E-09	6.97E-09	7.52E-09	8.07E-09	8.62E-09	8.62E-09
cd114	5.69E-09	6.28E-09	6.88E-09	7.48E-09	8.10E-09	8.10E-09
sn115	5.89E-09	6.39E-09	6.89E-09	7.39E-09	7.90E-09	7.90E-09
pd104	4.06E-09	4.76E-09	5.52E-09	6.33E-09	7.20E-09	7.20E-09
dy164	4.21E-09	4.75E-09	5.32E-09	5.90E-09	6.52E-09	6.52E-09
sr 88	4.76E-09	5.15E-09	5.54E-09	5.93E-09	6.32E-09	6.32E-09
dy162	3.93E-09	4.42E-09	4.94E-09	5.47E-09	6.03E-09	6.03E-09
pd110	4.24E-09	4.66E-09	5.09E-09	5.52E-09	5.97E-09	5.97E-09
sr 90	6.03E-09	6.13E-09	6.12E-09	6.11E-09	6.10E-09	5.95E-09
se 82	3.24E-09	3.51E-09	3.78E-09	4.04E-09	4.31E-09	4.31E-09
nb 93	2.18E-09	2.56E-09	2.96E-09	3.40E-09	3.86E-09	3.86E-09
sn126	2.73E-09	2.96E-09	3.20E-09	3.43E-09	3.67E-09	3.67E-09

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 35

0 fraction of total absorption rate

power= .00mw, burnup= 5362.mwd, flux= 9.25E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

se 78	2.48E-09	2.69E-09	2.89E-09	3.10E-09	3.30E-09	3.30E-09
eu154	2.42E-09	2.78E-09	3.00E-09	3.22E-09	3.44E-09	3.17E-09
sn124	2.04E-09	2.21E-09	2.39E-09	2.56E-09	2.74E-09	2.74E-09
mo 96	1.54E-09	1.79E-09	2.05E-09	2.34E-09	2.64E-09	2.64E-09
as 75	1.47E-09	1.59E-09	1.72E-09	1.84E-09	1.96E-09	1.96E-09
br 79	1.10E-09	1.29E-09	1.49E-09	1.71E-09	1.95E-09	1.95E-09
ba136	1.28E-09	1.42E-09	1.58E-09	1.74E-09	1.91E-09	1.91E-09
in113	1.14E-09	1.24E-09	1.34E-09	1.44E-09	1.54E-09	1.54E-09
cd110	7.79E-10	9.33E-10	1.10E-09	1.29E-09	1.50E-09	1.50E-09
dy163	9.59E-10	1.08E-09	1.21E-09	1.34E-09	1.48E-09	1.48E-09
xe130	9.02E-10	1.03E-09	1.17E-09	1.32E-09	1.48E-09	1.48E-09
kr 82	9.05E-10	1.02E-09	1.14E-09	1.26E-09	1.39E-09	1.39E-09
cs137	1.35E-09	1.37E-09	1.37E-09	1.37E-09	1.37E-09	1.34E-09
ag107	6.92E-10	8.21E-10	9.62E-10	1.12E-09	1.28E-09	1.28E-09
xe129	6.31E-10	7.40E-10	8.59E-10	9.86E-10	1.12E-09	1.12E-09

sn118	8.29E-10	9.00E-10	9.71E-10	1.04E-09	1.11E-09	1.11E-09
sn122	7.07E-10	7.67E-10	8.27E-10	8.88E-10	9.48E-10	9.48E-10
cd116	7.02E-10	7.62E-10	8.22E-10	8.82E-10	9.42E-10	9.42E-10
te126	4.15E-10	4.81E-10	5.52E-10	6.28E-10	7.09E-10	7.09E-10
sn120	5.26E-10	5.70E-10	6.15E-10	6.60E-10	7.05E-10	7.05E-10
ge 73	4.07E-10	4.42E-10	4.76E-10	5.10E-10	5.44E-10	5.44E-10
cs134	2.08E-10	2.89E-10	3.11E-10	3.33E-10	3.55E-10	2.53E-10
ge 76	1.45E-10	1.57E-10	1.69E-10	1.81E-10	1.93E-10	1.93E-10
kr 85	1.96E-10	2.06E-10	2.05E-10	2.05E-10	2.05E-10	1.92E-10
gd160	1.23E-10	1.36E-10	1.48E-10	1.62E-10	1.75E-10	1.75E-10
ho165	7.14E-11	8.10E-11	9.12E-11	1.02E-10	1.13E-10	1.13E-10
ce144	1.11E-10	2.17E-10	2.16E-10	2.16E-10	2.16E-10	8.88E-11
dy160	3.17E-11	3.74E-11	4.36E-11	5.03E-11	5.75E-11	5.75E-11
xe128	2.30E-11	2.70E-11	3.12E-11	3.58E-11	4.07E-11	4.07E-11
te124	2.25E-11	2.48E-11	2.73E-11	2.97E-11	3.23E-11	3.23E-11
sr 86	1.55E-11	1.78E-11	2.02E-11	2.27E-11	2.53E-11	2.53E-11
sr 87	1.76E-11	1.92E-11	2.07E-11	2.23E-11	2.38E-11	2.38E-11
sn116	8.75E-12	1.03E-11	1.19E-11	1.37E-11	1.56E-11	1.56E-11
nb 94	9.73E-12	1.06E-11	1.16E-11	1.25E-11	1.35E-11	1.35E-11
ge 74	8.20E-12	8.89E-12	9.58E-12	1.03E-11	1.10E-11	1.10E-11
se 76	5.80E-12	6.51E-12	7.26E-12	8.05E-12	8.87E-12	8.87E-12
ge 72	5.67E-12	6.16E-12	6.65E-12	7.14E-12	7.63E-12	7.63E-12
te122	3.67E-12	4.30E-12	4.99E-12	5.72E-12	6.51E-12	6.51E-12
ru106	6.75E-12	1.14E-11	1.15E-11	1.17E-11	1.18E-11	5.97E-12
er166	3.56E-12	4.09E-12	4.64E-12	5.22E-12	5.83E-12	5.83E-12
y 90	5.74E-12	5.83E-12	5.82E-12	5.81E-12	5.80E-12	5.66E-12
sb125	4.83E-12	5.86E-12	5.88E-12	5.91E-12	5.93E-12	4.61E-12
nb 95	5.97E-12	5.52E-11	5.51E-11	5.51E-11	5.50E-11	2.35E-12
zr 95	3.07E-12	5.95E-11	5.94E-11	5.94E-11	5.93E-11	1.14E-12
kr 80	5.18E-13	6.08E-13	7.08E-13	8.19E-13	9.43E-13	9.43E-13
y 91	2.02E-12	5.15E-11	5.14E-11	5.13E-11	5.12E-11	6.81E-13
te127m	5.32E-13	2.94E-12	2.96E-12	2.97E-12	2.98E-12	3.03E-13
ce141	1.69E-12	5.81E-10	5.80E-10	5.80E-10	5.80E-10	2.41E-13
ru103	1.07E-12	1.35E-10	1.35E-10	1.35E-10	1.35E-10	2.14E-13

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 36

0 fraction of total absorption rate

power= .00mw, burnup= 5362.mwd, flux= 9.28E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

er167	9.60E-14	1.16E-13	1.39E-13	1.65E-13	1.93E-13	1.93E-13
te123	5.98E-14	7.14E-14	8.44E-14	9.91E-14	1.15E-13	1.15E-13
sr 89	2.57E-13	1.10E-11	1.10E-11	1.10E-11	1.09E-11	7.31E-14
cd108	1.21E-14	1.54E-14	1.93E-14	2.37E-14	2.89E-14	2.89E-14
be 9	1.82E-14	1.97E-14	2.12E-14	2.27E-14	2.41E-14	2.41E-14
li 7	7.40E-15	8.01E-15	8.62E-15	9.23E-15	9.84E-15	9.84E-15
sb126	3.14E-15	5.01E-15	5.31E-15	5.62E-15	5.92E-15	4.22E-15
sn114	2.20E-15	2.59E-15	3.00E-15	3.45E-15	3.93E-15	3.93E-15
pm148m	1.36E-14	1.35E-12	1.36E-12	1.36E-12	1.37E-12	2.97E-15
sn123	8.62E-16	3.75E-15	3.76E-15	3.76E-15	3.77E-15	5.30E-16
tb160	8.46E-16	1.28E-14	1.39E-14	1.50E-14	1.61E-14	4.87E-16
te129m	2.37E-15	6.73E-13	6.74E-13	6.75E-13	6.76E-13	3.63E-16
cd115m	1.29E-15	9.19E-14	9.22E-14	9.25E-14	9.28E-14	3.18E-16
sb124	5.37E-17	1.30E-15	1.34E-15	1.38E-15	1.42E-15	2.11E-17
pr143	8.92E-16	9.64E-10	9.63E-10	9.62E-10	9.61E-10	8.40E-18
pm148	2.34E-17	4.90E-14	4.91E-14	4.91E-14	4.92E-14	5.11E-18
cd109	1.01E-18	1.65E-18	1.78E-18	1.93E-18	2.09E-18	1.21E-18
eu156	5.64E-17	1.50E-11	1.52E-11	1.53E-11	1.55E-11	9.14E-19
nd147	1.04E-17	3.38E-10	3.38E-10	3.38E-10	3.37E-10	3.69E-20
ba140	5.86E-18	1.72E-11	1.72E-11	1.71E-11	1.71E-11	3.69E-20
la140	2.17E-18	5.54E-12	5.54E-12	5.53E-12	5.53E-12	1.85E-20

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 37
power= 1.468E-03mw, burnup=5.3618E+03mwd, flux= 9.28E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	2.40E-04	2.59E-04	2.79E-04	2.99E-04	3.18E-04	3.18E-04
h 2	7.13E-07	7.72E-07	8.30E-07	8.89E-07	9.47E-07	9.47E-07
h 3	1.41E-11	1.49E-11	1.51E-11	1.53E-11	1.54E-11	1.46E-11
h 4	.00E+00	2.19E-35	2.21E-35	2.24E-35	2.26E-35	.00E+00
he 3	4.83E-09	5.18E-09	5.53E-09	5.87E-09	6.20E-09	6.20E-09
he 4	3.97E-05	4.29E-05	4.62E-05	4.95E-05	5.27E-05	5.27E-05
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	4.77E-06	5.16E-06	5.55E-06	5.94E-06	6.33E-06	6.33E-06
ne 21	4.18E-10	4.85E-10	5.56E-10	6.31E-10	7.11E-10	7.11E-10
ne 22	3.13E-08	3.39E-08	3.65E-08	3.91E-08	4.16E-08	4.16E-08
ne 23	2.60E-30	2.60E-15	2.60E-15	2.60E-15	2.60E-15	2.60E-30
na 22	1.26E-11	1.54E-11	1.54E-11	1.54E-11	1.54E-11	1.18E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	1.00E-23	9.66E-09	9.66E-09	9.66E-09	9.66E-09	9.66E-24
na 24m	1.65E-30	1.59E-15	1.59E-15	1.59E-15	1.59E-15	1.59E-30
na 25	4.85E-40	5.56E-25	6.35E-25	7.18E-25	8.06E-25	8.06E-40
mg 24	3.57E-02	3.82E-02	4.07E-02	4.32E-02	4.57E-02	4.57E-02
mg 25	4.67E-08	5.38E-08	6.14E-08	6.94E-08	7.79E-08	7.79E-08
mg 26	7.13E-07	7.71E-07	8.30E-07	8.88E-07	9.47E-07	9.47E-07
mg 27	7.77E-28	7.77E-13	7.77E-13	7.77E-13	7.77E-13	7.77E-28
mg 28	.00E+00	5.72E-25	5.72E-25	5.72E-25	5.72E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	7.45E-26	7.16E-11	7.16E-11	7.16E-11	7.16E-11	7.16E-26
al 29	3.60E-38	4.16E-23	4.78E-23	5.44E-23	6.13E-23	6.13E-38
al 30	.00E+00	2.34E-33	2.90E-33	3.53E-33	4.26E-33	.00E+00
si 28	1.04E-01	1.11E-01	1.19E-01	1.26E-01	1.33E-01	1.33E-01
si 29	3.87E-07	4.49E-07	5.16E-07	5.87E-07	6.62E-07	6.62E-07
si 30	1.50E-12	1.89E-12	2.34E-12	2.86E-12	3.44E-12	3.44E-12
si 31	3.82E-40	4.90E-25	6.07E-25	7.40E-25	8.92E-25	8.97E-40
si 32	2.24E-31	2.86E-31	3.57E-31	4.37E-31	5.29E-31	5.27E-31
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.28E+07	9.28E+07	9.28E+07	9.28E+07	9.27E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 38
power= 1.468E-03mw, burnup=5.3618E+03mwd, flux= 9.28E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	2.26E+00	2.56E+00	2.88E+00	3.21E+00	3.56E+00	3.56E+00
pb206	3.70E-03	4.51E-03	5.40E-03	6.38E-03	7.45E-03	7.45E-03
pb207	4.14E-04	4.85E-04	5.61E-04	6.43E-04	7.30E-04	7.30E-04
pb208	2.38E-05	2.79E-05	3.22E-05	3.69E-05	4.19E-05	4.19E-05
pb209	6.25E-11	7.20E-11	8.20E-11	9.25E-11	1.03E-10	1.03E-10
pb210	3.92E-05	4.37E-05	4.81E-05	5.25E-05	5.70E-05	5.70E-05
pb211	1.08E-11	1.17E-11	1.25E-11	1.34E-11	1.42E-11	1.43E-11
pb212	1.09E-11	1.17E-11	1.26E-11	1.34E-11	1.43E-11	1.43E-11
pb214	8.97E-11	9.98E-11	1.10E-10	1.20E-10	1.30E-10	1.30E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	3.09E-04	3.88E-04	4.77E-04	5.79E-04	6.94E-04	6.94E-04
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.42E-08	2.69E-08	2.96E-08	3.23E-08	3.51E-08	3.51E-08
bi211	6.43E-13	6.93E-13	7.43E-13	7.93E-13	8.43E-13	8.45E-13
bi212	1.03E-12	1.11E-12	1.19E-12	1.27E-12	1.35E-12	1.36E-12
bi213	1.46E-11	1.68E-11	1.92E-11	2.16E-11	2.41E-11	2.41E-11

bi214	6.66E-11	7.41E-11	8.16E-11	8.92E-11	9.68E-11	9.68E-11
po210	6.60E-07	7.42E-07	8.17E-07	8.93E-07	9.69E-07	9.59E-07
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	7.11E-18	7.65E-18	8.21E-18	8.77E-18	9.32E-18	9.34E-18
po212	5.44E-23	5.85E-23	6.27E-23	6.70E-23	7.12E-23	7.13E-23
po213	2.19E-20	2.53E-20	2.88E-20	3.25E-20	3.63E-20	3.63E-20
po214	9.16E-18	1.02E-17	1.12E-17	1.23E-17	1.33E-17	1.33E-17
po215	8.91E-18	9.60E-18	1.03E-17	1.10E-17	1.17E-17	1.17E-17
po216	4.13E-17	4.44E-17	4.76E-17	5.09E-17	5.40E-17	5.42E-17
po218	1.04E-11	1.15E-11	1.27E-11	1.39E-11	1.51E-11	1.51E-11
rn218	6.21E-33	6.16E-29	6.61E-29	7.05E-29	7.49E-29	3.88E-34
rn219	1.98E-14	2.14E-14	2.29E-14	2.45E-14	2.60E-14	2.61E-14
rn220	1.58E-14	1.70E-14	1.83E-14	1.95E-14	2.07E-14	2.08E-14
rn222	1.84E-08	2.05E-08	2.26E-08	2.47E-08	2.68E-08	2.68E-08
ra222	6.75E-30	6.69E-26	7.17E-26	7.66E-26	8.14E-26	4.21E-31
ra223	4.95E-09	5.33E-09	5.72E-09	6.10E-09	6.49E-09	6.50E-09
ra224	9.00E-11	9.68E-11	1.04E-10	1.11E-10	1.18E-10	1.18E-10
ra225	6.83E-09	7.87E-09	8.96E-09	1.01E-08	1.13E-08	1.13E-08
ra226	2.82E-03	3.13E-03	3.45E-03	3.77E-03	4.09E-03	4.09E-03
ra228	1.60E-11	1.73E-11	1.87E-11	2.00E-11	2.14E-11	2.14E-11
ac225	4.61E-09	5.31E-09	6.05E-09	6.82E-09	7.63E-09	7.63E-09
ac227	3.43E-06	3.71E-06	3.98E-06	4.25E-06	4.51E-06	4.51E-06
ac228	1.95E-15	2.11E-15	2.28E-15	2.44E-15	2.61E-15	2.61E-15
th226	3.29E-28	3.26E-24	3.50E-24	3.74E-24	3.97E-24	2.06E-29
th227	7.99E-09	8.60E-09	9.23E-09	9.85E-09	1.05E-08	1.05E-08
th228	1.71E-08	1.85E-08	1.98E-08	2.12E-08	2.25E-08	2.25E-08
th229	1.33E-03	1.53E-03	1.74E-03	1.96E-03	2.20E-03	2.20E-03
th230	1.88E-01	2.03E-01	2.18E-01	2.33E-01	2.49E-01	2.49E-01
th231	2.94E-09	3.27E-09	3.29E-09	3.31E-09	3.33E-09	2.92E-09
th232	3.90E-02	4.23E-02	4.56E-02	4.89E-02	5.22E-02	5.22E-02
th233	1.29E-28	1.40E-13	1.51E-13	1.62E-13	1.73E-13	1.73E-28
th234	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	5.16E-03	5.57E-03	5.98E-03	6.39E-03	6.79E-03	6.79E-03
pa232	3.20E-26	3.46E-11	3.71E-11	3.96E-11	4.21E-11	4.21E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 39
power= 1.468E-03mw, burnup=5.3618E+03mwd, flux= 9.28E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.45E-06	1.45E-06	1.45E-06	1.44E-06	1.44E-06	1.44E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.09E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	3.19E-25	3.16E-21	3.39E-21	3.62E-21	3.85E-21	1.99E-26
u231	2.73E-32	2.94E-17	3.15E-17	3.37E-17	3.58E-17	3.58E-32
u232	6.21E-07	6.74E-07	7.24E-07	7.72E-07	8.21E-07	8.13E-07
u233	9.92E-02	1.07E-01	1.15E-01	1.23E-01	1.31E-01	1.31E-01
u234	9.37E+00	9.35E+00	9.38E+00	9.40E+00	9.42E+00	9.42E+00
u235	7.11E+02	7.10E+02	7.08E+02	7.07E+02	7.06E+02	7.06E+02
u236	1.77E+02	1.78E+02	1.78E+02	1.78E+02	1.78E+02	1.78E+02
u237	4.49E-13	1.14E-06	1.14E-06	1.14E-06	1.14E-06	6.96E-13
u238	3.64E+04	3.64E+04	3.64E+04	3.64E+04	3.63E+04	3.63E+04
u239	1.12E-22	1.12E-07	1.12E-07	1.12E-07	1.12E-07	1.12E-22
u240	1.03E-40	2.05E-40	4.10E-40	8.21E-40	1.33E-39	1.33E-39
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.94E-12	3.12E-12	3.12E-12	3.12E-12	3.11E-12	1.64E-12
np236m	7.45E-28	7.41E-13	7.41E-13	7.40E-13	7.40E-13	7.40E-28
np236	5.30E-07	5.72E-07	6.14E-07	6.55E-07	6.97E-07	6.97E-07
np237	4.19E+01	4.18E+01	4.18E+01	4.18E+01	4.18E+01	4.18E+01

np238	1.17E-14	5.52E-07	5.51E-07	5.51E-07	5.51E-07	1.93E-14
np239	2.44E-15	1.62E-05	1.62E-05	1.62E-05	1.62E-05	6.38E-15
np240m	8.76E-43	1.75E-42	3.50E-42	7.01E-42	1.14E-41	1.14E-41
np240	1.80E-40	1.19E-15	1.19E-15	1.19E-15	1.19E-15	4.66E-40
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	3.39E-10	4.03E-10	4.03E-10	4.03E-10	4.03E-10	3.18E-10
pu237	9.81E-16	6.79E-14	7.04E-14	7.27E-14	7.51E-14	2.76E-16
pu238	8.32E-03	8.35E-03	8.34E-03	8.34E-03	8.33E-03	8.27E-03
pu239	1.16E+01	1.24E+01	1.32E+01	1.39E+01	1.47E+01	1.47E+01
pu240	1.02E-01	1.16E-01	1.31E-01	1.46E-01	1.61E-01	1.61E-01
pu241	1.46E-05	1.71E-05	1.93E-05	2.15E-05	2.37E-05	2.26E-05
pu242	1.00E-06	1.26E-06	1.56E-06	1.89E-06	2.26E-06	2.26E-06
pu243	7.66E-31	9.61E-16	1.19E-15	1.44E-15	1.72E-15	1.73E-30
pu244	6.24E-30	1.22E-29	2.27E-29	4.03E-29	6.88E-29	6.88E-29
pu245	.00E+00	1.53E-40	3.06E-40	6.11E-40	9.93E-40	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	3.89E-35	4.45E-20	5.06E-20	5.69E-20	6.33E-20	6.34E-35
am240	1.78E-32	2.04E-17	2.32E-17	2.60E-17	2.90E-17	2.90E-32
am241	3.89E-04	4.47E-04	5.08E-04	5.72E-04	6.36E-04	6.36E-04
am242m	6.31E-08	7.30E-08	8.32E-08	9.39E-08	1.05E-07	1.04E-07
am242	8.14E-13	6.07E-12	6.90E-12	7.76E-12	8.64E-12	1.35E-12
am243	2.79E-09	3.66E-09	4.69E-09	5.89E-09	7.29E-09	7.29E-09
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	7.67E-33	1.00E-17	1.28E-17	1.61E-17	1.99E-17	1.99E-32
am245	.00E+00	2.98E-41	5.97E-41	1.19E-40	2.09E-40	.00E+00
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	3.43E-25	1.28E-22	1.46E-22	1.64E-22	1.83E-22	8.12E-26
cm242	4.47E-10	1.23E-09	1.39E-09	1.57E-09	1.75E-09	5.85E-10
cm243	8.69E-15	1.01E-14	1.15E-14	1.29E-14	1.44E-14	1.41E-14
cm244	1.17E-13	1.57E-13	2.01E-13	2.53E-13	3.13E-13	3.01E-13

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 40
power= 1.468E-03mw, burnup=5.3618E+03mwd, flux= 9.28E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d
cm245	6.95E-17	9.78E-17	1.34E-16	1.79E-16	2.35E-16	2.35E-16
cm246	1.74E-19	2.63E-19	3.85E-19	5.48E-19	7.60E-19	7.60E-19
cm247	8.10E-24	1.34E-23	2.12E-23	3.25E-23	4.83E-23	4.83E-23
cm248	3.74E-27	6.74E-27	1.16E-26	1.91E-26	3.04E-26	3.04E-26
cm249	.00E+00	7.65E-38	1.31E-37	2.17E-37	3.45E-37	.00E+00
cm250	5.52E-43	1.08E-42	1.99E-42	3.52E-42	6.00E-42	6.00E-42
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		9.28E+07	9.28E+07	9.28E+07	9.28E+07	9.27E-08

```
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

         cross-section data taken from position number  5 of library on unit 33.

         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
```

```
  pass n applies mid time densities of nth library interval
first library updated was...
pass   1
pass   0
*scale-system control module sas2 library*
used a time-dependent neutron spectrum, for each of the above passes
  pass 0 applies start-up fuel densiities
  pass n applies mid time densities of nth library interval
first library updated was...
********************************************************************************
*                                                                              *
*            prelim lwr origen-s binary working library--id = 1143             *
*         made from modified card-image origen-s libraries of scale 4.2        *
*      data from the light element, actinide, and fission product libraries    *
*        decay data, including gamma and total energy, are from endf/b-vi      *
*                                                                              *
*      neutron flux spectrum factors and cross sections were produced from     *
*     the "presas2" case updating all nuclides on the scale "burnup" library   *
*                                                                              *
*                  fission product yields are from endf/b-v                    *
*                                                                              *
*              photon libraries use an 18-energy-group structure               *
*             the photon data are from the master photon data base,            *
*              produced to include bremsstrahlung from uo2 matrix              *
*                                                                              *
*        see information above this box (if present) for later updates         *
*                                                                              *
********************************************************************************
*                                                                              *
0********************************************************************************
0           .other identification and sizes of library.
0            data set name:  ft33f001
0          8/29/1996    date library was produced
0             1697    total number of nuclides in library
               689    number of light-element nuclides
               129    number of actinide nuclides
               879    number of fission product nuclides
0             7993    number of nonzero off-diagonal matrix elements
0     ***************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page   41
    power=    .00mw, burnup=   6702.mwd, flux= 9.23E+07n/cm**2-sec
0                              basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0              initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions  1.227854E+06  1.228214E+06  1.228540E+06  1.228833E+06  1.229094E+06  1.229093E+06
     absorptions  9.908031E+05  9.912365E+05  9.916465E+05  9.920353E+05  9.924034E+05  9.924018E+05
     k infinity   1.239251E+00  1.239072E+00  1.238889E+00  1.238699E+00  1.238502E+00  1.238503E+00
0              initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions  9.795352E+05  9.798043E+05  9.800555E+05  9.802891E+05  9.805056E+05  9.805048E+05
     non-actinide
     abs. fracs.  1.137245E-02  1.153332E-02  1.168865E-02  1.184052E-02  1.198888E-02  1.198804E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2             fission products         page   42
0                        fraction of total absorption rate
    power=    .00mw, burnup=   6702.mwd, flux= 9.23E+07n/cm**2-sec
0          initial ******* d ******* d ******* d ******* d ******* d

     sm149     5.41E-03  5.42E-03  5.43E-03  5.44E-03  5.44E-03  5.44E-03
     eu151     7.00E-04  7.37E-04  7.72E-04  8.08E-04  8.42E-04  8.42E-04
     nd143     5.33E-04  5.66E-04  5.99E-04  6.31E-04  6.63E-04  6.63E-04
```

rh103	2.49E-04	2.65E-04	2.81E-04	2.96E-04	3.12E-04	3.12E-04
xe131	1.70E-04	1.80E-04	1.91E-04	2.01E-04	2.12E-04	2.12E-04
gd155	1.74E-04	1.78E-04	1.81E-04	1.84E-04	1.86E-04	1.87E-04
cs133	1.32E-04	1.40E-04	1.48E-04	1.56E-04	1.64E-04	1.64E-04
sm147	9.76E-05	1.04E-04	1.10E-04	1.16E-04	1.22E-04	1.22E-04
tc 99	9.54E-05	1.01E-04	1.07E-04	1.13E-04	1.18E-04	1.18E-04
nd145	7.49E-05	7.95E-05	8.41E-05	8.87E-05	9.33E-05	9.33E-05
cd113	8.65E-05	8.78E-05	8.90E-05	9.00E-05	9.09E-05	9.09E-05
mo 95	5.19E-05	5.51E-05	5.83E-05	6.15E-05	6.47E-05	6.47E-05
sm152	4.64E-05	4.96E-05	5.29E-05	5.62E-05	5.95E-05	5.95E-05
gd157	4.69E-05	4.75E-05	4.81E-05	4.87E-05	4.93E-05	4.93E-05
sm150	3.23E-05	3.48E-05	3.74E-05	3.99E-05	4.25E-05	4.25E-05
kr 83	3.24E-05	3.44E-05	3.64E-05	3.84E-05	4.03E-05	4.03E-05
cs135	2.98E-05	3.16E-05	3.35E-05	3.53E-05	3.71E-05	3.71E-05
ru101	2.31E-05	2.45E-05	2.59E-05	2.74E-05	2.88E-05	2.88E-05
pr141	2.22E-05	2.36E-05	2.49E-05	2.63E-05	2.77E-05	2.77E-05
eu153	2.14E-05	2.27E-05	2.41E-05	2.55E-05	2.69E-05	2.69E-05
la139	1.82E-05	1.93E-05	2.04E-05	2.15E-05	2.26E-05	2.26E-05
sm151	1.74E-05	1.76E-05	1.76E-05	1.76E-05	1.77E-05	1.75E-05
ba137	8.68E-06	9.23E-06	9.77E-06	1.03E-05	1.08E-05	1.08E-05
pd105	8.26E-06	8.80E-06	9.35E-06	9.90E-06	1.05E-05	1.05E-05
zr 93	7.28E-06	7.73E-06	8.17E-06	8.62E-06	9.06E-06	9.06E-06
i129	5.75E-06	6.11E-06	6.48E-06	6.84E-06	7.20E-06	7.20E-06
ag109	5.27E-06	5.73E-06	6.21E-06	6.70E-06	7.20E-06	7.20E-06
nd144	5.49E-06	5.83E-06	6.17E-06	6.52E-06	6.86E-06	6.86E-06
mo 97	4.12E-06	4.37E-06	4.63E-06	4.88E-06	5.14E-06	5.14E-06
zr 91	1.92E-06	2.04E-06	2.16E-06	2.28E-06	2.39E-06	2.39E-06
gd152	1.52E-06	1.71E-06	1.90E-06	2.11E-06	2.32E-06	2.32E-06
y 89	1.84E-06	1.96E-06	2.07E-06	2.18E-06	2.29E-06	2.29E-06
ru102	1.69E-06	1.80E-06	1.91E-06	2.01E-06	2.12E-06	2.12E-06
pd108	1.44E-06	1.55E-06	1.67E-06	1.79E-06	1.92E-06	1.92E-06
ce142	1.51E-06	1.60E-06	1.70E-06	1.79E-06	1.88E-06	1.88E-06
nd148	1.45E-06	1.54E-06	1.63E-06	1.72E-06	1.81E-06	1.81E-06
nd146	1.22E-06	1.30E-06	1.37E-06	1.45E-06	1.52E-06	1.52E-06
ba138	1.04E-06	1.11E-06	1.17E-06	1.24E-06	1.30E-06	1.30E-06
in115	1.03E-06	1.10E-06	1.17E-06	1.23E-06	1.30E-06	1.30E-06
ce140	9.76E-07	1.04E-06	1.10E-06	1.16E-06	1.22E-06	1.22E-06
xe132	8.81E-07	9.36E-07	9.91E-07	1.05E-06	1.10E-06	1.10E-06
pd107	7.80E-07	8.39E-07	9.00E-07	9.62E-07	1.03E-06	1.03E-06
mo 98	6.02E-07	6.39E-07	6.77E-07	7.14E-07	7.51E-07	7.51E-07
mo100	5.84E-07	6.21E-07	6.57E-07	6.93E-07	7.29E-07	7.29E-07
xe134	5.76E-07	6.12E-07	6.48E-07	6.84E-07	7.19E-07	7.19E-07
zr 92	4.64E-07	4.93E-07	5.21E-07	5.50E-07	5.78E-07	5.78E-07
i127	3.99E-07	4.25E-07	4.51E-07	4.77E-07	5.03E-07	5.03E-07
ru104	3.73E-07	3.97E-07	4.21E-07	4.45E-07	4.69E-07	4.69E-07
zr 96	3.64E-07	3.87E-07	4.09E-07	4.31E-07	4.54E-07	4.54E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 43
0 fraction of total absorption rate
power= .00mw, burnup= 6702.mwd, flux= 9.23E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

nd150	3.24E-07	3.45E-07	3.65E-07	3.85E-07	4.06E-07	4.06E-07
xe136	3.12E-07	3.31E-07	3.50E-07	3.70E-07	3.89E-07	3.89E-07
ru 99	2.48E-07	2.80E-07	3.13E-07	3.48E-07	3.86E-07	3.86E-07
br 81	2.33E-07	2.47E-07	2.62E-07	2.76E-07	2.90E-07	2.90E-07
rb 85	2.26E-07	2.40E-07	2.54E-07	2.67E-07	2.81E-07	2.81E-07
cd111	1.88E-07	2.02E-07	2.16E-07	2.30E-07	2.45E-07	2.45E-07
zr 94	1.96E-07	2.08E-07	2.20E-07	2.32E-07	2.44E-07	2.44E-07
zr 90	1.81E-07	1.92E-07	2.03E-07	2.14E-07	2.26E-07	2.26E-07
sm154	1.44E-07	1.53E-07	1.62E-07	1.72E-07	1.81E-07	1.81E-07

te130	1.43E-07	1.51E-07	1.60E-07	1.69E-07	1.78E-07	1.78E-07
rb 87	1.30E-07	1.38E-07	1.46E-07	1.54E-07	1.62E-07	1.62E-07
se 77	9.37E-08	9.95E-08	1.05E-07	1.11E-07	1.17E-07	1.17E-07
pd106	7.68E-08	8.22E-08	8.76E-08	9.31E-08	9.86E-08	9.86E-08
gd156	6.21E-08	6.73E-08	7.26E-08	7.80E-08	8.35E-08	8.35E-08
gd154	5.18E-08	5.85E-08	6.56E-08	7.31E-08	8.11E-08	8.11E-08
kr 84	6.16E-08	6.54E-08	6.92E-08	7.30E-08	7.68E-08	7.68E-08
eu152	6.29E-08	6.98E-08	7.32E-08	7.65E-08	7.98E-08	7.47E-08
pm147	7.67E-08	9.87E-08	9.86E-08	9.85E-08	9.85E-08	7.16E-08
se 79	4.77E-08	5.07E-08	5.36E-08	5.65E-08	5.94E-08	5.94E-08
sb121	4.71E-08	5.01E-08	5.31E-08	5.61E-08	5.92E-08	5.92E-08
eu155	5.27E-08	6.14E-08	6.18E-08	6.21E-08	6.24E-08	5.19E-08
sb123	3.82E-08	4.06E-08	4.31E-08	4.55E-08	4.79E-08	4.79E-08
dy161	3.32E-08	3.61E-08	3.90E-08	4.20E-08	4.50E-08	4.50E-08
kr 86	3.44E-08	3.65E-08	3.86E-08	4.07E-08	4.28E-08	4.28E-08
te128	3.16E-08	3.36E-08	3.56E-08	3.76E-08	3.96E-08	3.96E-08
ba135	2.40E-08	2.70E-08	3.03E-08	3.38E-08	3.74E-08	3.74E-08
se 80	2.24E-08	2.38E-08	2.52E-08	2.66E-08	2.79E-08	2.79E-08
te125	2.05E-08	2.18E-08	2.32E-08	2.45E-08	2.59E-08	2.59E-08
ru100	1.57E-08	1.77E-08	1.98E-08	2.20E-08	2.44E-08	2.44E-08
tb159	1.71E-08	1.84E-08	1.97E-08	2.11E-08	2.24E-08	2.24E-08
cd112	1.43E-08	1.53E-08	1.63E-08	1.73E-08	1.83E-08	1.83E-08
gd158	1.38E-08	1.48E-08	1.59E-08	1.70E-08	1.81E-08	1.81E-08
nd142	1.11E-08	1.25E-08	1.40E-08	1.56E-08	1.72E-08	1.72E-08
ba134	1.07E-08	1.20E-08	1.35E-08	1.50E-08	1.66E-08	1.66E-08
li 6	1.25E-08	1.32E-08	1.40E-08	1.47E-08	1.55E-08	1.55E-08
sm148	9.77E-09	1.10E-08	1.23E-08	1.37E-08	1.52E-08	1.52E-08
sn117	1.08E-08	1.15E-08	1.22E-08	1.29E-08	1.37E-08	1.37E-08
pd104	7.20E-09	8.12E-09	9.10E-09	1.01E-08	1.12E-08	1.12E-08
sn119	8.62E-09	9.18E-09	9.73E-09	1.03E-08	1.08E-08	1.08E-08
cd114	8.10E-09	8.71E-09	9.34E-09	9.97E-09	1.06E-08	1.06E-08
sn115	7.90E-09	8.40E-09	8.91E-09	9.42E-09	9.93E-09	9.93E-09
dy164	6.52E-09	7.15E-09	7.80E-09	8.48E-09	9.18E-09	9.18E-09
dy162	6.03E-09	6.61E-09	7.21E-09	7.83E-09	8.47E-09	8.47E-09
sr 88	6.32E-09	6.71E-09	7.09E-09	7.48E-09	7.87E-09	7.87E-09
pd110	5.97E-09	6.42E-09	6.88E-09	7.35E-09	7.83E-09	7.83E-09
nb 93	3.86E-09	4.36E-09	4.88E-09	5.44E-09	6.02E-09	6.02E-09
sr 90	5.95E-09	6.09E-09	6.08E-09	6.07E-09	6.06E-09	5.87E-09
se 82	4.31E-09	4.57E-09	4.84E-09	5.10E-09	5.37E-09	5.37E-09
sn126	3.67E-09	3.91E-09	4.15E-09	4.39E-09	4.63E-09	4.63E-09

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 44
0 fraction of total absorption rate
power= .00mw, burnup= 6702.mwd, flux= 9.23E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

se 78	3.30E-09	3.51E-09	3.72E-09	3.92E-09	4.13E-09	4.13E-09
mo 96	2.64E-09	2.96E-09	3.30E-09	3.65E-09	4.03E-09	4.03E-09
eu154	3.17E-09	3.27E-09	3.38E-09	4.18E-09	4.32E-09	3.91E-09
sn124	2.74E-09	2.92E-09	3.09E-09	3.27E-09	3.45E-09	3.45E-09
br 79	1.95E-09	2.20E-09	2.46E-09	2.74E-09	3.03E-09	3.03E-09
ba136	1.91E-09	2.08E-09	2.26E-09	2.44E-09	2.63E-09	2.63E-09
cd110	1.50E-09	1.73E-09	1.97E-09	2.23E-09	2.52E-09	2.52E-09
as 75	1.96E-09	2.08E-09	2.20E-09	2.32E-09	2.45E-09	2.45E-09
xe130	1.48E-09	1.64E-09	1.82E-09	2.00E-09	2.19E-09	2.19E-09
dy163	1.48E-09	1.63E-09	1.78E-09	1.94E-09	2.10E-09	2.10E-09
ag107	1.28E-09	1.46E-09	1.66E-09	1.86E-09	2.09E-09	2.09E-09
kr 82	1.39E-09	1.53E-09	1.67E-09	1.81E-09	1.96E-09	1.96E-09
in113	1.54E-09	1.64E-09	1.74E-09	1.84E-09	1.94E-09	1.94E-09
xe129	1.12E-09	1.27E-09	1.42E-09	1.58E-09	1.75E-09	1.75E-09
sn118	1.11E-09	1.18E-09	1.26E-09	1.33E-09	1.40E-09	1.40E-09

cs137	1.34E-09	1.37E-09	1.37E-09	1.37E-09	1.37E-09	1.33E-09
sn122	9.49E-10	1.01E-09	1.07E-09	1.13E-09	1.19E-09	1.19E-09
cd116	9.41E-10	1.00E-09	1.06E-09	1.12E-09	1.18E-09	1.18E-09
te126	7.09E-10	7.95E-10	8.86E-10	9.81E-10	1.08E-09	1.08E-09
sn120	7.05E-10	7.50E-10	7.95E-10	8.40E-10	8.86E-10	8.86E-10
ge 73	5.45E-10	5.79E-10	6.13E-10	6.48E-10	6.82E-10	6.82E-10
cs134	2.53E-10	3.76E-10	3.98E-10	4.20E-10	4.42E-10	2.90E-10
ge 76	1.93E-10	2.05E-10	2.17E-10	2.29E-10	2.41E-10	2.41E-10
gd160	1.75E-10	1.89E-10	2.03E-10	2.18E-10	2.33E-10	2.33E-10
kr 85	1.92E-10	2.04E-10	2.04E-10	2.04E-10	2.04E-10	1.88E-10
ho165	1.13E-10	1.25E-10	1.37E-10	1.50E-10	1.64E-10	1.64E-10
dy160	5.75E-11	6.53E-11	7.36E-11	8.25E-11	9.19E-11	9.19E-11
ce144	8.88E-11	2.16E-10	2.16E-10	2.15E-10	2.15E-10	7.08E-11
xe128	4.07E-11	4.59E-11	5.14E-11	5.72E-11	6.34E-11	6.34E-11
te124	3.23E-11	3.49E-11	3.76E-11	4.04E-11	4.32E-11	4.32E-11
sr 86	2.53E-11	2.82E-11	3.11E-11	3.42E-11	3.74E-11	3.74E-11
sr 87	2.38E-11	2.54E-11	2.70E-11	2.86E-11	3.02E-11	3.02E-11
sn116	1.56E-11	1.76E-11	1.97E-11	2.20E-11	2.43E-11	2.43E-11
nb 94	1.35E-11	1.45E-11	1.55E-11	1.66E-11	1.77E-11	1.77E-11
ge 74	1.10E-11	1.16E-11	1.23E-11	1.30E-11	1.37E-11	1.37E-11
se 76	8.87E-12	9.73E-12	1.06E-11	1.15E-11	1.25E-11	1.25E-11
te122	6.51E-12	7.35E-12	8.24E-12	9.18E-12	1.02E-11	1.02E-11
ge 72	7.63E-12	8.13E-12	8.62E-12	9.12E-12	9.62E-12	9.62E-12
er166	5.84E-12	6.48E-12	7.15E-12	7.84E-12	8.57E-12	8.57E-12
y 90	5.66E-12	5.79E-12	5.78E-12	5.78E-12	5.77E-12	5.59E-12
ru106	5.97E-12	1.19E-11	1.20E-11	1.22E-11	1.23E-11	5.25E-12
sb125	4.61E-12	5.95E-12	5.98E-12	6.00E-12	6.02E-12	4.40E-12
kr 80	9.43E-13	1.08E-12	1.23E-12	1.39E-12	1.57E-12	1.57E-12
nb 95	2.35E-12	5.50E-11	5.49E-11	5.49E-11	5.48E-11	8.62E-13
zr 95	1.14E-12	5.92E-11	5.92E-11	5.91E-11	5.91E-11	4.21E-13
er167	1.93E-13	2.25E-13	2.59E-13	2.96E-13	3.36E-13	3.36E-13
y 91	6.81E-13	5.11E-11	5.11E-11	5.10E-11	5.09E-11	2.29E-13
te123	1.15E-13	1.33E-13	1.53E-13	1.75E-13	1.99E-13	1.99E-13
te127m	3.03E-13	3.00E-12	3.01E-12	3.02E-12	3.03E-12	1.72E-13

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 45
0 fraction of total absorption rate
power= .00mw, burnup= 6702.mwd, flux= 9.23E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

cd108	2.89E-14	3.48E-14	4.15E-14	4.90E-14	5.74E-14	5.74E-14
ru103	2.14E-13	1.36E-10	1.36E-10	1.36E-10	1.36E-10	4.29E-14
ce141	2.41E-13	5.79E-10	5.79E-10	5.79E-10	5.78E-10	3.43E-14
be 9	2.41E-14	2.56E-14	2.71E-14	2.86E-14	3.01E-14	3.01E-14
sr 89	7.32E-14	1.09E-11	1.09E-11	1.09E-11	1.09E-11	2.08E-14
li 7	9.84E-15	1.05E-14	1.11E-14	1.17E-14	1.23E-14	1.23E-14
sn114	3.93E-15	4.44E-15	4.98E-15	5.56E-15	6.17E-15	6.17E-15
sb126	4.22E-15	6.22E-15	6.52E-15	6.83E-15	7.13E-15	5.32E-15
pm154m	3.97E-15	1.37E-12	1.39E-12	1.39E-12	1.39E-12	4.50E-14
sn123	5.38E-16	5.77E-15	5.77E-15	5.77E-15	5.77E-15	5.20E-16
te160	4.87E-16	1.73E-14	1.85E-14	1.97E-14	2.09E-14	2.62E-16
cd115m	3.18E-16	9.31E-14	9.34E-14	9.37E-14	9.40E-14	7.78E-17
te129m	3.63E-16	6.77E-13	6.78E-13	6.79E-13	6.80E-13	5.54E-17
sb124	2.11E-17	1.46E-15	1.50E-15	1.53E-15	1.57E-15	8.19E-18
cd109	1.21E-18	2.24E-18	2.42E-18	2.59E-18	2.78E-18	1.40E-18
pm148	5.12E-18	4.92E-14	4.93E-14	4.93E-14	4.94E-14	1.12E-18
pr143	8.40E-18	9.60E-10	9.59E-10	9.59E-10	9.58E-10	8.30E-20
eu156	9.14E-19	1.56E-11	1.58E-11	1.59E-11	1.61E-11	1.84E-20

1
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 46
power= 1.468E-03mw, burnup=6.7023E+03mwd, flux= 9.23E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	3.18E-04	3.38E-04	3.58E-04	3.78E-04	3.97E-04	3.97E-04
h 2	9.47E-07	1.01E-06	1.07E-06	1.12E-06	1.18E-06	1.18E-06
h 3	1.46E-11	1.57E-11	1.58E-11	1.60E-11	1.62E-11	1.51E-11
h 4	.00E+00	2.30E-35	2.32E-35	2.35E-35	2.37E-35	.00E+00
he 3	6.20E-09	6.53E-09	6.86E-09	7.18E-09	7.49E-09	7.49E-09
he 4	5.27E-05	5.60E-05	5.92E-05	6.25E-05	6.58E-05	6.58E-05
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	6.33E-06	6.73E-06	7.12E-06	7.51E-06	7.90E-06	7.90E-06
ne 21	7.11E-10	7.96E-10	8.85E-10	9.79E-10	1.08E-09	1.08E-09
ne 22	4.16E-08	4.42E-08	4.68E-08	4.94E-08	5.20E-08	5.20E-08
ne 23	2.60E-30	2.61E-15	2.61E-15	2.61E-15	2.61E-15	2.61E-30
na 22	1.18E-11	1.54E-11	1.54E-11	1.54E-11	1.54E-11	1.11E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	9.66E-24	9.55E-09	9.55E-09	9.55E-09	9.55E-09	9.55E-24
na 24m	1.59E-30	1.57E-15	1.57E-15	1.57E-15	1.57E-15	1.57E-30
na 25	8.06E-40	8.98E-25	9.95E-25	1.10E-24	1.20E-24	1.20E-39
mg 24	4.57E-02	4.82E-02	5.07E-02	5.32E-02	5.56E-02	5.56E-02
mg 25	7.79E-08	8.69E-08	9.63E-08	1.06E-07	1.16E-07	1.16E-07
mg 26	9.47E-07	1.01E-06	1.06E-06	1.12E-06	1.18E-06	1.18E-06
mg 27	7.77E-28	7.79E-13	7.79E-13	7.79E-13	7.79E-13	7.79E-28
mg 28	.00E+00	5.74E-25	5.74E-25	5.74E-25	5.74E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	7.16E-26	7.08E-11	7.08E-11	7.08E-11	7.08E-11	7.08E-26
al 29	6.13E-38	6.87E-23	7.64E-23	8.45E-23	9.30E-23	9.30E-38
al 30	.00E+00	5.07E-33	5.97E-33	6.98E-33	8.09E-33	.00E+00
si 28	1.33E-01	1.40E-01	1.48E-01	1.55E-01	1.62E-01	1.62E-01
si 29	6.62E-07	7.42E-07	8.25E-07	9.13E-07	1.01E-06	1.01E-06
si 30	3.44E-12	4.10E-12	4.83E-12	5.64E-12	6.54E-12	6.54E-12
si 31	8.97E-40	1.06E-24	1.25E-24	1.46E-24	1.70E-24	1.70E-39
si 32	5.27E-31	6.33E-31	7.49E-31	8.78E-31	1.02E-30	1.02E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.23E+07	9.23E+07	9.23E+07	9.23E+07	9.23E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 47
power= 1.468E-03mw, burnup=6.7023E+03mwd, flux= 9.23E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	3.56E+00	3.92E+00	4.30E+00	4.70E+00	5.10E+00	5.11E+00
pb206	7.45E-03	8.61E-03	9.85E-03	1.12E-02	1.26E-02	1.26E-02
pb207	7.30E-04	8.22E-04	9.20E-04	1.02E-03	1.13E-03	1.13E-03
pb208	4.18E-05	4.71E-05	5.27E-05	5.85E-05	6.47E-05	6.47E-05
pb209	1.03E-10	1.15E-10	1.26E-10	1.38E-10	1.51E-10	1.51E-10
pb210	5.70E-05	6.15E-05	6.59E-05	7.04E-05	7.49E-05	7.49E-05
pb211	1.43E-11	1.51E-11	1.59E-11	1.67E-11	1.75E-11	1.76E-11
po212	1.43E-11	1.51E-11	1.59E-11	1.68E-11	1.76E-11	1.76E-11
pb214	1.30E-10	1.41E-10	1.51E-10	1.61E-10	1.71E-10	1.71E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	6.94E-04	8.21E-04	9.62E-04	1.12E-03	1.28E-03	1.28E-03
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	3.51E-08	3.78E-08	4.06E-08	4.33E-08	4.61E-08	4.61E-08
bi211	8.45E-13	8.93E-13	9.42E-13	9.91E-13	1.04E-12	1.04E-12
bi212	1.36E-12	1.43E-12	1.51E-12	1.59E-12	1.67E-12	1.67E-12
bi213	2.41E-11	2.68E-11	2.95E-11	3.23E-11	3.52E-11	3.52E-11
bi214	9.68E-11	1.04E-10	1.12E-10	1.19E-10	1.27E-10	1.27E-10
po210	9.59E-07	1.04E-06	1.12E-06	1.20E-06	1.27E-06	1.26E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

po211	9.34E-18	9.87E-18	1.04E-17	1.10E-17	1.15E-17	1.15E-17
po212	7.13E-23	7.53E-23	7.95E-23	8.36E-23	8.77E-23	8.78E-23
po213	3.63E-20	4.03E-20	4.43E-20	4.86E-20	5.29E-20	5.29E-20
po214	1.33E-17	1.44E-17	1.54E-17	1.64E-17	1.75E-17	1.75E-17
po215	1.17E-17	1.24E-17	1.31E-17	1.37E-17	1.44E-17	1.44E-17
po216	5.42E-17	5.72E-17	6.04E-17	6.35E-17	6.66E-17	6.67E-17
po218	1.51E-11	1.63E-11	1.74E-11	1.86E-11	1.98E-11	1.98E-11
rn218	3.88E-34	7.93E-29	8.37E-29	8.80E-29	9.23E-29	2.27E-35
rn219	2.61E-14	2.75E-14	2.91E-14	3.06E-14	3.21E-14	3.21E-14
rn220	2.08E-14	2.19E-14	2.31E-14	2.43E-14	2.55E-14	2.56E-14
rn222	2.68E-08	2.89E-08	3.10E-08	3.31E-08	3.52E-08	3.52E-08
ra222	4.21E-31	8.61E-26	9.08E-26	9.55E-26	1.00E-25	2.47E-32
ra223	6.50E-09	6.87E-09	7.25E-09	7.62E-09	8.00E-09	8.02E-09
ra224	1.18E-10	1.25E-10	1.32E-10	1.38E-10	1.45E-10	1.45E-10
ra225	1.13E-08	1.25E-08	1.38E-08	1.51E-08	1.64E-08	1.65E-08
ra226	4.09E-03	4.41E-03	4.73E-03	5.05E-03	5.37E-03	5.37E-03
ra228	2.14E-11	2.27E-11	2.41E-11	2.54E-11	2.68E-11	2.68E-11
ac225	7.63E-09	8.46E-09	9.32E-09	1.02E-08	1.11E-08	1.11E-08
ac227	4.51E-06	4.78E-06	5.04E-06	5.30E-06	5.56E-06	5.56E-06
ac228	2.61E-15	2.77E-15	2.94E-15	3.10E-15	3.27E-15	3.27E-15
th226	2.06E-29	4.20E-24	4.43E-24	4.66E-24	4.89E-24	1.20E-30
th227	1.05E-08	1.11E-08	1.17E-08	1.23E-08	1.29E-08	1.29E-08
th228	2.25E-08	2.38E-08	2.51E-08	2.64E-08	2.77E-08	2.77E-08
th229	2.20E-03	2.44E-03	2.68E-03	2.94E-03	3.20E-03	3.20E-03
th230	2.49E-01	2.64E-01	2.79E-01	2.94E-01	3.09E-01	3.09E-01
th231	2.92E-09	3.34E-09	3.36E-09	3.38E-09	3.40E-09	2.90E-09
th232	5.22E-02	5.55E-02	5.88E-02	6.21E-02	6.54E-02	6.55E-02
th233	1.73E-28	1.84E-13	1.95E-13	2.05E-13	2.16E-13	2.16E-28
th234	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	6.79E-03	7.19E-03	7.58E-03	7.98E-03	8.37E-03	8.37E-03
pa232	4.21E-26	4.45E-11	4.70E-11	4.94E-11	5.19E-11	5.19E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 48
power= 1.468E-03mw, burnup=6.7023E+03mwd, flux= 9.23E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.44E-06	1.44E-06	1.44E-06	1.44E-06	1.44E-06	1.44E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.99E-26	4.07E-21	4.30E-21	4.52E-21	4.74E-21	1.17E-27
u231	3.58E-32	3.80E-17	4.01E-17	4.22E-17	4.43E-17	4.43E-32
u232	8.13E-07	8.69E-07	9.17E-07	9.64E-07	1.01E-06	9.99E-07
u233	1.31E-01	1.39E-01	1.47E-01	1.54E-01	1.62E-01	1.62E-01
u234	9.42E+00	9.44E+00	9.47E+00	9.49E+00	9.51E+00	9.51E+00
u235	7.06E+02	7.04E+02	7.03E+02	7.01E+02	7.00E+02	7.00E+02
u236	1.79E+02	1.79E+02	1.79E+02	1.79E+02	1.79E+02	1.79E+02
u237	6.96E-15	1.14E-06	1.14E-06	1.14E-06	1.14E-06	9.56E-15
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	1.12E-22	1.12E-07	1.12E-07	1.12E-07	1.12E-07	1.12E-22
u240	1.33E-39	2.26E-39	3.69E-39	5.64E-39	8.62E-39	8.62E-39
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.64E-12	3.12E-12	3.11E-12	3.11E-12	3.11E-12	1.40E-12
np236m	7.40E-28	7.40E-13	7.40E-13	7.39E-13	7.39E-13	7.39E-28
np236	6.97E-07	7.38E-07	7.79E-07	8.20E-07	8.60E-07	8.60E-07
np237	4.18E+01	4.18E+01	4.17E+01	4.17E+01	4.17E+01	4.17E+01
np238	1.93E-14	5.50E-07	5.50E-07	5.49E-07	5.49E-07	2.77E-14
np239	6.38E-15	1.62E-05	1.62E-05	1.62E-05	1.62E-05	1.32E-14
np240m	1.14E-41	1.93E-41	3.15E-41	4.82E-41	7.36E-41	7.36E-41

np240	4.66E-40	1.18E-15	1.18E-15	1.18E-15	1.18E-15	9.61E-40
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	3.18E-10	4.03E-10	4.03E-10	4.03E-10	4.03E-10	2.99E-10
pu237	2.76E-16	7.74E-14	7.96E-14	8.18E-14	8.39E-14	7.60E-17
pu238	8.27E-03	8.32E-03	8.32E-03	8.31E-03	8.31E-03	8.23E-03
pu239	1.47E+01	1.54E+01	1.61E+01	1.68E+01	1.75E+01	1.75E+01
pu240	1.61E-01	1.76E-01	1.92E-01	2.08E-01	2.24E-01	2.24E-01
pu241	2.26E-05	2.60E-05	2.83E-05	3.06E-05	3.30E-05	3.10E-05
pu242	2.26E-06	2.68E-06	3.13E-06	3.63E-06	4.16E-06	4.16E-06
pu243	1.73E-30	2.04E-15	2.38E-15	2.76E-15	3.17E-15	3.18E-30
pu244	6.88E-29	1.13E-28	1.81E-28	2.82E-28	4.29E-28	4.30E-28
pu245	.00E+00	1.68E-39	2.67E-39	4.20E-39	6.34E-39	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	6.34E-35	6.99E-20	7.67E-20	8.35E-20	9.03E-20	9.04E-35
am240	2.90E-32	3.20E-17	3.51E-17	3.82E-17	4.13E-17	4.13E-32
am241	6.36E-04	7.02E-04	7.69E-04	8.37E-04	9.07E-04	9.07E-04
am242m	1.04E-07	1.16E-07	1.27E-07	1.39E-07	1.50E-07	1.50E-07
am242	1.35E-12	9.53E-12	1.04E-11	1.14E-11	1.23E-11	1.93E-12
am243	7.29E-09	8.89E-09	1.07E-08	1.28E-08	1.50E-08	1.50E-08
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.99E-32	2.43E-17	2.92E-17	3.48E-17	4.11E-17	4.11E-32
am245	.00E+00	3.43E-40	5.37E-40	8.50E-40	1.28E-39	1.49E-41
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	8.12E-26	2.02E-22	2.21E-22	2.41E-22	2.61E-22	1.68E-26
cm242	5.85E-10	1.92E-09	2.11E-09	2.30E-09	2.49E-09	6.92E-10
cm243	1.41E-14	1.59E-14	1.74E-14	1.90E-14	2.05E-14	1.99E-14
cm244	3.01E-13	3.81E-13	4.59E-13	5.47E-13	6.45E-13	6.15E-13

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 49
power= 1.468E-03mw, burnup=6.7023E+03mwd, flux= 9.23E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
cm245	2.35E-16	3.03E-16	3.84E-16	4.80E-16	5.92E-16	5.92E-16
cm246	7.60E-19	1.03E-18	1.37E-18	1.79E-18	2.31E-18	2.31E-18
cm247	4.83E-23	7.00E-23	9.91E-23	1.37E-22	1.87E-22	1.87E-22
cm248	3.04E-26	4.70E-26	7.07E-26	1.04E-25	1.50E-25	1.50E-25
cm249	.00E+00	5.33E-37	8.02E-37	1.18E-36	1.70E-36	.00E+00
cm250	6.00E-42	9.86E-42	1.57E-41	2.44E-41	3.70E-41	3.70E-41
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		9.23E+07	9.23E+07	9.23E+07	9.23E+07	9.23E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54g array has 12 entries.
library information...

cross-section data taken from position number 6 of library on unit 33.

pass 1
pass 0
scale-system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densiities
pass n applies mid time densities of nth library interval
first library updated was...
pass 1

```
      pass   0
      *scale-system control module sas2 library*
      used a time-dependent neutron spectrum, for each of the above passes
        pass 0 applies start-up fuel densiities
        pass n applies mid time densities of nth library interval
      first library updated was...
      ********************************************************************************
      *                                                                              *
      *           prelim lwr origen-s binary working library--id = 1143              *
      *         made from modified card-image origen-s libraries of scale 4.2        *
      *       data from the light element, actinide, and fission product libraries   *
      *         decay data, including gamma and total energy, are from endf/b-vi     *
      *                                                                              *
      *       neutron flux spectrum factors and cross sections were produced from    *
      *      the "presas2" case updating all nuclides on the scale "burnup" library  *
      *                                                                              *
      *                    fission product yields are from endf/b-v                  *
      *                                                                              *
      *              photon libraries use an 18-energy-group structure               *
      *             the photon data are from the master photon data base,            *
      *              produced to include bremsstrahlung from uo2 matrix              *
      *                                                                              *
      *         see information above this box (if present) for later updates        *
      *                                                                              *
      ********************************************************************************
      *                                                                              *
0     ********************************************************************************
0               .other identification and sizes of library.
0                data set name:  ft33f001
0              8/29/1996    date library was produced
0                   1697    total number of nuclides in library
                     689    number of light-element nuclides
                     129    number of actinide nuclides
                     879    number of fission product nuclides
0                   7993    number of nonzero off-diagonal matrix elements
0     ********************************************************************************
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page   50
        power=    .00mw, burnup=   8043.mwd, flux= 9.22E+07n/cm**2-sec
0                                    basis =
0   (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                 initial      ******* d      ******* d      ******* d      ******* d      ******* d
    productions  1.230308E+06  1.230539E+06  1.230739E+06  1.230910E+06  1.231051E+06  1.231049E+06
    absorptions  9.935671E+05  9.939184E+05  9.942503E+05  9.945639E+05  9.948606E+05  9.948588E+05
    k infinity   1.238274E+00  1.238068E+00  1.237857E+00  1.237638E+00  1.237410E+00  1.237411E+00
0                 initial      ******* d      ******* d      ******* d      ******* d      ******* d
    actinide
    absorptions  9.816583E+05  9.818589E+05  9.820431E+05  9.822113E+05  9.823639E+05  9.823629E+05
    non-actinide
    abs. fracs.  1.198596E-02  1.[illegible]  1.[illegible]  1.[illegible]  1.250152E-02  1.[illegible]
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2          fission products        page   51
0                          fraction of total absorption rate
        power=    .00mw, burnup=   8043.mwd, flux= 9.22E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d ******* d

    sm149     5.44E-03  5.45E-03  5.45E-03  5.45E-03  5.45E-03  5.45E-03
    eu151     8.42E-04  8.76E-04  9.09E-04  9.41E-04  9.73E-04  9.73E-04
    nd143     6.63E-04  6.96E-04  7.28E-04  7.60E-04  7.92E-04  7.92E-04
    rh103     3.12E-04  3.28E-04  3.43E-04  3.59E-04  3.75E-04  3.75E-04
    xe131     2.12E-04  2.22E-04  2.33E-04  2.43E-04  2.54E-04  2.54E-04
    cs133     1.64E-04  1.73E-04  1.81E-04  1.89E-04  1.97E-04  1.97E-04
```

gd155	1.86E-04	1.89E-04	1.91E-04	1.93E-04	1.95E-04	1.95E-04
sm147	1.22E-04	1.28E-04	1.34E-04	1.40E-04	1.45E-04	1.46E-04
tc 99	1.18E-04	1.24E-04	1.30E-04	1.36E-04	1.41E-04	1.41E-04
nd145	9.33E-05	9.79E-05	1.02E-04	1.07E-04	1.12E-04	1.12E-04
cd113	9.09E-05	9.18E-05	9.25E-05	9.32E-05	9.39E-05	9.39E-05
mo 95	6.47E-05	6.79E-05	7.10E-05	7.42E-05	7.74E-05	7.74E-05
sm152	5.96E-05	6.29E-05	6.63E-05	6.98E-05	7.32E-05	7.32E-05
sm150	4.25E-05	4.50E-05	4.76E-05	5.01E-05	5.26E-05	5.26E-05
gd157	4.93E-05	4.99E-05	5.04E-05	5.10E-05	5.15E-05	5.15E-05
kr 83	4.03E-05	4.23E-05	4.43E-05	4.62E-05	4.82E-05	4.82E-05
cs135	3.71E-05	3.90E-05	4.08E-05	4.27E-05	4.45E-05	4.45E-05
ru101	2.88E-05	3.03E-05	3.17E-05	3.31E-05	3.46E-05	3.46E-05
pr141	2.77E-05	2.90E-05	3.04E-05	3.18E-05	3.31E-05	3.31E-05
eu153	2.69E-05	2.83E-05	2.97E-05	3.11E-05	3.25E-05	3.25E-05
la139	2.26E-05	2.38E-05	2.49E-05	2.60E-05	2.71E-05	2.71E-05
sm151	1.75E-05	1.77E-05	1.77E-05	1.78E-05	1.78E-05	1.76E-05
ba137	1.08E-05	1.14E-05	1.19E-05	1.25E-05	1.30E-05	1.30E-05
pd105	1.05E-05	1.10E-05	1.16E-05	1.21E-05	1.27E-05	1.27E-05
zr 93	9.07E-06	9.51E-06	9.95E-06	1.04E-05	1.08E-05	1.08E-05
ag109	7.20E-06	7.71E-06	8.24E-06	8.78E-06	9.33E-06	9.33E-06
i129	7.20E-06	7.56E-06	7.93E-06	8.29E-06	8.66E-06	8.66E-06
nd144	6.86E-06	7.20E-06	7.54E-06	7.88E-06	8.23E-06	8.23E-06
mo 97	5.14E-06	5.39E-06	5.65E-06	5.90E-06	6.15E-06	6.15E-06
gd152	2.32E-06	2.54E-06	2.77E-06	3.01E-06	3.26E-06	3.26E-06
zr 91	2.39E-06	2.51E-06	2.63E-06	2.75E-06	2.86E-06	2.86E-06
y 89	2.29E-06	2.40E-06	2.52E-06	2.63E-06	2.74E-06	2.74E-06
ru102	2.12E-06	2.22E-06	2.33E-06	2.43E-06	2.54E-06	2.54E-06
pd108	1.92E-06	2.04E-06	2.17E-06	2.30E-06	2.44E-06	2.44E-06
ce142	1.88E-06	1.98E-06	2.07E-06	2.16E-06	2.26E-06	2.26E-06
nd148	1.81E-06	1.90E-06	1.99E-06	2.08E-06	2.17E-06	2.17E-06
nd146	1.52E-06	1.60E-06	1.67E-06	1.75E-06	1.82E-06	1.82E-06
in115	1.30E-06	1.36E-06	1.43E-06	1.50E-06	1.56E-06	1.56E-06
ba138	1.30E-06	1.36E-06	1.43E-06	1.49E-06	1.56E-06	1.56E-06
ce140	1.28E-06	1.28E-06	1.34E-06	1.40E-06	1.46E-06	1.46E-06
xe132	1.10E-06	1.16E-06	1.21E-06	1.27E-06	1.32E-06	1.32E-06
pd107	1.03E-06	1.09E-06	1.15E-06	1.22E-06	1.29E-06	1.29E-06
mo 98	7.51E-07	7.89E-07	8.26E-07	8.63E-07	9.00E-07	9.00E-07
mo100	7.29E-07	7.66E-07	8.02E-07	8.38E-07	8.74E-07	8.74E-07
xe134	7.19E-07	7.55E-07	7.90E-07	8.26E-07	8.62E-07	8.62E-07
zr 92	5.78E-07	6.06E-07	6.35E-07	6.63E-07	6.91E-07	6.91E-07
i127	5.03E-07	5.30E-07	5.56E-07	5.83E-07	6.09E-07	6.09E-07
ru104	4.69E-07	4.93E-07	5.17E-07	5.42E-07	5.66E-07	5.66E-07
ru 99	3.86E-07	4.25E-07	4.65E-07	5.08E-07	5.53E-07	5.53E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 52

0 fraction of total absorption rate

power= .00mw, burnup= 8043.mwd, flux= 9.22E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	4.54E-07	4.77E-07	4.99E-07	5.21E-07	5.44E-07	5.44E-07
nd150	4.00E-07	4.23E-07	4.46E-07	4.68E-07	4.87E-07	4.87E-07
xe136	3.89E-07	4.08E-07	4.28E-07	4.47E-07	4.66E-07	4.66E-07
br 81	2.94E-07	3.05E-07	3.19E-07	3.33E-07	3.48E-07	3.48E-07
rb 85	2.81E-07	2.95E-07	3.09E-07	3.22E-07	3.36E-07	3.36E-07
cd111	2.45E-07	2.59E-07	2.74E-07	2.89E-07	3.04E-07	3.04E-07
zr 94	2.44E-07	2.56E-07	2.69E-07	2.81E-07	2.93E-07	2.93E-07
zr 90	2.26E-07	2.37E-07	2.48E-07	2.59E-07	2.70E-07	2.70E-07
sm154	1.81E-07	1.90E-07	2.00E-07	2.09E-07	2.19E-07	2.19E-07
te130	1.78E-07	1.87E-07	1.96E-07	2.05E-07	2.14E-07	2.14E-07
rb 87	1.62E-07	1.70E-07	1.78E-07	1.86E-07	1.94E-07	1.94E-07
se 77	1.17E-07	1.23E-07	1.28E-07	1.34E-07	1.40E-07	1.40E-07

pd106	9.86E-08	1.04E-07	1.10E-07	1.16E-07	1.21E-07	1.21E-07
gd154	8.11E-08	8.94E-08	9.82E-08	1.07E-07	1.17E-07	1.17E-07
gd156	8.35E-08	8.91E-08	9.47E-08	1.00E-07	1.06E-07	1.06E-07
kr 84	7.68E-08	8.06E-08	8.43E-08	8.81E-08	9.19E-08	9.19E-08
eu152	7.47E-08	8.29E-08	8.61E-08	8.91E-08	9.21E-08	8.52E-08
sb121	5.92E-08	6.22E-08	6.52E-08	6.83E-08	7.13E-08	7.13E-08
se 79	5.94E-08	6.23E-08	6.52E-08	6.81E-08	7.10E-08	7.10E-08
pm147	7.16E-08	9.84E-08	9.84E-08	9.83E-08	9.83E-08	6.69E-08
dy161	4.50E-08	4.82E-08	5.13E-08	5.46E-08	5.79E-08	5.79E-08
sb123	4.79E-08	5.04E-08	5.29E-08	5.53E-08	5.78E-08	5.78E-08
ba135	3.74E-08	4.12E-08	4.52E-08	4.94E-08	5.38E-08	5.38E-08
kr 86	4.28E-08	4.49E-08	4.70E-08	4.91E-08	5.12E-08	5.12E-08
eu155	5.19E-08	6.27E-08	6.30E-08	6.33E-08	6.36E-08	5.09E-08
te128	3.96E-08	4.16E-08	4.36E-08	4.56E-08	4.76E-08	4.76E-08
ru100	2.44E-08	2.68E-08	2.94E-08	3.21E-08	3.49E-08	3.49E-08
se 80	2.79E-08	2.93E-08	3.07E-08	3.21E-08	3.35E-08	3.35E-08
te125	2.59E-08	2.72E-08	2.86E-08	2.99E-08	3.13E-08	3.13E-08
tb159	2.24E-08	2.38E-08	2.52E-08	2.66E-08	2.81E-08	2.81E-08
nd142	1.72E-08	1.90E-08	2.08E-08	2.28E-08	2.48E-08	2.48E-08
ba134	1.66E-08	1.83E-08	2.00E-08	2.19E-08	2.38E-08	2.38E-08
gd158	1.81E-08	1.92E-08	2.04E-08	2.15E-08	2.27E-08	2.27E-08
cd112	1.83E-08	1.93E-08	2.03E-08	2.13E-08	2.24E-08	2.24E-08
sm148	1.52E-08	1.67E-08	1.83E-08	2.00E-08	2.18E-08	2.18E-08
li 6	1.54E-08	1.62E-08	1.69E-08	1.77E-08	1.84E-08	1.84E-08
sn117	1.37E-08	1.44E-08	1.51E-08	1.59E-08	1.66E-08	1.66E-08
pd104	1.12E-08	1.24E-08	1.36E-08	1.49E-08	1.62E-08	1.62E-08
cd114	1.06E-08	1.12E-08	1.19E-08	1.25E-08	1.32E-08	1.32E-08
sn119	1.08E-08	1.14E-08	1.20E-08	1.25E-08	1.31E-08	1.31E-08
dy164	9.17E-09	9.89E-09	1.06E-08	1.14E-08	1.21E-08	1.21E-08
sn115	9.93E-09	1.04E-08	1.10E-08	1.15E-08	1.20E-08	1.20E-08
dy162	8.47E-09	9.13E-09	9.81E-09	1.05E-08	1.12E-08	1.12E-08
pd110	7.83E-09	8.31E-09	8.81E-09	9.31E-09	9.81E-09	9.81E-09
sr 88	7.86E-09	8.25E-09	8.63E-09	9.02E-09	9.40E-09	9.40E-09
nb 93	6.02E-09	6.63E-09	7.28E-09	7.95E-09	8.65E-09	8.65E-09
se 82	5.37E-09	5.63E-09	5.90E-09	6.16E-09	6.42E-09	6.42E-09
sr 90	5.87E-09	6.05E-09	6.04E-09	6.03E-09	6.02E-09	5.80E-09
mo 96	4.03E-09	4.42E-09	4.83E-09	5.26E-09	5.71E-09	5.71E-09

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 53
0 fraction of total absorption rate
power= .00mw, burnup= 8043.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sn126	4.62E-09	4.86E-09	5.10E-09	5.34E-09	5.59E-09	5.59E-09
se 78	4.13E-09	4.34E-09	4.54E-09	4.75E-09	4.95E-09	4.95E-09
eu154	3.91E-09	4.55E-09	4.77E-09	5.00E-09	5.23E-09	4.63E-09
br 79	3.03E-09	3.34E-09	3.66E-09	4.00E-09	4.35E-09	4.35E-09
sn124	3.45E-09	3.63E-09	3.81E-09	3.99E-09	4.17E-09	4.17E-09
cd110	3.52E-09	3.82E-09	4.15E-09	4.50E-09	3.87E-09	3.87E-09
ba136	2.65E-09	2.83E-09	3.05E-09	3.28E-09	3.46E-09	3.46E-09
ag107	2.09E-09	2.32E-09	2.57E-09	2.83E-09	3.11E-09	3.11E-09
xe130	2.19E-09	2.39E-09	2.60E-09	2.82E-09	3.04E-09	3.04E-09
as 75	2.45E-09	2.57E-09	2.69E-09	2.81E-09	2.93E-09	2.93E-09
dy163	2.10E-09	2.27E-09	2.44E-09	2.61E-09	2.80E-09	2.80E-09
kr 82	1.96E-09	2.12E-09	2.28E-09	2.44E-09	2.61E-09	2.61E-09
xe129	1.75E-09	1.94E-09	2.12E-09	2.32E-09	2.53E-09	2.53E-09
in113	1.94E-09	2.04E-09	2.15E-09	2.25E-09	2.35E-09	2.35E-09
sn118	1.40E-09	1.47E-09	1.54E-09	1.62E-09	1.69E-09	1.69E-09
te126	1.08E-09	1.19E-09	1.30E-09	1.41E-09	1.54E-09	1.54E-09
sn122	1.19E-09	1.25E-09	1.32E-09	1.38E-09	1.44E-09	1.44E-09
cd116	1.18E-09	1.24E-09	1.30E-09	1.37E-09	1.43E-09	1.43E-09

cs137	1.33E-09	1.37E-09	1.37E-09	1.37E-09	1.37E-09	1.32E-09
sn120	8.86E-10	9.31E-10	9.77E-10	1.02E-09	1.07E-09	1.07E-09
ge 73	6.82E-10	7.17E-10	7.51E-10	7.86E-10	8.20E-10	8.20E-10
cs134	2.90E-10	4.64E-10	4.86E-10	5.08E-10	5.30E-10	3.20E-10
gd160	2.33E-10	2.48E-10	2.63E-10	2.79E-10	2.95E-10	2.95E-10
ge 76	2.41E-10	2.52E-10	2.64E-10	2.76E-10	2.88E-10	2.88E-10
ho165	1.64E-10	1.78E-10	1.92E-10	2.07E-10	2.23E-10	2.23E-10
kr 85	1.88E-10	2.03E-10	2.03E-10	2.03E-10	2.02E-10	1.84E-10
dy160	9.19E-11	1.02E-10	1.12E-10	1.24E-10	1.35E-10	1.35E-10
xe128	6.34E-11	6.99E-11	7.67E-11	8.38E-11	9.13E-11	9.13E-11
ce144	7.08E-11	2.15E-10	2.15E-10	2.14E-10	2.14E-10	5.65E-11
te124	4.32E-11	4.61E-11	4.91E-11	5.21E-11	5.53E-11	5.53E-11
sr 86	3.74E-11	4.08E-11	4.43E-11	4.80E-11	5.18E-11	5.18E-11
sr 87	3.02E-11	3.18E-11	3.34E-11	3.51E-11	3.67E-11	3.67E-11
sn116	2.43E-11	2.69E-11	2.95E-11	3.23E-11	3.51E-11	3.51E-11
nb 94	1.77E-11	1.88E-11	2.00E-11	2.13E-11	2.25E-11	2.25E-11
se 76	1.25E-11	1.35E-11	1.45E-11	1.56E-11	1.67E-11	1.67E-11
ge 74	1.37E-11	1.44E-11	1.51E-11	1.58E-11	1.65E-11	1.65E-11
te122	1.02E-11	1.12E-11	1.23E-11	1.35E-11	1.47E-11	1.47E-11
er166	8.57E-12	9.32E-12	1.01E-11	1.09E-11	1.17E-11	1.17E-11
ge 72	9.62E-12	1.01E-11	1.06E-11	1.11E-11	1.16E-11	1.16E-11
y 90	5.59E-12	5.76E-12	5.75E-12	5.74E-12	5.73E-12	5.52E-12
ru106	5.25E-12	1.24E-11	1.25E-11	1.26E-11	1.28E-11	4.59E-12
sb125	4.40E-12	6.04E-12	6.06E-12	6.08E-12	6.10E-12	4.18E-12
kr 80	1.57E-12	1.76E-12	1.97E-12	2.20E-12	2.45E-12	2.45E-12
er167	3.36E-13	3.80E-13	4.27E-13	4.78E-13	5.32E-13	5.32E-13
nb 95	8.62E-13	5.48E-11	5.47E-11	5.47E-11	5.46E-11	3.18E-13
te123	1.99E-13	2.25E-13	2.53E-13	2.84E-13	3.17E-13	3.17E-13
zr 95	4.21E-13	5.90E-11	5.90E-11	5.90E-11	5.89E-11	1.56E-13
cd108	5.74E-14	6.68E-14	7.72E-14	8.86E-14	1.01E-13	1.01E-13
te127m	1.72E-13	3.04E-12	3.06E-12	3.07E-12	3.08E-12	9.79E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 54
0 fraction of total absorption rate
power= .00mw, burnup= 8043.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

y 91	2.29E-13	5.08E-11	5.08E-11	5.07E-11	5.06E-11	7.72E-14
be 9	3.02E-14	3.17E-14	3.31E-14	3.46E-14	3.61E-14	3.61E-14
li 7	1.23E-14	1.29E-14	1.35E-14	1.41E-14	1.47E-14	1.47E-14
sn114	6.17E-15	6.81E-15	7.48E-15	8.19E-15	8.93E-15	8.93E-15
ru103	4.29E-14	1.36E-10	1.37E-10	1.37E-10	1.37E-10	8.60E-15
sb126	5.32E-15	7.43E-15	7.73E-15	8.03E-15	8.34E-15	6.42E-15
sr 89	2.08E-14	1.08E-11	1.08E-11	1.08E-11	1.08E-11	5.89E-15
ce141	3.43E-14	5.78E-10	5.77E-10	5.77E-10	5.77E-10	4.87E-15
sn123	3.26E-16	3.78E-15	3.79E-15	3.79E-15	3.79E-15	2.00E-16
pm148m	6.49E-16	1.39E-12	1.39E-12	1.40E-12	1.40E-12	1.42E-16
tb160	2.62E-16	2.21E-14	2.33E-14	2.46E-14	2.59E-14	1.35E-16
cd115m	7.78E-17	9.43E-14	9.46E-14	9.48E-14	9.51E-14	1.90E-17
te129m	5.54E-17	6.80E-13	6.81E-13	6.82E-13	6.83E-13	8.45E-18
sb124	8.19E-18	1.61E-15	1.65E-15	1.69E-15	1.73E-15	3.14E-18
cd109	1.40E-18	2.98E-18	3.20E-18	3.42E-18	3.66E-18	1.61E-18
pm148	1.11E-18	4.94E-14	4.95E-14	4.95E-14	4.96E-14	2.48E-19

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 55
power= 1.468E-03mw, burnup=8.0428E+03mwd, flux= 9.22E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
h 1	3.97E-04	4.17E-04	4.37E-04	4.57E-04	4.77E-04	4.77E-04
h 2	1.18E-06	1.24E-06	1.30E-06	1.36E-06	1.42E-06	1.42E-06

h 3	1.51E-11	1.64E-11	1.65E-11	1.67E-11	1.68E-11	1.55E-11
h 4	.00E+00	2.40E-35	2.42E-35	2.45E-35	2.47E-35	.00E+00
he 3	7.49E-09	7.80E-09	8.10E-09	8.40E-09	8.70E-09	8.70E-09
he 4	6.58E-05	6.91E-05	7.24E-05	7.56E-05	7.89E-05	7.89E-05
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	7.90E-06	8.30E-06	8.69E-06	9.09E-06	9.48E-06	9.48E-06
ne 21	1.08E-09	1.18E-09	1.29E-09	1.40E-09	1.51E-09	1.51E-09
ne 22	5.20E-08	5.46E-08	5.72E-08	5.98E-08	6.24E-08	6.24E-08
ne 23	2.61E-30	2.62E-15	2.62E-15	2.62E-15	2.62E-15	2.62E-30
na 22	1.11E-11	1.55E-11	1.55E-11	1.55E-11	1.55E-11	1.04E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	9.55E-24	9.56E-09	9.56E-09	9.56E-09	9.56E-09	9.56E-24
na 24m	1.57E-30	1.57E-15	1.57E-15	1.57E-15	1.57E-15	1.57E-30
na 25	1.20E-39	1.32E-24	1.43E-24	1.55E-24	1.68E-24	1.68E-39
mg 24	5.56E-02	5.81E-02	6.06E-02	6.31E-02	6.55E-02	6.55E-02
mg 25	1.16E-07	1.27E-07	1.38E-07	1.50E-07	1.62E-07	1.62E-07
mg 26	1.18E-06	1.24E-06	1.30E-06	1.36E-06	1.42E-06	1.42E-06
mg 27	7.79E-28	7.82E-13	7.82E-13	7.82E-13	7.82E-13	7.82E-28
mg 28	.00E+00	5.76E-25	5.76E-25	5.76E-25	5.76E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	7.08E-26	7.08E-11	7.08E-11	7.08E-11	7.08E-11	7.09E-26
al 29	9.30E-38	1.02E-22	1.11E-22	1.21E-22	1.31E-22	1.31E-37
al 30	.00E+00	9.32E-33	1.07E-32	1.21E-32	1.37E-32	.00E+00
si 28	1.62E-01	1.69E-01	1.76E-01	1.84E-01	1.91E-01	1.91E-01
si 29	1.01E-06	1.10E-06	1.20E-06	1.31E-06	1.42E-06	1.42E-06
si 30	6.54E-12	7.53E-12	8.60E-12	9.78E-12	1.11E-11	1.11E-11
si 31	1.70E-39	1.95E-24	2.23E-24	2.53E-24	2.86E-24	2.86E-39
si 32	1.02E-30	1.18E-30	1.35E-30	1.54E-30	1.74E-30	1.73E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.22E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 56
power= 1.468E-03mw, burnup=8.0428E+03mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge ******* d	******* d	******* d	******* d	******* d	******* d
he 4	5.11E+00	5.53E+00	5.96E+00	6.41E+00	6.87E+00	6.87E+00
pb206	1.26E-02	1.41E-02	1.57E-02	1.74E-02	1.91E-02	1.91E-02
pb207	1.13E-03	1.24E-03	1.36E-03	1.49E-03	1.61E-03	1.61E-03
pb208	6.47E-05	7.12E-05	7.79E-05	8.49E-05	9.23E-05	9.23E-05
pb209	1.51E-10	1.63E-10	1.76E-10	1.89E-10	2.03E-10	2.03E-10
pb210	7.49E-05	7.93E-05	8.37E-05	8.82E-05	9.26E-05	9.26E-05
pb211	1.76E-11	1.84E-11	1.92E-11	2.00E-11	2.08E-11	2.08E-11
pb212	1.76E-11	1.84E-11	1.92E-11	2.00E-11	2.08E-11	2.08E-11
pb214	1.71E-10	1.81E-10	1.91E-10	2.01E-10	2.12E-10	2.12E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	1.28E-03	1.47E-03	1.67E-03	1.88E-03	2.11E-03	2.11E-03
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	4.61E-08	4.88E-08	5.15E-08	5.43E-08	5.70E-08	5.70E-08
bi211	1.04E-12	1.09E-12	1.14E-12	1.18E-12	1.23E-12	1.23E-12
bi212	1.67E-12	1.75E-12	1.82E-12	1.90E-12	1.98E-12	1.97E-12
bi213	3.52E-11	3.81E-11	4.11E-11	4.42E-11	4.73E-11	4.73E-11
bi214	1.27E-10	1.35E-10	1.42E-10	1.50E-10	1.57E-10	1.57E-10
po210	1.26E-06	1.35E-06	1.42E-06	1.50E-06	1.57E-06	1.56E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	1.15E-17	1.20E-17	1.26E-17	1.31E-17	1.36E-17	1.36E-17
po212	8.78E-23	9.17E-23	9.58E-23	9.98E-23	1.04E-22	1.04E-22
po213	5.29E-20	5.73E-20	6.18E-20	6.64E-20	7.11E-20	7.11E-20
po214	1.75E-17	1.85E-17	1.96E-17	2.06E-17	2.16E-17	2.16E-17
po215	1.44E-17	1.51E-17	1.57E-17	1.64E-17	1.71E-17	1.71E-17

po216	6.67E-17	6.97E-17	7.28E-17	7.58E-17	7.88E-17	7.88E-17
po218	1.98E-11	2.10E-11	2.21E-11	2.33E-11	2.45E-11	2.45E-11
rn218	2.27E-35	9.67E-29	1.01E-28	1.05E-28	1.09E-28	1.28E-36
rn219	3.21E-14	3.35E-14	3.50E-14	3.65E-14	3.80E-14	3.80E-14
rn220	2.56E-14	2.67E-14	2.79E-14	2.91E-14	3.02E-14	3.02E-14
rn222	3.52E-08	3.73E-08	3.93E-08	4.14E-08	4.35E-08	4.35E-08
ra222	2.47E-32	1.05E-25	1.10E-25	1.14E-25	1.19E-25	1.39E-33
ra223	8.02E-09	8.37E-09	8.74E-09	9.10E-09	9.47E-09	9.49E-09
ra224	1.45E-10	1.52E-10	1.59E-10	1.65E-10	1.72E-10	1.72E-10
ra225	1.65E-08	1.78E-08	1.92E-08	2.07E-08	2.21E-08	2.21E-08
ra226	5.37E-03	5.69E-03	6.01E-03	6.33E-03	6.64E-03	6.64E-03
ra228	2.68E-11	2.81E-11	2.95E-11	3.09E-11	3.22E-11	3.22E-11
ac225	1.11E-08	1.20E-08	1.30E-08	1.40E-08	1.49E-08	1.50E-08
ac227	5.56E-06	5.82E-06	6.08E-06	6.33E-06	6.58E-06	6.58E-06
ac228	3.27E-15	3.43E-15	3.60E-15	3.77E-15	3.93E-15	3.93E-15
th226	1.20E-30	5.12E-24	5.35E-24	5.57E-24	5.80E-24	6.79E-32
th227	1.29E-08	1.35E-08	1.41E-08	1.47E-08	1.53E-08	1.53E-08
th228	2.77E-08	2.90E-08	3.03E-08	3.16E-08	3.28E-08	3.27E-08
th229	3.20E-03	3.47E-03	3.74E-03	4.02E-03	4.30E-03	4.30E-03
th230	3.09E-01	3.24E-01	3.38E-01	3.53E-01	3.68E-01	3.68E-01
th231	2.90E-09	3.42E-09	3.44E-09	3.46E-09	3.48E-09	2.87E-09
th232	6.55E-02	6.88E-02	7.21E-02	7.54E-02	7.88E-02	7.88E-02
th233	2.16E-28	2.27E-13	2.38E-13	2.49E-13	2.61E-13	2.61E-28
th234	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	8.37E-03	8.75E-03	9.14E-03	9.52E-03	9.90E-03	9.90E-03
pa232	5.19E-26	5.43E-11	5.67E-11	5.90E-11	6.14E-11	6.14E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 57
power= 1.468E-03mw, burnup=8.0428E+03mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.44E-06	1.44E-06	1.44E-06	1.44E-06	1.44E-06	1.44E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.17E-27	4.96E-21	5.18E-21	5.40E-21	5.62E-21	6.57E-29
u231	4.43E-32	4.65E-17	4.86E-17	5.06E-17	5.27E-17	5.27E-32
u232	9.99E-07	1.06E-06	1.11E-06	1.15E-06	1.20E-06	1.18E-06
u233	1.62E-01	1.70E-01	1.77E-01	1.85E-01	1.92E-01	1.92E-01
u234	9.51E+00	9.53E+00	9.56E+00	9.58E+00	9.60E+00	9.60E+00
u235	7.00E+02	6.99E+02	6.97E+02	6.96E+02	6.95E+02	6.95E+02
u236	1.79E+02	1.80E+02	1.80E+02	1.80E+02	1.80E+02	1.80E+02
u237	9.56E-13	1.15E-06	1.15E-06	1.15E-06	1.15E-06	1.22E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	1.12E-22	1.12E-07	1.12E-07	1.12E-07	1.12E-07	1.12E-22
u240	8.62E-39	1.28E-38	1.87E-38	2.68E-38	3.78E-38	3.78E-38
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.40E-12	3.12E-12	3.12E-12	3.11E-12	3.11E-12	1.19E-12
np236m	7.39E-28	7.40E-13	7.40E-13	7.40E-13	7.39E-13	7.39E-28
np236	8.60E-07	9.01E-07	9.41E-07	9.82E-07	1.02E-06	1.02E-06
np237	4.17E+01	4.17E+01	4.16E+01	4.16E+01	4.16E+01	4.16E+01
np238	2.77E-14	5.49E-07	5.49E-07	5.48E-07	5.48E-07	3.64E-14
np239	1.32E-14	1.62E-05	1.62E-05	1.62E-05	1.62E-05	2.34E-14
np240m	7.36E-41	1.09E-40	1.59E-40	2.29E-40	3.22E-40	3.22E-40
np240	9.61E-40	1.19E-15	1.19E-15	1.19E-15	1.19E-15	1.72E-39
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	2.99E-10	4.04E-10	4.03E-10	4.03E-10	4.03E-10	2.83E-10
pu237	7.60E-17	8.62E-14	8.82E-14	9.02E-14	9.22E-14	2.05E-17
pu238	8.23E-03	8.31E-03	8.30E-03	8.30E-03	8.30E-03	8.20E-03

pu239	1.75E+01	1.82E+01	1.88E+01	1.95E+01	2.01E+01	2.01E+01
pu240	2.24E-01	2.40E-01	2.56E-01	2.72E-01	2.89E-01	2.89E-01
pu241	3.10E-05	3.53E-05	3.77E-05	4.01E-05	4.25E-05	3.95E-05
pu242	4.16E-06	4.74E-06	5.36E-06	6.02E-06	6.73E-06	6.73E-06
pu243	3.18E-30	3.61E-15	4.08E-15	4.59E-15	5.13E-15	5.15E-30
pu244	4.30E-28	6.39E-28	9.31E-28	1.33E-27	1.88E-27	1.88E-27
pu245	.00E+00	9.48E-39	1.38E-38	1.97E-38	2.78E-38	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	9.04E-35	9.75E-20	1.05E-19	1.12E-19	1.19E-19	1.19E-34
am240	4.13E-32	4.46E-17	4.78E-17	5.10E-17	5.43E-17	5.43E-32
am241	9.07E-04	9.76E-04	1.05E-03	1.12E-03	1.19E-03	1.19E-03
am242m	1.50E-07	1.62E-07	1.74E-07	1.86E-07	1.98E-07	1.97E-07
am242	1.93E-12	1.33E-11	1.42E-11	1.52E-11	1.62E-11	2.54E-12
am243	1.50E-08	1.76E-08	2.04E-08	2.34E-08	2.68E-08	2.68E-08
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	4.11E-32	4.80E-17	5.56E-17	6.40E-17	7.32E-17	7.31E-32
am245	1.49E-41	1.91E-39	2.78E-39	3.97E-39	5.59E-39	4.48E-41
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.68E-26	2.81E-22	3.01E-22	3.22E-22	3.42E-22	3.20E-27
cm242	6.92E-10	2.68E-09	2.87E-09	3.07E-09	3.26E-09	7.81E-10
cm243	1.99E-14	2.21E-14	2.37E-14	2.53E-14	2.69E-14	2.60E-14
cm244	6.15E-13	7.54E-13	8.74E-13	1.01E-12	1.15E-12	1.09E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 58
power= 1.468E-03mw, burnup=8.0428E+03mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
cm245	5.92E-16	7.21E-16	8.70E-16	1.04E-15	1.23E-15	1.23E-15
cm246	2.31E-18	2.93E-18	3.67E-18	4.55E-18	5.57E-18	5.57E-18
cm247	1.87E-22	2.50E-22	3.31E-22	4.30E-22	5.53E-22	5.53E-22
cm248	1.50E-25	2.11E-25	2.93E-25	4.00E-25	5.39E-25	5.39E-25
cm249	.00E+00	2.40E-36	3.32E-36	4.54E-36	6.11E-36	.00E+00
cm250	3.70E-41	5.48E-41	7.98E-41	1.14E-40	1.60E-40	1.60E-40
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		9.22E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 7 of library on unit 33.

pass 1
pass 0
scale-system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densiities
pass n applies mid time densities of nth library interval
first library updated was...
pass 1
pass 0
scale-system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densiities
pass n applies mid time densities of nth library interval

```
      first library updated was...
      ********************************************************************************
      *                                                                              *
      *           prelim lwr origen-s binary working library--id = 1143              *
      *         made from modified card-image origen-s libraries of scale 4.2        *
      *       data from the light element, actinide, and fission product libraries   *
      *         decay data, including gamma and total energy, are from endf/b-vi     *
      *                                                                              *
      *       neutron flux spectrum factors and cross sections were produced from    *
      *      the "presas2" case updating all nuclides on the scale "burnup" library  *
      *                                                                              *
      *                    fission product yields are from endf/b-v                  *
      *                                                                              *
      *                photon libraries use an 18-energy-group structure             *
      *              the photon data are from the master photon data base,           *
      *               produced to include bremsstrahlung from uo2 matrix             *
      *                                                                              *
      *         see information above this box (if present) for later updates        *
      *                                                                              *
      ********************************************************************************
      *                                                                              *
0     ********************************************************************************
0              .other identification and sizes of library.
0               data set name:  ft33f001
0             8/29/1996    date library was produced
0                1697    total number of nuclides in library
                  689    number of light-element nuclides
                  129    number of actinide nuclides
                  879    number of fission product nuclides
0                7993    number of nonzero off-diagonal matrix elements
0     ********************************************************************************
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page   59
      power=    .00mw, burnup=   9383.mwd, flux= 9.22E+07n/cm**2-sec
0                                    basis =
0   (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                initial      ******* d      ******* d      ******* d      ******* d      ******* d
    productions  1.232141E+06  1.232255E+06  1.232342E+06  1.232401E+06  1.232434E+06  1.232432E+06
    absorptions  9.958843E+05  9.961657E+05  9.964301E+05  9.966786E+05  9.969119E+05  9.969099E+05
    k infinity   1.237233E+00  1.236998E+00  1.236757E+00  1.236508E+00  1.236251E+00  1.236252E+00
0                initial      ******* d      ******* d      ******* d      ******* d      ******* d
    actinide
    absorptions  9.833770E+05  9.835148E+05  9.836378E+05  9.837461E+05  9.838402E+05  9.838389E+05
    non-actinide
    abs. fracs.  1.255894E-02  1.269954E-02  1.283813E-02  1.297551E-02  1.311225E-02  1.311159E-02
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2              fission products      page   60
0                              fraction of total absorption rate
      power=    .00mw, burnup=   9383.mwd, flux= 9.22E+07n/cm**2-sec
0            initial ******* d ******* d ******* d ******* d ******* d

    sm149     5.45E-03  5.45E-03  5.45E-03  5.45E-03  5.45E-03  5.45E-03
    cu151     9.72E-04  1.00E-03  1.03E-03  1.06E-03  1.09E-03  1.09E-03
    nd143     7.92E-04  8.24E-04  8.56E-04  8.88E-04  9.20E-04  9.20E-04
    rh103     3.75E-04  3.91E-04  4.06E-04  4.22E-04  4.38E-04  4.38E-04
    xe131     2.54E-04  2.64E-04  2.75E-04  2.85E-04  2.96E-04  2.96E-04
    cs133     1.97E-04  2.05E-04  2.13E-04  2.21E-04  2.30E-04  2.30E-04
    gd155     1.95E-04  1.97E-04  1.99E-04  2.00E-04  2.02E-04  2.02E-04
    sm147     1.46E-04  1.51E-04  1.57E-04  1.63E-04  1.69E-04  1.69E-04
    tc 99     1.41E-04  1.47E-04  1.53E-04  1.58E-04  1.64E-04  1.64E-04
    nd145     1.12E-04  1.16E-04  1.21E-04  1.25E-04  1.30E-04  1.30E-04
    cd113     9.39E-05  9.45E-05  9.50E-05  9.55E-05  9.60E-05  9.60E-05
```

mo 95	7.74E-05	8.06E-05	8.38E-05	8.69E-05	9.01E-05	9.01E-05
sm152	7.32E-05	7.67E-05	8.03E-05	8.38E-05	8.74E-05	8.74E-05
sm150	5.26E-05	5.52E-05	5.77E-05	6.03E-05	6.28E-05	6.28E-05
kr 83	4.82E-05	5.01E-05	5.21E-05	5.40E-05	5.60E-05	5.60E-05
gd157	5.15E-05	5.20E-05	5.25E-05	5.30E-05	5.35E-05	5.35E-05
cs135	4.45E-05	4.64E-05	4.82E-05	5.00E-05	5.19E-05	5.19E-05
ru101	3.46E-05	3.60E-05	3.74E-05	3.89E-05	4.03E-05	4.03E-05
pr141	3.31E-05	3.45E-05	3.59E-05	3.72E-05	3.86E-05	3.86E-05
eu153	3.25E-05	3.39E-05	3.53E-05	3.68E-05	3.82E-05	3.82E-05
la139	2.71E-05	2.82E-05	2.93E-05	3.05E-05	3.16E-05	3.16E-05
sm151	1.76E-05	1.78E-05	1.79E-05	1.79E-05	1.79E-05	1.77E-05
ba137	1.30E-05	1.35E-05	1.41E-05	1.46E-05	1.52E-05	1.52E-05
pd105	1.27E-05	1.33E-05	1.38E-05	1.44E-05	1.50E-05	1.50E-05
zr 93	1.08E-05	1.13E-05	1.17E-05	1.22E-05	1.26E-05	1.26E-05
ag109	9.33E-06	9.89E-06	1.05E-05	1.10E-05	1.16E-05	1.16E-05
i129	8.65E-06	9.02E-06	9.39E-06	9.75E-06	1.01E-05	1.01E-05
nd144	8.22E-06	8.57E-06	8.91E-06	9.25E-06	9.60E-06	9.60E-06
mo 97	6.15E-06	6.41E-06	6.66E-06	6.91E-06	7.17E-06	7.17E-06
gd152	3.26E-06	3.51E-06	3.77E-06	4.05E-06	4.32E-06	4.32E-06
zr 91	2.86E-06	2.98E-06	3.10E-06	3.21E-06	3.33E-06	3.33E-06
y 89	2.74E-06	2.85E-06	2.96E-06	3.07E-06	3.19E-06	3.19E-06
pd108	2.44E-06	2.57E-06	2.71E-06	2.85E-06	2.99E-06	2.99E-06
ru102	2.54E-06	2.65E-06	2.75E-06	2.86E-06	2.96E-06	2.96E-06
ce142	2.26E-06	2.35E-06	2.44E-06	2.54E-06	2.63E-06	2.63E-06
nd148	2.17E-06	2.26E-06	2.35E-06	2.44E-06	2.53E-06	2.53E-06
nd146	1.82E-06	1.90E-06	1.97E-06	2.05E-06	2.13E-06	2.13E-06
in115	1.56E-06	1.63E-06	1.70E-06	1.77E-06	1.83E-06	1.83E-06
ba138	1.56E-06	1.62E-06	1.69E-06	1.75E-06	1.81E-06	1.81E-06
ce140	1.46E-06	1.52E-06	1.58E-06	1.64E-06	1.70E-06	1.70E-06
pd107	1.29E-06	1.36E-06	1.42E-06	1.49E-06	1.57E-06	1.57E-06
xe132	1.32E-06	1.38E-06	1.43E-06	1.49E-06	1.54E-06	1.54E-06
mo 98	9.01E-07	9.38E-07	9.75E-07	1.01E-06	1.05E-06	1.05E-06
mo100	8.74E-07	9.11E-07	9.47E-07	9.83E-07	1.02E-06	1.02E-06
xe134	8.61E-07	8.97E-07	9.33E-07	9.68E-07	1.00E-06	1.00E-06
zr 92	6.91E-07	7.19E-07	7.47E-07	7.76E-07	8.04E-07	8.04E-07
ru 99	5.53E-07	5.99E-07	6.47E-07	6.97E-07	7.49E-07	7.49E-07
i127	6.09E-07	6.36E-07	6.63E-07	6.90E-07	7.17E-07	7.17E-07
ru104	5.66E-07	5.91E-07	6.15E-07	6.40E-07	6.64E-07	6.64E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 61
0 fraction of total absorption rate
power= .00mw, burnup= 9383.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	5.44E-07	5.66E-07	5.89E-07	6.11E-07	6.33E-07	6.33E-07
nd150	4.87E-07	5.07E-07	5.27E-07	5.48E-07	5.68E-07	5.68E-07
xe136	4.66E-07	4.86E-07	5.05E-07	5.24E-07	5.43E-07	5.43E-07
br 81	3.48E-07	3.62E-07	3.76E-07	3.91E-07	4.05E-07	4.05E-07
rb 85	3.36E-07	3.50E-07	3.64E-07	3.77E-07	3.91E-07	3.91E-07
cd111	3.04E-07	3.19E-07	3.35E-07	3.51E-07	3.66E-07	3.66E-07
zr 94	2.93E-07	3.05E-07	3.17E-07	3.29E-07	3.41E-07	3.41E-07
zr 90	2.70E-07	2.81E-07	2.92E-07	3.03E-07	3.14E-07	3.14E-07
sm154	2.19E-07	2.28E-07	2.38E-07	2.47E-07	2.57E-07	2.57E-07
te130	2.14E-07	2.23E-07	2.31E-07	2.40E-07	2.49E-07	2.49E-07
rb 87	1.94E-07	2.02E-07	2.10E-07	2.18E-07	2.25E-07	2.25E-07
se 77	1.40E-07	1.46E-07	1.51E-07	1.57E-07	1.63E-07	1.63E-07
gd154	1.17E-07	1.27E-07	1.38E-07	1.49E-07	1.60E-07	1.60E-07
pd106	1.21E-07	1.27E-07	1.33E-07	1.39E-07	1.45E-07	1.45E-07
gd156	1.06E-07	1.12E-07	1.18E-07	1.24E-07	1.29E-07	1.29E-07
kr 84	9.19E-08	9.57E-08	9.94E-08	1.03E-07	1.07E-07	1.07E-07
eu152	8.52E-08	9.51E-08	9.80E-08	1.01E-07	1.04E-07	9.46E-08

sb121	7.13E-08	7.44E-08	7.75E-08	8.06E-08	8.36E-08	8.36E-08
se 79	7.10E-08	7.39E-08	7.68E-08	7.97E-08	8.26E-08	8.26E-08
ba135	5.38E-08	5.83E-08	6.31E-08	6.80E-08	7.31E-08	7.31E-08
dy161	5.79E-08	6.13E-08	6.48E-08	6.83E-08	7.18E-08	7.18E-08
sb123	5.78E-08	6.03E-08	6.28E-08	6.52E-08	6.77E-08	6.77E-08
pm147	6.69E-08	9.82E-08	9.82E-08	9.81E-08	9.81E-08	6.25E-08
kr 86	5.12E-08	5.33E-08	5.53E-08	5.74E-08	5.95E-08	5.95E-08
te128	4.76E-08	4.96E-08	5.16E-08	5.37E-08	5.57E-08	5.57E-08
eu155	5.09E-08	6.39E-08	6.42E-08	6.45E-08	6.47E-08	4.99E-08
ru100	3.49E-08	3.78E-08	4.08E-08	4.40E-08	4.73E-08	4.73E-08
se 80	3.34E-08	3.48E-08	3.62E-08	3.76E-08	3.90E-08	3.90E-08
te125	3.13E-08	3.26E-08	3.40E-08	3.54E-08	3.68E-08	3.68E-08
tb159	2.81E-08	2.95E-08	3.10E-08	3.25E-08	3.40E-08	3.40E-08
nd142	2.48E-08	2.68E-08	2.90E-08	3.13E-08	3.36E-08	3.36E-08
ba134	2.38E-08	2.58E-08	2.79E-08	3.01E-08	3.23E-08	3.23E-08
sm148	2.18E-08	2.36E-08	2.55E-08	2.75E-08	2.96E-08	2.96E-08
gd158	2.27E-08	2.38E-08	2.50E-08	2.62E-08	2.74E-08	2.74E-08
cd112	2.24E-08	2.34E-08	2.45E-08	2.55E-08	2.66E-08	2.66E-08
pd104	1.62E-08	1.76E-08	1.90E-08	2.05E-08	2.20E-08	2.20E-08
li 6	1.84E-08	1.91E-08	1.98E-08	2.06E-08	2.13E-08	2.13E-08
sn117	1.66E-08	1.73E-08	1.81E-08	1.88E-08	1.96E-08	1.96E-08
cd114	1.32E-08	1.39E-08	1.45E-08	1.52E-08	1.58E-08	1.58E-08
dy164	1.21E-08	1.29E-08	1.37E-08	1.45E-08	1.54E-08	1.54E-08
sn119	1.31E-08	1.37E-08	1.42E-08	1.48E-08	1.54E-08	1.54E-08
dy162	1.12E-08	1.20E-08	1.27E-08	1.35E-08	1.43E-08	1.43E-08
sn115	1.20E-08	1.25E-08	1.30E-08	1.35E-08	1.41E-08	1.41E-08
pd110	9.81E-09	1.03E-08	1.08E-08	1.14E-08	1.19E-08	1.19E-08
nb 93	8.65E-09	9.38E-09	1.01E-08	1.09E-08	1.17E-08	1.17E-08
sr 88	9.40E-09	9.78E-09	1.02E-08	1.05E-08	1.09E-08	1.09E-08
mo 96	5.71E-09	6.17E-09	6.65E-09	7.16E-09	7.68E-09	7.68E-09
se 82	6.42E-09	6.69E-09	6.95E-09	7.21E-09	7.47E-09	7.47E-09
sn126	5.58E-09	5.83E-09	6.07E-09	6.31E-09	6.55E-09	6.55E-09

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 62
0 fraction of total absorption rate
power= .00mw, burnup= 9383.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

br 79	4.35E-09	4.72E-09	5.10E-09	5.50E-09	5.91E-09	5.91E-09
se 78	4.95E-09	5.16E-09	5.37E-09	5.57E-09	5.78E-09	5.78E-09
sr 90	5.80E-09	6.01E-09	6.00E-09	6.00E-09	5.99E-09	5.74E-09
cd110	3.87E-09	4.26E-09	4.68E-09	5.12E-09	5.59E-09	5.59E-09
eu154	4.63E-09	5.45E-09	5.68E-09	5.91E-09	6.14E-09	5.34E-09
sn124	4.17E-09	4.35E-09	4.53E-09	4.72E-09	4.90E-09	4.90E-09
ag107	3.11E-09	3.41E-09	3.72E-09	4.04E-09	4.38E-09	4.38E-09
ba136	3.46E-09	3.68E-09	3.90E-09	4.14E-09	4.37E-09	4.37E-09
xe130	3.04E-09	3.27E-09	3.51E-09	3.76E-09	4.02E-09	4.02E-09
dy163	2.80E-09	2.98E-09	3.17E-09	3.37E-09	3.57E-09	3.57E-09
xe129	2.53E-09	2.75E-09	2.97E-09	3.20E-09	3.45E-09	3.45E-09
as 75	2.93E-09	3.05E-09	3.17E-09	3.30E-09	3.42E-09	3.42E-09
kr 82	2.61E-09	2.78E-09	2.96E-09	3.14E-09	3.33E-09	3.33E-09
in115	2.35E-09	2.45E-09	2.55E-09	2.66E-09	2.77E-09	2.77E-09
te126	1.54E-09	1.66E-09	1.79E-09	1.93E-09	2.07E-09	2.07E-09
sn118	1.69E-09	1.76E-09	1.84E-09	1.91E-09	1.98E-09	1.98E-09
sn122	1.44E-09	1.50E-09	1.57E-09	1.63E-09	1.69E-09	1.69E-09
cd116	1.43E-09	1.49E-09	1.55E-09	1.61E-09	1.67E-09	1.67E-09
cs137	1.32E-09	1.37E-09	1.37E-09	1.37E-09	1.37E-09	1.31E-09
sn120	1.07E-09	1.11E-09	1.16E-09	1.21E-09	1.25E-09	1.25E-09
ge 73	8.20E-10	8.55E-10	8.90E-10	9.24E-10	9.59E-10	9.59E-10
gd160	2.95E-10	3.11E-10	3.27E-10	3.44E-10	3.61E-10	3.61E-10
cs134	3.20E-10	5.52E-10	5.73E-10	5.95E-10	6.17E-10	3.43E-10

ge 76	2.88E-10	3.00E-10	3.12E-10	3.23E-10	3.35E-10	3.35E-10
ho165	2.23E-10	2.39E-10	2.55E-10	2.72E-10	2.90E-10	2.90E-10
dy160	1.35E-10	1.48E-10	1.60E-10	1.74E-10	1.88E-10	1.88E-10
kr 85	1.84E-10	2.02E-10	2.02E-10	2.02E-10	2.02E-10	1.80E-10
xe128	9.13E-11	9.91E-11	1.07E-10	1.16E-10	1.25E-10	1.25E-10
te124	5.53E-11	5.84E-11	6.17E-11	6.50E-11	6.84E-11	6.84E-11
sr 86	5.18E-11	5.57E-11	5.98E-11	6.40E-11	6.84E-11	6.84E-11
sn116	3.51E-11	3.82E-11	4.13E-11	4.46E-11	4.80E-11	4.80E-11
ce144	5.65E-11	2.14E-10	2.14E-10	2.14E-10	2.14E-10	4.51E-11
sr 87	3.67E-11	3.84E-11	4.00E-11	4.17E-11	4.34E-11	4.34E-11
nb 94	2.25E-11	2.39E-11	2.52E-11	2.66E-11	2.81E-11	2.81E-11
se 76	1.67E-11	1.78E-11	1.90E-11	2.02E-11	2.15E-11	2.15E-11
te122	1.47E-11	1.59E-11	1.72E-11	1.86E-11	2.00E-11	2.00E-11
ge 74	1.65E-11	1.72E-11	1.79E-11	1.85E-11	1.92E-11	1.92E-11
er166	1.17E-11	1.26E-11	1.35E-11	1.44E-11	1.53E-11	1.53E-11
ge 72	1.16E-11	1.21E-11	1.27E-11	1.32E-11	1.37E-11	1.37E-11
y 90	5.52E-12	5.72E-12	5.71E-12	5.71E-12	5.70E-12	5.46E-12
ru106	4.59E-12	1.29E-11	1.30E-11	1.31E-11	1.32E-11	4.00E-12
sb125	4.18E-12	6.12E-12	6.14E-12	6.16E-12	6.18E-12	3.97E-12
kr 80	2.45E-12	2.71E-12	2.99E-12	3.29E-12	3.62E-12	3.62E-12
er167	5.32E-13	5.89E-13	6.51E-13	7.16E-13	7.86E-13	7.86E-13
te123	3.17E-13	3.53E-13	3.91E-13	4.32E-13	4.76E-13	4.76E-13
cd108	1.01E-13	1.15E-13	1.30E-13	1.46E-13	1.64E-13	1.64E-13
nb 95	3.18E-13	5.46E-11	5.46E-11	5.45E-11	5.45E-11	1.18E-13
zr 95	1.56E-13	5.89E-11	5.88E-11	5.88E-11	5.88E-11	5.78E-14
te127m	9.79E-14	3.09E-12	3.10E-12	3.11E-12	3.12E-12	5.55E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 63
0 fraction of total absorption rate
power= .00mw, burnup= 9383.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

be 9	3.62E-14	3.77E-14	3.91E-14	4.06E-14	4.21E-14	4.21E-14
y 91	7.72E-14	5.05E-11	5.05E-11	5.04E-11	5.04E-11	2.60E-14
li 7	1.47E-14	1.53E-14	1.59E-14	1.65E-14	1.71E-14	1.71E-14
sn114	8.92E-15	9.70E-15	1.05E-14	1.13E-14	1.22E-14	1.22E-14
sb126	6.42E-15	8.64E-15	8.94E-15	9.24E-15	9.54E-15	7.54E-15
ru103	8.60E-15	1.37E-10	1.37E-10	1.38E-10	1.38E-10	1.72E-15
sr 89	5.89E-15	1.08E-11	1.08E-11	1.08E-11	1.07E-11	1.67E-15
ce141	4.87E-15	5.76E-10	5.76E-10	5.76E-10	5.76E-10	6.91E-16
sn123	2.00E-16	3.80E-15	3.80E-15	3.80E-15	3.81E-15	1.23E-16
tb160	1.35E-16	2.72E-14	2.85E-14	2.98E-14	3.11E-14	6.77E-17
pm148m	1.42E-16	1.41E-12	1.41E-12	1.41E-12	1.42E-12	3.09E-17
cd115m	1.90E-17	9.54E-14	9.56E-14	9.59E-14	9.61E-14	4.64E-18
cd109	1.61E-18	3.92E-18	4.19E-18	4.47E-18	4.79E-18	1.84E-18
te129m	8.44E-18	6.84E-13	6.84E-13	6.85E-13	6.86E-13	1.29E-18
sb124	3.14E-18	1.77E-15	1.81E-15	1.85E-15	1.88E-15	1.19E-18
pm148	2.48E-19	4.97E-14	4.97E-14	4.98E-14	4.98E-14	5.51E-20

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 64
power= 1.468E-03mw, burnup=9.3832E+03mwd, flux= 9.22E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h	1	4.77E-04	4.96E-04	5.16E-04	5.36E-04	5.56E-04	5.56E-04
h	2	1.42E-06	1.48E-06	1.54E-06	1.60E-06	1.66E-06	1.66E-06
h	3	1.55E-11	1.70E-11	1.72E-11	1.73E-11	1.75E-11	1.58E-11
h	4	.00E+00	2.50E-35	2.52E-35	2.54E-35	2.56E-35	.00E+00
he	3	8.70E-09	8.99E-09	9.27E-09	9.55E-09	9.83E-09	9.83E-09
he	4	7.89E-05	8.22E-05	8.55E-05	8.88E-05	9.21E-05	9.21E-05
he	6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

ne 20	9.48E-06	9.88E-06	1.03E-05	1.07E-05	1.11E-05	1.11E-05
ne 21	1.51E-09	1.63E-09	1.76E-09	1.89E-09	2.02E-09	2.02E-09
ne 22	6.24E-08	6.50E-08	6.76E-08	7.02E-08	7.28E-08	7.28E-08
ne 23	2.62E-30	2.63E-15	2.63E-15	2.63E-15	2.63E-15	2.63E-30
na 22	1.04E-11	1.56E-11	1.56E-11	1.56E-11	1.56E-11	9.76E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	9.56E-24	9.56E-09	9.56E-09	9.56E-09	9.56E-09	9.57E-24
na 24m	1.57E-30	1.57E-15	1.57E-15	1.57E-15	1.57E-15	1.57E-30
na 25	1.68E-39	1.81E-24	1.94E-24	2.08E-24	2.23E-24	2.23E-39
mg 24	6.55E-02	6.80E-02	7.05E-02	7.30E-02	7.55E-02	7.55E-02
mg 25	1.62E-07	1.75E-07	1.88E-07	2.01E-07	2.15E-07	2.15E-07
mg 26	1.42E-06	1.48E-06	1.54E-06	1.60E-06	1.65E-06	1.65E-06
mg 27	7.82E-28	7.84E-13	7.84E-13	7.84E-13	7.84E-13	7.84E-28
mg 28	.00E+00	5.77E-25	5.78E-25	5.78E-25	5.78E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	7.09E-26	7.09E-11	7.09E-11	7.09E-11	7.09E-11	7.09E-26
al 29	1.31E-37	1.42E-22	1.53E-22	1.64E-22	1.76E-22	1.76E-37
al 30	.00E+00	1.54E-32	1.72E-32	1.92E-32	2.14E-32	.00E+00
si 28	1.91E-01	1.98E-01	2.05E-01	2.12E-01	2.20E-01	2.20E-01
si 29	1.42E-06	1.53E-06	1.65E-06	1.77E-06	1.89E-06	1.89E-06
si 30	1.11E-11	1.24E-11	1.39E-11	1.55E-11	1.72E-11	1.72E-11
si 31	2.86E-39	3.22E-24	3.61E-24	4.02E-24	4.47E-24	4.47E-39
si 32	1.73E-30	1.96E-30	2.20E-30	2.46E-30	2.73E-30	2.72E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.21E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 65
power= 1.468E-03mw, burnup=9.3832E+03mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	6.87E+00	7.35E+00	7.84E+00	8.34E+00	8.85E+00	8.85E+00
pb206	1.91E-02	2.10E-02	2.29E-02	2.50E-02	2.71E-02	2.71E-02
pb207	1.61E-03	1.75E-03	1.89E-03	2.03E-03	2.18E-03	2.18E-03
pb208	9.23E-05	9.99E-05	1.08E-04	1.16E-04	1.24E-04	1.24E-04
pb209	2.03E-10	2.16E-10	2.30E-10	2.44E-10	2.58E-10	2.58E-10
pb210	9.26E-05	9.70E-05	1.01E-04	1.06E-04	1.10E-04	1.10E-04
pb211	2.08E-11	2.16E-11	2.23E-11	2.31E-11	2.39E-11	2.40E-11
pb212	2.08E-11	2.16E-11	2.24E-11	2.32E-11	2.40E-11	2.39E-11
pb214	2.12E-10	2.22E-10	2.32E-10	2.42E-10	2.52E-10	2.52E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	2.11E-03	2.35E-03	2.61E-03	2.89E-03	3.18E-03	3.18E-03
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	5.70E-08	5.97E-08	6.24E-08	6.51E-08	6.77E-08	6.78E-08
bi211	1.23E-12	1.28E-12	1.32E-12	1.37E-12	1.42E-12	1.42E-12
bi212	1.97E-12	2.05E-12	2.13E-12	2.20E-12	2.27E-12	2.27E-12
bi213	4.73E-11	5.05E-11	5.37E-11	5.70E-11	6.03E-11	6.03E-11
bi214	1.57E-10	1.65E-10	1.73E-10	1.79E-10	1.87E-10	1.87E-10
po210	1.56E-06	1.65E-06	1.73E-06	1.80E-06	1.87E-06	1.85E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	1.36E-17	1.41E-17	1.46E-17	1.51E-17	1.57E-17	1.57E-17
po212	1.04E-22	1.08E-22	1.12E-22	1.16E-22	1.20E-22	1.19E-22
po213	7.11E-20	7.59E-20	8.08E-20	8.57E-20	9.06E-20	9.07E-20
po214	2.16E-17	2.26E-17	2.37E-17	2.47E-17	2.57E-17	2.57E-17
po215	1.71E-17	1.77E-17	1.84E-17	1.90E-17	1.96E-17	1.97E-17
po216	7.88E-17	8.19E-17	8.49E-17	8.78E-17	9.08E-17	9.06E-17
po218	2.45E-11	2.56E-11	2.68E-11	2.80E-11	2.91E-11	2.91E-11
rn218	1.28E-36	1.14E-28	1.18E-28	1.22E-28	1.26E-28	7.02E-38
rn219	3.80E-14	3.94E-14	4.08E-14	4.23E-14	4.37E-14	4.38E-14
rn220	3.02E-14	3.14E-14	3.25E-14	3.37E-14	3.48E-14	3.48E-14

rn222	4.35E-08	4.55E-08	4.76E-08	4.97E-08	5.17E-08	5.17E-08
ra222	1.39E-33	1.23E-25	1.28E-25	1.33E-25	1.37E-25	7.63E-35
ra223	9.49E-09	9.83E-09	1.02E-08	1.05E-08	1.09E-08	1.09E-08
ra224	1.72E-10	1.79E-10	1.85E-10	1.92E-10	1.98E-10	1.98E-10
ra225	2.21E-08	2.36E-08	2.51E-08	2.67E-08	2.82E-08	2.82E-08
ra226	6.64E-03	6.96E-03	7.27E-03	7.59E-03	7.90E-03	7.90E-03
ra228	3.22E-11	3.36E-11	3.50E-11	3.63E-11	3.77E-11	3.77E-11
ac225	1.50E-08	1.60E-08	1.70E-08	1.80E-08	1.90E-08	1.91E-08
ac227	6.58E-06	6.84E-06	7.09E-06	7.33E-06	7.58E-06	7.58E-06
ac228	3.93E-15	4.10E-15	4.27E-15	4.43E-15	4.60E-15	4.60E-15
th226	6.79E-32	6.02E-24	6.25E-24	6.47E-24	6.68E-24	3.72E-33
th227	1.53E-08	1.59E-08	1.64E-08	1.70E-08	1.76E-08	1.76E-08
th228	3.27E-08	3.41E-08	3.53E-08	3.66E-08	3.78E-08	3.76E-08
th229	4.30E-03	4.59E-03	4.89E-03	5.18E-03	5.48E-03	5.48E-03
th230	3.68E-01	3.83E-01	3.97E-01	4.12E-01	4.27E-01	4.27E-01
th231	2.87E-09	3.50E-09	3.52E-09	3.53E-09	3.55E-09	2.85E-09
th232	7.88E-02	8.21E-02	8.54E-02	8.88E-02	9.21E-02	9.22E-02
th233	2.61E-28	2.72E-13	2.83E-13	2.94E-13	3.05E-13	3.05E-28
th234	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	9.90E-03	1.03E-02	1.07E-02	1.10E-02	1.14E-02	1.14E-02
pa232	6.14E-26	6.38E-11	6.61E-11	6.84E-11	7.07E-11	7.07E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 66
power= 1.463E-03mw, burnup=9.3832E+03mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.44E-06	1.44E-06	1.44E-06	1.44E-06	1.43E-06	1.43E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	6.57E-29	5.84E-21	6.05E-21	6.27E-21	6.48E-21	3.60E-30
u231	5.27E-32	5.48E-17	5.69E-17	5.89E-17	6.10E-17	6.10E-32
u232	1.18E-06	1.24E-06	1.29E-06	1.33E-06	1.38E-06	1.36E-06
u233	1.92E-01	2.00E-01	2.07E-01	2.15E-01	2.22E-01	2.22E-01
u234	9.60E+00	9.62E+00	9.64E+00	9.67E+00	9.69E+00	9.69E+00
u235	6.95E+02	6.94E+02	6.92E+02	6.91E+02	6.90E+02	6.90E+02
u236	1.80E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02
u237	1.22E-12	1.15E-06	1.15E-06	1.16E-06	1.16E-06	1.47E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	1.12E-22	1.12E-07	1.12E-07	1.12E-07	1.12E-07	1.12E-22
u240	3.78E-38	5.23E-38	7.17E-38	9.69E-38	1.29E-37	1.30E-37
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.19E-12	3.12E-12	3.12E-12	3.12E-12	3.11E-12	1.02E-12
np236m	7.39E-28	7.41E-13	7.40E-13	7.40E-13	7.40E-13	7.40E-28
np236	1.02E-06	1.06E-06	1.10E-06	1.14E-06	1.18E-06	1.18E-06
np237	4.16E+01	4.16E+01	4.16E+01	4.15E+01	4.15E+01	4.15E+01
np238	3.44E-14	5.48E-07	5.48E-07	5.48E-07	5.47E-07	4.52E-14
np239	2.54E-14	1.62E-05	1.62E-05	1.62E-05	1.62E-05	3.77E-14
np240m	3.22E-40	4.47E-40	6.12E-40	8.27E-40	1.19E-39	1.11E-39
np240	1.72E-39	1.19E-15	1.19E-15	1.19E-15	1.19E-15	2.78E-39
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	2.83E-10	4.04E-10	4.04E-10	4.04E-10	4.04E-10	2.67E-10
pu237	2.05E-17	9.43E-14	9.61E-14	9.80E-14	9.97E-14	5.47E-18
pu238	8.20E-03	8.29E-03	8.29E-03	8.29E-03	8.29E-03	8.17E-03
pu239	2.01E+01	2.07E+01	2.13E+01	2.19E+01	2.24E+01	2.24E+01
pu240	2.89E-01	3.05E-01	3.21E-01	3.37E-01	3.53E-01	3.53E-01
pu241	3.95E-05	4.49E-05	4.72E-05	4.96E-05	5.20E-05	4.78E-05
pu242	6.73E-06	7.48E-06	8.27E-06	9.10E-06	9.98E-06	9.98E-06
pu243	5.15E-30	5.70E-15	6.30E-15	6.94E-15	7.61E-15	7.66E-30

pu244	1.88E-27	2.61E-27	3.57E-27	4.83E-27	6.45E-27	6.45E-27
pu245	.00E+00	3.86E-38	5.28E-38	7.14E-38	9.54E-38	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.19E-34	1.26E-19	1.33E-19	1.40E-19	1.47E-19	1.47E-34
am240	5.43E-32	5.76E-17	6.08E-17	6.41E-17	6.73E-17	6.73E-32
am241	1.19E-03	1.26E-03	1.33E-03	1.40E-03	1.47E-03	1.47E-03
am242m	1.97E-07	2.10E-07	2.22E-07	2.34E-07	2.46E-07	2.44E-07
am242	2.54E-12	1.71E-11	1.81E-11	1.90E-11	2.00E-11	3.15E-12
am243	2.68E-08	3.04E-08	3.43E-08	3.86E-08	4.31E-08	4.31E-08
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	7.31E-32	8.31E-17	9.38E-17	1.05E-16	1.18E-16	1.18E-31
am245	4.48E-41	7.76E-39	1.06E-38	1.43E-38	1.91E-38	1.19E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	3.20E-27	3.63E-22	3.84E-22	4.05E-22	4.25E-22	5.76E-28
cm242	7.81E-10	3.45E-09	3.65E-09	3.84E-09	4.04E-09	8.62E-10
cm243	2.60E-14	2.85E-14	3.01E-14	3.18E-14	3.34E-14	3.20E-14
cm244	1.09E-12	1.31E-12	1.47E-12	1.66E-12	1.85E-12	1.73E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 67
power= 1.468E-03mw, burnup=9.3832E+03mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d
cm245	1.23E-15	1.45E-15	1.69E-15	1.96E-15	2.26E-15	2.26E-15
cm246	5.57E-18	6.77E-18	8.15E-18	9.73E-18	1.15E-17	1.15E-17
cm247	5.53E-22	7.03E-22	8.84E-22	1.10E-21	1.36E-21	1.36E-21
cm248	5.39E-25	7.15E-25	9.39E-25	1.22E-24	1.57E-24	1.57E-24
cm249	.00E+00	8.13E-36	1.07E-35	1.38E-35	1.78E-35	.00E+00
cm250	1.60E-40	2.22E-40	3.03E-40	4.08E-40	5.44E-40	5.44E-40
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		9.21E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

0 1q array has 20 entries.
0 3a array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 8 of library on unit 33.

pass 1
pass 0
scale-system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densities
pass n applies mid time densities of nth library interval
first library updated was...
pass 1
pass 0
scale-system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densities
pass n applies mid time densities of nth library interval
first library updated was...
****
*
* prelim lwr origen-s binary working library--id = 1143 *
* made from modified card-image origen-s libraries of scale 4.2 *

```
      *      data from the light element, actinide, and fission product libraries    *
      *        decay data, including gamma and total energy, are from endf/b-vi      *
      *                                                                               *
      *      neutron flux spectrum factors and cross sections were produced from      *
      *     the "presas2" case updating all nuclides on the scale "burnup" library    *
      *                                                                               *
      *                  fission product yields are from endf/b-v                     *
      *                                                                               *
      *              photon libraries use an 18-energy-group structure                *
      *             the photon data are from the master photon data base,             *
      *              produced to include bremsstrahlung from uo2 matrix               *
      *                                                                               *
      *         see information above this box (if present) for later updates         *
      *                                                                               *
      *********************************************************************************
      *                                                                               *
0     *********************************************************************************
0               .other identification and sizes of library.
0                data set name:  ft33f001
0              8/29/1996    date library was produced
0                  1697    total number of nuclides in library
                    689    number of light-element nuclides
                    129    number of actinide nuclides
                    879    number of fission product nuclides
0                  7993    number of nonzero off-diagonal matrix elements
0     ********************************************************************************
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                  page   68
      power=     .00mw, burnup=  10724.mwd, flux= 9.22E+07n/cm**2-sec
0                                      basis =
0   (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                  initial      ******* d      ******* d      ******* d      ******* d      ******* d
    productions  1.233181E+06  1.233189E+06  1.233173E+06  1.233132E+06  1.233067E+06  1.233064E+06
    absorptions  9.976366E+05  9.978565E+05  9.980606E+05  9.982511E+05  9.984277E+05  9.984253E+05
    k infinity   1.236103E+00  1.235838E+00  1.235569E+00  1.235292E+00  1.235008E+00  1.235009E+00
0                  initial      ******* d      ******* d      ******* d      ******* d      ******* d
    actinide
    absorptions  9.845568E+05  9.846375E+05  9.847045E+05  9.847583E+05  9.847991E+05  9.847976E+05
    non-actinide
    abs. fracs.  1.311076E-02  1.324737E-02  1.338202E-02  1.351643E-02  1.365000E-02  1.364917E-02
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2          fission products      page   69
0                          fraction of total absorption rate
      power=     .00mw, burnup=  10724.mwd, flux= 9.22E+07n/cm**2-sec
0           initial ******* d ******* d ******* d ******* d ******* d

    sm149     5.45E-03  5.45E-03  5.45E-03  5.45E-03  5.45E-03  5.45E-03
    eu151     1.09E-03  1.12E-03  1.15E-03  1.18E-03  1.20E-03  1.20E-03
    nd143     9.20E-04  9.52E-04  9.84E-04  1.02E-03  1.05E-03  1.05E-03
    rh103     4.31E-04  4.47E-04  4.63E-04  4.79E-04  5.11E-04  5.11E-04
    xe131     2.98E-04  3.08E-04  3.17E-04  3.27E-04  3.36E-04  3.36E-04
    cs133     2.30E-04  2.38E-04  2.46E-04  2.54E-04  2.62E-04  2.62E-04
    gd155     2.02E-04  2.03E-04  2.05E-04  2.06E-04  2.07E-04  2.07E-04
    sm147     1.69E-04  1.75E-04  1.81E-04  1.87E-04  1.93E-04  1.93E-04
    tc 99     1.64E-04  1.70E-04  1.75E-04  1.81E-04  1.86E-04  1.86E-04
    nd145     1.36E-04  1.54E-04  1.59E-04  1.44E-04  1.48E-04  1.48E-04
    mo 95     9.01E-05  9.33E-05  9.64E-05  9.96E-05  1.03E-04  1.03E-04
    sm152     8.74E-05  9.10E-05  9.46E-05  9.83E-05  1.02E-04  1.02E-04
    cd113     9.60E-05  9.64E-05  9.69E-05  9.73E-05  9.77E-05  9.77E-05
    sm150     6.28E-05  6.54E-05  6.79E-05  7.04E-05  7.30E-05  7.30E-05
    kr 83     5.60E-05  5.79E-05  5.98E-05  6.18E-05  6.37E-05  6.37E-05
    cs135     5.19E-05  5.37E-05  5.56E-05  5.74E-05  5.92E-05  5.92E-05
```

gd157	5.35E-05	5.40E-05	5.44E-05	5.49E-05	5.53E-05	5.53E-05
ru101	4.03E-05	4.17E-05	4.32E-05	4.46E-05	4.60E-05	4.60E-05
pr141	3.86E-05	4.00E-05	4.13E-05	4.27E-05	4.41E-05	4.41E-05
eu153	3.82E-05	3.96E-05	4.11E-05	4.25E-05	4.40E-05	4.40E-05
la139	3.16E-05	3.27E-05	3.38E-05	3.49E-05	3.60E-05	3.60E-05
sm151	1.77E-05	1.80E-05	1.80E-05	1.80E-05	1.81E-05	1.78E-05
pd105	1.50E-05	1.56E-05	1.62E-05	1.67E-05	1.73E-05	1.73E-05
ba137	1.52E-05	1.57E-05	1.62E-05	1.68E-05	1.73E-05	1.73E-05
zr 93	1.26E-05	1.31E-05	1.35E-05	1.39E-05	1.44E-05	1.44E-05
ag109	1.16E-05	1.22E-05	1.29E-05	1.35E-05	1.41E-05	1.41E-05
i129	1.01E-05	1.05E-05	1.08E-05	1.12E-05	1.16E-05	1.16E-05
nd144	9.59E-06	9.94E-06	1.03E-05	1.06E-05	1.10E-05	1.10E-05
mo 97	7.17E-06	7.42E-06	7.67E-06	7.93E-06	8.18E-06	8.18E-06
gd152	4.32E-06	4.61E-06	4.90E-06	5.20E-06	5.51E-06	5.51E-06
zr 91	3.33E-06	3.44E-06	3.56E-06	3.68E-06	3.79E-06	3.79E-06
y 89	3.18E-06	3.30E-06	3.41E-06	3.52E-06	3.63E-06	3.63E-06
pd108	2.99E-06	3.13E-06	3.28E-06	3.43E-06	3.58E-06	3.58E-06
ru102	2.96E-06	3.07E-06	3.18E-06	3.28E-06	3.39E-06	3.39E-06
ce142	2.63E-06	2.72E-06	2.81E-06	2.91E-06	3.00E-06	3.00E-06
nd148	2.53E-06	2.62E-06	2.71E-06	2.80E-06	2.89E-06	2.89E-06
nd146	2.13E-06	2.20E-06	2.28E-06	2.35E-06	2.43E-06	2.43E-06
in115	1.83E-06	1.90E-06	1.97E-06	2.03E-06	2.10E-06	2.10E-06
ba138	1.81E-06	1.88E-06	1.94E-06	2.01E-06	2.07E-06	2.07E-06
ce140	1.70E-06	1.76E-06	1.82E-06	1.88E-06	1.94E-06	1.94E-06
pd107	1.56E-06	1.64E-06	1.71E-06	1.78E-06	1.86E-06	1.86E-06
xe132	1.54E-06	1.60E-06	1.65E-06	1.71E-06	1.77E-06	1.77E-06
mo 98	1.05E-06	1.09E-06	1.12E-06	1.16E-06	1.20E-06	1.20E-06
mo100	1.02E-06	1.06E-06	1.09E-06	1.13E-06	1.16E-06	1.16E-06
xe134	1.00E-06	1.04E-06	1.07E-06	1.11E-06	1.15E-06	1.15E-06
ru 99	7.49E-07	8.03E-07	8.58E-07	9.16E-07	9.75E-07	9.75E-07
zr 92	8.04E-07	8.32E-07	8.60E-07	8.88E-07	9.16E-07	9.16E-07
i127	7.17E-07	7.44E-07	7.71E-07	7.98E-07	8.26E-07	8.26E-07
ru104	6.64E-07	6.89E-07	7.14E-07	7.39E-07	7.64E-07	7.64E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 70
0 fraction of total absorption rate
power= .09mw, burnup= 10724.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	6.34E-07	6.56E-07	6.78E-07	7.01E-07	7.23E-07	7.23E-07
nd150	5.68E-07	5.89E-07	6.09E-07	6.29E-07	6.50E-07	6.50E-07
xe136	5.43E-07	5.63E-07	5.82E-07	6.01E-07	6.20E-07	6.20E-07
br 81	4.05E-07	4.19E-07	4.34E-07	4.48E-07	4.62E-07	4.62E-07
rb 85	3.91E-07	4.05E-07	4.18E-07	4.32E-07	4.46E-07	4.46E-07
cd111	3.66E-07	3.82E-07	3.99E-07	4.15E-07	4.31E-07	4.31E-07
zr 94	3.41E-07	3.53E-07	3.65E-07	3.77E-07	3.89E-07	3.89E-07
zr 90	3.14E-07	3.25E-07	3.35E-07	3.46E-07	3.57E-07	3.57E-07
sm154	2.57E-07	2.67E-07	2.76E-07	2.86E-07	2.96E-07	2.96E-07
te130	2.49E-07	2.58E-07	2.67E-07	2.76E-07	2.85E-07	2.85E-07
rb 87	2.25E-07	2.33E-07	2.41E-07	2.49E-07	2.57E-07	2.57E-07
gd154	1.60E-07	1.72E-07	1.84E-07	1.97E-07	2.10E-07	2.10E-07
se 77	1.63E-07	1.69E-07	1.74E-07	1.80E-07	1.86E-07	1.86E-07
pd106	1.45E-07	1.51E-07	1.57E-07	1.63E-07	1.69E-07	1.69E-07
gd156	1.29E-07	1.35E-07	1.41E-07	1.47E-07	1.54E-07	1.54E-07
kr 84	1.07E-07	1.11E-07	1.14E-07	1.18E-07	1.22E-07	1.22E-07
eu152	9.45E-08	1.06E-07	1.09E-07	1.12E-07	1.14E-07	1.03E-07
sb121	8.36E-08	8.67E-08	8.98E-08	9.29E-08	9.60E-08	9.60E-08
ba135	7.31E-08	7.84E-08	8.39E-08	8.96E-08	9.54E-08	9.55E-08
se 79	8.25E-08	8.54E-08	8.83E-08	9.12E-08	9.40E-08	9.40E-08
dy161	7.18E-08	7.54E-08	7.91E-08	8.28E-08	8.66E-08	8.66E-08
sb123	6.77E-08	7.02E-08	7.27E-08	7.52E-08	7.78E-08	7.78E-08

kr 86	5.95E-08	6.16E-08	6.36E-08	6.57E-08	6.78E-08	6.78E-08
te128	5.57E-08	5.77E-08	5.97E-08	6.18E-08	6.38E-08	6.38E-08
ru100	4.73E-08	5.06E-08	5.41E-08	5.78E-08	6.15E-08	6.15E-08
pm147	6.25E-08	9.81E-08	9.80E-08	9.80E-08	9.79E-08	5.84E-08
eu155	4.99E-08	6.50E-08	6.52E-08	6.55E-08	6.57E-08	4.89E-08
se 80	3.90E-08	4.03E-08	4.17E-08	4.31E-08	4.45E-08	4.45E-08
nd142	3.36E-08	3.61E-08	3.86E-08	4.12E-08	4.39E-08	4.39E-08
te125	3.68E-08	3.82E-08	3.96E-08	4.10E-08	4.24E-08	4.24E-08
ba134	3.23E-08	3.47E-08	3.71E-08	3.96E-08	4.22E-08	4.22E-08
tb159	3.40E-08	3.55E-08	3.71E-08	3.86E-08	4.02E-08	4.02E-08
sm148	2.96E-08	3.17E-08	3.39E-08	3.62E-08	3.86E-08	3.86E-08
gd158	2.74E-08	2.86E-08	2.98E-08	3.11E-08	3.23E-08	3.23E-08
cd112	2.66E-08	2.77E-08	2.88E-08	2.98E-08	3.09E-08	3.09E-08
pd104	2.20E-08	2.36E-08	2.53E-08	2.70E-08	2.88E-08	2.88E-08
li 6	2.13E-08	2.20E-08	2.27E-08	2.34E-08	2.42E-08	2.42E-08
sn117	1.96E-08	2.03E-08	2.11E-08	2.19E-08	2.26E-08	2.26E-08
dy164	1.54E-08	1.62E-08	1.71E-08	1.80E-08	1.88E-08	1.88E-08
cd114	1.58E-08	1.65E-08	1.72E-08	1.79E-08	1.85E-08	1.85E-08
sn119	1.54E-08	1.59E-08	1.65E-08	1.71E-08	1.76E-08	1.76E-08
dy162	1.43E-08	1.51E-08	1.59E-08	1.68E-08	1.76E-08	1.76E-08
sn115	1.41E-08	1.46E-08	1.51E-08	1.56E-08	1.62E-08	1.62E-08
nb 93	1.17E-08	1.26E-08	1.35E-08	1.44E-08	1.53E-08	1.53E-08
pd110	1.19E-08	1.25E-08	1.30E-08	1.36E-08	1.41E-08	1.41E-08
sr 88	1.09E-08	1.13E-08	1.17E-08	1.21E-08	1.25E-08	1.25E-08
mo 96	7.68E-09	8.21E-09	8.77E-09	9.34E-09	9.94E-09	9.94E-09
se 82	7.47E-09	7.73E-09	8.00E-09	8.26E-09	8.52E-09	8.52E-09
br 79	5.91E-09	6.34E-09	6.77E-09	7.23E-09	7.70E-09	7.70E-09

1 sas2h: far-field crit based on b&w 15x15, 3.09w%, 20gwd/mtu 40% h2o/ 8% ur2 fission products page 71
0 fraction of total absorption rate
power= .00mw, burnup= 10724.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

cd110	5.58E-09	6.07E-09	6.59E-09	7.13E-09	7.70E-09	7.70E-09
sn126	6.55E-09	6.79E-09	7.04E-09	7.28E-09	7.53E-09	7.53E-09
se 78	5.78E-09	5.99E-09	6.19E-09	6.40E-09	6.61E-09	6.61E-09
eu154	5.33E-09	6.30E-09	6.61E-09	6.84E-09	7.06E-09	6.02E-09
ag107	4.38E-09	4.74E-09	5.11E-09	5.50E-09	5.90E-09	5.90E-09
sr 90	5.73E-09	5.90E-09	5.97E-09	5.97E-09	5.96E-09	5.67E-09
sn124	4.90E-09	5.08E-09	5.27E-09	5.45E-09	5.63E-09	5.63E-09
ba136	4.37E-09	4.62E-09	4.87E-09	5.12E-09	5.38E-09	5.38E-09
xe130	4.02E-09	4.29E-09	4.56E-09	4.85E-09	5.14E-09	5.14E-09
xe129	3.45E-09	3.70E-09	3.96E-09	4.23E-09	4.51E-09	4.51E-09
dy163	3.57E-09	3.77E-09	3.98E-09	4.19E-09	4.41E-09	4.41E-09
kr 82	3.33E-09	3.52E-09	3.71E-09	3.91E-09	4.12E-09	4.12E-09
as 75	3.42E-09	3.54E-09	3.66E-09	3.78E-09	3.90E-09	3.90E-09
in113	2.77E-09	2.87E-09	2.98E-09	3.08E-09	3.19E-09	3.19E-09
te126	2.07E-09	2.21E-09	2.37E-09	2.52E-09	2.68E-09	2.68E-09
sn118	1.93E-09	2.06E-09	2.13E-09	2.21E-09	2.30E-09	2.38E-09
sn122	1.69E-09	1.75E-09	1.82E-09	1.88E-09	1.94E-09	1.94E-09
cd116	1.67E-09	1.74E-09	1.80E-09	1.86E-09	1.92E-09	1.92E-09
sn120	1.25E-09	1.30E-09	1.35E-09	1.39E-09	1.44E-09	1.44E-09
cs137	1.31E-09	1.36E-09	1.36E-09	1.36E-09	1.36E-09	1.30E-09
ge 73	9.59E-10	9.94E-10	1.03E-09	1.06E-09	1.10E-09	1.10E-09
gd160	3.61E-10	3.78E-10	3.95E-10	4.13E-10	4.31E-10	4.31E-10
ge 76	3.35E-10	3.47E-10	3.59E-10	3.71E-10	3.82E-10	3.82E-10
ho165	2.90E-10	3.08E-10	3.27E-10	3.46E-10	3.66E-10	3.66E-10
cs134	3.43E-10	6.39E-10	6.61E-10	6.83E-10	7.05E-10	3.60E-10
dy160	1.88E-10	2.03E-10	2.18E-10	2.34E-10	2.51E-10	2.51E-10
kr 85	1.80E-10	2.01E-10	2.01E-10	2.01E-10	2.01E-10	1.76E-10
xe128	1.25E-10	1.34E-10	1.43E-10	1.53E-10	1.63E-10	1.63E-10

sr 86	6.84E-11	7.29E-11	7.75E-11	8.23E-11	8.73E-11	8.73E-11
te124	6.84E-11	7.19E-11	7.54E-11	7.90E-11	8.27E-11	8.27E-11
sn116	4.80E-11	5.15E-11	5.51E-11	5.89E-11	6.28E-11	6.28E-11
sr 87	4.34E-11	4.51E-11	4.68E-11	4.85E-11	5.02E-11	5.02E-11
ce144	4.51E-11	2.13E-10	2.13E-10	2.13E-10	2.13E-10	3.60E-11
nb 94	2.81E-11	2.96E-11	3.12E-11	3.28E-11	3.45E-11	3.45E-11
se 76	2.15E-11	2.27E-11	2.40E-11	2.54E-11	2.68E-11	2.68E-11
te122	2.00E-11	2.15E-11	2.30E-11	2.46E-11	2.62E-11	2.62E-11
ge 74	1.92E-11	1.99E-11	2.06E-11	2.13E-11	2.20E-11	2.20E-11
er166	1.53E-11	1.62E-11	1.72E-11	1.82E-11	1.92E-11	1.92E-11
ge 72	1.37E-11	1.42E-11	1.47E-11	1.52E-11	1.58E-11	1.58E-11
y 90	5.46E-12	5.69E-12	5.68E-12	5.68E-12	5.67E-12	5.40E-12
kr 80	3.62E-12	3.96E-12	4.33E-12	4.72E-12	5.13E-12	5.13E-12
sb125	3.97E-12	6.20E-12	6.22E-12	6.24E-12	6.25E-12	3.77E-12
ru106	4.00E-12	1.33E-11	1.34E-11	1.35E-11	1.36E-11	3.47E-12
er167	7.85E-13	8.59E-13	9.36E-13	1.02E-12	1.10E-12	1.10E-12
te123	4.76E-13	5.23E-13	5.74E-13	6.27E-13	6.83E-13	6.83E-13
cd108	1.64E-13	1.84E-13	2.04E-13	2.27E-13	2.51E-13	2.51E-13
be 9	4.22E-14	4.37E-14	4.51E-14	4.66E-14	4.81E-14	4.81E-14
nb 95	1.18E-13	5.44E-11	5.44E-11	5.44E-11	5.43E-11	4.36E-14
te127m	5.55E-14	3.13E-12	3.14E-12	3.15E-12	3.16E-12	3.13E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 72

0 fraction of total absorption rate

power= .00mw, burnup= 10724.mwd, flux= 9.22E+07n/cm**2-sec

0

	initial ******* d	******* d	******* d	******* d	******* d
zr 95	5.78E-14	5.87E-11	5.87E-11	5.87E-11	5.86E-11	2.14E-14
li 7	1.71E-14	1.77E-14	1.84E-14	1.90E-14	1.96E-14	1.96E-14
sn114	1.22E-14	1.31E-14	1.41E-14	1.50E-14	1.60E-14	1.60E-14
y 91	2.60E-14	5.03E-11	5.02E-11	5.02E-11	5.01E-11	8.73E-15
sb126	7.54E-15	9.84E-15	1.01E-14	1.04E-14	1.07E-14	8.66E-15
sr 89	1.67E-15	1.07E-11	1.07E-11	1.07E-11	1.07E-11	4.73E-16
ru103	1.72E-15	1.38E-10	1.38E-10	1.38E-10	1.38E-10	3.42E-16
ce141	6.91E-16	5.75E-10	5.75E-10	5.75E-10	5.75E-10	9.75E-17
sn123	1.23E-16	3.81E-15	3.81E-15	3.82E-15	3.82E-15	7.55E-17
tb160	6.77E-17	3.25E-14	3.38E-14	3.52E-14	3.66E-14	3.30E-17
pm148m	3.09E-17	1.42E-12	1.43E-12	1.43E-12	1.43E-12	6.70E-18
cd109	1.84E-18	5.11E-13	5.45E-18	5.82E-18	6.21E-18	2.07E-13
cd115m	4.64E-18	9.64E-14	9.66E-14	9.68E-14	9.71E-14	1.13E-18
sb124	1.19E-18	1.92E-15	1.96E-15	2.00E-15	2.04E-15	4.49E-19
te129m	1.28E-18	6.87E-13	6.88E-13	6.88E-13	6.89E-13	1.93E-19
pm148	5.51E-20	4.99E-14	4.99E-14	5.00E-14	5.01E-14	9.17E-21

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 73

power= 1.468E-03mw, burnup=1.0724E+04mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

charge ******* d	******* d	******* d	******* d	******* d	******* d
h 1	5.56E-04	5.70E-04	5.90E-04	6.16E-04	6.36E-04	6.36E-04
h 2	1.66E-06	1.72E-06	1.78E-06	1.84E-06	1.89E-06	1.89E-06
h 3	1.58E-11	1.76E-11	1.78E-11	1.79E-11	1.81E-11	1.61E-11
h 4	.00E+00	2.59E-35	2.61E-35	2.63E-35	2.65E-35	.00E+00
he 3	9.83E-09	1.01E-08	1.04E-08	1.06E-08	1.09E-08	1.09E-08
he 4	9.21E-05	9.54E-05	9.87E-05	1.02E-04	1.05E-04	1.05E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.11E-05	1.15E-05	1.19E-05	1.23E-05	1.27E-05	1.27E-05
ne 21	2.02E-09	2.16E-09	2.30E-09	2.45E-09	2.60E-09	2.60E-09
ne 22	7.28E-08	7.54E-08	7.80E-08	8.06E-08	8.33E-08	8.33E-08
ne 23	2.63E-30	2.64E-15	2.64E-15	2.64E-15	2.64E-15	2.64E-30
na 22	9.76E-12	1.56E-11	1.56E-11	1.56E-11	1.56E-11	9.16E-12

na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	9.57E-24	9.57E-09	9.57E-09	9.57E-09	9.58E-09	9.58E-24
na 24m	1.57E-30	1.57E-15	1.57E-15	1.57E-15	1.57E-15	1.57E-30
na 25	2.23E-39	2.38E-24	2.53E-24	2.69E-24	2.86E-24	2.86E-39
mg 24	7.55E-02	7.79E-02	8.04E-02	8.29E-02	8.54E-02	8.54E-02
mg 25	2.15E-07	2.29E-07	2.44E-07	2.59E-07	2.75E-07	2.75E-07
mg 26	1.65E-06	1.71E-06	1.77E-06	1.83E-06	1.89E-06	1.89E-06
mg 27	7.84E-28	7.86E-13	7.86E-13	7.87E-13	7.87E-13	7.87E-28
mg 28	.00E+00	5.79E-25	5.80E-25	5.80E-25	5.80E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	7.09E-26	7.09E-11	7.10E-11	7.10E-11	7.10E-11	7.10E-26
al 29	1.76E-37	1.88E-22	2.00E-22	2.13E-22	2.27E-22	2.27E-37
al 30	.00E+00	2.37E-32	2.61E-32	2.87E-32	3.14E-32	.00E+00
si 28	2.20E-01	2.27E-01	2.34E-01	2.41E-01	2.48E-01	2.48E-01
si 29	1.89E-06	2.02E-06	2.16E-06	2.29E-06	2.44E-06	2.44E-06
si 30	1.72E-11	1.91E-11	2.10E-11	2.31E-11	2.53E-11	2.53E-11
si 31	4.47E-39	4.94E-24	5.45E-24	5.99E-24	6.57E-24	6.56E-39
si 32	2.72E-30	3.03E-30	3.35E-30	3.69E-30	4.05E-30	4.01E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.21E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 74

power= 1.468E-03mw, burnup=1.0724E+04mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	8.85E+00	9.37E+00	9.91E+00	1.05E+01	1.10E+01	1.10E+01
pb206	2.71E-02	2.93E-02	3.15E-02	3.39E-02	3.63E-02	3.63E-02
pb207	2.18E-03	2.33E-03	2.49E-03	2.65E-03	2.82E-03	2.82E-03
pb208	1.24E-04	1.33E-04	1.42E-04	1.51E-04	1.61E-04	1.61E-04
pb209	2.58E-10	2.72E-10	2.87E-10	3.02E-10	3.16E-10	3.16E-10
pb210	1.10E-04	1.14E-04	1.19E-04	1.23E-04	1.27E-04	1.27E-04
pb211	2.40E-11	2.47E-11	2.54E-11	2.62E-11	2.70E-11	2.70E-11
pb212	2.39E-11	2.48E-11	2.55E-11	2.63E-11	2.71E-11	2.70E-11
pb214	2.52E-10	2.62E-10	2.71E-10	2.81E-10	2.91E-10	2.91E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	3.18E-03	3.49E-03	3.82E-03	4.16E-03	4.52E-03	4.53E-03
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	6.78E-08	7.04E-08	7.31E-08	7.57E-08	7.84E-08	7.84E-08
bi211	1.42E-12	1.46E-12	1.51E-12	1.55E-12	1.60E-12	1.60E-12
bi212	2.27E-12	2.35E-12	2.42E-12	2.50E-12	2.57E-12	2.56E-12
bi213	6.03E-11	6.36E-11	6.70E-11	7.04E-11	7.39E-11	7.39E-11
bi214	1.87E-10	1.94E-10	2.02E-10	2.09E-10	2.16E-10	2.16E-10
po210	1.85E-06	1.94E-06	2.02E-06	2.09E-06	2.16E-06	2.15E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	1.57E-17	1.62E-17	1.67E-17	1.72E-17	1.77E-17	1.77E-17
po212	1.19E-22	1.23E-22	1.27E-22	1.31E-22	1.35E-22	1.35E-22
po213	9.07E-20	9.57E-20	1.01E-19	1.06E-19	1.11E-19	1.11E-19
po214	2.57E-17	2.67E-17	2.77E-17	2.87E-17	2.97E-17	2.97E-17
po215	1.97E-17	2.03E-17	2.09E-17	2.15E-17	2.22E-17	2.22E-17
po216	9.06E-17	9.37E-17	9.67E-17	9.96E-17	1.02E-16	1.02E-16
po218	2.91E-11	3.03E-11	3.14E-11	3.25E-11	3.37E-11	3.37E-11
rn218	7.02E-38	1.30E-28	1.35E-28	1.39E-28	1.43E-28	3.73E-39
rn219	4.38E-14	4.51E-14	4.65E-14	4.79E-14	4.93E-14	4.94E-14
rn220	3.48E-14	3.59E-14	3.71E-14	3.82E-14	3.93E-14	3.92E-14
rn222	5.17E-08	5.37E-08	5.58E-08	5.78E-08	5.98E-08	5.98E-08
ra222	7.63E-35	1.42E-25	1.46E-25	1.50E-25	1.55E-25	4.05E-36
ra223	1.09E-08	1.13E-08	1.16E-08	1.20E-08	1.23E-08	1.23E-08
ra224	1.98E-10	2.04E-10	2.11E-10	2.17E-10	2.24E-10	2.23E-10
ra225	2.82E-08	2.98E-08	3.13E-08	3.29E-08	3.45E-08	3.45E-08

ra226	7.90E-03	8.21E-03	8.52E-03	8.83E-03	9.14E-03	9.14E-03
ra228	3.77E-11	3.91E-11	4.04E-11	4.18E-11	4.32E-11	4.32E-11
ac225	1.91E-08	2.01E-08	2.12E-08	2.22E-08	2.33E-08	2.33E-08
ac227	7.58E-06	7.83E-06	8.07E-06	8.31E-06	8.55E-06	8.55E-06
ac228	4.60E-15	4.77E-15	4.94E-15	5.10E-15	5.27E-15	5.27E-15
th226	3.72E-33	6.91E-24	7.13E-24	7.34E-24	7.56E-24	1.97E-34
th227	1.76E-08	1.82E-08	1.87E-08	1.93E-08	1.98E-08	1.99E-08
th228	3.76E-08	3.90E-08	4.03E-08	4.15E-08	4.27E-08	4.24E-08
th229	5.48E-03	5.79E-03	6.09E-03	6.40E-03	6.72E-03	6.72E-03
th230	4.27E-01	4.41E-01	4.56E-01	4.70E-01	4.84E-01	4.84E-01
th231	2.85E-09	3.57E-09	3.59E-09	3.61E-09	3.63E-09	2.83E-09
th232	9.22E-02	9.55E-02	9.89E-02	1.02E-01	1.06E-01	1.06E-01
th233	3.05E-28	3.16E-13	3.27E-13	3.39E-13	3.50E-13	3.50E-28
th234	5.37E-07	5.37E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	1.14E-02	1.18E-02	1.21E-02	1.25E-02	1.29E-02	1.29E-02
pa232	7.07E-26	7.30E-11	7.53E-11	7.76E-11	7.98E-11	7.99E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 75
power= 1.468E-03mw, burnup=1.0724E+04mwd, flux= 9.22E+07n/cm**2-sec

0

nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.43E-06	1.43E-06	1.43E-06	1.43E-06	1.43E-06	1.43E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	3.60E-30	6.70E-21	6.91E-21	7.12E-21	7.33E-21	1.91E-31
u231	6.10E-32	6.30E-17	6.50E-17	6.71E-17	6.90E-17	6.91E-32
u232	1.36E-06	1.42E-06	1.47E-06	1.51E-06	1.56E-06	1.53E-06
u233	2.22E-01	2.29E-01	2.37E-01	2.44E-01	2.51E-01	2.51E-01
u234	9.69E+00	9.71E+00	9.73E+00	9.75E+00	9.77E+00	9.77E+00
u235	6.90E+02	6.89E+02	6.87E+02	6.86E+02	6.85E+02	6.85E+02
u236	1.81E+02	1.82E+02	1.82E+02	1.82E+02	1.83E+02	1.83E+02
u237	1.47E-12	1.16E-06	1.16E-06	1.16E-06	1.17E-06	1.71E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	1.12E-22	1.12E-07	1.12E-07	1.12E-07	1.12E-07	1.12E-22
u240	1.30E-37	1.71E-37	2.24E-37	2.90E-37	3.72E-37	3.73E-37
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.02E-12	3.12E-12	3.12E-12	3.12E-12	3.12E-12	8.67E-13
np236m	7.40E-28	7.41E-13	7.41E-13	7.40E-13	7.40E-13	7.40E-28
np236	1.18E-06	1.22E-06	1.26E-06	1.30E-06	1.34E-06	1.34E-06
np237	4.15E+01	4.15E+01	4.15E+01	4.15E+01	4.14E+01	4.14E+01
np238	4.52E-14	5.47E-07	5.47E-07	5.47E-07	5.47E-07	5.38E-14
np239	3.77E-14	1.62E-05	1.62E-05	1.62E-05	1.62E-05	5.64E-14
np240m	1.11E-39	1.46E-39	1.91E-39	2.47E-39	3.18E-39	3.18E-39
np240	2.78E-39	1.19E-15	1.19E-15	1.19E-15	1.19E-15	4.17E-39
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	2.67E-13	4.00E-13	4.04E-13	4.08E-13	4.12E-13	2.58E-13
pu237	5.47E-18	1.06E-15	1.06E-15	1.06E-15	1.07E-15	1.45E-18
pu238	8.17E-03	8.26E-03	8.28E-03	8.28E-03	8.27E-03	8.14E-03
pu239	2.24E+01	2.30E+01	2.35E+01	2.41E+01	2.46E+01	2.46E+01
pu240	3.53E-01	3.69E-01	3.85E-01	4.00E-01	4.16E-01	4.16E-01
pu241	4.78E-05	5.43E-05	5.66E-05	5.89E-05	6.12E-05	5.56E-05
pu242	9.98E-06	1.09E-05	1.19E-05	1.29E-05	1.39E-05	1.39E-05
pu243	7.66E-30	8.31E-15	9.05E-15	9.81E-15	1.06E-14	1.07E-29
pu244	6.45E-27	8.52E-27	1.11E-26	1.44E-26	1.85E-26	1.86E-26
pu245	.00E+00	1.25E-37	1.65E-37	2.14E-37	2.74E-37	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.47E-34	1.54E-19	1.61E-19	1.68E-19	1.75E-19	1.75E-34
am240	6.73E-32	7.06E-17	7.38E-17	7.70E-17	8.02E-17	8.02E-32

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     am241   1.47E-03  1.54E-03  1.61E-03  1.68E-03  1.75E-03  1.75E-03
     am242m  2.44E-07  2.58E-07  2.70E-07  2.82E-07  2.94E-07  2.91E-07
     am242   3.15E-12  2.09E-11  2.19E-11  2.29E-11  2.38E-11  3.75E-12
     am243   4.31E-08  4.79E-08  5.31E-08  5.86E-08  6.44E-08  6.44E-08
     am244m   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am244   1.18E-31  1.31E-16  1.45E-16  1.60E-16  1.76E-16  1.76E-31
     am245   1.19E-40  2.52E-38  3.30E-38  4.27E-38  5.48E-38  2.54E-40
     am246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm241   5.76E-28  4.46E-22  4.66E-22  4.87E-22  5.07E-22  9.87E-29
     cm242   8.62E-10  4.23E-09  4.42E-09  4.61E-09  4.80E-09  9.40E-10
     cm243   3.20E-14  3.49E-14  3.66E-14  3.82E-14  3.97E-14  3.79E-14
     cm244   1.73E-12  2.06E-12  2.28E-12  2.52E-12  2.77E-12  2.57E-12
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                  actinides        page   76
       power= 1.468E-03mw, burnup=1.0724E+04mwd, flux= 9.22E+07n/cm**2-sec
0                                        nuclide concentrations, gram atoms
                                         basis = single reactor assembly
             charge ******* d ******* d ******* d ******* d ******* d
     cm245   2.26E-15  2.59E-15  2.95E-15  3.35E-15  3.78E-15  3.77E-15
     cm246   1.15E-17  1.36E-17  1.58E-17  1.84E-17  2.13E-17  2.13E-17
     cm247   1.36E-21  1.66E-21  2.02E-21  2.44E-21  2.92E-21  2.92E-21
     cm248   1.57E-24  1.99E-24  2.51E-24  3.14E-24  3.90E-24  3.90E-24
     cm249    .00E+00  2.26E-35  2.86E-35  3.57E-35  4.43E-35   .00E+00
     cm250   5.44E-40  7.17E-40  9.35E-40  1.21E-39  1.55E-39  1.55E-39
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              9.21E+07  9.22E+07  9.22E+07  9.22E+07  9.22E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number  9 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr origen-s binary working library--id = 1143             *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *       neutron flux spectrum factors and cross sections were produced from    *
          *      the "presas2" case updating all nuclides on the scale "burnup" library  *
```

```
           *                                                                         *
           *                fission product yields are from endf/b-v                *
           *                                                                         *
           *             photon libraries use an 18-energy-group structure          *
           *            the photon data are from the master photon data base,       *
           *             produced to include bremsstrahlung from uo2 matrix         *
           *                                                                         *
           *       see information above this box (if present) for later updates   *
           *                                                                         *
           ***************************************************************************
           *                                                                         *
0          ***************************************************************************
0                     .other identification and sizes of library.
0                      data set name:  ft33f001
0                8/29/1996     date library was produced
0                      1697    total number of nuclides in library
                        689    number of light-element nuclides
                        129    number of actinide nuclides
                        879    number of fission product nuclides
0                      7993    number of nonzero off-diagonal matrix elements  .
0          ***************************************************************************
1     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                page   77
          power=     .00mw, burnup=  12064.mwd, flux= 9.22E+07n/cm**2-sec
0                                              basis =
0     (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                      initial       ******* d        ******* d        ******* d        ******* d        ******* d
      productions    1.234046E+06   1.233959E+06   1.233848E+06   1.233716E+06   1.233562E+06   1.233559E+06
      absorptions    9.992796E+05   9.994441E+05   9.995941E+05   9.997313E+05   9.998563E+05   9.998534E+05
      k infinity     1.234936E+00   1.234645E+00   1.234349E+00   1.234047E+00   1.233739E+00   1.233740E+00
0                      initial       ******* d        ******* d        ******* d        ******* d        ******* d
      actinide
      absorptions    9.856426E+05   9.856710E+05   9.856871E+05   9.856911E+05   9.856834E+05   9.856814E+05
      non-actinide
      abs. fracs.    1.364673E-02   1.378077E-02   1.391262E-02   1.404399E-02   1.417500E-02   1.417410E-02
1     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2          fission products      page   78
0                                    fraction of total absorption rate
          power=     .00mw, burnup=  12064.mwd, flux= 9.22E+07n/cm**2-sec
0                 initial ******* d ******* d ******* d ******* d ******* d
```

	initial	******* d	******* d	******* d	******* d	******* d
sm149	5.45E-03	5.45E-03	5.45E-03	5.45E-03	5.45E-03	5.45E-03
eu151	1.20E-03	1.23E-03	1.26E-03	1.28E-03	1.31E-03	1.31E-03
nd143	1.05E-03	1.08E-03	1.11E-03	1.14E-03	1.17E-03	1.17E-03
rh103	5.01E-04	5.17E-04	5.32E-04	5.48E-04	5.64E-04	5.64E-04
xe131	3.38E-04	3.48E-04	3.58E-04	3.69E-04	3.79E-04	3.79E-04
cs133	2.62E-04	2.70E-04	2.78E-04	2.86E-04	2.94E-04	2.94E-04
sm147	1.93E-04	1.99E-04	2.05E-04	2.11E-04	2.17E-04	2.17E-04
gd155	2.07E-04	2.08E-04	2.09E-04	2.10E-04	2.11E-04	2.11E-04
tc 99	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
nd145	[illegible]	[illegible]	1.57E-04	[illegible]	[illegible]	[illegible]
sm152	1.02E-04	1.06E-04	1.09E-04	1.13E-04	1.17E-04	1.17E-04
mo 95	1.03E-04	1.06E-04	1.09E-04	1.12E-04	1.15E-04	1.15E-04
cd113	9.77E-05	9.80E-05	9.84E-05	9.87E-05	9.90E-05	9.90E-05
sm150	7.30E-05	7.55E-05	7.81E-05	8.06E-05	8.31E-05	8.31E-05
kr 83	6.37E-05	6.56E-05	6.75E-05	6.95E-05	7.14E-05	7.14E-05
cs135	5.92E-05	6.11E-05	6.29E-05	6.48E-05	6.66E-05	6.66E-05
gd157	5.53E-05	5.57E-05	5.62E-05	5.66E-05	5.70E-05	5.70E-05
ru101	4.60E-05	4.75E-05	4.89E-05	5.03E-05	[illegible]	5.18E-05
eu153	4.40E-05	4.54E-05	4.69E-05	4.84E-05	4.99E-05	4.99E-05
pr141	4.41E-05	4.54E-05	4.68E-05	4.81E-05	4.95E-05	4.95E-05
la139	3.60E-05	3.71E-05	3.83E-05	3.94E-05	4.05E-05	4.05E-05

pd105	1.73E-05	1.79E-05	1.85E-05	1.91E-05	1.97E-05	1.97E-05
ba137	1.73E-05	1.79E-05	1.84E-05	1.89E-05	1.95E-05	1.95E-05
sm151	1.78E-05	1.81E-05	1.81E-05	1.82E-05	1.82E-05	1.79E-05
ag109	1.41E-05	1.48E-05	1.54E-05	1.61E-05	1.67E-05	1.67E-05
zr 93	1.44E-05	1.48E-05	1.52E-05	1.57E-05	1.61E-05	1.61E-05
i129	1.16E-05	1.20E-05	1.23E-05	1.27E-05	1.31E-05	1.31E-05
nd144	1.10E-05	1.13E-05	1.17E-05	1.20E-05	1.23E-05	1.23E-05
mo 97	8.18E-06	8.44E-06	8.69E-06	8.94E-06	9.20E-06	9.20E-06
gd152	5.51E-06	5.82E-06	6.14E-06	6.47E-06	6.80E-06	6.80E-06
zr 91	3.79E-06	3.91E-06	4.02E-06	4.14E-06	4.26E-06	4.26E-06
pd108	3.58E-06	3.73E-06	3.88E-06	4.04E-06	4.20E-06	4.20E-06
y 89	3.63E-06	3.74E-06	3.85E-06	3.96E-06	4.07E-06	4.07E-06
ru102	3.39E-06	3.50E-06	3.60E-06	3.71E-06	3.82E-06	3.82E-06
ce142	3.00E-06	3.09E-06	3.18E-06	3.28E-06	3.37E-06	3.37E-06
nd148	2.89E-06	2.98E-06	3.07E-06	3.16E-06	3.25E-06	3.25E-06
nd146	2.43E-06	2.50E-06	2.58E-06	2.65E-06	2.73E-06	2.73E-06
in115	2.10E-06	2.17E-06	2.24E-06	2.31E-06	2.37E-06	2.37E-06
ba138	2.07E-06	2.13E-06	2.20E-06	2.26E-06	2.33E-06	2.33E-06
ce140	1.94E-06	2.00E-06	2.06E-06	2.12E-06	2.18E-06	2.18E-06
pd107	1.86E-06	1.93E-06	2.01E-06	2.08E-06	2.16E-06	2.16E-06
xe132	1.77E-06	1.82E-06	1.88E-06	1.93E-06	1.99E-06	1.99E-06
mo 98	1.20E-06	1.24E-06	1.27E-06	1.31E-06	1.35E-06	1.35E-06
mo100	1.16E-06	1.20E-06	1.24E-06	1.27E-06	1.31E-06	1.31E-06
xe134	1.15E-06	1.18E-06	1.22E-06	1.25E-06	1.29E-06	1.29E-06
ru 99	9.75E-07	1.04E-06	1.10E-06	1.16E-06	1.23E-06	1.23E-06
zr 92	9.16E-07	9.44E-07	9.72E-07	1.00E-06	1.03E-06	1.03E-06
i127	8.26E-07	8.53E-07	8.81E-07	9.09E-07	9.36E-07	9.36E-07
ru104	7.64E-07	7.89E-07	8.14E-07	8.39E-07	8.64E-07	8.64E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 79
0 fraction of total absorption rate
power= .00mw, burnup= 12064.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	7.23E-07	7.45E-07	7.68E-07	7.90E-07	8.12E-07	8.12E-07
nd150	6.50E-07	6.70E-07	6.91E-07	7.11E-07	7.31E-07	7.31E-07
xe136	6.20E-07	6.40E-07	6.59E-07	6.78E-07	6.98E-07	6.98E-07
br 81	4.62E-07	4.77E-07	4.91E-07	5.05E-07	5.20E-07	5.20E-07
rb 85	4.46E-07	4.59E-07	4.73E-07	4.87E-07	5.00E-07	5.00E-07
cd111	4.31E-07	4.48E-07	4.65E-07	4.82E-07	4.99E-07	4.99E-07
zr 94	3.89E-07	4.01E-07	4.12E-07	4.24E-07	4.36E-07	4.36E-07
zr 90	3.57E-07	3.68E-07	3.79E-07	3.90E-07	4.01E-07	4.01E-07
sm154	2.96E-07	3.05E-07	3.15E-07	3.25E-07	3.35E-07	3.35E-07
te130	2.85E-07	2.94E-07	3.03E-07	3.12E-07	3.21E-07	3.21E-07
rb 87	2.57E-07	2.65E-07	2.73E-07	2.80E-07	2.88E-07	2.88E-07
gd154	2.10E-07	2.24E-07	2.38E-07	2.52E-07	2.67E-07	2.67E-07
se 77	1.86E-07	1.92E-07	1.97E-07	2.03E-07	2.09E-07	2.09E-07
pd106	1.69E-07	1.75E-07	1.82E-07	1.88E-07	1.94E-07	1.94E-07
gd156	1.54E-07	1.60E-07	1.66E-07	1.72E-07	1.78E-07	1.78E-07
kr 84	1.22E-07	1.26E-07	1.30E-07	1.33E-07	1.37E-07	1.37E-07
ba135	9.54E-08	1.01E-07	1.08E-07	1.14E-07	1.21E-07	1.21E-07
eu152	1.03E-07	1.17E-07	1.19E-07	1.22E-07	1.24E-07	1.10E-07
sb121	9.60E-08	9.92E-08	1.02E-07	1.05E-07	1.09E-07	1.09E-07
se 79	9.40E-08	9.69E-08	9.97E-08	1.03E-07	1.05E-07	1.05E-07
dy161	8.66E-08	9.05E-08	9.43E-08	9.83E-08	1.02E-07	1.02E-07
sb123	7.78E-08	8.03E-08	8.28E-08	8.53E-08	8.78E-08	8.78E-08
ru100	6.15E-08	6.55E-08	6.93E-08	7.34E-08	7.76E-08	7.76E-08
kr 86	6.78E-08	6.99E-08	7.19E-08	7.40E-08	7.61E-08	7.61E-08
te128	6.38E-08	6.59E-08	6.79E-08	6.99E-08	7.20E-08	7.20E-08
nd142	4.39E-08	4.67E-08	4.95E-08	5.25E-08	5.55E-08	5.55E-08
pm147	5.84E-08	9.79E-08	9.79E-08	9.78E-08	9.78E-08	5.46E-08

ba134	4.22E-08	4.48E-08	4.76E-08	5.04E-08	5.33E-08	5.33E-08
se 80	4.45E-08	4.58E-08	4.72E-08	4.86E-08	5.00E-08	5.00E-08
sm148	3.86E-08	4.10E-08	4.35E-08	4.61E-08	4.87E-08	4.87E-08
te125	4.24E-08	4.38E-08	4.52E-08	4.66E-08	4.80E-08	4.80E-08
eu155	4.89E-08	6.60E-08	6.62E-08	6.65E-08	6.67E-08	4.78E-08
tb159	4.02E-08	4.18E-08	4.34E-08	4.51E-08	4.67E-08	4.67E-08
gd158	3.23E-08	3.36E-08	3.49E-08	3.61E-08	3.74E-08	3.74E-08
pd104	2.88E-08	3.06E-08	3.25E-08	3.45E-08	3.65E-08	3.65E-08
cd112	3.09E-08	3.20E-08	3.32E-08	3.43E-08	3.54E-08	3.54E-08
li 6	2.42E-08	2.49E-08	2.56E-08	2.63E-08	2.70E-08	2.70E-08
sn117	2.26E-08	2.34E-08	2.42E-08	2.49E-08	2.57E-08	2.57E-08
dy164	1.88E-08	1.97E-08	2.07E-08	2.16E-08	2.25E-08	2.25E-08
cd114	1.85E-08	1.92E-08	1.99E-08	2.06E-08	2.13E-08	2.13E-08
dy162	1.76E-08	1.85E-08	1.94E-08	2.03E-08	2.12E-08	2.12E-08
sn119	1.76E-08	1.82E-08	1.88E-08	1.94E-08	2.00E-08	2.00E-08
nb 93	1.53E-08	1.63E-08	1.73E-08	1.83E-08	1.93E-08	1.93E-08
sn115	1.62E-08	1.67E-08	1.72E-08	1.77E-08	1.83E-08	1.83E-08
pd110	1.41E-08	1.47E-08	1.52E-08	1.58E-08	1.64E-08	1.64E-08
sr 88	1.25E-08	1.28E-08	1.32E-08	1.36E-08	1.40E-08	1.40E-08
mo 96	9.94E-09	1.05E-08	1.12E-08	1.18E-08	1.25E-08	1.25E-08
cd110	7.69E-09	8.29E-09	8.91E-09	9.55E-09	1.02E-08	1.02E-08
br 79	7.70E-09	8.18E-09	8.68E-09	9.19E-09	9.72E-09	9.72E-09

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 80
0 fraction of total absorption rate
power= .00mw, burnup= 12064.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

se 82	8.52E-09	8.78E-09	9.04E-09	9.31E-09	9.57E-09	9.57E-09
sn126	7.55E-09	7.77E-09	8.01E-09	8.26E-09	8.50E-09	8.50E-09
ag107	5.90E-09	6.32E-09	6.76E-09	7.22E-09	7.69E-09	7.69E-09
se 78	6.61E-09	6.81E-09	7.02E-09	7.23E-09	7.44E-09	7.44E-09
eu154	6.02E-09	7.32E-09	7.55E-09	7.79E-09	8.03E-09	6.70E-09
ba136	5.39E-09	5.65E-09	5.92E-09	6.20E-09	6.48E-09	6.48E-09
xe130	5.14E-09	5.44E-09	5.75E-09	6.07E-09	6.39E-09	6.39E-09
sn124	5.63E-09	5.82E-09	6.00E-09	6.19E-09	6.38E-09	6.38E-09
xe129	4.51E-09	4.80E-09	5.09E-09	5.40E-09	5.71E-09	5.71E-09
sr 90	5.67E-09	5.95E-09	5.95E-09	5.94E-09	5.93E-09	5.61E-09
dy163	4.41E-09	4.63E-09	4.85E-09	5.08E-09	5.32E-09	5.32E-09
kr 82	4.12E-09	4.32E-09	4.54E-09	4.75E-09	4.97E-09	4.97E-09
as 75	3.90E-09	4.02E-09	4.15E-09	4.27E-09	4.39E-09	4.39E-09
in113	3.19E-09	3.29E-09	3.40E-09	3.51E-09	3.61E-09	3.61E-09
te126	2.68E-09	2.85E-09	3.02E-09	3.20E-09	3.38E-09	3.38E-09
sn118	2.28E-09	2.36E-09	2.43E-09	2.51E-09	2.58E-09	2.58E-09
sn122	1.94E-09	2.01E-09	2.07E-09	2.14E-09	2.20E-09	2.20E-09
cd116	1.92E-09	1.99E-09	2.05E-09	2.11E-09	2.17E-09	2.17E-09
sn120	1.44E-09	1.49E-09	1.53E-09	1.58E-09	1.63E-09	1.63E-09
cs137	1.30E-09	1.36E-09	1.36E-09	1.36E-09	1.36E-09	1.29E-09
se 77	1.19E-09	1.13E-09	1.17E-09	1.20E-09	1.24E-09	1.24E-09
ga160	4.51E-10	4.49E-10	4.67E-10	4.89E-10	5.04E-10	5.04E-10
ho165	3.46E-10	3.86E-10	4.07E-10	4.28E-10	4.50E-10	4.50E-10
ge 76	3.82E-10	3.94E-10	4.06E-10	4.18E-10	4.29E-10	4.29E-10
cs134	3.60E-10	7.27E-10	7.49E-10	7.71E-10	7.93E-10	3.72E-10
dy160	2.51E-10	2.68E-10	2.86E-10	3.05E-10	3.24E-10	3.24E-10
xe128	1.63E-10	1.74E-10	1.84E-10	1.96E-10	2.07E-10	2.07E-10
kr 85	1.76E-10	2.00E-10	2.00E-10	2.00E-10	2.00E-10	1.73E-10
sr 86	8.73E-11	9.23E-11	9.75E-11	1.03E-10	1.08E-10	1.08E-10
te124	8.27E-11	8.64E-11	9.02E-11	9.41E-11	9.80E-11	9.80E-11
sn116	6.28E-11	6.69E-11	7.10E-11	7.53E-11	7.98E-11	7.98E-11
sr 87	5.02E-11	5.19E-11	5.37E-11	5.54E-11	5.72E-11	5.72E-11
nb 94	3.45E-11	3.63E-11	3.81E-11	4.00E-11	4.19E-11	4.19E-11

te122	2.62E-11	2.79E-11	2.96E-11	3.14E-11	3.33E-11	3.33E-11
se 76	2.68E-11	2.82E-11	2.96E-11	3.11E-11	3.27E-11	3.27E-11
ce144	3.60E-11	2.13E-10	2.13E-10	2.13E-10	2.12E-10	2.87E-11
ge 74	2.20E-11	2.27E-11	2.34E-11	2.41E-11	2.48E-11	2.48E-11
er166	1.92E-11	2.02E-11	2.13E-11	2.24E-11	2.35E-11	2.35E-11
ge 72	1.58E-11	1.63E-11	1.68E-11	1.73E-11	1.78E-11	1.78E-11
kr 80	5.13E-12	5.57E-12	6.03E-12	6.52E-12	7.03E-12	7.03E-12
y 90	5.40E-12	5.66E-12	5.66E-12	5.65E-12	5.65E-12	5.34E-12
sb125	3.77E-12	6.27E-12	6.29E-12	6.30E-12	6.32E-12	3.58E-12
ru106	3.47E-12	1.37E-11	1.38E-11	1.38E-11	1.39E-11	3.00E-12
er167	1.10E-12	1.19E-12	1.29E-12	1.39E-12	1.49E-12	1.49E-12
te123	6.83E-13	7.43E-13	8.07E-13	8.74E-13	9.44E-13	9.44E-13
cd108	2.51E-13	2.76E-13	3.04E-13	3.33E-13	3.65E-13	3.65E-13
be 9	4.81E-14	4.96E-14	5.11E-14	5.26E-14	5.41E-14	5.41E-14
li 7	1.96E-14	2.02E-14	2.08E-14	2.14E-14	2.20E-14	2.20E-14
sn114	1.60E-14	1.71E-14	1.82E-14	1.93E-14	2.04E-14	2.04E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 81
0 fraction of total absorption rate
power= .00mw, burnup= 12064.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

te127m	3.13E-14	3.17E-12	3.18E-12	3.19E-12	3.19E-12	1.78E-14
nb 95	4.36E-14	5.43E-11	5.43E-11	5.43E-11	5.42E-11	1.63E-14
sb126	8.66E-15	1.11E-14	1.14E-14	1.17E-14	1.20E-14	9.78E-15
zr 95	2.14E-14	5.86E-11	5.86E-11	5.85E-11	5.85E-11	7.96E-15
y 91	8.73E-15	5.01E-11	5.00E-11	5.00E-11	4.99E-11	2.96E-15
sr 89	4.73E-16	1.07E-11	1.07E-11	1.07E-11	1.06E-11	1.35E-16
ru103	3.42E-14	1.39E-10	1.39E-10	1.39E-10	1.39E-10	6.90E-17
sn123	7.55E-17	3.82E-15	3.82E-15	3.83E-15	3.83E-15	4.64E-17
tb160	3.30E-17	3.80E-14	3.94E-14	4.08E-14	4.23E-14	1.59E-17
ce141	9.75E-17	5.74E-10	5.74E-10	5.74E-10	5.74E-10	1.40E-17
cd109	2.07E-18	6.61E-18	7.04E-18	7.51E-18	7.99E-18	2.33E-18
pm148m	6.71E-18	1.44E-12	1.44E-12	1.44E-12	1.45E-12	1.47E-18
cd115m	1.13E-18	9.73E-14	9.75E-14	9.77E-14	9.79E-14	2.75E-19
sb124	4.49E-19	2.08E-15	2.12E-15	2.16E-15	2.19E-15	1.74E-19
te129m	1.92E-19	6.90E-13	6.90E-13	6.91E-13	6.92E-13	2.75E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 82
power= 1.468E-03mw, burnup=1.2064E+04mwd, flux= 9.22E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d	******* d
h 1	6.36E-04	6.56E-04	6.76E-04	6.95E-04	7.15E-04	7.15E-04
h 2	1.89E-06	1.95E-06	2.01E-06	2.07E-06	2.13E-06	2.13E-06
h 3	1.61E-11	1.82E-11	1.84E-11	1.85E-11	1.86E-11	1.64E-11
h 4	.00E+00	2.68E-35	2.70E-35	2.72E-35	2.74E-35	.00E+00
he 3	1.09E-08	1.11E-08	1.14E-08	1.16E-08	1.19E-08	1.19E-08
he 4	1.05E-04	1.06E-04	1.07E-04	1.08E-04	1.09E-04	1.09E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.27E-05	1.31E-05	1.34E-05	1.38E-05	1.42E-05	1.42E-05
ne 21	2.60E-09	2.76E-09	2.92E-09	3.09E-09	3.26E-09	3.26E-09
ne 22	8.33E-08	8.59E-08	8.85E-08	9.11E-08	9.38E-08	9.38E-08
ne 23	2.64E-30	2.64E-15	2.64E-15	2.64E-15	2.64E-15	2.64E-30
na 22	9.16E-12	1.57E-11	1.57E-11	1.57E-11	1.57E-11	8.60E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	9.58E-24	9.59E-09	9.58E-09	9.58E-09	9.58E-09	9.58E-24
na 24m	1.57E-30	1.57E-15	1.57E-15	1.57E-15	1.57E-15	1.57E-30
na 25	2.86E-39	3.02E-24	3.20E-24	3.38E-24	3.56E-24	3.56E-39
mg 24	8.54E-02	8.79E-02	9.03E-02	9.28E-02	9.53E-02	9.53E-02
mg 25	2.75E-07	2.91E-07	3.08E-07	3.25E-07	3.43E-07	3.43E-07

mg 26	1.89E-06	1.95E-06	2.01E-06	2.07E-06	2.13E-06	2.13E-06
mg 27	7.87E-28	7.88E-13	7.88E-13	7.89E-13	7.89E-13	7.89E-28
mg 28	.00E+00	5.81E-25	5.81E-25	5.82E-25	5.82E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	7.10E-26	7.10E-11	7.10E-11	7.10E-11	7.10E-11	7.10E-26
al 29	2.27E-37	2.40E-22	2.54E-22	2.69E-22	2.84E-22	2.84E-37
al 30	.00E+00	3.44E-32	3.75E-32	4.08E-32	4.43E-32	.00E+00
si 28	2.48E-01	2.56E-01	2.63E-01	2.70E-01	2.77E-01	2.77E-01
si 29	2.44E-06	2.58E-06	2.74E-06	2.89E-06	3.05E-06	3.05E-06
si 30	2.53E-11	2.77E-11	3.02E-11	3.28E-11	3.56E-11	3.56E-11
si 31	6.56E-39	7.18E-24	7.83E-24	8.52E-24	9.24E-24	9.24E-39
si 32	4.01E-30	4.42E-30	4.83E-30	5.26E-30	5.72E-30	5.67E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.21E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 83

power= 1.468E-03mw, burnup=1.2064E+04mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	1.10E+01	1.16E+01	1.22E+01	1.28E+01	1.34E+01	1.34E+01
pb206	3.63E-02	3.89E-02	4.15E-02	4.42E-02	4.70E-02	4.70E-02
pb207	2.82E-03	2.99E-03	3.17E-03	3.35E-03	3.54E-03	3.54E-03
pb208	1.61E-04	1.71E-04	1.81E-04	1.91E-04	2.02E-04	2.02E-04
pb209	3.16E-10	3.31E-10	3.46E-10	3.61E-10	3.76E-10	3.76E-10
pb210	1.27E-04	1.32E-04	1.36E-04	1.40E-04	1.44E-04	1.44E-04
pb211	2.70E-11	2.77E-11	2.85E-11	2.92E-11	2.99E-11	3.00E-11
pb212	2.70E-11	2.78E-11	2.86E-11	2.94E-11	3.01E-11	3.00E-11
pb214	2.91E-10	3.01E-10	3.11E-10	3.20E-10	3.30E-10	3.30E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	4.53E-03	4.90E-03	5.30E-03	5.71E-03	6.14E-03	6.14E-03
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	7.84E-08	8.10E-08	8.36E-08	8.63E-08	8.89E-08	8.89E-08
bi211	1.60E-12	1.64E-12	1.69E-12	1.73E-12	1.78E-12	1.78E-12
bi212	2.56E-12	2.64E-12	2.71E-12	2.78E-12	2.86E-12	2.84E-12
bi213	7.39E-11	7.73E-11	8.08E-11	8.43E-11	8.78E-11	8.79E-11
bi214	2.16E-10	2.23E-10	2.31E-10	2.38E-10	2.45E-10	2.45E-10
po210	2.15E-06	2.24E-06	2.31E-06	2.38E-06	2.45E-06	2.44E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	1.77E-17	1.82E-17	1.86E-17	1.91E-17	1.96E-17	1.97E-17
po212	1.35E-22	1.39E-22	1.43E-22	1.46E-22	1.50E-22	1.49E-22
po213	1.11E-19	1.16E-19	1.21E-19	1.27E-19	1.32E-19	1.32E-19
po214	2.97E-17	3.07E-17	3.17E-17	3.27E-17	3.37E-17	3.37E-17
po215	2.22E-17	2.28E-17	2.34E-17	2.40E-17	2.46E-17	2.47E-17
po216	1.02E-16	1.05E-16	1.08E-16	1.11E-16	1.14E-16	1.13E-16
po218	3.37E-11	3.48E-11	3.59E-11	3.71E-11	3.82E-11	3.82E-11
rn218	3.73E-39	1.47E-28	1.51E-28	1.55E-28	1.59E-28	2.00E-40
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
rn220	3.92E-14	4.04E-14	4.15E-14	[illegible]	4.37E-14	4.35E-14
rn222	5.98E-08	6.18E-08	6.38E-08	6.58E-08	6.78E-08	6.78E-08
ra222	4.05E-36	1.59E-25	1.64E-25	1.68E-25	1.72E-25	2.17E-37
ra223	1.23E-08	1.26E-08	1.30E-08	1.33E-08	1.37E-08	1.37E-08
ra224	2.23E-10	2.30E-10	2.36E-10	2.42E-10	2.49E-10	2.47E-10
ra225	3.45E-08	3.62E-08	3.78E-08	3.94E-08	4.11E-08	4.11E-08
ra226	9.14E-03	9.45E-03	9.76E-03	1.01E-02	1.04E-02	1.04E-02
ra228	4.32E-11	4.46E-11	4.60E-11	4.74E-11	4.87E-11	4.87E-11
ac225	2.33E-08	2.44E-08	2.55E-08	2.66E-08	2.78E-08	2.78E-08
ac227	8.55E-06	8.79E-06	9.03E-06	9.26E-06	9.50E-06	9.50E-06
ac228	5.27E-15	5.44E-15	5.61E-15	5.78E-15	5.95E-15	5.95E-15
th226	1.97E-34	7.78E-24	7.99E-24	8.20E-24	8.41E-24	1.06E-35

th227	1.99E-08	2.04E-08	2.10E-08	2.15E-08	2.20E-08	2.21E-08
th228	4.24E-08	4.39E-08	4.51E-08	4.63E-08	4.74E-08	4.71E-08
th229	6.72E-03	7.03E-03	7.35E-03	7.67E-03	7.99E-03	7.99E-03
th230	4.84E-01	4.99E-01	5.13E-01	5.27E-01	5.41E-01	5.41E-01
th231	2.83E-09	3.65E-09	3.67E-09	3.69E-09	3.70E-09	2.81E-09
th232	1.06E-01	1.09E-01	1.12E-01	1.16E-01	1.19E-01	1.19E-01
th233	3.50E-28	3.61E-13	3.72E-13	3.84E-13	3.95E-13	3.95E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	1.29E-02	1.32E-02	1.36E-02	1.39E-02	1.43E-02	1.43E-02
pa232	7.99E-26	8.21E-11	8.43E-11	8.66E-11	8.88E-11	8.88E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 84
power= 1.468E-03mw, burnup=1.2064E+04mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.43E-06	1.43E-06	1.43E-06	1.43E-06	1.43E-06	1.43E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.91E-31	7.54E-21	7.74E-21	7.95E-21	8.16E-21	1.03E-32
u231	6.91E-32	7.11E-17	7.31E-17	7.50E-17	7.70E-17	7.70E-32
u232	1.53E-06	1.60E-06	1.64E-06	1.69E-06	1.73E-06	1.69E-06
u233	2.51E-01	2.58E-01	2.66E-01	2.73E-01	2.80E-01	2.80E-01
u234	9.77E+00	9.79E+00	9.82E+00	9.84E+00	9.86E+00	9.86E+00
u235	6.85E+02	6.84E+02	6.83E+02	6.81E+02	6.80E+02	6.80E+02
u236	1.83E+02	1.83E+02	1.83E+02	1.83E+02	1.84E+02	1.84E+02
u237	1.71E-12	1.17E-06	1.17E-06	1.17E-06	1.17E-06	1.94E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	1.12E-22	1.12E-07	1.12E-07	1.12E-07	1.12E-07	1.12E-22
u240	3.73E-37	4.74E-37	5.99E-37	7.51E-37	9.36E-37	9.36E-37
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	8.67E-13	3.12E-12	3.12E-12	3.12E-12	3.12E-12	7.40E-13
np236m	7.40E-28	7.41E-13	7.41E-13	7.41E-13	7.40E-13	7.41E-28
np236	1.34E-06	1.38E-06	1.41E-06	1.45E-06	1.49E-06	1.49E-06
np237	4.14E+01	4.14E+01	4.14E+01	4.14E+01	4.14E+01	4.14E+01
np238	5.38E-14	5.47E-07	5.47E-07	5.46E-07	5.46E-07	6.21E-14
np239	5.64E-14	1.62E-05	1.62E-05	1.62E-05	1.62E-05	7.97E-14
np240m	3.18E-39	4.05E-39	5.11E-39	6.41E-39	7.98E-39	7.99E-39
np240	4.17E-39	1.19E-15	1.19E-15	1.19E-15	1.19E-15	5.94E-39
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	2.52E-10	4.05E-10	4.05E-10	4.05E-10	4.05E-10	2.38E-10
pu237	1.43E-18	1.08E-13	1.10E-13	1.12E-13	1.13E-13	3.75E-19
pu238	8.14E-03	8.27E-03	8.27E-03	8.27E-03	8.27E-03	8.12E-03
pu239	2.46E+01	2.51E+01	2.56E+01	2.61E+01	2.65E+01	2.65E+01
pu240	4.16E-01	4.31E-01	4.46E-01	4.61E-01	4.76E-01	4.76E-01
pu241	5.56E-05	6.35E-05	6.58E-05	6.80E-05	7.02E-05	6.30E-05
pu242	1.78E-05	1.58E-05	1.61E-05	1.73E-05	1.85E-05	1.85E-05
pu243	1.07E-29	1.14E-14	1.23E-14	1.32E-14	1.41E-14	1.45E-29
pu244	1.18E-26	2.33E-26	2.98E-26	3.74E-26	4.66E-26	4.66E-26
pu245	.00E+00	3.50E-37	4.42E-37	5.54E-37	6.91E-37	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.75E-34	1.82E-19	1.89E-19	1.96E-19	2.03E-19	2.03E-34
am240	8.02E-32	8.33E-17	8.65E-17	8.96E-17	9.27E-17	9.27E-32
am241	1.79E-03	1.81E-03	1.88E-03	1.95E-03	2.01E-03	2.01E-03
am242m	2.91E-07	3.05E-07	3.16E-07	3.28E-07	3.40E-07	3.36E-07
am242	3.75E-12	2.47E-11	2.56E-11	2.66E-11	2.75E-11	4.35E-12
am243	6.44E-08	7.06E-08	7.71E-08	8.39E-08	9.11E-08	9.11E-08
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.76E-31	1.93E-16	2.11E-16	2.30E-16	2.50E-16	2.50E-31

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     am245    2.54E-40  6.98E-38  8.81E-38  1.10E-37  1.38E-37  4.63E-40
     am246     .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm241    9.87E-29  5.27E-22  5.47E-22  5.67E-22  5.87E-22  1.67E-29
     cm242    9.40E-10  4.98E-09  5.18E-09  5.36E-09  5.55E-09  1.02E-09
     cm243    3.79E-14  4.13E-14  4.28E-14  4.44E-14  4.59E-14  4.35E-14
     cm244    2.57E-12  3.04E-12  3.32E-12  3.61E-12  3.92E-12  3.60E-12
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                  actinides         page   85
       power= 1.468E-03mw, burnup=1.2064E+04mwd, flux= 9.22E+07n/cm**2-sec
0                                            nuclide concentrations, gram atoms
                                             basis = single reactor assembly
            charge ******* d ******* d ******* d ******* d ******* d
     cm245    3.77E-15  4.24E-15  4.74E-15  5.28E-15  5.87E-15  5.87E-15
     cm246    2.13E-17  2.44E-17  2.79E-17  3.18E-17  3.60E-17  3.60E-17
     cm247    2.92E-21  3.47E-21  4.11E-21  4.84E-21  5.66E-21  5.66E-21
     cm248    3.90E-24  4.80E-24  5.87E-24  7.13E-24  8.62E-24  8.62E-24
     cm249     .00E+00  5.46E-35  6.68E-35  8.12E-35  9.81E-35   .00E+00
     cm250    1.55E-39  1.97E-39  2.48E-39  3.10E-39  3.85E-39  3.85E-39
     cm251     .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals     3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux               9.21E+07  9.22E+07  9.22E+07  9.22E+07  9.22E-08
0         1q array has     20 entries.
0         3q array has      1 entries.
0         3q array has      1 entries.
0         3q array has      1 entries.
0         4q array has      1 entries.
0        54q array has     12 entries.
1library information...

          cross-section data taken from position number 10 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ************************************************************************
          *                                                                      *
          *          prelim. for origen-s binary working library--id = 1143      *
          *         made from modified card-image origen-s libraries of scale 4.2 *
          *       data from the light element, actinide, and fission product libraries *
          *         decay data, including gamma and total energy, are from endf/b-vi *
          *                                                                      *
          *        neutron flux spectrum factors and cross sections were produced from *
          *      the "presas2" case updating all nuclides on the scale "burnup" library *
          *                                                                      *
          *                    fission product yields are from endf/b-v          *
          *                                                                      *
          *                photon libraries use an 18-energy-group structure     *
          *               the photon data are from the master photon data base,  *
          *                produced to include bremsstrahlung from uo2 matrix    *
```

```
*                                                                          *
*       see information above this box (if present) for later updates      *
*                                                                          *
****************************************************************************
*                                                                          *
0 ****************************************************************************
0              .other identification and sizes of library.
0               data set name:  ft33f001
0            8/29/1996    date library was produced
0                 1697    total number of nuclides in library
                   689    number of light-element nuclides
                   129    number of actinide nuclides
                   879    number of fission product nuclides
0                 7993    number of nonzero off-diagonal matrix elements
0 ****************************************************************************
1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2          page   86
     power=    .00mw, burnup=  13405.mwd, flux= 9.22E+07n/cm**2-sec
0                                  basis =
0 (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
```

	initial	******* d	******* d	******* d	******* d	******* d
productions	1.234425E+06	1.234251E+06	1.234056E+06	1.233841E+06	1.233607E+06	1.233607E+06
absorptions	1.000585E+06	1.000699E+06	1.000800E+06	1.000889E+06	1.000967E+06	1.000967E+06
k infinity	1.233703E+00	1.233389E+00	1.233069E+00	1.232746E+00	1.232415E+00	1.232415E+00

0	initial	******* d	******* d	******* d	******* d	******* d
actinide absorptions	9.864043E+05	9.863852E+05	9.863549E+05	9.863136E+05	9.862617E+05	9.862617E+05
non-actinide abs. fracs.	1.417267E-02	1.430368E-02	1.443362E-02	1.456237E-02	1.469141E-02	1.469141E-02

```
1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2     fission products     page   87
0                              fraction of total absorption rate
     power=    .00mw, burnup=  13405.mwd, flux= 9.22E+07n/cm**2-sec
0
```

	initial	******* d	******* d	******* d	******* d	******* d
sm149	5.45E-03	5.44E-03	5.44E-03	5.44E-03	5.44E-03	5.44E-03
eu151	1.31E-03	1.33E-03	1.35E-03	1.38E-03	1.40E-03	1.40E-03
nd143	1.17E-03	1.20E-03	1.24E-03	1.27E-03	1.30E-03	1.30E-03
rh103	5.64E-04	5.80E-04	5.96E-04	6.12E-04	6.27E-04	6.27E-04
xe131	3.79E-04	3.90E-04	4.00E-04	4.11E-04	4.21E-04	4.21E-04
cs133	2.94E-04	3.02E-04	3.11E-04	3.19E-04	3.27E-04	3.27E-04
sm147	2.17E-04	2.23E-04	2.29E-04	2.35E-04	2.40E-04	2.40E-04
tc 99	2.09E-04	2.14E-04	2.20E-04	2.25E-04	2.31E-04	2.31E-04
gd155	2.11E-04	2.12E-04	2.13E-04	2.14E-04	2.15E-04	2.15E-04
nd145	1.66E-04	1.71E-04	1.75E-04	1.80E-04	1.85E-04	1.85E-04
sm152	1.17E-04	1.21E-04	1.25E-04	1.28E-04	1.32E-04	1.32E-04
mo 95	1.15E-04	1.19E-04	1.22E-04	1.25E-04	1.28E-04	1.28E-04
cd113	9.90E-05	9.93E-05	9.96E-05	9.99E-05	1.00E-04	1.00E-04
sm150	8.31E-05	8.57E-05	8.82E-05	9.08E-05	9.33E-05	9.33E-05
kr 83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
cs135	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
gd157	[illegible]	5.74E-05	[illegible]	[illegible]	5.85E-05	[illegible]
ru101	5.18E-05	5.32E-05	5.47E-05	5.61E-05	5.75E-05	5.75E-05
eu153	4.99E-05	5.13E-05	5.28E-05	5.43E-05	5.58E-05	5.58E-05
pr141	4.95E-05	5.09E-05	5.22E-05	5.36E-05	5.50E-05	5.50E-05
la139	4.05E-05	4.16E-05	4.27E-05	4.38E-05	4.49E-05	4.49E-05
pd105	1.97E-05	2.03E-05	2.09E-05	2.15E-05	2.21E-05	2.21E-05
ba137	1.95E-05	2.00E-05	2.06E-05	2.11E-05	2.16E-05	2.16E-05
ag109	1.67E-05	1.74E-05	1.81E-05	1.88E-05	1.95E-05	1.95E-05
sm151	1.79E-05	1.82E-05	1.83E-05	1.83E-05	1.83E-05	1.83E-05
zr 93	1.61E-05	1.66E-05	1.70E-05	1.74E-05	1.79E-05	1.79E-05
i129	1.31E-05	1.34E-05	1.38E-05	1.42E-05	1.45E-05	1.45E-05

nd144	1.23E-05	1.27E-05	1.30E-05	1.34E-05	1.37E-05	1.37E-05
mo 97	9.20E-06	9.45E-06	9.70E-06	9.96E-06	1.02E-05	1.02E-05
gd152	6.80E-06	7.14E-06	7.49E-06	7.84E-06	8.20E-06	8.20E-06
pd108	4.20E-06	4.35E-06	4.52E-06	4.68E-06	4.84E-06	4.84E-06
zr 91	4.25E-06	4.37E-06	4.49E-06	4.60E-06	4.72E-06	4.72E-06
y 89	4.07E-06	4.18E-06	4.29E-06	4.40E-06	4.51E-06	4.51E-06
ru102	3.81E-06	3.92E-06	4.03E-06	4.14E-06	4.24E-06	4.24E-06
ce142	3.37E-06	3.46E-06	3.55E-06	3.65E-06	3.74E-06	3.74E-06
nd148	3.25E-06	3.34E-06	3.43E-06	3.52E-06	3.61E-06	3.61E-06
nd146	2.73E-06	2.80E-06	2.88E-06	2.95E-06	3.03E-06	3.03E-06
in115	2.37E-06	2.44E-06	2.51E-06	2.58E-06	2.65E-06	2.65E-06
ba138	2.33E-06	2.39E-06	2.45E-06	2.52E-06	2.58E-06	2.58E-06
pd107	2.16E-06	2.24E-06	2.32E-06	2.40E-06	2.48E-06	2.48E-06
ce140	2.18E-06	2.24E-06	2.30E-06	2.36E-06	2.42E-06	2.42E-06
xe132	1.99E-06	2.04E-06	2.10E-06	2.16E-06	2.21E-06	2.21E-06
ru 99	1.23E-06	1.30E-06	1.37E-06	1.44E-06	1.51E-06	1.51E-06
mo 98	1.35E-06	1.38E-06	1.42E-06	1.46E-06	1.50E-06	1.50E-06
mo100	1.31E-06	1.35E-06	1.38E-06	1.42E-06	1.45E-06	1.45E-06
xe134	1.29E-06	1.32E-06	1.36E-06	1.39E-06	1.43E-06	1.43E-06
zr 92	1.03E-06	1.06E-06	1.08E-06	1.11E-06	1.14E-06	1.14E-06
i127	9.36E-07	9.64E-07	9.92E-07	1.02E-06	1.05E-06	1.05E-06
ru104	8.64E-07	8.89E-07	9.14E-07	9.40E-07	9.65E-07	9.65E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 88
0 fraction of total absorption rate
power= .00mw, burnup= 13405.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	8.12E-07	8.35E-07	8.57E-07	8.79E-07	9.02E-07	9.02E-07
xe135	.00E+00	8.44E-07	8.44E-07	8.44E-07	8.45E-07	8.45E-07
nd150	7.31E-07	7.52E-07	7.72E-07	7.93E-07	8.13E-07	8.13E-07
xe136	6.98E-07	7.17E-07	7.36E-07	7.56E-07	7.75E-07	7.75E-07
br 81	5.20E-07	5.34E-07	5.48E-07	5.62E-07	5.77E-07	5.77E-07
cd111	4.99E-07	5.16E-07	5.33E-07	5.51E-07	5.68E-07	5.68E-07
rb 85	5.00E-07	5.14E-07	5.27E-07	5.41E-07	5.54E-07	5.54E-07
zr 94	4.36E-07	4.48E-07	4.60E-07	4.72E-07	4.84E-07	4.84E-07
zr 90	4.01E-07	4.12E-07	4.23E-07	4.34E-07	4.44E-07	4.44E-07
sm154	3.35E-07	3.45E-07	3.55E-07	3.65E-07	3.74E-07	3.74E-07
te130	3.21E-07	3.29E-07	3.38E-07	3.47E-07	3.56E-07	3.56E-07
gd154	2.67E-07	2.82E-07	2.98E-07	3.15E-07	3.31E-07	3.31E-07
rb 87	2.88E-07	2.96E-07	3.04E-07	3.12E-07	3.19E-07	3.19E-07
se 77	2.09E-07	2.14E-07	2.20E-07	2.26E-07	2.32E-07	2.32E-07
pd106	1.94E-07	2.00E-07	2.07E-07	2.13E-07	2.20E-07	2.20E-07
gd156	1.78E-07	1.84E-07	1.91E-07	1.97E-07	2.03E-07	2.03E-07
kr 84	1.37E-07	1.41E-07	1.45E-07	1.48E-07	1.52E-07	1.52E-07
ba135	1.21E-07	1.28E-07	1.34E-07	1.42E-07	1.49E-07	1.49E-07
eu152	1.10E-07	1.26E-07	1.29E-07	1.31E-07	1.33E-07	1.33E-07
sb121	1.09E-07	1.12E-07	1.15E-07	1.18E-07	1.21E-07	1.21E-07
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
se 79	1.09E-07	1.08E-07	1.11E-07	1.14E-07	1.17E-07	1.17E-07
sb123	8.70E-08	9.04E-08	9.29E-08	9.55E-08	9.80E-08	9.80E-08
pm147	5.46E-08	9.78E-08	9.77E-08	9.77E-08	9.77E-08	9.77E-08
ru100	7.76E-08	8.19E-08	8.63E-08	9.08E-08	9.55E-08	9.55E-08
kr 86	7.60E-08	7.81E-08	8.02E-08	8.22E-08	8.43E-08	8.43E-08
te128	7.20E-08	7.40E-08	7.61E-08	7.81E-08	8.02E-08	8.02E-08
nd142	5.55E-08	5.86E-08	6.18E-08	6.51E-08	6.85E-08	6.85E-08
eu155	4.78E-08	6.69E-08	6.71E-08	6.73E-08	6.76E-08	6.76E-08
ba134	5.33E-08	5.63E-08	5.94E-08	6.26E-08	6.58E-08	6.58E-08
sm148	4.87E-08	5.15E-08	5.43E-08	5.71E-08	6.01E-08	6.01E-08
se 80	5.00E-08	5.13E-08	5.27E-08	5.41E-08	5.54E-08	5.54E-08
te125	4.80E-08	4.94E-08	5.08E-08	5.23E-08	5.37E-08	5.37E-08

tb159	4.67E-08	4.84E-08	5.00E-08	5.17E-08	5.34E-08	5.34E-08
pd104	3.65E-08	3.86E-08	4.07E-08	4.29E-08	4.51E-08	4.51E-08
gd158	3.74E-08	3.87E-08	4.00E-08	4.14E-08	4.27E-08	4.27E-08
cd112	3.54E-08	3.65E-08	3.77E-08	3.88E-08	3.99E-08	3.99E-08
li 6	2.70E-08	2.77E-08	2.84E-08	2.91E-08	2.98E-08	2.98E-08
sn117	2.57E-08	2.65E-08	2.73E-08	2.80E-08	2.88E-08	2.88E-08
dy164	2.25E-08	2.35E-08	2.44E-08	2.54E-08	2.64E-08	2.64E-08
dy162	2.12E-08	2.21E-08	2.31E-08	2.41E-08	2.50E-08	2.50E-08
cd114	2.13E-08	2.20E-08	2.26E-08	2.33E-08	2.40E-08	2.40E-08
nb 93	1.93E-08	2.04E-08	2.15E-08	2.27E-08	2.38E-08	2.38E-08
sn119	2.00E-08	2.05E-08	2.11E-08	2.17E-08	2.23E-08	2.23E-08
sn115	1.83E-08	1.88E-08	1.93E-08	1.99E-08	2.04E-08	2.04E-08
pd110	1.64E-08	1.70E-08	1.76E-08	1.82E-08	1.88E-08	1.88E-08
sr 88	1.40E-08	1.43E-08	1.47E-08	1.51E-08	1.55E-08	1.55E-08
mo 96	1.25E-08	1.32E-08	1.39E-08	1.46E-08	1.53E-08	1.53E-08
cd110	1.02E-08	1.09E-08	1.17E-08	1.24E-08	1.32E-08	1.32E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 89

0 fraction of total absorption rate

power= .00mw, burnup= 13405.mwd, flux= 9.22E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

br 79	9.72E-09	1.03E-08	1.08E-08	1.14E-08	1.20E-08	1.20E-08
se 82	9.57E-09	9.83E-09	1.01E-08	1.04E-08	1.06E-08	1.06E-08
ag107	7.69E-09	8.18E-09	8.69E-09	9.21E-09	9.75E-09	9.75E-09
sn126	8.50E-09	8.75E-09	8.99E-09	9.24E-09	9.48E-09	9.48E-09
eu154	6.70E-09	8.27E-09	8.52E-09	8.76E-09	9.01E-09	9.01E-09
se 78	7.44E-09	7.64E-09	7.85E-09	8.06E-09	8.27E-09	8.27E-09
xe130	6.34E-09	6.73E-09	7.07E-09	7.42E-09	7.72E-09	7.72E-09
ba136	6.40E-09	6.77E-09	7.07E-09	7.37E-09	7.67E-09	7.67E-09
sn124	6.35E-09	6.58E-09	6.75E-09	6.94E-09	7.13E-09	7.13E-09
xe129	5.71E-09	6.04E-09	6.37E-09	6.71E-09	7.06E-09	7.06E-09
dy163	5.32E-09	5.55E-09	5.79E-09	6.04E-09	6.29E-09	6.29E-09
sr 90	5.61E-09	5.93E-09	5.92E-09	5.92E-09	5.91E-09	5.91E-09
kr 82	4.97E-09	5.20E-09	5.42E-09	5.65E-09	5.89E-09	5.89E-09
as 75	4.39E-09	4.51E-09	4.63E-09	4.75E-09	4.88E-09	4.88E-09
te126	3.38E-09	3.56E-09	3.76E-09	3.95E-09	4.15E-09	4.15E-09
in113	3.61E-09	3.72E-09	3.83E-09	3.94E-09	4.04E-09	4.04E-09
rh105	.00E+00	3.82E-09	3.83E-09	3.84E-09	3.86E-09	3.86E-09
sn118	2.58E-09	2.66E-09	2.73E-09	2.81E-09	2.83E-09	2.83E-09
sn122	2.20E-09	2.26E-09	2.33E-09	2.39E-09	2.46E-09	2.46E-09
cd116	2.17E-09	2.24E-09	2.30E-09	2.36E-09	2.43E-09	2.43E-09
sn120	1.63E-09	1.67E-09	1.72E-09	1.77E-09	1.82E-09	1.82E-09
ge 73	1.24E-09	1.27E-09	1.31E-09	1.34E-09	1.38E-09	1.38E-09
cs137	1.29E-09	1.36E-09	1.36E-09	1.36E-09	1.36E-09	1.36E-09
pr143	.00E+00	9.47E-10	9.46E-10	9.46E-10	9.45E-10	9.45E-10
cs134	3.72E-10	8.15E-10	8.37E-10	8.59E-10	8.81E-10	8.81E-10
xe133	.00E+00	7.30E-10	7.30E-10	7.30E-10	7.30E-10	7.30E-10
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ce141	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ho165	4.50E-10	4.72E-10	4.95E-10	5.18E-10	5.42E-10	5.42E-10
ge 76	4.29E-10	4.41E-10	4.53E-10	4.65E-10	4.76E-10	4.76E-10
dy160	3.24E-10	3.44E-10	3.65E-10	3.86E-10	4.08E-10	4.08E-10
pm149	.00E+00	3.56E-10	3.56E-10	3.56E-10	3.56E-10	3.56E-10
nd147	.00E+00	3.34E-10	3.34E-10	3.34E-10	3.34E-10	3.34E-10
xe128	2.07E-10	2.19E-10	2.31E-10	2.44E-10	2.57E-10	2.57E-10
ce144	2.87E-11	2.12E-10	2.12E-10	2.12E-10	2.12E-10	2.12E-10
kr 85	1.73E-10	2.00E-10	2.00E-10	1.99E-10	1.99E-10	1.99E-10
ru103	6.90E-17	1.39E-10	1.39E-10	1.40E-10	1.40E-10	1.40E-10
sr 86	1.03E-10	1.14E-10	1.20E-10	1.26E-10	1.32E-10	1.32E-10
te124	9.80E-11	1.02E-10	1.06E-10	1.10E-10	1.15E-10	1.15E-10

sn116	**7.98E-11**	**8.43E-11**	**8.90E-11**	**9.38E-11**	**9.88E-11**	**9.88E-11**
sr 87	**5.72E-11**	**5.89E-11**	**6.07E-11**	**6.25E-11**	**6.43E-11**	**6.43E-11**
zr 95	**7.96E-15**	**5.85E-11**	**5.84E-11**	**5.84E-11**	**5.84E-11**	**5.84E-11**
nb 95	**1.63E-14**	**5.42E-11**	**5.42E-11**	**5.42E-11**	**5.41E-11**	**5.41E-11**
nb 94	**4.19E-11**	**4.39E-11**	**4.60E-11**	**4.81E-11**	**5.03E-11**	**5.03E-11**
y 91	**2.96E-15**	**4.99E-11**	**4.99E-11**	**4.98E-11**	**4.98E-11**	**4.98E-11**
pm151	**.00E+00**	**4.18E-11**	**4.19E-11**	**4.19E-11**	**4.19E-11**	**4.19E-11**
te122	**3.33E-11**	**3.52E-11**	**3.71E-11**	**3.91E-11**	**4.12E-11**	**4.12E-11**
se 76	**3.27E-11**	**3.42E-11**	**3.58E-11**	**3.74E-11**	**3.91E-11**	**3.91E-11**
er166	**2.35E-11**	**2.46E-11**	**2.57E-11**	**2.69E-11**	**2.81E-11**	**2.81E-11**

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 90
0 fraction of total absorption rate
power= .00mw, burnup= 13405.mwd, flux= 9.22E+07n/cm**2-sec
0

	initial	******* d	******* d	******* d	******* d	******* d
ge 74	2.48E-11	2.55E-11	2.62E-11	2.69E-11	2.76E-11	2.76E-11
ge 72	1.78E-11	1.84E-11	1.89E-11	1.94E-11	2.00E-11	2.00E-11
eu156	.00E+00	1.80E-11	1.81E-11	1.82E-11	1.83E-11	1.83E-11
sm153	.00E+00	1.68E-11	1.69E-11	1.69E-11	1.70E-11	1.70E-11
ba140	.00E+00	1.69E-11	1.69E-11	1.69E-11	1.69E-11	1.69E-11
ru106	3.00E-12	1.40E-11	1.41E-11	1.42E-11	1.43E-11	1.43E-11
sr 89	1.35E-16	1.06E-11	1.06E-11	1.06E-11	1.06E-11	1.06E-11
kr 80	7.03E-12	7.57E-12	8.14E-12	8.74E-12	9.37E-12	9.37E-12
kr 87	.00E+00	7.97E-12	7.96E-12	7.96E-12	7.95E-12	7.95E-12
sb125	3.58E-12	6.33E-12	6.35E-12	6.37E-12	6.38E-12	6.38E-12
ce143	.00E+00	6.21E-12	6.20E-12	6.20E-12	6.20E-12	6.20E-12
y 90	5.34E-12	5.64E-12	5.64E-12	5.63E-12	5.63E-12	5.63E-12
la140	.00E+00	5.43E-12	5.47E-12	5.47E-12	5.47E-12	5.47E-12
mo 99	.00E+00	4.73E-12	4.73E-12	4.73E-12	4.73E-12	4.73E-12
te127m	1.78E-14	3.20E-12	3.21E-12	3.22E-12	3.23E-12	3.23E-12
i131	.00E+00	2.49E-12	2.49E-12	2.49E-12	2.49E-12	2.49E-12
er167	1.49E-12	1.60E-12	1.71E-12	1.83E-12	1.95E-12	1.95E-12
pm148m	1.47E-18	1.45E-12	1.46E-12	1.46E-12	1.46E-12	1.46E-12
te123	9.44E-13	1.02E-12	1.10E-12	1.18E-12	1.27E-12	1.27E-12
te129m	2.74E-20	6.92E-13	6.93E-13	6.94E-13	6.94E-13	6.94E-13
cd108	3.65E-13	3.98E-13	4.34E-13	4.72E-13	5.12E-13	5.12E-13
ag111	.00E+00	2.11E-13	2.12E-13	2.14E-13	2.16E-13	2.16E-13
eu157	.00E+00	1.73E-13	1.75E-13	1.76E-13	1.77E-13	1.77E-13
cd115m	2.74E-19	9.81E-14	9.84E-14	9.86E-14	9.88E-14	9.88E-14
cs136	.00E+00	9.04E-14	9.21E-14	9.38E-14	9.55E-14	9.55E-14
be 9	5.41E-14	5.56E-14	5.71E-14	5.86E-14	6.01E-14	6.01E-14
pm148	**.00E+00**	**5.03E-14**	**5.04E-14**	**5.04E-14**	**5.05E-14**	**5.05E-14**
tb160	**1.59E-17**	**4.37E-14**	**4.52E-14**	**4.67E-14**	**4.81E-14**	**4.81E-14**
sn114	**2.04E-14**	**2.16E-14**	**2.28E-14**	**2.41E-14**	**2.54E-14**	**2.54E-14**
li 7	2.20E-14	2.26E-14	2.32E-14	2.38E-14	2.44E-14	2.44E-14
pr142	.00E+00	2.09E-14	2.14E-14	2.20E-14	2.26E-14	2.26E-14
ru105	.00E+00	1.35E-14	1.35E-14	1.36E-14	1.36E-14	1.36E-14
sb126	9.73E-15	1.23E-14	1.24E-14	1.25E-14	1.27E-14	1.28E-14
sn125	.00E+00	1.17E-14	1.17E-14	1.17E-14	1.18E-14	1.18E-14
rb 88	.00E+00	4.48E-15	4.47E-15	4.47E-15	4.47E-15	4.47E-15
i130	.00E+00	3.89E-15	3.99E-15	4.09E-15	4.18E-15	4.18E-15
sn123	4.64E-17	3.83E-15	3.84E-15	3.84E-15	3.84E-15	3.84E-15
i135	.00E+00	3.67E-15	3.67E-15	3.67E-15	3.67E-15	3.67E-15
te132	.00E+00	3.50E-15	3.50E-15	3.50E-15	3.50E-15	3.50E-15
sb124	1.74E-19	2.23E-15	2.27E-15	2.31E-15	2.35E-15	2.35E-15
te134	.00E+00	2.07E-15	2.07E-15	2.07E-15	2.07E-15	2.07E-15
rb 86	.00E+00	1.28E-15	1.31E-15	1.34E-15	1.37E-15	1.37E-15
in117m	.00E+00	9.41E-16	9.44E-16	9.47E-16	9.50E-16	9.50E-16
dy165	.00E+00	7.31E-16	7.47E-16	7.64E-16	7.80E-16	7.80E-16
in117	.00E+00	2.81E-16	2.82E-16	2.83E-16	2.84E-16	2.84E-16

	cs134m	.00E+00	1.54E-16	1.58E-16	1.62E-16	1.66E-16	1.66E-16
	cd118	.00E+00	4.96E-17	4.97E-17	4.98E-17	4.99E-17	4.99E-17
	ge 75	.00E+00	3.14E-17	3.14E-17	3.14E-17	3.14E-17	3.14E-17
	in119m	.00E+00	1.22E-17	1.22E-17	1.22E-17	1.22E-17	1.22E-17

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 91
0 fraction of total absorption rate
power= .00mw, burnup= 13405.mwd, flux= 9.22E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

cd109	2.33E-18	8.50E-18	9.04E-18	9.61E-18	1.02E-17	1.02E-17
ag110	.00E+00	8.29E-18	8.62E-18	8.96E-18	9.30E-18	9.30E-18
in119	.00E+00	9.87E-19	9.96E-19	9.96E-19	9.96E-19	9.96E-19

1
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 92
power= 1.468E-03mw, burnup=1.3405E+04mwd, flux= 9.22E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d	******* d
h 1	7.15E-04	7.35E-04	7.55E-04	7.75E-04	7.95E-04	7.95E-04
h 2	2.13E-06	2.19E-06	2.25E-06	2.31E-06	2.37E-06	2.37E-06
h 3	1.64E-11	1.88E-11	1.89E-11	1.90E-11	1.92E-11	1.92E-11
h 4	.00E+00	2.76E-35	2.78E-35	2.80E-35	2.82E-35	2.82E-35
he 3	1.19E-08	1.21E-08	1.23E-08	1.26E-08	1.28E-08	1.28E-08
he 4	1.19E-04	1.22E-04	1.25E-04	1.29E-04	1.32E-04	1.32E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.42E-05	1.46E-05	1.50E-05	1.54E-05	1.58E-05	1.58E-05
ne 21	3.26E-09	3.43E-09	3.61E-09	3.80E-09	3.99E-09	3.99E-09
ne 22	9.38E-08	9.64E-08	9.90E-08	1.02E-07	1.04E-07	1.04E-07
ne 23	2.64E-30	2.65E-15	2.65E-15	2.65E-15	2.65E-15	2.65E-15
na 22	8.60E-12	1.57E-11	1.57E-11	1.57E-11	1.57E-11	1.57E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	9.58E-24	9.58E-09	9.59E-09	9.59E-09	9.59E-09	9.59E-09
na 24m	1.57E-30	1.57E-15	1.58E-15	1.58E-15	1.58E-15	1.58E-15
na 25	3.56E-39	3.75E-24	3.94E-24	4.14E-24	4.34E-24	4.34E-24
mg 24	9.53E-02	9.78E-02	1.00E-01	1.03E-01	1.05E-01	1.05E-01
mg 25	3.43E-07	3.61E-07	3.79E-07	3.98E-07	4.17E-07	4.17E-07
mg 26	2.13E-06	2.19E-06	2.25E-06	2.31E-06	2.37E-06	2.37E-06
mg 27	7.89E-28	7.90E-13	7.90E-13	7.91E-13	7.91E-13	7.91E-13
mg 28	.00E+00	5.83E-25	5.83E-25	5.84E-25	5.84E-25	5.84E-25
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	7.10E-26	7.10E-11	7.11E-11	7.11E-11	7.11E-11	7.11E-11
al 29	**2.84E-37**	**2.99E-22**	**3.15E-22**	**3.31E-22**	**3.48E-22**	**3.48E-22**
al 30	**.00E+00**	**4.79E-32**	**5.18E-32**	**5.59E-32**	**6.02E-32**	**6.02E-32**
si 28	**2.77E-01**	**2.85E-01**	**2.92E-01**	**2.99E-01**	**3.06E-01**	**3.06E-01**
si 29	3.05E-06	3.21E-06	3.38E-06	3.55E-06	3.73E-06	3.73E-06
si 30	3.56E-11	3.85E-11	4.16E-11	4.49E-11	4.83E-11	4.83E-11
si 31	9.24E-39	1.00E-23	1.08E-23	1.17E-23	1.26E-23	1.26E-23
si 32	5.67E-30	6.20E-30	6.71E-30	7.24E-30	7.80E-30	7.80E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		9.22E+07	9.22E+07	9.22E+07	9.23E+07	9.23E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 93
power= 1.468E-03mw, burnup=1.3405E+04mwd, flux= 9.22E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d	******* d
he 4	1.34E+01	1.40E+01	1.46E+01	1.52E+01	1.59E+01	1.59E+01
pb206	4.70E-02	4.98E-02	5.28E-02	5.58E-02	5.89E-02	5.89E-02
pb207	3.54E-03	3.73E-03	3.93E-03	4.13E-03	4.33E-03	4.33E-03
pb208	2.02E-04	2.13E-04	2.24E-04	2.36E-04	2.47E-04	2.47E-04

pb209	3.76E-10	3.91E-10	4.07E-10	4.22E-10	4.37E-10	4.37E-10
pb210	1.44E-04	1.49E-04	1.53E-04	1.57E-04	1.61E-04	1.61E-04
pb211	3.00E-11	3.07E-11	3.14E-11	3.21E-11	3.29E-11	3.29E-11
pb212	3.00E-11	3.08E-11	3.16E-11	3.23E-11	3.31E-11	3.31E-11
pb214	3.30E-10	3.40E-10	3.49E-10	3.59E-10	3.69E-10	3.69E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	6.14E-03	6.59E-03	7.06E-03	7.54E-03	8.04E-03	8.04E-03
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	8.89E-08	9.15E-08	9.41E-08	9.67E-08	9.92E-08	9.92E-08
bi211	1.78E-12	1.82E-12	1.86E-12	1.91E-12	1.95E-12	1.95E-12
bi212	2.84E-12	2.93E-12	3.00E-12	3.07E-12	3.14E-12	3.14E-12
bi213	8.79E-11	9.14E-11	9.49E-11	9.85E-11	1.02E-10	1.02E-10
bi214	2.45E-10	2.52E-10	2.59E-10	2.67E-10	2.74E-10	2.74E-10
po210	2.44E-06	2.53E-06	2.60E-06	2.67E-06	2.74E-06	2.74E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	1.97E-17	2.01E-17	2.06E-17	2.11E-17	2.15E-17	2.15E-17
po212	1.49E-22	1.54E-22	1.57E-22	1.61E-22	1.65E-22	1.65E-22
po213	1.32E-19	1.37E-19	1.43E-19	1.48E-19	1.53E-19	1.53E-19
po214	3.37E-17	3.47E-17	3.57E-17	3.67E-17	3.76E-17	3.76E-17
po215	2.47E-17	2.52E-17	2.58E-17	2.64E-17	2.70E-17	2.70E-17
po216	1.13E-16	1.17E-16	1.20E-16	1.22E-16	1.25E-16	1.25E-16
po218	3.82E-11	3.93E-11	4.04E-11	4.15E-11	4.26E-11	4.26E-11
rn218	2.00E-40	1.63E-28	1.67E-28	1.71E-28	1.75E-28	1.75E-28
rn219	5.49E-14	5.61E-14	5.74E-14	5.88E-14	6.01E-14	6.01E-14
rn220	4.35E-14	4.48E-14	4.59E-14	4.69E-14	4.80E-14	4.80E-14
rn222	6.78E-08	6.98E-08	7.18E-08	7.38E-08	7.57E-08	7.57E-08
ra222	2.17E-37	1.77E-25	1.81E-25	1.85E-25	1.90E-25	1.90E-25
ra223	1.37E-08	1.40E-08	1.43E-08	1.47E-08	1.50E-08	1.50E-03
ra224	2.47E-10	2.55E-10	2.61E-10	2.67E-10	2.73E-10	2.73E-10
ra225	4.11E-08	4.27E-03	4.44E-08	4.61E-03	4.77E-08	4.77E-08
ra226	1.04E-02	1.07E-02	1.10E-02	1.13E-02	1.16E-02	1.16E-02
ra228	4.87E-11	5.01E-11	5.15E-11	5.29E-11	5.43E-11	5.43E-11
ac225	2.78E-08	2.89E-03	3.00E-08	3.11E-08	3.23E-08	3.23E-08
ac227	9.50E-06	9.73E-06	9.96E-06	1.02E-05	1.04E-05	1.04E-05
ac228	5.95E-15	6.12E-15	6.29E-15	6.46E-15	6.63E-15	6.63E-15
th226	1.06E-35	8.63E-24	8.84E-24	9.05E-24	9.26E-24	9.26E-24
th227	2.21E-08	2.26E-08	2.31E-08	2.37E-08	2.42E-08	2.42E-08
th228	4.71E-08	4.86E-08	4.98E-08	5.10E-08	5.21E-08	5.21E-08
th229	7.99E-03	8.31E-03	8.63E-03	8.96E-03	9.28E-03	9.28E-03
th230	5.41E-01	5.55E-01	5.69E-01	5.84E-01	5.97E-01	5.97E-01
th231	2.81E-09	3.72E-09	3.74E-09	3.76E-09	3.78E-09	3.78E-09
th232	1.19E-01	1.23E-01	1.26E-01	1.29E-01	1.33E-01	1.33E-01
th233	3.95E-28	4.06E-13	4.18E-13	4.29E-13	4.41E-13	4.41E-13
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	1.43E-02	1.46E-02	1.50E-02	1.53E-02	1.57E-02	1.57E-02
pa232	8.88E-26	9.10E-11	9.32E-11	9.54E-11	9.75E-11	9.75E-11

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% u-2 [illegible] page 94

power= 1.468E-03mw, burnup=1.3405E+04mwd, flux= 9.22E+07n/cm**2-sec

0

nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.43E-06	1.43E-06	1.43E-06	1.43E-06	1.43E-06	1.43E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.03E-32	8.36E-21	8.57E-21	8.77E-21	8.97E-21	8.97E-21
u231	7.70E-32	7.90E-17	8.09E-17	8.29E-17	8.48E-17	8.48E-17
u232	1.69E-06	1.77E-06	1.82E-06	1.86E-06	1.90E-06	1.90E-06
u233	2.80E-01	2.87E-01	2.94E-01	3.01E-01	3.08E-01	3.08E-01

u234	9.86E+00	9.88E+00	9.90E+00	9.92E+00	9.94E+00	9.94E+00
u235	6.80E+02	6.79E+02	6.78E+02	6.77E+02	6.76E+02	6.76E+02
u236	1.84E+02	1.84E+02	1.84E+02	1.84E+02	1.85E+02	1.85E+02
u237	1.94E-12	1.17E-06	1.18E-06	1.18E-06	1.18E-06	1.18E-06
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	1.12E-22	1.12E-07	1.12E-07	1.12E-07	1.12E-07	1.12E-07
u240	9.36E-37	1.16E-36	1.42E-36	1.74E-36	2.12E-36	2.12E-36
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	7.40E-13	3.12E-12	3.12E-12	3.12E-12	3.12E-12	3.12E-12
np236m	7.41E-28	7.41E-13	7.41E-13	7.41E-13	7.41E-13	7.41E-13
np236	1.49E-06	1.53E-06	1.57E-06	1.61E-06	1.64E-06	1.64E-06
np237	4.14E+01	4.13E+01	4.13E+01	4.13E+01	4.13E+01	4.13E+01
np238	6.21E-14	5.46E-07	5.46E-07	5.46E-07	5.46E-07	5.46E-07
np239	7.97E-14	1.62E-05	1.62E-05	1.62E-05	1.62E-05	1.62E-05
np240m	7.99E-39	9.89E-39	1.22E-38	1.49E-38	1.81E-38	1.81E-38
np240	5.94E-39	1.19E-15	1.19E-15	1.19E-15	1.19E-15	1.19E-15
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	2.38E-10	4.05E-10	4.05E-10	4.05E-10	4.05E-10	4.05E-10
pu237	3.75E-19	1.15E-13	1.16E-13	1.18E-13	1.19E-13	1.19E-13
pu238	8.12E-03	8.26E-03	8.26E-03	8.26E-03	8.26E-03	8.26E-03
pu239	2.65E+01	2.70E+01	2.74E+01	2.79E+01	2.83E+01	2.83E+01
pu240	4.76E-01	4.91E-01	5.05E-01	5.19E-01	5.33E-01	5.33E-01
pu241	6.30E-05	7.23E-05	7.45E-05	7.66E-05	7.87E-05	7.87E-05
pu242	1.85E-05	1.97E-05	2.10E-05	2.23E-05	2.37E-05	2.37E-05
pu243	1.43E-29	1.51E-14	1.60E-14	1.71E-14	1.81E-14	1.81E-14
pu244	4.66E-26	5.77E-26	7.09E-26	8.67E-26	1.05E-25	1.05E-25
pu245	.00E+00	8.55E-37	1.05E-36	1.29E-36	1.56E-36	1.56E-36
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	2.03E-34	2.09E-19	2.16E-19	2.23E-19	2.29E-19	2.29E-19
am240	9.27E-32	9.57E-17	9.88E-17	1.02E-16	1.05E-16	1.05E-16
am241	2.01E-03	2.08E-03	2.14E-03	2.21E-03	2.27E-03	2.27E-03
am242m	3.36E-07	3.50E-07	3.62E-07	3.73E-07	3.84E-07	3.84E-07
am242	4.35E-12	2.85E-11	2.92E-11	3.01E-11	3.10E-11	3.10E-11
am243	9.11E-08	9.86E-08	1.06E-07	1.15E-07	1.23E-07	1.23E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	2.50E-31	2.70E-16	2.92E-16	3.15E-16	3.38E-16	3.38E-16
am245	4.63E-40	1.70E-37	2.09E-37	2.56E-37	3.11E-37	3.11E-37
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.67E-29	6.06E-22	6.25E-22	6.45E-22	6.64E-22	6.64E-22
cm242	1.02E-09	5.72E-09	5.90E-09	6.08E-09	6.26E-09	6.26E-09
cm243	4.35E-14	4.74E-14	4.89E-14	5.04E-14	5.19E-14	5.19E-14
cm244	3.60E-12	4.24E-12	4.59E-12	4.94E-12	5.31E-12	5.31E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 95
power= 1.468E-03mw, burnup=1.3405E+04mwd, flux= 9.22E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d	******* d
cm245	5.87E-15	6.49E-15	7.15E-15	7.87E-15	8.62E-15	8.62E-15
cm246	3.60E-17	4.06E-17	4.56E-17	5.11E-17	5.70E-17	5.70E-17
cm247	5.66E-21	6.59E-21	7.64E-21	8.82E-21	1.01E-20	1.01E-20
cm248	8.62E-24	1.03E-23	1.24E-23	1.47E-23	1.74E-23	1.74E-23
cm249	.00E+00	1.18E-34	1.41E-34	1.67E-34	1.98E-34	1.98E-34
cm250	3.85E-39	4.76E-39	5.84E-39	7.12E-39	8.64E-39	8.64E-39
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		9.22E+07	9.22E+07	9.22E+07	9.23E+07	9.23E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.

```
0        3q array has      1 entries.
0        4q array has      1 entries.
0       54q array has     12 entries.
1library information...

          cross-section data taken from position number 11 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr origen-s binary working library--id = 1143             *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *       neutron flux spectrum factors and cross sections were produced from    *
          *      the "presas2" case updating all nuclides on the scale "burnup" library  *
          *                                                                              *
          *                    fission product yields are from endf/b-v                  *
          *                                                                              *
          *                photon libraries use an 18-energy-group structure             *
          *               the photon data are from the master photon data base,          *
          *                produced to include bremsstrahlung from uo2 matrix            *
          *                                                                              *
          *          see information above this box (if present) for later updates       *
          *                                                                              *
          ********************************************************************************
          *                                                                              *
0         ********************************************************************************
0                   .other identification and sizes of library.
0                    data set name:  ft33f001
0                 8/29/1996     date library was produced
0                      1697     total number of nuclides in library
                        689     number of light-element nuclides
                        139     number of actinide nuclides
                        679     number of fission product nuclides
0                      7993     number of nonzero off-diagonal matrix elements
0         ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page   96
         power=     .00mw, burnup=  14299.mwd, flux= 5.99E+07n/cm**2-sec
0                                    basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.269297E+06   1.268572E+06   1.268044E+06   1.267512E+06   1.266977E+06   1.266978E+06
     absorptions   1.026357E+06   1.026214E+06   1.026069E+06   1.025919E+06   1.025763E+06   1.025763E+06
     k infinity    1.236506E+00   1.236167E+00   1.235827E+00   1.235490E+00   1.235155E+00   1.235155E+00
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
```

actinide absorptions	1.011393E+06	1.011139E+06	1.010885E+06	1.010629E+06	1.010372E+06	1.010369E+06
non-actinide abs. fracs.	1.457953E-02	1.469040E-02	1.479900E-02	1.490355E-02	1.500481E-02	1.500428E-02

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 97
0 fraction of total absorption rate

power= .00mw, burnup= 14299.mwd, flux= 5.99E+07n/cm**2-sec

0

	initial	******* d	******* d	******* d	******* d
sm149	5.31E-03	5.33E-03	5.35E-03	5.37E-03	5.38E-03	5.39E-03
eu151	1.40E-03	1.42E-03	1.44E-03	1.45E-03	1.47E-03	1.47E-03
nd143	1.30E-03	1.32E-03	1.34E-03	1.37E-03	1.39E-03	1.39E-03
rh103	6.26E-04	6.37E-04	6.48E-04	6.59E-04	6.69E-04	6.69E-04
xe131	4.22E-04	4.29E-04	4.36E-04	4.43E-04	4.50E-04	4.50E-04
cs133	3.27E-04	3.33E-04	3.38E-04	3.44E-04	3.49E-04	3.49E-04
sm147	2.41E-04	2.45E-04	2.49E-04	2.53E-04	2.57E-04	2.57E-04
tc 99	2.31E-04	2.35E-04	2.38E-04	2.42E-04	2.45E-04	2.45E-04
gd155	2.20E-04	2.20E-04	2.21E-04	2.21E-04	2.21E-04	2.21E-04
nd145	1.85E-04	1.88E-04	1.91E-04	1.94E-04	1.97E-04	1.97E-04
sm152	1.33E-04	1.35E-04	1.38E-04	1.40E-04	1.43E-04	1.43E-04
mo 95	1.28E-04	1.30E-04	1.32E-04	1.35E-04	1.37E-04	1.37E-04
cd113	1.00E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04
sm150	9.36E-05	9.52E-05	9.69E-05	9.86E-05	1.00E-04	1.00E-04
kr 83	7.93E-05	8.06E-05	8.19E-05	8.32E-05	8.44E-05	8.44E-05
cs135	7.41E-05	7.53E-05	7.66E-05	7.78E-05	7.91E-05	7.91E-05
ru101	5.76E-05	5.86E-05	5.95E-05	6.05E-05	6.15E-05	6.15E-05
eu153	5.62E-05	5.72E-05	5.82E-05	5.93E-05	6.03E-05	6.03E-05
gd157	5.86E-05	5.87E-05	5.88E-05	5.89E-05	5.90E-05	5.90E-05
pr141	5.50E-05	5.60E-05	5.69E-05	5.78E-05	5.87E-05	5.87E-05
la139	4.50E-05	4.58E-05	4.65E-05	4.73E-05	4.80E-05	4.80E-05
pd105	2.22E-05	2.26E-05	2.30E-05	2.34E-05	2.38E-05	2.38E-05
ba137	2.17E-05	2.21E-05	2.24E-05	2.28E-05	2.32E-05	2.32E-05
ag109	1.95E-05	2.00E-05	2.05E-05	2.09E-05	2.14E-05	2.14E-05
zr 93	1.79E-05	1.82E-05	1.85E-05	1.88E-05	1.91E-05	1.91E-05
i129	1.46E-05	1.48E-05	1.51E-05	1.53E-05	1.56E-05	1.56E-05
nd144	1.38E-05	1.40E-05	1.42E-05	1.45E-05	1.47E-05	1.47E-05
sm151	1.89E-05	1.27E-05	1.27E-05	1.27E-05	1.27E-05	1.24E-05
mo 97	1.02E-05	1.04E-05	1.06E-05	1.07E-05	1.09E-05	1.09E-05
gd152	8.22E-06	8.46E-06	8.71E-06	8.96E-06	9.21E-06	9.21E-06
pd108	4.85E-06	4.96E-06	5.07E-06	5.18E-06	5.29E-06	5.29E-06
zr 91	4.72E-06	4.80E-06	4.88E-06	4.96E-06	5.04E-06	5.04E-06
y 89	4.52E-06	4.59E-06	4.67E-06	4.74E-06	4.82E-06	4.82E-06
ru102	4.25E-06	4.32E-06	4.39E-06	4.47E-06	4.54E-06	4.54E-06
ce142	3.75E-06	3.81E-06	3.87E-06	3.93E-06	4.00E-06	4.00E-06
nd148	3.61E-06	3.67E-06	3.73E-06	3.79E-06	3.85E-06	3.85E-06
nd146	3.03E-06	3.09E-06	3.14E-06	3.19E-06	3.24E-06	3.24E-06
in115	2.65E-06	2.70E-06	2.74E-06	2.79E-06	2.83E-06	2.83E-06
ba138	2.58E-06	2.63E-06	2.67E-06	2.72E-06	2.76E-06	2.76E-06
pd107	1.44E-06	2.48E-06	2.53E-06	2.58E-06	2.64E-06	2.70E-06
ce140	2.42E-06	2.46E-06	2.50E-06	2.54E-06	2.59E-06	2.59E-06
xe132	2.21E-06	2.25E-06	2.29E-06	2.33E-06	2.37E-06	2.37E-06
ru 99	1.51E-06	1.59E-06	1.67E-06	1.74E-06	1.82E-06	1.82E-06
mo 98	1.50E-06	1.52E-06	1.55E-06	1.57E-06	1.60E-06	1.60E-06
mo100	1.46E-06	1.48E-06	1.50E-06	1.53E-06	1.55E-06	1.55E-06
xe134	1.43E-06	1.46E-06	1.48E-06	1.50E-06	1.53E-06	1.53E-06
zr 92	1.14E-06	1.16E-06	1.18E-06	1.20E-06	1.22E-06	1.22E-06
i127	1.05E-06	1.07E-06	1.09E-06	1.11E-06	1.13E-06	1.13E-06
ru104	9.66E-07	9.83E-07	1.00E-06	1.02E-06	1.03E-06	1.03E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 98
0 fraction of total absorption rate

power= .00mw, burnup= 14299.mwd, flux= 5.99E+07n/cm**2-sec

0	initial ******* d	******* d	******* d	******* d	******* d
zr 96	9.02E-07	9.17E-07	9.32E-07	9.47E-07	9.62E-07	9.62E-07
nd150	8.14E-07	8.28E-07	8.42E-07	8.56E-07	8.70E-07	8.70E-07
xe136	7.76E-07	7.89E-07	8.02E-07	8.15E-07	8.28E-07	8.28E-07
cd111	5.69E-07	5.81E-07	5.93E-07	6.05E-07	6.17E-07	6.17E-07
br 81	5.77E-07	5.87E-07	5.97E-07	6.06E-07	6.16E-07	6.16E-07
rb 85	5.55E-07	5.64E-07	5.74E-07	5.83E-07	5.92E-07	5.92E-07
zr 94	4.85E-07	4.93E-07	5.01E-07	5.09E-07	5.17E-07	5.17E-07
zr 90	4.45E-07	4.53E-07	4.60E-07	4.67E-07	4.75E-07	4.75E-07
sm154	3.75E-07	3.82E-07	3.88E-07	3.95E-07	4.02E-07	4.02E-07
te130	3.57E-07	3.63E-07	3.69E-07	3.75E-07	3.81E-07	3.81E-07
gd154	3.32E-07	3.44E-07	3.55E-07	3.67E-07	3.80E-07	3.80E-07
rb 87	3.20E-07	3.25E-07	3.30E-07	3.36E-07	3.41E-07	3.41E-07
se 77	2.32E-07	2.36E-07	2.40E-07	2.44E-07	2.48E-07	2.48E-07
pd106	2.20E-07	2.24E-07	2.29E-07	2.33E-07	2.37E-07	2.37E-07
gd156	2.04E-07	2.08E-07	2.12E-07	2.17E-07	2.21E-07	2.21E-07
ba135	1.49E-07	1.57E-07	1.64E-07	1.72E-07	1.80E-07	1.80E-07
kr 84	1.52E-07	1.55E-07	1.57E-07	1.60E-07	1.62E-07	1.62E-07
dy161	1.19E-07	1.22E-07	1.24E-07	1.27E-07	1.30E-07	1.30E-07
sb121	1.21E-07	1.23E-07	1.26E-07	1.28E-07	1.30E-07	1.30E-07
se 79	1.17E-07	1.19E-07	1.21E-07	1.23E-07	1.24E-07	1.24E-07
ru100	9.56E-08	9.88E-08	1.02E-07	1.05E-07	1.09E-07	1.09E-07
sb123	9.81E-08	9.93E-08	1.02E-07	1.03E-07	1.05E-07	1.05E-07
kr 86	8.44E-08	8.58E-08	8.72E-08	8.86E-08	9.00E-08	9.00E-08
te128	8.03E-08	8.17E-08	8.31E-08	8.45E-08	8.59E-08	8.59E-08
eu152	1.33E-07	9.00E-08	9.10E-08	9.20E-08	9.30E-08	8.06E-08
nd142	6.86E-08	7.09E-08	7.33E-08	7.57E-08	7.81E-08	7.81E-08
ba134	6.59E-08	6.81E-08	7.04E-08	7.27E-08	7.50E-08	7.50E-08
sm148	6.02E-08	6.22E-08	6.43E-08	6.63E-08	6.85E-08	6.85E-08
se 80	5.56E-08	5.65E-08	5.74E-08	5.83E-08	5.93E-08	5.93E-08
tb159	5.35E-08	5.46E-08	5.58E-08	5.69E-08	5.81E-08	5.81E-08
te125	5.38E-08	5.47E-08	5.57E-08	5.67E-08	5.76E-08	5.76E-08
pd104	4.52E-08	4.67E-08	4.82E-08	4.98E-08	5.14E-08	5.14E-08
gd158	4.27E-08	4.36E-08	4.45E-08	4.54E-08	4.63E-08	4.63E-08
cd112	4.00E-08	4.08E-08	4.16E-08	4.23E-08	4.31E-08	4.31E-08
pm147	9.79E-08	6.53E-08	6.54E-08	6.54E-08	6.54E-08	3.20E-08
li 6	2.98E-08	3.03E-08	3.08E-08	3.12E-08	3.17E-08	3.17E-08
sn117	2.89E-08	2.94E-08	2.99E-08	3.05E-08	3.10E-08	3.10E-08
eu155	6.70E-08	4.45E-08	4.46E-08	4.46E-08	4.47E-08	2.97E-08
dy164	2.64E-08	2.71E-08	2.77E-08	2.84E-08	2.90E-08	2.90E-08
nb 93	2.39E-08	2.51E-08	2.63E-08	2.75E-08	2.88E-08	2.88E-08
dy162	2.51E-08	2.57E-08	2.64E-08	2.71E-08	2.77E-08	2.77E-08
cd114	2.40E-08	2.45E-08	2.50E-08	2.55E-08	2.59E-08	2.59E-08
sn119	2.23E-08	2.27E-08	2.31E-08	2.35E-08	2.39E-08	2.39E-08
sn115	2.04E-08	2.08E-08	2.12E-08	2.15E-08	2.19E-08	2.19E-08
pd110	1.89E-08	1.93E-08	1.96E-08	2.00E-08	2.04E-08	2.04E-08
se 82	1.69E-08	1.71E-08	1.64E-08	1.68E-08	1.74E-08	1.74E-08
sn 88	1.55E-08	1.58E-08	1.60E-08	1.62E-08	1.65E-08	1.65E-08
cd110	1.38E-08	1.38E-08	1.43E-08	1.49E-08	1.55E-08	1.55E-08
br 79	1.20E-08	1.26E-08	1.32E-08	1.38E-08	1.45E-08	1.45E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 99

0 fraction of total absorption rate

power= .00mw, burnup= 14299.mwd, flux= 5.99E+07n/cm**2-sec

0	initial ******* d	******* d	******* d	******* d	******* d
ag107	9.77E-09	1.03E-08	1.09E-08	1.15E-08	1.21E-08	1.21E-08
se 82	1.06E-08	1.08E-08	1.10E-08	1.12E-08	1.13E-08	1.13E-08
sn126	9.50E-09	9.65E-09	9.80E-09	9.95E-09	1.01E-08	1.01E-08

se 78	8.28E-09	8.42E-09	8.56E-09	8.70E-09	8.84E-09	8.84E-09
xe130	7.80E-09	8.04E-09	8.29E-09	8.55E-09	8.80E-09	8.80E-09
xe129	7.07E-09	7.43E-09	7.80E-09	8.18E-09	8.55E-09	8.56E-09
ba136	7.68E-09	7.89E-09	8.10E-09	8.31E-09	8.53E-09	8.53E-09
sn124	7.13E-09	7.26E-09	7.39E-09	7.52E-09	7.64E-09	7.64E-09
dy163	6.30E-09	6.46E-09	6.63E-09	6.80E-09	6.96E-09	6.96E-09
kr 82	5.90E-09	6.06E-09	6.22E-09	6.38E-09	6.54E-09	6.54E-09
as 75	4.88E-09	4.96E-09	5.05E-09	5.13E-09	5.21E-09	5.21E-09
eu154	8.76E-09	5.96E-09	6.07E-09	6.18E-09	6.29E-09	5.04E-09
te126	4.16E-09	4.36E-09	4.57E-09	4.78E-09	4.99E-09	4.99E-09
in113	4.05E-09	4.12E-09	4.20E-09	4.27E-09	4.34E-09	4.34E-09
sr 90	5.92E-09	3.95E-09	3.95E-09	3.95E-09	3.95E-09	3.69E-09
sn118	2.89E-09	2.94E-09	2.99E-09	3.04E-09	3.09E-09	3.09E-09
sn122	2.46E-09	2.50E-09	2.55E-09	2.59E-09	2.64E-09	2.64E-09
cd116	2.43E-09	2.47E-09	2.51E-09	2.56E-09	2.60E-09	2.60E-09
sn120	1.82E-09	1.85E-09	1.88E-09	1.92E-09	1.95E-09	1.95E-09
ge 73	1.38E-09	1.41E-09	1.43E-09	1.45E-09	1.48E-09	1.48E-09
cs137	1.36E-09	9.10E-10	9.10E-10	9.11E-10	9.11E-10	8.55E-10
gd160	5.82E-10	5.95E-10	6.08E-10	6.21E-10	6.34E-10	6.34E-10
ho165	5.43E-10	5.59E-10	5.75E-10	5.91E-10	6.08E-10	6.08E-10
ge 76	4.77E-10	4.85E-10	4.93E-10	5.01E-10	5.09E-10	5.09E-10
dy160	4.08E-10	4.24E-10	4.39E-10	4.55E-10	4.71E-10	4.71E-10
xe128	2.57E-10	2.66E-10	2.75E-10	2.84E-10	2.93E-10	2.93E-10
cs134	8.83E-10	5.98E-10	6.08E-10	6.18E-10	6.28E-10	2.49E-10
sr 86	1.32E-10	1.36E-10	1.40E-10	1.45E-10	1.49E-10	1.49E-10
te124	1.15E-10	1.18E-10	1.21E-10	1.23E-10	1.26E-10	1.26E-10
sn116	9.85E-11	1.03E-10	1.06E-10	1.09E-10	1.13E-10	1.13E-10
kr 85	2.00E-10	1.33E-10	1.33E-10	1.33E-10	1.33E-10	1.12E-10
sr 87	6.44E-11	6.57E-11	6.71E-11	6.84E-11	6.97E-11	6.97E-11
nb 94	5.04E-11	5.15E-11	5.28E-11	5.40E-11	5.54E-11	5.54E-11
te122	4.13E-11	4.27E-11	4.41E-11	4.56E-11	4.71E-11	4.71E-11
se 76	3.92E-11	4.03E-11	4.15E-11	4.26E-11	4.38E-11	4.38E-11
er166	2.81E-11	2.89E-11	2.97E-11	3.05E-11	3.13E-11	3.13E-11
ge 74	2.77E-11	2.81E-11	2.86E-11	2.91E-11	2.96E-11	2.96E-11
ge 72	2.00E-11	2.04E-11	2.07E-11	2.11E-11	2.14E-11	2.14E-11
ce144	2.12E-10	1.42E-10	1.42E-10	1.42E-10	1.42E-10	1.23E-11
kr 80	9.38E-12	9.82E-12	1.03E-11	1.08E-11	1.13E-11	1.13E-11
y 90	5.64E-12	3.76E-12	3.76E-12	3.76E-12	3.76E-12	3.52E-12
er167	1.95E-12	2.04E-12	2.13E-12	2.22E-12	2.31E-12	2.31E-12
sb125	6.39E-12	4.25E-12	4.25E-12	4.26E-12	4.26E-12	2.12E-12
te123	1.27E-12	1.33E-12	1.39E-12	1.46E-12	1.52E-12	1.52E-12
ru106	1.43E-11	9.45E-12	9.47E-12	9.49E-12	9.50E-12	1.46E-12
cd108	5.12E-13	5.41E-13	5.71E-13	6.02E-13	6.35E-13	6.35E-13
be 9	6.02E-14	6.12E-14	6.22E-14	6.32E-14	6.42E-14	6.42E-14
sn114	2.54E-14	2.63E-14	2.72E-14	2.81E-14	2.91E-14	2.91E-14
li 7	2.45E-14	2.49E-14	2.53E-14	2.57E-14	2.61E-14	2.61E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 100
0 fraction of total absorption rate
power= .00kw, burnup= 14.29mwd, flux= 5.9E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.33E-14	1.24E-14	1.28E-14	1.29E-14	1.31E-14	1.16E-14
te127m	3.23E-12	2.13E-12	2.15E-12	2.15E-12	2.16E-12	3.73E-15
nb 95	5.42E-11	3.62E-11	3.62E-11	3.62E-11	3.62E-11	1.50E-15
zr 95	5.85E-11	3.90E-11	3.90E-11	3.90E-11	3.90E-11	7.33E-16
y 91	4.99E-11	3.33E-11	3.33E-11	3.33E-11	3.33E-11	2.26E-16
sn123	3.84E-15	2.56E-15	2.56E-15	2.56E-15	2.56E-15	1.17E-17
sr 89	1.06E-11	7.09E-12	7.09E-12	7.09E-12	7.09E-12	7.35E-18
tb160	4.82E-14	3.77E-14	3.34E-14	3.40E-14	3.47E-14	2.27E-18
ru103	1.40E-10	9.32E-11	9.33E-11	9.33E-11	9.34E-11	1.84E-18

cd109	1.02E-17	7.04E-18	7.32E-18	7.62E-18	7.94E-18	1.76E-18
ce141	5.74E-10	3.83E-10	3.83E-10	3.83E-10	3.83E-10	1.92E-19
pm148m	1.47E-12	6.98E-13	6.99E-13	7.00E-13	7.01E-13	2.75E-20
sb124	2.35E-15	1.58E-15	1.60E-15	1.61E-15	1.63E-15	1.37E-20
cd115m	9.89E-14	6.58E-14	6.59E-14	6.59E-14	6.60E-14	1.37E-20

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements. page 101
power= 9.790E-04mw, burnup=1.4299E+04mwd, flux= 5.99E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	7.95E-04	8.09E-04	8.22E-04	8.35E-04	8.49E-04	8.49E-04
h 2	2.37E-06	2.41E-06	2.45E-06	2.49E-06	2.53E-06	2.53E-06
h 3	1.92E-11	1.28E-11	1.28E-11	1.29E-11	1.30E-11	1.11E-11
h 4	2.82E-35	1.25E-35	1.26E-35	1.27E-35	1.27E-35	.00E+00
he 3	1.28E-08	1.30E-08	1.31E-08	1.32E-08	1.34E-08	1.34E-08
he 4	1.32E-04	1.34E-04	1.36E-04	1.38E-04	1.41E-04	1.41E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.58E-05	1.61E-05	1.64E-05	1.66E-05	1.69E-05	1.69E-05
ne 21	3.99E-09	4.11E-09	4.24E-09	4.38E-09	4.51E-09	4.51E-09
ne 22	1.04E-07	1.06E-07	1.08E-07	1.10E-07	1.11E-07	1.11E-07
ne 23	2.65E-15	1.76E-15	1.76E-15	1.76E-15	1.76E-15	1.76E-30
na 22	1.57E-11	1.05E-11	1.05E-11	1.05E-11	1.05E-11	5.03E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	9.59E-09	6.39E-09	6.40E-09	6.40E-09	6.40E-09	6.40E-24
na 24m	1.58E-15	1.05E-15	1.05E-15	1.05E-15	1.05E-15	1.05E-30
na 25	4.34E-24	2.92E-24	3.07E-24	3.17E-24	3.27E-24	3.27E-39
mg 24	1.05E-01	1.07E-01	1.09E-01	1.10E-01	1.12E-01	1.12E-01
mg 25	4.17E-07	4.31E-07	4.44E-07	4.57E-07	4.71E-07	4.71E-07
mg 26	2.37E-06	2.41E-06	2.45E-06	2.49E-06	2.53E-06	2.53E-06
mg 27	7.91E-13	5.26E-13	5.26E-13	5.26E-13	5.26E-13	5.26E-28
mg 28	5.84E-25	2.59E-25	2.59E-25	2.59E-25	2.59E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	7.11E-11	4.74E-11	4.74E-11	4.74E-11	4.75E-11	4.75E-26
al 29	3.48E-22	2.39E-22	2.46E-22	2.54E-22	2.62E-22	2.62E-37
al 30	6.02E-32	4.20E-32	4.40E-32	4.61E-32	4.83E-32	.00E+00
si 28	3.06E-01	3.11E-01	3.16E-01	3.21E-01	3.26E-01	3.26E-01
si 29	3.73E-06	3.85E-06	3.97E-06	4.10E-06	4.22E-06	4.22E-06
si 30	4.83E-11	5.07E-11	5.31E-11	5.56E-11	5.82E-11	5.82E-11
si 31	1.26E-23	8.78E-24	9.21E-24	9.65E-24	1.01E-23	1.01E-38
si 32	7.80E-30	4.02E-30	3.88E-30	4.04E-30	4.23E-30	4.19E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		5.98E+07	5.99E+07	5.99E+07	5.99E+07	5.99E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 102
power= 9.790E-04mw, burnup=1.4299E+04mwd, flux= 5.99E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	1.59E-01	1.65E-01	1.71E-01	1.78E-01	1.84E-01	1.84E-01
pb206	5.89E-02	6.21E-02	6.54E-02	6.87E-02	7.22E-02	7.22E-02
pb207	4.33E-03	4.54E-03	4.75E-03	4.97E-03	5.19E-03	5.19E-03
pb208	2.47E-04	2.56E-04	2.64E-04	2.72E-04	2.81E-04	2.81E-04
pb209	4.37E-10	4.53E-10	4.68E-10	4.83E-10	4.99E-10	4.99E-10
pb210	1.61E-04	1.65E-04	1.70E-04	1.74E-04	1.78E-04	1.78E-04
pb211	3.29E-11	3.35E-11	3.41E-11	3.47E-11	3.53E-11	3.54E-11
pb212	3.31E-11	2.26E-11	2.29E-11	2.33E-11	2.37E-11	2.35E-11
pb214	3.69E-10	3.78E-10	3.88E-10	3.97E-10	4.06E-10	4.07E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	8.04E-03	8.56E-03	9.10E-03	9.65E-03	1.02E-02	1.02E-02

bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	9.92E-08	1.02E-07	1.04E-07	1.07E-07	1.09E-07	1.10E-07
bi211	1.95E-12	1.98E-12	2.02E-12	2.06E-12	2.09E-12	2.10E-12
bi212	3.14E-12	2.13E-12	2.17E-12	2.21E-12	2.25E-12	2.23E-12
bi213	1.02E-10	1.06E-10	1.09E-10	1.13E-10	1.17E-10	1.17E-10
bi214	2.74E-10	2.81E-10	2.88E-10	2.95E-10	3.02E-10	3.02E-10
po210	2.74E-06	2.81E-06	2.88E-06	2.95E-06	3.02E-06	3.00E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	2.15E-17	2.19E-17	2.23E-17	2.27E-17	2.31E-17	2.32E-17
po212	1.65E-22	1.12E-22	1.14E-22	1.16E-22	1.18E-22	1.17E-22
po213	1.53E-19	1.59E-19	1.64E-19	1.70E-19	1.75E-19	1.75E-19
po214	3.76E-17	3.86E-17	3.96E-17	4.06E-17	4.15E-17	4.15E-17
po215	2.70E-17	2.75E-17	2.80E-17	2.85E-17	2.90E-17	2.91E-17
po216	1.25E-16	8.51E-17	8.66E-17	8.82E-17	8.98E-17	8.91E-17
po218	4.26E-11	4.37E-11	4.48E-11	4.59E-11	4.70E-11	4.70E-11
rn218	1.75E-28	7.90E-29	8.05E-29	8.20E-29	8.35E-29	3.18E-43
rn219	6.01E-14	6.12E-14	6.24E-14	6.35E-14	6.46E-14	6.47E-14
rn220	4.80E-14	3.26E-14	3.32E-14	3.38E-14	3.44E-14	3.42E-14
rn222	7.57E-08	7.77E-08	7.96E-08	8.16E-08	8.35E-08	8.35E-08
ra222	1.90E-25	8.58E-26	8.74E-26	8.90E-26	9.07E-26	3.46E-40
ra223	1.50E-08	1.53E-08	1.56E-08	1.58E-08	1.61E-08	1.61E-08
ra224	2.73E-10	1.86E-10	1.89E-10	1.92E-10	1.96E-10	1.94E-10
ra225	4.77E-08	4.94E-08	5.11E-08	5.28E-08	5.45E-08	5.45E-08
ra226	1.16E-02	1.19E-02	1.22E-02	1.25E-02	1.28E-02	1.28E-02
ra228	5.43E-11	5.57E-11	5.71E-11	5.85E-11	5.99E-11	5.99E-11
ac225	3.23E-08	3.34E-08	3.45E-08	3.57E-08	3.68E-08	3.68E-08
ac227	1.04E-05	1.06E-05	1.08E-05	1.10E-05	1.12E-05	1.12E-05
ac228	6.63E-15	6.80E-15	6.97E-15	7.14E-15	7.31E-15	7.31E-15
th226	9.26E-24	4.19E-24	4.26E-24	4.34E-24	4.42E-24	1.69E-38
th227	2.42E-08	2.47E-08	2.51E-08	2.56E-08	2.60E-08	2.61E-08
th228	5.21E-08	3.54E-08	3.61E-08	3.67E-08	3.74E-08	3.70E-08
th229	9.28E-03	9.61E-03	9.94E-03	1.03E-02	1.06E-02	1.06E-02
th230	5.97E-01	6.11E-01	6.25E-01	6.39E-01	6.53E-01	6.55E-01
th231	3.78E-09	3.46E-09	3.48E-09	3.49E-09	3.50E-09	2.79E-09
th232	1.33E-01	1.36E-01	1.40E-01	1.43E-01	1.46E-01	1.46E-01
th233	4.41E-13	3.01E-13	3.09E-13	3.16E-13	3.24E-13	3.24E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	1.57E-02	1.60E-02	1.63E-02	1.66E-02	1.69E-02	1.69E-02
pa232	9.75E-11	6.62E-11	6.75E-11	6.87E-11	6.99E-11	7.00E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 103
power= 9.790E-04mw, burnup=1.4299E+04mwd, flux= 5.99E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.43E-06	1.43E-06	1.43E-06	1.42E-06	1.42E-06	1.42E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.60E-13	8.61E-13	8.63E-13	8.65E-13	8.66E-13	8.66E-13
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	8.37E-21	8.62E-21	4.15E-21	4.21E-21	4.29E-21	1.64E-35
u231	8.40E-17	5.77E-17	5.90E-17	6.03E-17	6.16E-17	6.16E-32
u232	1.90E-06	1.29E-06	1.32E-06	1.34E-06	1.36E-06	1.33E-06
u233	3.08E-01	3.15E-01	3.22E-01	3.29E-01	3.36E-01	3.36E-01
u234	9.94E+00	9.95E+00	9.96E+00	9.97E+00	9.98E+00	9.98E+00
u235	6.76E+02	6.75E+02	6.75E+02	6.74E+02	6.74E+02	6.74E+02
u236	1.85E+02	1.85E+02	1.85E+02	1.85E+02	1.85E+02	1.85E+02
u237	1.10E-06	7.53E-07	7.70E-07	7.87E-07	7.83E-07	1.50E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	1.12E-07	7.44E-08	7.44E-08	7.44E-08	7.45E-08	7.45E-23
u240	2.12E-36	2.55E-36	3.03E-36	3.56E-36	4.15E-36	4.15E-36

u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	3.12E-12	2.07E-12	2.08E-12	2.08E-12	2.08E-12	3.58E-13
np236m	7.41E-13	4.93E-13	4.93E-13	4.93E-13	4.93E-13	4.93E-28
np236	1.64E-06	1.67E-06	1.69E-06	1.71E-06	1.74E-06	1.74E-06
np237	4.13E+01	4.13E+01	4.12E+01	4.12E+01	4.12E+01	4.12E+01
np238	5.46E-07	3.63E-07	3.63E-07	3.63E-07	3.63E-07	3.19E-14
np239	1.62E-05	1.07E-05	1.08E-05	1.08E-05	1.08E-05	1.18E-13
np240m	1.81E-38	2.17E-38	2.58E-38	3.04E-38	3.54E-38	3.54E-38
np240	1.19E-15	5.27E-16	5.27E-16	5.28E-16	5.28E-16	6.16E-39
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	4.05E-10	2.71E-10	2.71E-10	2.71E-10	2.71E-10	1.42E-10
pu237	1.19E-13	7.29E-14	7.31E-14	7.34E-14	7.37E-14	1.48E-20
pu238	8.26E-03	5.52E-03	5.50E-03	5.50E-03	5.50E-03	5.38E-03
pu239	2.83E+01	2.84E+01	2.85E+01	2.86E+01	2.87E+01	2.87E+01
pu240	5.33E-01	5.30E-01	5.27E-01	5.24E-01	5.22E-01	5.22E-01
pu241	7.87E-05	5.20E-05	5.17E-05	5.15E-05	5.13E-05	4.49E-05
pu242	2.37E-05	2.45E-05	2.51E-05	2.57E-05	2.63E-05	2.63E-05
pu243	1.81E-14	1.25E-14	1.28E-14	1.31E-14	1.34E-14	1.39E-29
pu244	1.05E-25	1.27E-25	1.51E-25	1.77E-25	2.07E-25	2.07E-25
pu245	1.56E-36	1.25E-36	1.49E-36	1.75E-36	2.05E-36	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	2.29E-19	1.22E-19	1.10E-19	1.06E-19	1.04E-19	1.04E-34
am240	1.05E-16	5.59E-17	5.04E-17	4.83E-17	4.74E-17	4.74E-32
am241	2.27E-03	1.82E-03	1.64E-03	1.57E-03	1.54E-03	1.54E-03
am242m	3.84E-07	2.24E-07	1.91E-07	1.80E-07	1.75E-07	1.73E-07
am242	3.10E-11	1.67E-11	1.49E-11	1.42E-11	1.39E-11	2.23E-12
am243	1.23E-07	1.26E-07	1.29E-07	1.32E-07	1.35E-07	1.35E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	3.38E-16	2.30E-16	2.36E-16	2.41E-16	2.47E-16	2.47E-31
am245	3.11E-37	2.49E-37	2.96E-37	3.47E-37	4.05E-37	6.27E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	6.64E-22	2.37E-22	2.12E-22	2.03E-22	1.99E-22	1.19E-31
cm242	6.26E-09	3.37E-09	3.01E-09	2.87E-09	2.81E-09	4.84E-10
cm243	5.19E-14	1.86E-14	1.66E-14	1.59E-14	1.56E-14	1.46E-14
cm244	5.31E-12	3.62E-12	3.70E-12	3.79E-12	3.87E-12	3.49E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 104
power= 9.790E-04mw, burnup=1.4299E+04mwd, flux= 5.99E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
cm245	8.62E-15	8.72E-15	8.82E-15	8.93E-15	9.04E-15	9.04E-15
cm246	5.70E-17	5.92E-17	6.14E-17	6.34E-17	6.54E-17	6.54E-17
cm247	1.01E-20	1.11E-20	1.21E-20	1.31E-20	1.41E-20	1.41E-20
cm248	1.74E-23	1.94E-23	2.15E-23	2.39E-23	2.64E-23	2.64E-23
cm249	1.98E-34	1.47E-34	1.63E-34	1.81E-34	2.01E-34	.00E+00
cm250	8.64E-39	9.29E-39	1.00E-38	1.08E-38	1.17E-38	1.17E-38
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		5.99E+07	5.99E+07	5.99E+07	5.99E+07	5.99E+07

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 12 of library on unit 33.

```
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ******************************************************************************
          *                                                                            *
          *            prelim lwr origen-s binary working library--id = 1143           *
          *         made from modified card-image origen-s libraries of scale 4.2      *
          *      data from the light element, actinide, and fission product libraries  *
          *        decay data, including gamma and total energy, are from endf/b-vi    *
          *                                                                            *
          *      neutron flux spectrum factors and cross sections were produced from   *
          *     the "presas2" case updating all nuclides on the scale "burnup" library *
          *                                                                            *
          *                  fission product yields are from endf/b-v                  *
          *                                                                            *
          *              photon libraries use an 18-energy-group structure             *
          *             the photon data are from the master photon data base,          *
          *              produced to include bremsstrahlung from uo2 matrix            *
          *                                                                            *
          *         see information above this box (if present) for later updates     *
          *                                                                            *
          ******************************************************************************
          *                                                                            *
0         ******************************************************************************
0                  .other identification and sizes of library.
0                   data set name:  ft33f001
0               8/29/1996     date library was produced
0                    1697     total number of nuclides in library
                      689     number of light-element nuclides
                      129     number of actinide nuclides
                      879     number of fission product nuclides
0                    7993     number of nonzero off-diagonal matrix elements
0         ******************************************************************************
1     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                  page  105
          power=     .00mw, burnup=  15192.mwd, flux= 5.99E+07n/cm**2-sec
0                                            basis =
0     (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                       initial       ******* d      ******* d      ******* d      ******* d      ******* d
      productions    1.266396E+06   1.267856E+06   1.267312E+06   1.266765E+06   1.266216E+06   1.2[illegible]11E+06
      absorptions    1.026710E+06   1.026550E+06   1.026386E+06   1.026217E+06   1.026046E+06   1.02[illegible]42E+06
      k infinity     1.235393E+00   1.235065E+00   1.234733E+00   1.234403E+00   1.234073E+00   1.2[illegible]073E+00
0                       initial       ******* d      ******* d      ******* d      ******* d      ******* d
      actinide
      absorptions    1.011309E+06   1.011050E+06   1.010789E+06   1.010527E+06   1.010264E+06   1.010261E+06
      non-actinide
      abs. fracs.    1.500005E-02   1.509905E-02   1.519519E-02   1.528919E-02   1.538122E-02   1.538050E-02
1     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2             fission products       page  106
0                                     fraction of total absorption rate
          power=     .00mw, burnup=  15192.mwd, flux= 5.99E+07n/cm**2-sec
```

0

	initial	******* d	******* d	******* d	******* d	******* d
sm149	5.39E-03	5.40E-03	5.41E-03	5.42E-03	5.42E-03	5.42E-03
eu151	1.47E-03	1.48E-03	1.50E-03	1.51E-03	1.52E-03	1.52E-03
nd143	1.39E-03	1.41E-03	1.43E-03	1.45E-03	1.47E-03	1.47E-03
rh103	6.69E-04	6.80E-04	6.90E-04	7.01E-04	7.12E-04	7.12E-04
xe131	4.50E-04	4.57E-04	4.64E-04	4.71E-04	4.78E-04	4.78E-04
cs133	3.49E-04	3.55E-04	3.60E-04	3.66E-04	3.71E-04	3.71E-04
sm147	2.57E-04	2.61E-04	2.65E-04	2.69E-04	2.73E-04	2.73E-04
tc 99	2.45E-04	2.49E-04	2.52E-04	2.56E-04	2.59E-04	2.59E-04
gd155	2.21E-04	2.21E-04	2.21E-04	2.21E-04	2.21E-04	2.21E-04
nd145	1.97E-04	2.00E-04	2.03E-04	2.06E-04	2.09E-04	2.09E-04
sm152	1.43E-04	1.46E-04	1.48E-04	1.51E-04	1.54E-04	1.54E-04
mo 95	1.37E-04	1.39E-04	1.41E-04	1.43E-04	1.45E-04	1.45E-04
sm150	1.00E-04	1.02E-04	1.04E-04	1.05E-04	1.07E-04	1.07E-04
cd113	1.01E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04
kr 83	8.45E-05	8.58E-05	8.71E-05	8.83E-05	8.96E-05	8.96E-05
cs135	7.90E-05	8.03E-05	8.15E-05	8.28E-05	8.40E-05	8.40E-05
ru101	6.15E-05	6.24E-05	6.34E-05	6.44E-05	6.54E-05	6.54E-05
eu153	6.03E-05	6.13E-05	6.24E-05	6.34E-05	6.44E-05	6.44E-05
pr141	5.87E-05	5.97E-05	6.06E-05	6.15E-05	6.24E-05	6.24E-05
gd157	5.90E-05	5.91E-05	5.92E-05	5.93E-05	5.94E-05	5.94E-05
la139	4.80E-05	4.88E-05	4.95E-05	5.03E-05	5.11E-05	5.11E-05
pd105	2.38E-05	2.42E-05	2.46E-05	2.50E-05	2.54E-05	2.54E-05
ba137	2.32E-05	2.35E-05	2.39E-05	2.43E-05	2.46E-05	2.46E-05
ag109	2.14E-05	2.19E-05	2.24E-05	2.28E-05	2.33E-05	2.33E-05
zr 93	1.91E-05	1.94E-05	1.97E-05	2.00E-05	2.02E-05	2.02E-05
i129	1.56E-05	1.58E-05	1.61E-05	1.63E-05	1.66E-05	1.66E-05
nd144	1.47E-05	1.49E-05	1.52E-05	1.54E-05	1.56E-05	1.56E-05
sm151	1.24E-05	1.27E-05	1.27E-05	1.28E-05	1.28E-05	1.25E-05
mo 97	1.09E-05	1.11E-05	1.13E-05	1.14E-05	1.16E-05	1.16E-05
gd152	9.22E-06	9.47E-06	9.73E-06	9.99E-06	1.03E-05	1.03E-05
pd108	5.29E-06	5.40E-06	5.51E-06	5.62E-06	5.73E-06	5.73E-06
zr 91	5.04E-06	5.12E-06	5.19E-06	5.27E-06	5.35E-06	5.35E-06
y 89	4.82E-06	4.89E-06	4.97E-06	5.04E-06	5.12E-06	5.12E-06
ru102	4.54E-06	4.61E-06	4.68E-06	4.76E-06	4.83E-06	4.83E-06
ce142	4.00E-06	4.06E-06	4.12E-06	4.19E-06	4.25E-06	4.25E-06
nd148	3.85E-06	3.92E-06	3.98E-06	4.04E-06	4.10E-06	4.10E-06
nd146	3.24E-06	3.29E-06	3.34E-06	3.39E-06	3.44E-06	3.44E-06
in115	2.83E-06	2.88E-06	2.93E-06	2.97E-06	3.02E-06	3.02E-06
ba138	2.76E-06	2.81E-06	2.85E-06	2.89E-06	2.94E-06	2.94E-06
pd107	2.70E-06	2.75E-06	2.81E-06	2.86E-06	2.92E-06	2.92E-06
ce140	2.59E-06	2.63E-06	2.67E-06	2.71E-06	2.75E-06	2.75E-06
xe132	2.37E-06	2.40E-06	2.44E-06	2.48E-06	2.52E-06	2.52E-06
ru 99	1.82E-06	1.90E-06	1.98E-06	2.06E-06	2.15E-06	2.15E-06
mo 98	1.60E-06	1.62E-06	1.65E-06	1.67E-06	1.70E-06	1.70E-06
mo100	1.55E-06	1.58E-06	1.60E-06	1.63E-06	1.65E-06	1.65E-06
xe134	1.53E-06	1.55E-06	1.58E-06	1.60E-06	1.63E-06	1.63E-06
zr 92	[illegible]	[illegible]	1.26E-06	[illegible]	[illegible]	[illegible]
i127	1.12E-06	1.14E-06	1.16E-06	[illegible]	1.20E-06	1.20E-06
ru104	1.03E-06	1.05E-06	1.07E-06	1.09E-06	1.10E-06	1.10E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 107

0 fraction of total absorption rate

power= .00mw, burnup= 15192.mwd, flux= 5.99E+07n/cm**2-sec

0

	initial	******* d	******* d	******* d	******* d	******* d
zr 96	9.62E-07	9.77E-07	9.92E-07	1.01E-06	1.02E-06	1.02E-06
nd150	8.70E-07	8.84E-07	8.98E-07	9.12E-07	9.26E-07	9.26E-07
xe136	8.29E-07	8.42E-07	8.55E-07	[illegible]	8.81E-07	8.81E-07
cd111	6.17E-07	6.29E-07	6.41E-07	6.53E-07	6.65E-07	6.65E-07

br 81	6.16E-07	6.26E-07	6.35E-07	6.45E-07	6.55E-07	6.55E-07
rb 85	5.92E-07	6.01E-07	6.10E-07	6.20E-07	6.29E-07	6.29E-07
zr 94	5.17E-07	5.25E-07	5.33E-07	5.41E-07	5.49E-07	5.49E-07
zr 90	4.75E-07	4.82E-07	4.90E-07	4.97E-07	5.04E-07	5.04E-07
gd154	3.80E-07	3.92E-07	4.05E-07	4.18E-07	4.31E-07	4.31E-07
sm154	4.02E-07	4.09E-07	4.15E-07	4.22E-07	4.29E-07	4.29E-07
te130	3.81E-07	3.87E-07	3.93E-07	3.99E-07	4.06E-07	4.06E-07
rb 87	3.41E-07	3.46E-07	3.52E-07	3.57E-07	3.62E-07	3.62E-07
se 77	2.48E-07	2.52E-07	2.55E-07	2.59E-07	2.63E-07	2.63E-07
pd106	2.37E-07	2.42E-07	2.46E-07	2.50E-07	2.55E-07	2.55E-07
gd156	2.21E-07	2.25E-07	2.30E-07	2.34E-07	2.38E-07	2.38E-07
ba135	1.80E-07	1.88E-07	1.96E-07	2.05E-07	2.13E-07	2.13E-07
kr 84	1.62E-07	1.65E-07	1.67E-07	1.70E-07	1.72E-07	1.72E-07
dy161	1.30E-07	1.33E-07	1.36E-07	1.38E-07	1.41E-07	1.41E-07
sb121	1.30E-07	1.32E-07	1.34E-07	1.36E-07	1.38E-07	1.38E-07
se 79	1.25E-07	1.26E-07	1.28E-07	1.30E-07	1.32E-07	1.32E-07
ru100	1.09E-07	1.12E-07	1.16E-07	1.19E-07	1.23E-07	1.23E-07
sb123	1.05E-07	1.07E-07	1.08E-07	1.10E-07	1.12E-07	1.12E-07
kr 86	9.00E-08	9.14E-08	9.28E-08	9.42E-08	9.56E-08	9.56E-08
te128	8.59E-08	8.73E-08	8.87E-08	9.00E-08	9.14E-08	9.14E-08
nd142	7.81E-08	8.06E-08	8.31E-08	8.57E-08	8.83E-08	8.83E-08
ba134	7.50E-08	7.74E-08	7.98E-08	8.22E-08	8.47E-08	8.47E-08
eu152	8.06E-08	9.39E-08	9.49E-08	9.58E-08	9.68E-08	8.28E-08
sm148	6.85E-08	7.06E-08	7.28E-08	7.51E-08	7.73E-08	7.73E-08
se 80	5.93E-08	6.02E-08	6.11E-08	6.21E-08	6.30E-08	6.30E-08
tb159	5.81E-08	5.92E-08	6.04E-08	6.15E-08	6.27E-08	6.27E-08
te125	5.76E-08	5.86E-08	5.96E-08	6.05E-08	6.15E-08	6.15E-08
pd104	5.14E-08	5.31E-08	5.47E-08	5.64E-08	5.81E-08	5.81E-08
gd158	4.63E-08	4.72E-08	4.81E-08	4.90E-08	4.99E-08	4.99E-08
cd112	4.31E-08	4.39E-08	4.47E-08	4.55E-08	4.62E-08	4.62E-08
nb 93	2.88E-08	3.01E-08	3.14E-08	3.27E-08	3.40E-08	3.40E-08
li 6	3.17E-08	3.22E-08	3.27E-08	3.31E-08	3.36E-08	3.36E-08
sn117	3.10E-08	3.15E-08	3.21E-08	3.26E-08	3.31E-08	3.31E-08
dy164	2.90E-08	2.97E-08	3.03E-08	3.10E-08	3.16E-08	3.16E-08
dy162	2.77E-08	2.84E-08	2.91E-08	2.98E-08	3.04E-08	3.04E-08
pm147	3.20E-08	6.54E-08	6.54E-08	6.54E-08	6.54E-08	2.99E-08
eu155	2.97E-08	4.47E-08	4.48E-08	4.48E-08	4.49E-08	2.88E-08
cd114	2.59E-08	2.64E-08	2.69E-08	2.73E-08	2.78E-08	2.78E-08
sn119	2.39E-08	2.43E-08	2.47E-08	2.51E-08	2.55E-08	2.55E-08
sn115	2.19E-08	2.23E-08	2.26E-08	2.30E-08	2.34E-08	2.34E-08
pd110	2.04E-08	2.08E-08	2.12E-08	2.17E-08	2.21E-08	2.21E-08
mo 96	1.74E-08	1.80E-08	1.85E-08	1.91E-08	1.96E-08	1.96E-08
cd110	1.55E-08	1.61E-08	1.67E-08	1.73E-08	1.80E-08	1.80E-08
sr 88	1.65E-08	1.68E-08	1.70E-08	1.73E-08	1.76E-08	1.76E-08
br 79	1.45E-08	1.51E-08	1.57E-08	1.64E-08	1.71E-08	1.71E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 108

0 fraction of total absorption rate

power= .00mw, burnup= 15192.mwd, flux= 5.99E+07n/cm**2-sec

0 initial [illegible]

ag107	1.21E-08	1.27E-08	1.33E-08	1.40E-08	1.46E-08	1.46E-08
se 82	1.12E-08	1.15E-08	1.17E-08	1.19E-08	1.20E-08	[illegible]
sn126	[illegible]	[illegible]	[illegible]	[illegible]	1.07E-08	[illegible]
xe129	8.56E-09	8.94E-09	9.33E-09	9.73E-09	1.01E-08	1.01E-08
xe130	8.80E-09	9.07E-09	9.33E-09	9.60E-09	9.87E-09	9.87E-09
ba136	8.53E-09	8.74E-09	8.96E-09	9.19E-09	9.41E-09	9.41E-09
se 78	8.84E-09	8.95E-09	9.12E-09	9.26E-09	9.40E-09	9.40E-09
sn124	7.64E-09	7.77E-09	7.89E-09	8.02E-09	8.15E-09	8.15E-09
dy163	6.96E-09	7.13E-09	7.30E-09	7.47E-09	7.64E-09	7.64E-09
kr 82	6.54E-09	6.70E-09	6.87E-09	7.03E-09	7.20E-09	7.20E-09

te126	4.99E-09	5.21E-09	5.42E-09	5.65E-09	5.87E-09	5.87E-09
as 75	5.21E-09	5.29E-09	5.38E-09	5.46E-09	5.54E-09	5.54E-09
eu154	5.04E-09	6.40E-09	6.51E-09	6.63E-09	6.74E-09	5.29E-09
in113	4.34E-09	4.42E-09	4.49E-09	4.56E-09	4.64E-09	4.64E-09
sr 90	3.69E-09	3.95E-09	3.95E-09	3.95E-09	3.95E-09	3.67E-09
sn118	3.09E-09	3.14E-09	3.19E-09	3.24E-09	3.30E-09	3.30E-09
sn122	2.64E-09	2.68E-09	2.72E-09	2.77E-09	2.81E-09	2.81E-09
cd116	2.60E-09	2.64E-09	2.68E-09	2.73E-09	2.77E-09	2.77E-09
sn120	1.95E-09	1.98E-09	2.01E-09	2.04E-09	2.08E-09	2.08E-09
ge 73	1.48E-09	1.50E-09	1.53E-09	1.55E-09	1.57E-09	1.57E-09
cs137	8.55E-10	9.11E-10	9.11E-10	9.11E-10	9.11E-10	8.50E-10
gd160	6.34E-10	6.47E-10	6.60E-10	6.74E-10	6.87E-10	6.87E-10
ho165	6.08E-10	6.25E-10	6.42E-10	6.59E-10	6.76E-10	6.76E-10
ge 76	5.09E-10	5.17E-10	5.25E-10	5.33E-10	5.41E-10	5.41E-10
dy160	4.71E-10	4.87E-10	5.04E-10	5.21E-10	5.38E-10	5.38E-10
xe128	2.93E-10	3.03E-10	3.13E-10	3.22E-10	3.32E-10	3.32E-10
cs134	2.49E-10	6.38E-10	6.48E-10	6.59E-10	6.69E-10	2.44E-10
sr 86	1.49E-10	1.53E-10	1.58E-10	1.62E-10	1.67E-10	1.67E-10
te124	1.26E-10	1.29E-10	1.32E-10	1.36E-10	1.39E-10	1.39E-10
sn116	1.13E-10	1.16E-10	1.20E-10	1.24E-10	1.28E-10	1.28E-10
kr 85	1.12E-10	1.33E-10	1.33E-10	1.33E-10	1.33E-10	1.10E-10
sr 87	6.97E-11	7.11E-11	7.24E-11	7.37E-11	7.51E-11	7.51E-11
nb 94	5.53E-11	5.67E-11	5.82E-11	5.97E-11	6.12E-11	6.12E-11
te122	4.71E-11	4.86E-11	5.01E-11	5.17E-11	5.33E-11	5.33E-11
se 76	4.38E-11	4.50E-11	4.63E-11	4.75E-11	4.88E-11	4.88E-11
er166	3.13E-11	3.21E-11	3.29E-11	3.38E-11	3.46E-11	3.46E-11
ge 74	2.96E-11	3.00E-11	3.05E-11	3.10E-11	3.15E-11	3.15E-11
ge 72	2.14E-11	2.18E-11	2.22E-11	2.25E-11	2.29E-11	2.29E-11
kr 80	1.13E-11	1.18E-11	1.23E-11	1.29E-11	1.35E-11	1.35E-11
ce144	1.23E-11	1.42E-10	1.42E-10	1.42E-10	1.42E-10	9.85E-12
y 90	3.52E-12	3.76E-12	3.76E-12	3.76E-12	3.76E-12	3.50E-12
er167	2.31E-12	2.40E-12	2.50E-12	2.59E-12	2.69E-12	2.69E-12
sb125	2.12E-12	4.26E-12	4.27E-12	4.27E-12	4.27E-12	2.00E-12
te123	1.52E-12	1.59E-12	1.66E-12	1.73E-12	1.81E-12	1.81E-12
ru106	1.46E-12	9.51E-12	9.53E-12	9.54E-12	9.56E-12	1.24E-12
cd108	6.35E-13	6.70E-13	7.07E-13	7.45E-13	7.86E-13	7.86E-13
be 9	6.42E-14	6.52E-14	6.62E-14	6.72E-14	6.82E-14	6.82E-14
sn114	2.91E-14	3.00E-14	3.10E-14	3.20E-14	3.30E-14	3.30E-14
li 7	2.61E-14	2.65E-14	2.70E-14	2.74E-14	2.78E-14	2.78E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 109
0 fraction of total absorption rate
power= .00mw, burnup= 15192.mwd, flux= 5.99E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.16E-14	1.33E-14	1.35E-14	1.36E-14	1.38E-14	1.23E-14
te127m	3.75E-15	2.16E-12	2.16E-12	2.16E-12	2.16E-12	2.11E-15
nb 95	1.50E-15	3.62E-11	3.62E-11	3.62E-11	3.62E-11	5.59E-16
zr 95	7.35E-16	3.90E-11	3.90E-11	3.90E-11	3.90E-11	2.74E-16
y 91	2.66E-16	3.33E-11	3.33E-11	3.33E-11	3.33E-11	7.09E-17
sn123	1.17E-17	2.56E-15	2.56E-15	2.57E-15	2.57E-15	7.16E-18
sr 89	7.35E-18	7.09E-12	7.09E-12	7.09E-12	7.09E-12	2.11E-18
cd109	1.76E-18	8.27E-18	8.61E-18	8.99E-18	9.34E-18	1.91E-18
tb160	2.28E-18	3.54E-14	3.60E-14	3.67E-14	3.74E-14	1.02E-18
ru103	1.84E-18	9.34E-11	9.35E-11	9.36E-11	9.38E-11	3.70E-19
ce141	1.92E-19	3.85E-10	3.83E-10	3.83E-10	3.84E-10	2.74E-20
pm148m	2.74E-20	7.02E-13	7.03E-13	7.04E-13	7.05E-13	1.37E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 110
power= 9.790E-04mw, burnup=1.5192E+04mwd, flux= 5.9xE+07n/cm**2-sec
0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	8.49E-04	8.62E-04	8.75E-04	8.89E-04	9.02E-04	9.02E-04
h 2	2.53E-06	2.57E-06	2.61E-06	2.65E-06	2.69E-06	2.69E-06
h 3	1.11E-11	1.30E-11	1.31E-11	1.31E-11	1.32E-11	1.11E-11
h 4	.00E+00	1.28E-35	1.28E-35	1.29E-35	1.30E-35	.00E+00
he 3	1.34E-08	1.35E-08	1.37E-08	1.38E-08	1.39E-08	1.39E-08
he 4	1.41E-04	1.43E-04	1.45E-04	1.47E-04	1.50E-04	1.50E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.69E-05	1.72E-05	1.74E-05	1.77E-05	1.80E-05	1.80E-05
ne 21	4.51E-09	4.65E-09	4.78E-09	4.92E-09	5.07E-09	5.07E-09
ne 22	1.11E-07	1.13E-07	1.15E-07	1.17E-07	1.18E-07	1.18E-07
ne 23	1.76E-30	1.76E-15	1.76E-15	1.76E-15	1.77E-15	1.77E-30
na 22	5.03E-12	1.05E-11	1.05E-11	1.05E-11	1.05E-11	4.71E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	6.40E-24	6.39E-09	6.40E-09	6.40E-09	6.40E-09	6.40E-24
na 24m	1.05E-30	1.05E-15	1.05E-15	1.05E-15	1.05E-15	1.05E-30
na 25	3.27E-39	3.36E-24	3.46E-24	3.56E-24	3.67E-24	3.67E-39
mg 24	1.12E-01	1.14E-01	1.15E-01	1.17E-01	1.19E-01	1.19E-01
mg 25	4.71E-07	4.85E-07	4.99E-07	5.14E-07	5.28E-07	5.28E-07
mg 26	2.53E-06	2.57E-06	2.61E-06	2.65E-06	2.69E-06	2.69E-06
mg 27	5.26E-28	5.26E-13	5.26E-13	5.26E-13	5.27E-13	5.27E-28
mg 28	.00E+00	2.59E-25	2.60E-25	2.60E-25	2.60E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	4.75E-26	4.74E-11	4.74E-11	4.74E-11	4.75E-11	4.75E-26
al 29	2.62E-37	2.70E-22	2.78E-22	2.86E-22	2.95E-22	2.95E-37
al 30	.00E+00	5.05E-32	5.28E-32	5.52E-32	5.77E-32	.00E+00
si 28	3.26E-01	3.30E-01	3.35E-01	3.40E-01	3.45E-01	3.45E-01
si 29	4.22E-06	4.35E-06	4.48E-06	4.61E-06	4.74E-06	4.74E-06
si 30	5.82E-11	6.09E-11	6.37E-11	6.66E-11	6.95E-11	6.95E-11
si 31	1.01E-38	1.06E-23	1.11E-23	1.16E-23	1.21E-23	1.21E-38
si 32	4.19E-30	4.43E-30	4.64E-30	4.85E-30	5.07E-30	5.01E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		5.99E+07	5.99E+07	5.99E+07	6.00E+07	6.00E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 111
power= 9.790E-04mw, burnup=1.5192E+04mwd, flux= 5.99E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	1.84E+01	1.90E+01	1.97E+01	2.03E+01	2.10E+01	2.10E+01
pb206	7.22E-02	7.57E-02	7.93E-02	8.30E-02	8.67E-02	8.67E-02
pb207	5.19E-03	5.42E-03	5.65E-03	5.88E-03	6.11E-03	6.12E-03
pb208	2.81E-04	2.89E-04	2.98E-04	3.07E-04	3.16E-04	3.16E-04
pb209	4.99E-10	5.15E-10	5.30E-10	5.46E-10	5.62E-10	5.62E-10
pb210	1.78E-04	1.82E-04	1.86E-04	1.90E-04	1.94E-04	1.94E-04
pb211	3.54E-11	3.59E-11	3.65E-11	3.71E-11	3.77E-11	3.78E-11
pb212	2.35E-11	2.41E-11	2.46E-11	2.50E-11	2.54E-11	2.51E-11
pb214	4.07E-10	4.16E-10	4.25E-10	4.35E-10	4.44E-10	4.44E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	1.07E-02	1.09E-02	1.14E-02	1.21E-02	1.27E-02	1.27E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.10E-07	1.12E-07	1.15E-07	1.17E-07	1.20E-07	1.20E-07
bi211	2.10E-12	2.13E-12	2.17E-12	2.20E-12	2.24E-12	2.24E-12
bi212	2.27E-12	2.29E-12	2.33E-12	2.37E-12	2.41E-12	2.38E-12
bi213	1.17E-10	1.20E-10	1.24E-10	1.27E-10	1.31E-10	1.31E-10
bi214	3.03E-10	3.09E-10	3.16E-10	3.23E-10	3.30E-10	3.30E-10
po210	3.00E-06	3.09E-06	3.18E-06	3.23E-06	3.30E-06	3.29E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	2.32E-17	2.35E-17	2.39E-17	2.43E-17	2.47E-17	2.46E-17

po212	1.17E-22	1.20E-22	1.22E-22	1.24E-22	1.27E-22	1.25E-22
po213	1.75E-19	1.81E-19	1.86E-19	1.92E-19	1.97E-19	1.97E-19
po214	4.15E-17	4.25E-17	4.34E-17	4.44E-17	4.53E-17	4.54E-17
po215	2.91E-17	2.95E-17	3.00E-17	3.05E-17	3.10E-17	3.11E-17
po216	8.91E-17	9.14E-17	9.30E-17	9.45E-17	9.61E-17	9.52E-17
po218	4.70E-11	4.81E-11	4.92E-11	5.03E-11	5.14E-11	5.14E-11
rn218	3.18E-43	8.49E-29	8.64E-29	8.79E-29	8.94E-29	9.95E-44
rn219	6.47E-14	6.57E-14	6.68E-14	6.79E-14	6.90E-14	6.91E-14
rn220	3.42E-14	3.51E-14	3.57E-14	3.63E-14	3.68E-14	3.65E-14
rn222	8.35E-08	8.55E-08	8.74E-08	8.93E-08	9.12E-08	9.12E-08
ra222	3.46E-40	9.22E-26	9.38E-26	9.55E-26	9.71E-26	1.08E-40
ra223	1.61E-08	1.64E-08	1.67E-08	1.69E-08	1.72E-08	1.72E-08
ra224	1.94E-10	1.99E-10	2.03E-10	2.06E-10	2.10E-10	2.08E-10
ra225	5.45E-08	5.62E-08	5.79E-08	5.96E-08	6.13E-08	6.13E-08
ra226	1.28E-02	1.31E-02	1.34E-02	1.36E-02	1.39E-02	1.39E-02
ra228	5.99E-11	6.13E-11	6.27E-11	6.41E-11	6.55E-11	6.55E-11
ac225	3.68E-08	3.80E-08	3.91E-08	4.03E-08	4.14E-08	4.14E-08
ac227	1.12E-05	1.14E-05	1.16E-05	1.18E-05	1.20E-05	1.20E-05
ac228	7.31E-15	7.48E-15	7.65E-15	7.83E-15	8.00E-15	8.00E-15
th226	1.69E-38	4.50E-24	4.58E-24	4.66E-24	4.74E-24	5.25E-39
th227	2.61E-08	2.65E-08	2.69E-08	2.73E-08	2.78E-08	2.78E-08
th228	3.70E-08	3.81E-08	3.87E-08	3.94E-08	4.00E-08	3.96E-08
th229	1.06E-02	1.09E-02	1.13E-02	1.16E-02	1.19E-02	1.19E-02
th230	6.53E-01	6.67E-01	6.80E-01	6.94E-01	7.07E-01	7.08E-01
th231	2.79E-09	3.52E-09	3.53E-09	3.54E-09	3.55E-09	2.78E-09
th232	1.46E-01	1.50E-01	1.53E-01	1.57E-01	1.60E-01	1.60E-01
th233	3.24E-28	3.32E-13	3.40E-13	3.47E-13	3.55E-13	3.55E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	1.69E-02	1.71E-02	1.74E-02	1.77E-02	1.80E-02	1.80E-02
pa232	7.00E-26	7.12E-11	7.24E-11	7.36E-11	7.48E-11	7.48E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 112
power= 9.790E-04mw, burnup=1.5192E+04mwd, flux= 5.99E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d ******* d ******* d ******* d ******* d ******* d
pa233	1.42E-06 1.42E-06 1.42E-06 1.42E-06 1.42E-06 1.42E-06
pa234m	1.81E-11 1.81E-11 1.81E-11 1.81E-11 1.81E-11 1.81E-11
pa234	8.08E-12 8.08E-12 8.08E-12 8.08E-12 8.08E-12 8.08E-12
pa235	.00E+00 .00E+00 .00E+00 .00E+00 .00E+00 .00E+00
u230	1.64E-35 4.36E-21 4.44E-21 4.51E-21 4.59E-21 5.09E-36
u231	6.16E-32 6.29E-17 6.42E-17 6.55E-17 6.68E-17 6.68E-32
u232	1.33E-06 1.39E-06 1.41E-06 1.44E-06 1.46E-06 1.42E-06
u233	3.36E-01 3.43E-01 3.50E-01 3.57E-01 3.63E-01 3.64E-01
u234	9.98E+00 9.99E+00 1.00E+01 1.00E+01 1.00E+01 1.00E+01
u235	6.74E+02 6.73E+02 6.73E+02 6.72E+02 6.71E+02 6.71E+02
u236	1.85E+02 1.86E+02 1.86E+02 1.86E+02 1.86E+02 1.86E+02
u237	1.38E-12 7.88E-07 7.90E-07 7.91E-07 7.90E-07 1.38E-12
u238	3.63E+04 3.63E+04 3.63E+04 3.63E+04 3.63E+04 3.63E+04
u239	7.45E-23 7.45E-08 7.45E-08 7.45E-08 7.46E-08 7.46E-23
u240	4.15E-36 4.80E-36 5.52E-36 6.31E-36 7.18E-36 7.19E-36
u241	.00E+00 .00E+00 .00E+00 .00E+00 .00E+00 .00E+00
np235	3.58E-13 2.07E-12 2.07E-12 2.07E-12 2.07E-12 3.05E-13
np236m	4.93E-28 4.92E-13 4.93E-13 4.93E-13 4.93E-13 4.93E-28
np236	1.74E-06 1.76E-06 1.78E-06 1.80E-06 1.83E-06 1.83E-06
np237	4.12E+01 4.12E+01 4.12E+01 4.12E+01 4.12E+01 4.11E-01
np238	3.19E-14 3.63E-07 3.65E-07 3.65E-07 3.63E-07 3.11E-14
np239	1.18E-13 1.08E-05 1.08E-05 1.08E-05 1.08E-05 1.29E-13
np240m	3.54E-38 4.10E-38 4.71E-38 5.39E-38 6.13E-38 6.13E-38
np240	6.16E-39 5.28E-16 5.29E-16 5.27E-16 5.30E-16 6.95E-39

np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.42E-10	2.71E-10	2.71E-10	2.71E-10	2.71E-10	1.35E-10
pu237	1.48E-20	7.39E-14	7.41E-14	7.43E-14	7.46E-14	3.70E-21
pu238	5.38E-03	5.50E-03	5.50E-03	5.50E-03	5.50E-03	5.37E-03
pu239	2.87E+01	2.88E+01	2.89E+01	2.90E+01	2.91E+01	2.91E+01
pu240	5.22E-01	5.20E-01	5.18E-01	5.16E-01	5.15E-01	5.15E-01
pu241	4.49E-05	5.10E-05	5.09E-05	5.08E-05	5.07E-05	4.38E-05
pu242	2.63E-05	2.69E-05	2.75E-05	2.81E-05	2.87E-05	2.87E-05
pu243	1.39E-29	1.37E-14	1.40E-14	1.43E-14	1.46E-14	1.53E-29
pu244	2.07E-25	2.39E-25	2.75E-25	3.14E-25	3.58E-25	3.58E-25
pu245	.00E+00	2.37E-36	2.73E-36	3.12E-36	3.55E-36	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.04E-34	1.02E-19	1.02E-19	1.02E-19	1.01E-19	1.01E-34
am240	4.74E-32	4.68E-17	4.66E-17	4.65E-17	4.64E-17	4.64E-32
am241	1.54E-03	1.52E-03	1.52E-03	1.51E-03	1.51E-03	1.51E-03
am242m	1.73E-07	1.72E-07	1.72E-07	1.71E-07	1.71E-07	1.68E-07
am242	2.23E-12	1.38E-11	1.37E-11	1.37E-11	1.36E-11	2.17E-12
am243	1.35E-07	1.38E-07	1.41E-07	1.44E-07	1.47E-07	1.47E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	2.47E-31	2.52E-16	2.58E-16	2.63E-16	2.69E-16	2.69E-31
am245	6.27E-40	4.69E-37	5.39E-37	6.16E-37	7.01E-37	7.61E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.19E-31	1.96E-22	1.95E-22	1.95E-22	1.95E-22	1.70E-32
cm242	4.84E-10	2.78E-09	2.77E-09	2.76E-09	2.75E-09	4.61E-10
cm243	1.46E-14	1.54E-14	1.53E-14	1.53E-14	1.53E-14	1.42E-14
cm244	3.49E-12	3.90E-12	4.05E-12	4.14E-12	4.23E-12	3.77E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 113
power= 9.790E-04mw, burnup=1.5192E+04mwd, flux= 5.99E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d ******* d ******* d ******* d ******* d
cm245	9.04E-15 9.16E-15 9.28E-15 9.42E-15 9.56E-15 9.56E-15
cm246	6.54E-17 6.75E-17 6.91E-17 7.09E-17 7.27E-17 7.26E-17
cm247	1.41E-20 1.52E-20 1.63E-20 1.74E-20 1.86E-20 1.86E-20
cm248	2.64E-23 2.92E-23 3.21E-23 3.53E-23 3.87E-23 3.87E-23
cm249	.00E+00 2.22E-34 2.44E-34 2.68E-34 2.94E-34 .00E+00
cm250	1.17E-38 1.28E-38 1.39E-38 1.51E-38 1.65E-38 1.65E-38
cm251	.00E+00 .00E+00 .00E+00 .00E+00 .00E+00 .00E+00
totals	3.73E+04 3.73E+04 3.73E+04 3.73E+04 3.73E+04 3.73E+04
0 flux	5.99E+07 5.99E+07 5.99E+07 6.00E+07 6.00E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 13 of library on unit 33.

pass 1
pass 0
scale:system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densities
pass n applies mid time densities of nth library interval
first library updated was...
pass 1
pass 0

```
       *scale-system control module sas2 library*
       used a time-dependent neutron spectrum, for each of the above passes
         pass 0 applies start-up fuel densiities
         pass n applies mid time densities of nth library interval
       first library updated was...
       ***************************************************************************
       *                                                                         *
       *            prelim lwr origen-s binary working library--id = 1143        *
       *         made from modified card-image origen-s libraries of scale 4.2   *
       *      data from the light element, actinide, and fission product libraries *
       *        decay data, including gamma and total energy, are from endf/b-vi  *
       *                                                                         *
       *      neutron flux spectrum factors and cross sections were produced from *
       *     the "presas2" case updating all nuclides on the scale "burnup" library *
       *                                                                         *
       *                  fission product yields are from endf/b-v               *
       *                                                                         *
       *              photon libraries use an 18-energy-group structure          *
       *             the photon data are from the master photon data base,       *
       *              produced to include bremsstrahlung from uo2 matrix         *
       *                                                                         *
       *         see information above this box (if present) for later updates   *
       *                                                                         *
       ***************************************************************************
       *                                                                         *
0      ***************************************************************************
0               .other identification and sizes of library.
0                data set name:  ft33f001
0            8/29/1996    date library was produced
0                 1697    total number of nuclides in library
                   689    number of light-element nuclides
                   129    number of actinide nuclides
                   879    number of fission product nuclides
0                 7993    number of nonzero off-diagonal matrix elements
0      ***************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                       page  114
       .power=    .00mw, burnup=  16086.mwd, flux= 6.00E+07n/cm**2-sec
0                                         basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                 initial      ******* d     ******* d     ******* d     ******* d     ******* d
     productions  1.267559E+06  1.267004E+06  1.266447E+06  1.265886E+06  1.265323E+06  1.265318E+06
     absorptions  1.026885E+06  1.026710E+06  1.026532E+06  1.026352E+06  1.026170E+06  1.026165E+06
     k infinity   1.234373E+00  1.234043E+00  1.233714E+00  1.233384E+00  1.233054E+00  1.233054E+00
0                 initial      ******* d     ******* d     ******* d     ******* d     ******* d
     actinide
     absorptions  1.011094E+06  1.010828E+06  1.010561E+06  1.010293E+06  1.010023E+06  1.010020E+06
     non-actinide
     abs. fracs.  1.537752E-02  1.5468[illegible]E-02  1.5558[illegible]E-02  1.5647[illegible]E-02  1.573461E-02  1.57[illegible]E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2            fission products            page  115
0                                 fraction of total absorption rate
       power=    .00mw, burnup=  16086.mwd, flux= 6.00E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d ******* d

     sm149      5.42E-03  5.43E-03  5.43E-03  5.43E-03  5.44E-03  5.44E-03
     eu151      1.52E-03  1.54E-03  1.55E-03  1.56E-03  1.58E-03  1.58E-03
     nd143      1.47E-03  1.49E-03  1.51E-03  1.54E-03  [illegible]  [illegible]
     rh103      7.12E-04  7.22E-04  7.33E-04  7.44E-04  7.54E-04  7.54E-04
     xe131      4.78E-04  4.85E-04  4.92E-04  4.99E-04  5.0[illegible]E-04  5.04E-04
     cs133      3.71E-04  3.77E-04  3.82E-04  3.88E-04  3.93E-04  3.93E-04
     sm147      2.73E-04  2.77E-04  2.81E-04  2.85E-04  2.89E-04  2.89E-04
```

tc 99	2.59E-04	2.63E-04	2.66E-04	2.70E-04	2.73E-04	2.73E-04
gd155	2.21E-04	2.21E-04	2.22E-04	2.22E-04	2.22E-04	2.22E-04
nd145	2.09E-04	2.12E-04	2.15E-04	2.19E-04	2.22E-04	2.22E-04
sm152	1.54E-04	1.56E-04	1.59E-04	1.62E-04	1.64E-04	1.64E-04
mo 95	1.45E-04	1.47E-04	1.50E-04	1.52E-04	1.54E-04	1.54E-04
sm150	1.07E-04	1.09E-04	1.11E-04	1.12E-04	1.14E-04	1.14E-04
cd113	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04
kr 83	8.97E-05	9.10E-05	9.22E-05	9.35E-05	9.48E-05	9.48E-05
cs135	8.40E-05	8.52E-05	8.65E-05	8.77E-05	8.90E-05	8.90E-05
ru101	6.53E-05	6.63E-05	6.73E-05	6.82E-05	6.92E-05	6.92E-05
eu153	6.44E-05	6.55E-05	6.65E-05	6.76E-05	6.86E-05	6.86E-05
pr141	6.24E-05	6.34E-05	6.43E-05	6.52E-05	6.61E-05	6.61E-05
gd157	5.94E-05	5.95E-05	5.96E-05	5.96E-05	5.97E-05	5.97E-05
la139	5.11E-05	5.18E-05	5.26E-05	5.33E-05	5.41E-05	5.41E-05
pd105	2.54E-05	2.58E-05	2.63E-05	2.67E-05	2.71E-05	2.71E-05
ba137	2.46E-05	2.50E-05	2.54E-05	2.57E-05	2.61E-05	2.61E-05
ag109	2.33E-05	2.38E-05	2.43E-05	2.48E-05	2.52E-05	2.52E-05
zr 93	2.02E-05	2.05E-05	2.08E-05	2.11E-05	2.14E-05	2.14E-05
i129	1.66E-05	1.68E-05	1.71E-05	1.73E-05	1.76E-05	1.76E-05
nd144	1.56E-05	1.59E-05	1.61E-05	1.64E-05	1.66E-05	1.66E-05
sm151	1.25E-05	1.28E-05	1.28E-05	1.28E-05	1.28E-05	1.25E-05
mo 97	1.16E-05	1.18E-05	1.19E-05	1.21E-05	1.23E-05	1.23E-05
gd152	1.03E-05	1.05E-05	1.08E-05	1.11E-05	1.13E-05	1.13E-05
pd108	5.73E-06	5.84E-06	5.96E-06	6.07E-06	6.18E-06	6.18E-06
zr 91	5.35E-06	5.43E-06	5.51E-06	5.59E-06	5.66E-06	5.66E-06
y 89	5.12E-06	5.19E-06	5.27E-06	5.34E-06	5.42E-06	5.42E-06
ru102	4.85E-06	4.90E-06	4.98E-06	5.05E-06	5.12E-06	5.12E-06
ce142	4.25E-06	4.31E-06	4.38E-06	4.44E-06	4.50E-06	4.50E-06
nd148	4.10E-06	4.16E-06	4.22E-06	4.28E-06	4.34E-06	4.34E-06
nd146	3.45E-06	3.50E-06	3.55E-06	3.60E-06	3.65E-06	3.65E-06
in115	3.02E-06	3.06E-06	3.11E-06	3.16E-06	3.20E-06	3.20E-06
pd107	2.92E-06	2.97E-06	3.03E-06	3.08E-06	3.14E-06	3.14E-06
ba138	2.94E-06	2.98E-06	3.02E-06	3.07E-06	3.11E-06	3.11E-06
ce140	2.75E-06	2.79E-06	2.83E-06	2.87E-06	2.91E-06	2.91E-06
xe132	2.52E-06	2.56E-06	2.59E-06	2.63E-06	2.67E-06	2.67E-06
ru 99	2.15E-06	2.23E-06	2.32E-06	2.40E-06	2.49E-06	2.49E-06
mo 98	1.70E-06	1.72E-06	1.75E-06	1.77E-06	1.80E-06	1.80E-06
mo100	1.65E-06	1.68E-06	1.70E-06	1.73E-06	1.75E-06	1.75E-06
xe134	1.63E-06	1.65E-06	1.67E-06	1.70E-06	1.72E-06	1.72E-06
zr 92	1.29E-06	1.31E-06	1.33E-06	1.35E-06	1.37E-06	1.37E-06
i127	1.20E-06	1.22E-06	1.24E-06	1.26E-06	1.28E-06	1.28E-06
ru104	1.10E-06	1.12E-06	1.14E-06	1.16E-06	1.17E-06	1.17E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 116
0 fraction of total absorption rate
power= .00mw, burnup= 16086.mwd, flux= 6.00E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.02E-06	1.04E-06	1.05E-06	1.07E-06	1.08E-06	1.08E-06
nd150	9.21E-07	9.36E-07	9.53E-07	9.67E-07	9.81E-07	9.81E-07
xe136	8.81E-07	8.94E-07	9.07E-07	9.21E-07	9.34E-07	9.34E-07
cd111	6.61E-07	6.77E-07	6.93E-07	7.01E-07	7.13E-07	7.13E-07
br 81	6.55E-07	6.64E-07	6.74E-07	6.84E-07	6.94E-07	6.94E-07
rb 85	6.29E-07	6.38E-07	6.47E-07	6.56E-07	6.66E-07	6.66E-07
zr 94	5.49E-07	5.57E-07	5.65E-07	5.73E-07	5.82E-07	5.82E-07
zr 90	5.04E-07	5.12E-07	5.19E-07	5.27E-07	5.34E-07	5.34E-07
gd154	4.31E-07	4.44E-07	4.58E-07	4.72E-07	4.86E-07	4.86E-07
sm154	4.28E-07	4.36E-07	4.43E-07	4.49E-07	4.56E-07	4.56E-07
te130	4.06E-07	4.12E-07	4.18E-07	4.24E-07	4.30E-07	4.30E-07
rb 87	3.67E-07	3.67E-07	3.73E-07	3.79E-07	3.83E-07	3.83E-07
se 77	2.63E-07	2.67E-07	2.71E-07	2.75E-07	2.79E-07	2.79E-07

pd106	2.55E-07	2.59E-07	2.64E-07	2.68E-07	2.73E-07	2.73E-07
gd156	2.38E-07	2.43E-07	2.47E-07	2.51E-07	2.56E-07	2.56E-07
ba135	2.13E-07	2.22E-07	2.30E-07	2.39E-07	2.48E-07	2.48E-07
kr 84	1.72E-07	1.75E-07	1.77E-07	1.80E-07	1.83E-07	1.83E-07
dy161	1.41E-07	1.44E-07	1.47E-07	1.50E-07	1.53E-07	1.53E-07
sb121	1.38E-07	1.40E-07	1.43E-07	1.45E-07	1.47E-07	1.47E-07
se 79	1.32E-07	1.34E-07	1.36E-07	1.38E-07	1.39E-07	1.39E-07
ru100	1.23E-07	1.26E-07	1.30E-07	1.34E-07	1.37E-07	1.37E-07
sb123	1.12E-07	1.14E-07	1.15E-07	1.17E-07	1.19E-07	1.19E-07
kr 86	9.56E-08	9.70E-08	9.84E-08	9.98E-08	1.01E-07	1.01E-07
nd142	8.83E-08	9.09E-08	9.36E-08	9.63E-08	9.91E-08	9.91E-08
te128	9.14E-08	9.28E-08	9.42E-08	9.56E-08	9.70E-08	9.70E-08
ba134	8.47E-08	8.73E-08	8.98E-08	9.24E-08	9.51E-08	9.51E-08
sm148	7.73E-08	7.96E-08	8.19E-08	8.43E-08	8.67E-08	8.67E-08
eu152	8.28E-08	9.77E-08	9.86E-08	9.95E-08	1.00E-07	8.48E-08
tb159	6.27E-08	6.39E-08	6.50E-08	6.62E-08	6.74E-08	6.74E-08
se 80	6.30E-08	6.40E-08	6.49E-08	6.58E-08	6.68E-08	6.68E-08
te125	6.15E-08	6.25E-08	6.35E-08	6.44E-08	6.54E-08	6.54E-08
pd104	5.81E-08	5.99E-08	6.16E-08	6.34E-08	6.53E-08	6.53E-08
gd158	4.99E-08	5.09E-08	5.18E-08	5.27E-08	5.36E-08	5.36E-08
cd112	4.62E-08	4.70E-08	4.78E-08	4.86E-08	4.94E-08	4.94E-08
nb 93	3.40E-08	3.54E-08	3.68E-08	3.82E-08	3.96E-08	3.96E-08
li 6	3.36E-08	3.41E-08	3.45E-08	3.50E-08	3.54E-08	3.54E-08
sn117	3.32E-08	3.37E-08	3.42E-08	3.48E-08	3.53E-08	3.53E-08
dy164	3.17E-08	3.23E-08	3.30E-08	3.36E-08	3.43E-08	3.43E-08
dy162	3.04E-08	3.11E-08	3.18E-08	3.25E-08	3.32E-08	3.32E-08
cd114	2.78E-08	2.83E-08	2.87E-08	2.92E-08	2.97E-08	2.97E-08
pm147	2.99E-08	6.54E-08	6.54E-08	6.54E-08	6.54E-08	2.70E-08
eu155	2.88E-08	4.49E-08	4.49E-08	4.50E-08	4.50E-08	2.70E-08
sn119	2.55E-08	2.59E-08	2.63E-08	2.67E-08	2.71E-08	2.71E-08
sn115	2.34E-08	2.37E-08	2.41E-08	2.45E-08	2.48E-08	2.48E-08
pd110	2.21E-08	2.25E-08	2.29E-08	2.33E-08	2.37E-08	2.37E-08
mo 96	1.96E-08	2.02E-08	2.08E-08	2.14E-08	2.20E-08	2.20E-08
cd110	1.80E-08	1.86E-08	1.93E-08	2.00E-08	2.07E-08	2.07E-08
br 79	1.71E-08	1.78E-08	1.84E-08	1.91E-08	1.98E-08	1.98E-08
sr 88	1.76E-08	1.78E-08	1.81E-08	1.83E-08	1.86E-08	1.86E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 117

0 fraction of total absorption rate

power= .00mw, burnup= 16086.mwd, flux= 6.00E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

ag107	1.46E-08	1.53E-08	1.59E-08	1.66E-08	1.73E-08	1.73E-08
se 82	1.20E-08	1.22E-08	1.24E-08	1.26E-08	1.28E-08	1.28E-08
xe129	1.01E-08	1.05E-08	1.10E-08	1.14E-08	1.18E-08	1.18E-08
sn126	1.07E-08	1.09E-08	1.10E-08	1.11E-08	1.13E-08	1.13E-08
xe130	9.87E-09	1.02E-08	1.04E-08	1.07E-08	1.10E-08	1.10E-08
ba136	9.41E-09	9.63E-09	9.86E-09	1.01E-08	1.03E-08	1.03E-08
se 78	9.40E-09	9.55E-09	9.69E-09	9.83E-09	9.97E-09	9.97E-09
sn124	8.15E-09	8.27E-09	8.40E-09	8.53E-09	8.66E-09	8.66E-09
dy163	7.64E-09	7.82E-09	7.99E-09	8.16E-09	8.34E-09	8.34E-09
kr 82	7.20E-09	7.37E-09	7.54E-09	7.71E-09	7.88E-09	7.88E-09
te126	5.87E-09	6.10E-09	6.33E-09	6.56E-09	6.80E-09	6.80E-09
as 75	5.54E-09	5.62E-09	5.71E-09	5.79E-09	5.87E-09	5.87E-09
eu154	5.29E-09	6.85E-09	6.96E-09	7.07E-09	7.19E-09	5.53E-09
in113	4.64E-09	4.71E-09	4.78E-09	4.86E-09	4.93E-09	4.93E-09
sr 90	3.67E-09	3.95E-09	3.95E-09	3.95E-09	3.95E-09	3.65E-09
sn118	3.29E-09	3.37E-09	3.46E-09	3.45E-09	3.58E-09	3.58E-09
sn122	2.81E-09	2.86E-09	2.90E-09	2.94E-09	2.99E-09	2.99E-09
cd116	2.77E-09	2.81E-09	2.86E-09	2.90E-09	2.94E-09	2.94E-09
sn120	2.08E-09	2.11E-09	2.14E-09	2.17E-09	2.21E-09	2.21E-09

ge 73	1.57E-09	1.60E-09	1.62E-09	1.65E-09	1.67E-09	1.67E-09
cs137	8.50E-10	9.11E-10	9.11E-10	9.12E-10	9.12E-10	8.46E-10
ho165	6.76E-10	6.94E-10	7.11E-10	7.29E-10	7.47E-10	7.47E-10
gd160	6.87E-10	7.00E-10	7.13E-10	7.27E-10	7.40E-10	7.40E-10
dy160	5.38E-10	5.55E-10	5.73E-10	5.91E-10	6.10E-10	6.10E-10
ge 76	5.41E-10	5.49E-10	5.57E-10	5.65E-10	5.73E-10	5.73E-10
xe128	3.32E-10	3.43E-10	3.53E-10	3.63E-10	3.74E-10	3.74E-10
cs134	2.44E-10	6.79E-10	6.89E-10	6.99E-10	7.09E-10	2.38E-10
sr 86	1.67E-10	1.72E-10	1.76E-10	1.81E-10	1.86E-10	1.86E-10
te124	1.39E-10	1.42E-10	1.45E-10	1.48E-10	1.51E-10	1.51E-10
sn116	1.28E-10	1.31E-10	1.35E-10	1.39E-10	1.43E-10	1.43E-10
kr 85	1.10E-10	1.33E-10	1.33E-10	1.33E-10	1.33E-10	1.08E-10
sr 87	7.51E-11	7.65E-11	7.78E-11	7.92E-11	8.06E-11	8.06E-11
nb 94	6.12E-11	6.28E-11	6.45E-11	6.62E-11	6.79E-11	6.79E-11
te122	5.33E-11	5.49E-11	5.65E-11	5.82E-11	5.99E-11	5.99E-11
se 76	4.88E-11	5.00E-11	5.13E-11	5.26E-11	5.40E-11	5.40E-11
er166	3.46E-11	3.54E-11	3.62E-11	3.71E-11	3.79E-11	3.79E-11
ge 74	3.15E-11	3.20E-11	3.24E-11	3.29E-11	3.34E-11	3.34E-11
ge 72	2.29E-11	2.33E-11	2.36E-11	2.40E-11	2.44E-11	2.44E-11
kr 80	1.35E-11	1.41E-11	1.48E-11	1.54E-11	1.61E-11	1.61E-11
ce144	9.85E-12	1.42E-10	1.42E-10	1.42E-10	1.42E-10	7.88E-12
y 90	3.50E-12	3.76E-12	3.76E-12	3.76E-12	3.76E-12	3.47E-12
er167	2.69E-12	2.80E-12	2.90E-12	3.01E-12	3.12E-12	3.12E-12
te123	1.81E-12	1.88E-12	1.96E-12	2.04E-12	2.13E-12	2.13E-12
sb125	2.00E-12	4.28E-12	4.28E-12	4.28E-12	4.29E-12	1.88E-12
ru106	1.24E-12	9.57E-12	9.58E-12	9.60E-12	9.61E-12	1.05E-12
cd108	7.66E-13	8.28E-13	8.72E-13	9.18E-13	9.66E-13	9.66E-13
be 9	6.62E-14	6.92E-14	7.02E-14	7.12E-14	7.22E-14	7.22E-14
sn114	3.30E-14	3.40E-14	3.50E-14	3.61E-14	3.72E-14	3.72E-14
li 7	2.78E-14	2.82E-14	2.86E-14	2.90E-14	2.94E-14	2.94E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 118
0 fraction of total absorption rate
power= .00mw, burnup= 16086.mwd, flux= 6.00E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.23E-14	1.40E-14	1.42E-14	1.43E-14	1.45E-14	1.30E-14
te127m	2.11E-15	2.17E-12	2.17E-12	2.17E-12	2.17E-12	1.18E-15
nb 95	5.59E-16	3.62E-11	3.62E-11	3.62E-11	3.62E-11	2.07E-16
zr 95	2.74E-16	3.90E-11	3.90E-11	3.90E-11	3.90E-11	1.01E-16
y 91	7.69E-17	3.33E-11	3.33E-11	3.33E-11	3.33E-11	2.59E-17
sn123	7.15E-18	2.57E-15	2.57E-15	2.57E-15	2.57E-15	4.37E-18
cd109	1.81E-18	9.77E-18	1.02E-17	1.06E-17	1.11E-17	1.86E-18
sr 89	2.11E-18	7.09E-12	7.09E-12	7.09E-12	7.09E-12	6.03E-19
tb160	1.03E-18	3.81E-14	3.87E-14	3.94E-14	4.01E-14	4.52E-19
ru103	3.70E-19	9.36E-11	9.36E-11	9.37E-11	9.37E-11	6.85E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 119
power= 9.77[illegible]E-04mw, burnup=1.6086E+04mwd, flux= 6.00E+07n/cm**2-sec
0 nuclide concentrations, grams/cm3
basis = single reactor assembly
change ******* d ******* d ******* d ******* d ******* d

h 1	9.62E-04	9.15E-04	9.29E-04	9.42E-04	9.55E-04	9.55E-04
h 2	2.[illegible]	[illegible]	2.77E-08	2.81E-08	2.85E-08	2.85E-08
h 3	1.11E-11	1.32E-11	1.33E-11	1.35E-11	1.34E-11	1.11E-11
h 4	.00E+00	1.30E-35	1.31E-35	1.31E-35	1.32E-35	.00E+00
he 3	1.39E-08	1.41E-08	1.42E-08	1.43E-08	1.45E-08	1.45E-08
he 4	1.50E-04	1.52E-04	1.54E-04	1.56E-04	1.58E-04	1.58E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.[illegible]	[illegible]	1.85E-05	1.88E-05	1.90E-05	1.90E-05
ne 21	5.07E-09	5.21E-09	5.36E-09	5.51E-09	5.66E-09	5.66E-09

ne 22	1.18E-07	1.20E-07	1.22E-07	1.24E-07	1.25E-07	1.25E-07
ne 23	1.77E-30	1.76E-15	1.77E-15	1.77E-15	1.77E-15	1.77E-30
na 22	4.71E-12	1.05E-11	1.05E-11	1.05E-11	1.05E-11	4.41E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	6.40E-24	6.39E-09	6.40E-09	6.40E-09	6.40E-09	6.40E-24
na 24m	1.05E-30	1.05E-15	1.05E-15	1.05E-15	1.05E-15	1.05E-30
na 25	3.67E-39	3.77E-24	3.87E-24	3.98E-24	4.09E-24	4.09E-39
mg 24	1.19E-01	1.20E-01	1.22E-01	1.23E-01	1.25E-01	1.25E-01
mg 25	5.28E-07	5.43E-07	5.58E-07	5.73E-07	5.89E-07	5.89E-07
mg 26	2.69E-06	2.73E-06	2.77E-06	2.81E-06	2.85E-06	2.85E-06
mg 27	5.27E-28	5.26E-13	5.27E-13	5.27E-13	5.27E-13	5.27E-28
mg 28	.00E+00	2.60E-25	2.60E-25	2.61E-25	2.61E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	4.75E-26	4.74E-11	4.74E-11	4.74E-11	4.75E-11	4.75E-26
al 29	2.95E-37	3.03E-22	3.12E-22	3.21E-22	3.30E-22	3.30E-37
al 30	.00E+00	6.02E-32	6.28E-32	6.55E-32	6.82E-32	.00E+00
si 28	3.45E-01	3.50E-01	3.55E-01	3.59E-01	3.64E-01	3.64E-01
si 29	4.74E-06	4.88E-06	5.02E-06	5.16E-06	5.30E-06	5.30E-06
si 30	6.95E-11	7.25E-11	7.56E-11	7.88E-11	8.21E-11	8.21E-11
si 31	1.21E-38	1.26E-23	1.32E-23	1.37E-23	1.43E-23	1.43E-38
si 32	5.01E-30	5.30E-30	5.54E-30	5.78E-30	6.03E-30	5.95E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		5.99E+07	5.99E+07	6.00E+07	6.00E+07	6.00E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 120

power= 9.790E-04mw, burnup=1.6086E+04mwd, flux= 6.00E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge *******	d *******	d *******	d *******	d *******	d *******	d
he 4	2.10E+01	2.16E+01	2.23E+01	2.29E+01	2.36E+01	2.36E+01	
pb206	8.67E-02	9.06E-02	9.45E-02	9.85E-02	1.03E-01	1.03E-01	
pb207	6.12E-03	6.35E-03	6.60E-03	6.85E-03	7.10E-03	7.10E-03	
pb208	3.16E-04	3.25E-04	3.35E-04	3.44E-04	3.54E-04	3.54E-04	
pb209	5.62E-10	5.77E-10	5.93E-10	6.09E-10	6.24E-10	6.24E-10	
pb210	1.94E-04	1.98E-04	2.02E-04	2.06E-04	2.10E-04	2.10E-04	
pb211	3.78E-11	3.83E-11	3.89E-11	3.95E-11	4.01E-11	4.01E-11	
pb212	2.51E-11	2.58E-11	2.62E-11	2.66E-11	2.70E-11	2.67E-11	
pb214	4.44E-10	4.53E-10	4.62E-10	4.72E-10	4.81E-10	4.81E-10	
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
bi209	1.27E-02	1.34E-02	1.41E-02	1.48E-02	1.55E-02	1.55E-02	
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
bi210	1.20E-07	1.22E-07	1.25E-07	1.27E-07	1.29E-07	1.30E-07	
bi211	2.24E-12	2.27E-12	2.31E-12	2.34E-12	2.37E-12	2.38E-12	
bi212	2.38E-12	2.45E-12	2.49E-12	2.52E-12	2.56E-12	2.53E-12	
bi213	1.31E-10	1.35E-10	1.38E-10	1.42E-10	1.46E-10	1.46E-10	
bi214	3.30E-10	3.37E-10	3.43E-10	3.50E-10	3.57E-10	3.57E-10	
po210	3.28E-06	3.37E-06	3.44E-06	3.51E-06	3.57E-06	3.55E-06	
po211	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
po211	2.55E-17	2.51E-17	2.55E-17	2.59E-17	2.62E-17	2.63E-17	
po212	1.25E-22	1.29E-22	1.31E-22	1.33E-22	1.35E-22	1.33E-22	
po213	1.97E-19	2.03E-19	2.06E-19	2.14E-19	2.19E-19	2.14E-19	
po214	4.54E-17	4.65E-17	4.72E-17	4.80E-17	4.91E-17	4.91E-17	
po215	3.11E-17	3.15E-17	3.20E-17	3.24E-17	3.29E-17	3.28E-17	
po216	9.52E-17	9.76E-17	9.92E-17	1.01E-16	1.03E-16	1.01E-16	
po218	5.14E-11	5.24E-11	5.35E-11	5.44E-11	5.54E-11	5.49E-11	
rn218	9.95E-44	9.00E-29	9.23E-29	9.37E-29	9.52E-29	9.00E-44	
rn219	6.91E-14	7.01E-14	7.11E-14	7.22E-14	7.32E-14	7.34E-14	
rn220	3.65E-14	3.74E-14	3.80E-14	3.86E-14	3.92E-14	3.87E-14	
rn222	9.12E-08	9.31E-08	9.50E-08	9.69E-08	9.88E-08	9.88E-08	
ra222	1.08E-40	9.86E-26	1.00E-25	1.02E-25	1.03E-25	1.01E-40	

ra223	1.72E-08	1.75E-08	1.77E-08	1.80E-08	1.83E-08	1.83E-08
ra224	2.08E-10	2.13E-10	2.16E-10	2.20E-10	2.23E-10	2.20E-10
ra225	6.13E-08	6.31E-08	6.48E-08	6.65E-08	6.82E-08	6.82E-08
ra226	1.39E-02	1.42E-02	1.45E-02	1.48E-02	1.51E-02	1.51E-02
ra228	6.55E-11	6.69E-11	6.84E-11	6.98E-11	7.12E-11	7.12E-11
ac225	4.14E-08	4.26E-08	4.38E-08	4.49E-08	4.61E-08	4.61E-08
ac227	1.20E-05	1.22E-05	1.23E-05	1.25E-05	1.27E-05	1.27E-05
ac228	8.00E-15	8.17E-15	8.34E-15	8.51E-15	8.69E-15	8.69E-15
th226	5.25E-39	4.81E-24	4.89E-24	4.97E-24	5.04E-24	4.92E-39
th227	2.78E-08	2.82E-08	2.86E-08	2.91E-08	2.95E-08	2.96E-08
th228	3.96E-08	4.07E-08	4.13E-08	4.19E-08	4.26E-08	4.20E-08
th229	1.19E-02	1.23E-02	1.26E-02	1.29E-02	1.33E-02	1.33E-02
th230	7.08E-01	7.21E-01	7.34E-01	7.48E-01	7.61E-01	7.61E-01
th231	2.78E-09	3.57E-09	3.58E-09	3.59E-09	3.61E-09	2.77E-09
th232	1.60E-01	1.64E-01	1.67E-01	1.71E-01	1.74E-01	1.74E-01
th233	3.55E-28	3.63E-13	3.71E-13	3.79E-13	3.86E-13	3.87E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	1.80E-02	1.83E-02	1.86E-02	1.88E-02	1.91E-02	1.91E-02
pa232	7.48E-26	7.60E-11	7.72E-11	7.84E-11	7.96E-11	7.96E-26

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 121
power= 9.790E-04mw, burnup=1.6086E+04mwd, flux= 6.00E+07n/cm**2-sec

0

nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	[illegible]	8.08E-12	8.08E-12	[illegible]	8.08E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	5.09E-36	4.66E-21	4.74E-21	4.81E-21	4.89E-21	4.77E-36
u231	6.68E-32	6.80E-17	6.93E-17	7.05E-17	7.18E-17	7.18E-32
u232	1.42E-06	1.48E-06	1.51E-06	1.53E-06	1.55E-06	1.50E-06
u233	3.64E-01	3.70E-01	3.77E-01	3.84E-01	3.91E-01	3.91E-01
u234	1.00E+01	1.00E+01	1.00E+01	1.00E+01	1.01E+01	1.01E+01
u235	6.71E+02	6.71E+02	6.70E+02	6.70E+02	6.69E+02	6.69E+02
u236	1.86E+02	1.86E+02	1.86E+02	1.87E+02	1.87E+02	1.87E+02
u237	1.35E-12	7.92E-07	7.93E-07	7.94E-07	7.95E-07	1.33E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	7.46E-23	7.46E-08	7.46E-08	7.46E-08	7.47E-08	7.47E-23
u240	7.18E-36	8.13E-36	9.17E-36	1.03E-35	1.15E-35	1.15E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	3.05E-13	2.07E-12	2.07E-12	2.07E-12	2.07E-12	2.60E-13
np236m	4.93E-28	4.92E-13	4.92E-13	4.92E-13	4.92E-13	4.93E-28
np236	1.83E-06	1.85E-06	1.87E-06	1.89E-06	1.91E-06	1.91E-06
np237	4.11E+01	4.11E+01	4.11E+01	4.11E+01	4.11E+01	4.11E+01
np238	3.11E-14	3.63E-07	3.63E-07	3.63E-07	3.63E-07	3.09E-14
np239	1.29E-13	1.08E-05	1.08E-05	1.08E-05	1.08E-05	1.40E-13
np240m	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
np240	[illegible]	[illegible]	[illegible]	5.51E-16	[illegible]	[illegible]
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	[illegible]	2.71E-10	2.71E-10	2.71E-10	[illegible]	1.27E-10
pu237	[illegible]	[illegible]	7.50E-14	7.52E-14	7.54E-14	[illegible]
pu238	5.37E-03	[illegible]	5.50E-03	5.50E-03	5.50E-03	[illegible]
pu239	[illegible]	[illegible]	[illegible]	2.94E+01	[illegible]	[illegible]
pu240	5.15E-01	5.14E-01	5.13E-01	5.12E-01	5.12E-01	5.11E-01
pu241	[illegible]	[illegible]	[illegible]	5.04E-05	[illegible]	[illegible]
pu242	[illegible]	[illegible]	2.99E-05	3.04E-05	3.09E-05	[illegible]
pu243	1.53E-29	1.49E-14	1.52E-14	1.55E-14	1.58E-14	1.60E-29
pu244	3.59E-25	4.05E-25	4.57E-25	5.13E-25	5.74E-25	5.74E-25
pu245	.00E+00	4.02E-36	4.53E-36	5.10E-36	5.70E-36	.00E+00

pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.01E-34	1.01E-19	1.01E-19	1.01E-19	1.01E-19	1.01E-34
am240	4.64E-32	4.61E-17	4.61E-17	4.61E-17	4.61E-17	4.61E-32
am241	1.51E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03	1.49E-03
am242m	1.68E-07	1.70E-07	1.70E-07	1.70E-07	1.70E-07	1.67E-07
am242	2.17E-12	1.36E-11	1.36E-11	1.36E-11	1.36E-11	2.15E-12
am243	1.47E-07	1.50E-07	1.53E-07	1.57E-07	1.60E-07	1.60E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	2.69E-31	2.75E-16	2.81E-16	2.87E-16	2.93E-16	2.93E-31
am245	7.61E-40	7.94E-37	8.95E-37	1.01E-36	1.13E-36	8.80E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.70E-32	1.94E-22	1.94E-22	1.94E-22	1.94E-22	2.43E-33
cm242	4.61E-10	2.74E-09	2.74E-09	2.74E-09	2.74E-09	4.50E-10
cm243	1.42E-14	1.52E-14	1.52E-14	1.52E-14	1.52E-14	1.40E-14
cm244	3.77E-12	4.31E-12	4.41E-12	4.50E-12	4.60E-12	4.06E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 122

power= 9.790E-04mw, burnup=1.6086E+04mwd, flux= 6.00E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
cm245	9.56E-15	9.70E-15	9.86E-15	1.00E-14	1.02E-14	1.02E-14
cm246	7.26E-17	7.44E-17	7.61E-17	7.78E-17	7.94E-17	7.94E-17
cm247	1.86E-20	1.98E-20	2.10E-20	2.22E-20	2.35E-20	2.35E-20
cm248	3.87E-23	4.23E-23	4.61E-23	5.02E-23	5.45E-23	5.45E-23
cm249	.00E+00	3.21E-34	3.51E-34	3.82E-34	4.15E-34	.00E+00
cm250	1.65E-38	1.80E-38	1.97E-38	2.14E-38	2.34E-38	2.34E-38
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		5.99E+07	5.99E+07	6.00E+07	6.00E+07	6.00E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 14 of library on unit 33.

pass 1
pass 0
scale-system control module sas2 library
used a time-dependent neutron spectrum, for each of the above passes
pass 0 applies start-up fuel densiities
pass n applies mid time densities of nth library interval
first library updated was...
[illegible] 1
pass 0
scale-system control module sas2 library
[illegible]
[illegible]
[illegible]
[illegible]

```
**************************************************************************
*                                                                        *
*               [illegible]                                              *
*        made from modified card-image origen-s libraries of scale 4.2   *
*     data from the light element, actinide, and fission product libraries *
*       decay data, including gamma and total energy, are from endf/b-vi *
```

```
*                                                                              *
*       neutron flux spectrum factors and cross sections were produced from    *
*      the "presas2" case updating all nuclides on the scale "burnup" library  *
*                                                                              *
*                    fission product yields are from endf/b-v                  *
*                                                                              *
*                   photon libraries use an 18-energy-group structure          *
*                  the photon data are from the master photon data base,       *
*                   produced to include bremsstrahlung from uo2 matrix         *
*                                                                              *
*        see information above this box (if present) for later updates         *
*                                                                              *
********************************************************************************
*                                                                              *
********************************************************************************
```

0
0 .other identification and sizes of library.
0 data set name: ft33f001
0 8/29/1996 date library was produced
0 1697 total number of nuclides in library
689 number of light-element nuclides
129 number of actinide nuclides
879 number of fission product nuclides
0 7993 number of nonzero off-diagonal matrix elements
0 **

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 page 123

power= .00mw, burnup= 16980.mwd, flux= 6.00E+07n/cm**2-sec

0 basis =

0 (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)

0		initial	******* d	******* d	******* d	******* d	******* d
	productions	1.266238E+06	1.265670E+06	1.265100E+06	1.264527E+06	1.263952E+06	1.263946E+06
	absorptions	1.026683E+06	1.026493E+06	1.026311E+06	1.026122E+06	1.025931E+06	1.025927E+06
	k infinity	1.233329E+00	1.232998E+00	1.232667E+00	1.232337E+00	1.232005E+00	1.232004E+00
0		initial	******* d	******* d	******* d	******* d	******* d
	actinide absorptions	1.010530E+06	1.010258E+06	1.009985E+06	1.009711E+06	1.009436E+06	1.009433E+06
	non-actinide abs. fracs.	1.573360E-02	1.582122E-02	1.590741E-02	1.599288E-02	1.607811E-02	1.607752E-02

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 124

0 fraction of total absorption rate

power= .00mw, burnup= 16980.mwd, flux= 6.00E+07n/cm2-sec**

0	initial	******* d	******* d	******* d	******* d	******* d
sm149	**5.44E-03**	**5.44E-03**	**5.44E-03**	**5.44E-03**	**5.44E-03**	**5.44E-03**
nd143	**1.56E-03**	**1.58E-03**	**1.60E-03**	**1.62E-03**	**1.64E-03**	**1.64E-03**
eu151	1.58E-03	1.59E-03	1.60E-03	1.62E-03	1.63E-03	1.63E-03
rh103	7.54E-04	7.65E-04	7.76E-04	7.86E-04	7.97E-04	7.97E-04
xe131	5.06E-04	5.13E-04	5.20E-04	5.27E-04	5.34E-04	5.34E-04
cs133	[illegible]	[illegible]	[illegible]	4.09E-04	4.15E-04	4.15E-04
sm147	[illegible]	[illegible]	[illegible]	3.01E-04	[illegible]	[illegible]
tc 99	2.73E-04	[illegible]	2.80E-04	2.83E-04	[illegible]	[illegible]
nd145	2.22E-04	2.25E-04	2.28E-04	2.31E-04	2.34E-04	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	1.60E-04	1.62E-04	[illegible]
sm150	1.14E-04	1.16E-04	1.17E-04	1.19E-04	1.21E-04	1.21E-04
cd113	1.02E-04	[illegible]	1.02E-04	1.02E-04	1.02E-04	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
cs135	8.90E-05	9.02E-05	9.14E-05	9.27E-05	9.39E-05	9.39E-05
ru101	6.92E-05	7.02E-05	7.11E-05	7.21E-05	7.31E-05	7.31E-05
eu153	6.86E-05	6.97E-05	7.07E-05	7.18E-05	7.29E-05	7.29E-05

pr141	6.62E-05	6.71E-05	6.80E-05	6.89E-05	6.99E-05	6.99E-05
gd157	5.97E-05	5.98E-05	5.99E-05	5.99E-05	6.00E-05	6.00E-05
la139	5.41E-05	5.49E-05	5.56E-05	5.64E-05	5.71E-05	5.71E-05
pd105	2.71E-05	2.75E-05	2.79E-05	2.83E-05	2.87E-05	2.87E-05
ba137	2.61E-05	2.65E-05	2.68E-05	2.72E-05	2.76E-05	2.76E-05
ag109	2.52E-05	2.57E-05	2.62E-05	2.67E-05	2.72E-05	2.72E-05
zr 93	2.14E-05	2.17E-05	2.20E-05	2.23E-05	2.26E-05	2.26E-05
i129	1.76E-05	1.78E-05	1.81E-05	1.84E-05	1.86E-05	1.86E-05
nd144	1.66E-05	1.68E-05	1.71E-05	1.73E-05	1.76E-05	1.76E-05
mo 97	1.23E-05	1.25E-05	1.26E-05	1.28E-05	1.30E-05	1.30E-05
sm151	1.25E-05	1.28E-05	1.29E-05	1.29E-05	1.29E-05	1.25E-05
gd152	1.13E-05	1.16E-05	1.19E-05	1.22E-05	1.25E-05	1.25E-05
pd108	6.18E-06	6.29E-06	6.41E-06	6.52E-06	6.63E-06	6.63E-06
zr 91	5.66E-06	5.74E-06	5.82E-06	5.90E-06	5.98E-06	5.98E-06
y 89	5.42E-06	5.49E-06	5.57E-06	5.64E-06	5.72E-06	5.72E-06
ru102	5.12E-06	5.20E-06	5.27E-06	5.34E-06	5.41E-06	5.41E-06
ce142	4.50E-06	4.57E-06	4.63E-06	4.69E-06	4.76E-06	4.76E-06
nd148	4.34E-06	4.40E-06	4.46E-06	4.53E-06	4.59E-06	4.59E-06
nd146	3.65E-06	3.70E-06	3.75E-06	3.81E-06	3.86E-06	3.86E-06
in115	3.20E-06	3.25E-06	3.29E-06	3.34E-06	3.39E-06	3.39E-06
pd107	3.14E-06	3.19E-06	3.25E-06	3.31E-06	3.36E-06	3.36E-06
ba138	3.11E-06	3.16E-06	3.20E-06	3.24E-06	3.29E-06	3.29E-06
ce140	2.91E-06	2.95E-06	3.00E-06	3.04E-06	3.08E-06	3.08E-06
ru 99	2.49E-06	2.58E-06	2.67E-06	2.76E-06	2.86E-06	2.86E-06
xe132	2.67E-06	2.71E-06	2.75E-06	2.78E-06	2.82E-06	2.82E-06
mo 98	1.80E-06	1.82E-06	1.85E-06	1.87E-06	1.90E-06	1.90E-06
mo100	1.75E-06	1.77E-06	1.80E-06	1.82E-06	1.85E-06	1.85E-06
xe134	1.72E-06	1.75E-06	1.77E-06	1.80E-06	1.82E-06	1.82E-06
zr 92	1.37E-06	1.39E-06	1.41E-06	1.43E-06	1.45E-06	1.45E-06
i127	[illegible]	1.30E-06	1.32E-06	1.33E-06	1.35E-06	1.35E-06
ru104	1.17E-06	1.19E-06	1.21E-06	1.22E-06	1.24E-06	1.24E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 125

0 fraction of total absorption rate

power= .00mw, burnup= 16980.mwd, flux= 6.00E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.08E-06	1.10E-06	1.11E-06	1.13E-06	1.14E-06	1.14E-06
nd150	9.81E-07	9.95E-07	1.01E-06	1.02E-06	1.04E-06	1.04E-06
xe136	9.34E-07	9.47E-07	9.60E-07	9.73E-07	9.86E-07	9.86E-07
cd111	7.14E-07	7.26E-07	7.38E-07	7.50E-07	7.62E-07	7.62E-07
br 81	6.94E-07	7.03E-07	7.13E-07	7.23E-07	7.32E-07	7.32E-07
rb 85	6.66E-07	6.75E-07	6.84E-07	6.93E-07	7.02E-07	7.02E-07
zr 94	5.81E-07	5.89E-07	5.98E-07	6.06E-07	6.14E-07	6.14E-07
zr 90	5.34E-07	5.41E-07	5.49E-07	5.56E-07	5.64E-07	5.64E-07
gd154	4.86E-07	5.00E-07	5.14E-07	5.29E-07	5.44E-07	5.44E-07
sm154	4.56E-07	4.63E-07	4.70E-07	4.77E-07	4.83E-07	4.83E-07
te130	4.30E-07	4.36E-07	4.42E-07	4.48E-07	4.55E-07	4.55E-07
rb 87	[illegible]	[illegible]	3.94E-07	[illegible]	4.04E-07	4.04E-07
se 77	[illegible]	2.83E-07	2.87E-07	[illegible]	[illegible]	[illegible]
pd106	[illegible]	2.77E-07	2.81E-07	[illegible]	2.90E-07	2.90E-07
[illegible]	[illegible]	2.57E-07	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
kr 84	[illegible]	1.85E-07	[illegible]	[illegible]	1.93E-07	[illegible]
dy161	[illegible]	1.55E-07	[illegible]	[illegible]	1.64E-07	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ru100	[illegible]	[illegible]	1.45E-07	[illegible]	1.53E-07	[illegible]
se 79	1.39E-07	1.41E-07	1.43E-07	[illegible]	1.47E-07	1.47E-07
sb123	1.19E-07	1.21E-07	1.22E-07	1.24E-07	1.26E-07	1.26E-07
nd142	9.91E-08	1.02E-07	[illegible]	[illegible]	1.11E-07	1.11E-07
kr 86	1.01E-07	1.03E-07	1.04E-07	1.05E-07	1.07E-07	1.07E-07

ba134	9.51E-08	9.78E-08	1.00E-07	1.03E-07	1.06E-07	1.06E-07
te128	9.70E-08	9.84E-08	9.98E-08	1.01E-07	1.03E-07	1.03E-07
sm148	8.67E-08	8.92E-08	9.16E-08	9.41E-08	9.67E-08	9.67E-08
eu152	8.48E-08	1.01E-07	1.02E-07	1.03E-07	1.04E-07	8.66E-08
pd104	6.52E-08	6.71E-08	6.90E-08	7.09E-08	7.28E-08	7.28E-08
tb159	6.74E-08	6.85E-08	6.97E-08	7.09E-08	7.21E-08	7.21E-08
se 80	6.68E-08	6.77E-08	6.87E-08	6.96E-08	7.05E-08	7.05E-08
te125	6.54E-08	6.64E-08	6.74E-08	6.83E-08	6.93E-08	6.93E-08
gd158	5.36E-08	5.45E-08	5.54E-08	5.63E-08	5.73E-08	5.73E-08
cd112	4.94E-08	5.02E-08	5.10E-08	5.18E-08	5.26E-08	5.26E-08
nb 93	3.96E-08	4.10E-08	4.25E-08	4.40E-08	4.54E-08	4.55E-08
sn117	3.53E-08	3.58E-08	3.64E-08	3.69E-08	3.75E-08	3.75E-08
li 6	3.55E-08	3.59E-08	3.64E-08	3.68E-08	3.73E-08	3.73E-08
dy164	3.43E-08	3.49E-08	3.56E-08	3.62E-08	3.69E-08	3.69E-08
dy162	3.32E-08	3.39E-08	3.46E-08	3.53E-08	3.60E-08	3.60E-08
cd114	2.97E-08	3.02E-08	3.06E-08	3.11E-08	3.16E-08	3.16E-08
sn119	2.71E-08	2.75E-08	2.79E-08	2.83E-08	2.87E-08	2.87E-08
eu155	2.78E-08	4.51E-08	4.51E-08	4.51E-08	4.52E-08	2.69E-08
sn115	2.48E-08	2.52E-08	2.56E-08	2.59E-08	2.63E-08	2.63E-08
pm147	2.80E-08	6.54E-08	6.54E-08	6.54E-08	6.54E-08	2.62E-08
pd110	2.37E-08	2.41E-08	2.45E-08	2.50E-08	2.54E-08	2.54E-08
mo 96	2.20E-08	2.26E-08	2.32E-08	2.38E-08	2.44E-08	2.44E-08
cd110	2.07E-08	2.14E-08	2.21E-08	2.28E-08	2.36E-08	2.36E-08
br 79	1.98E-08	2.06E-08	2.13E-08	2.20E-08	2.28E-08	2.28E-08
ag107	1.73E-08	1.80E-08	1.88E-08	1.95E-08	2.02E-08	2.02E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 126

0 fraction of total absorption rate

power= .00mw, burnup= 16980.mwd, flux= 6.00E+07n/cm**2-sec

0	initial	******* d	******* d	******* d	******* d	******* d
sr 89	1.86E-08	1.89E-08	1.91E-08	1.94E-08	1.96E-08	1.96E-08
xe129	1.18E-08	1.23E-08	1.27E-08	1.31E-08	1.36E-08	1.36E-08
se 82	1.28E-08	1.29E-08	1.31E-08	1.33E-08	1.35E-08	1.35E-08
xe130	1.10E-08	1.13E-08	1.16E-08	1.19E-08	1.22E-08	1.22E-08
sn126	1.13E-08	1.14E-08	1.16E-08	1.17E-08	1.19E-08	1.19E-08
ba136	1.03E-08	1.06E-08	1.08E-08	1.10E-08	1.13E-08	1.13E-08
se 78	9.97E-09	1.01E-08	1.03E-08	1.04E-08	1.05E-08	1.05E-08
sn124	8.66E-09	8.78E-09	8.91E-09	9.04E-09	9.17E-09	9.17E-09
dy163	8.34E-09	8.51E-09	8.69E-09	8.87E-09	9.04E-09	9.04E-09
kr 82	7.88E-09	8.05E-09	8.23E-09	8.40E-09	8.58E-09	8.58E-09
te126	6.80E-09	7.04E-09	7.28E-09	7.53E-09	7.78E-09	7.78E-09
as 75	5.87E-09	5.95E-09	6.04E-09	6.12E-09	6.20E-09	6.20E-09
eu154	5.53E-09	7.30E-09	7.42E-09	7.53E-09	7.65E-09	5.76E-09
in113	4.93E-09	5.01E-09	5.08E-09	5.15E-09	5.23E-09	5.23E-09
sn118	3.50E-09	3.55E-09	3.60E-09	3.65E-09	3.71E-09	3.71E-09
sr 90	3.65E-09	3.95E-09	3.95E-09	3.95E-09	3.95E-09	3.63E-09
sn122	2.99E-09	3.03E-09	3.08E-09	3.12E-09	3.17E-09	3.17E-09
cd116	2.94E-09	[illegible]	[illegible]	3.07E-09	3.11E-09	3.11E-09
sn120	2.21E-09	2.24E-09	2.27E-09	2.30E-09	2.34E-09	[illegible]
ge 73	1.67E-09	1.69E-09	1.72E-09	1.74E-09	1.77E-09	1.77E-09
cs137	[illegible]	9.12E-10	[illegible]	9.12E-10	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
gd160	7.40E-10	7.54E-10	7.67E-10	7.81E-10	7.94E-10	7.94E-10
dy160	6.10E-10	6.29E-10	[illegible]	6.67E-10	6.87E-10	6.87E-10
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
xe128	3.74E-10	3.85E-10	3.96E-10	4.07E-10	4.18E-10	4.18E-10
cs134	2.38E-10	7.19E-10	7.30E-10	7.40E-10	7.50E-10	2.31E-10
sr 86	1.86E-10	1.91E-10	1.96E-10	2.01E-10	2.06E-10	2.06E-10
te124	1.51E-10	1.55E-10	[illegible]	1.61E-10	1.65E-10	[illegible]
sn116	1.43E-10	1.47E-10	1.52E-10	1.56E-10	1.60E-10	1.60E-10

kr 85	1.08E-10	1.33E-10	1.33E-10	1.33E-10	1.33E-10	1.06E-10
sr 87	8.06E-11	8.20E-11	8.34E-11	8.48E-11	8.62E-11	8.62E-11
nb 94	6.79E-11	6.97E-11	7.16E-11	7.36E-11	7.55E-11	7.55E-11
te122	5.99E-11	6.16E-11	6.34E-11	6.52E-11	6.70E-11	6.70E-11
se 76	5.40E-11	5.53E-11	5.67E-11	5.80E-11	5.94E-11	5.94E-11
er166	3.79E-11	3.88E-11	3.96E-11	4.05E-11	4.13E-11	4.13E-11
ge 74	3.34E-11	3.39E-11	3.44E-11	3.48E-11	3.53E-11	3.53E-11
ge 72	2.44E-11	2.47E-11	2.51E-11	2.55E-11	2.58E-11	2.58E-11
kr 80	1.61E-11	1.68E-11	1.75E-11	1.83E-11	1.91E-11	1.91E-11
ce144	7.88E-12	1.42E-10	1.42E-10	1.42E-10	1.42E-10	6.32E-12
er167	3.12E-12	3.23E-12	3.34E-12	3.46E-12	3.58E-12	3.58E-12
y 90	3.48E-12	3.76E-12	3.76E-12	3.76E-12	3.76E-12	3.45E-12
te123	2.13E-12	2.21E-12	2.30E-12	2.39E-12	2.48E-12	2.48E-12
sb125	1.88E-12	4.29E-12	4.29E-12	4.29E-12	4.30E-12	1.77E-12
cd108	9.66E-13	1.02E-12	1.07E-12	1.12E-12	1.18E-12	1.18E-12
ru106	1.05E-12	9.62E-12	9.64E-12	9.65E-12	9.66E-12	8.90E-13
be 9	7.22E-14	7.32E-14	7.42E-14	7.52E-14	7.63E-14	7.63E-14
sn114	3.72E-14	3.83E-14	3.94E-14	4.05E-14	4.16E-14	4.16E-14
li 7	2.95E-14	2.99E-14	3.03E-14	3.07E-14	3.11E-14	3.11E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 127
0 fraction of total absorption rate
power= .00mw, burnup= 16980.mwd, flux= 6.00E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.30E-14	1.47E-14	1.48E-14	1.50E-14	1.52E-14	1.37E-14
te127m	1.18E-15	2.17E-12	2.17E-12	2.18E-12	2.18E-12	6.64E-16
nb 95	2.07E-16	3.62E-11	3.62E-11	3.62E-11	3.62E-11	7.73E-17
zr 95	1.01E-16	3.90E-11	3.90E-11	3.90E-11	3.90E-11	3.78E-17
y 91	2.59E-17	3.33E-11	3.33E-11	3.33E-11	3.33E-11	8.82E-18
sn123	4.38E-18	2.57E-15	2.57E-15	2.57E-15	2.57E-15	2.68E-18
cd109	1.86E-18	1.15E-17	1.20E-17	1.25E-17	1.31E-17	1.92E-18
tb160	4.52E-19	4.08E-14	4.15E-14	4.22E-14	4.29E-14	2.05E-19
sr 89	6.02E-19	7.09E-12	7.09E-12	7.09E-12	7.09E-12	1.78E-19
ru103	6.84E-20	9.38E-11	9.38E-11	9.38E-11	9.39E-11	1.37E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 128
power= 9.790E-04mw, burnup=1.6980E+04mwd, flux= 6.00E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
h 1	9.55E-04	9.69E-04	9.82E-04	9.95E-04	1.01E-03	1.01E-03
h 2	2.85E-06	2.89E-06	2.93E-06	2.97E-06	3.01E-06	3.01E-06
h 3	1.11E-11	1.34E-11	1.35E-11	1.35E-11	1.36E-11	1.11E-11
h 4	.00E+00	1.32E-35	1.33E-35	1.33E-35	1.34E-35	.00E+00
he 3	1.45E-08	1.46E-08	1.47E-08	1.49E-08	1.50E-08	1.50E-08
he 4	1.58E-04	1.61E-04	1.63E-04	1.65E-04	1.67E-04	1.67E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.99E-05	1.99E-05	1.99E-05	1.99E-05	2.01E-05	2.01E-05
ne 21	5.66E-09	5.81E-09	5.96E-09	6.12E-09	6.28E-09	6.28E-09
ne 22	1.25E-07	1.27E-07	1.29E-07	1.31E-07	1.32E-07	1.32E-07
ne 23	1.77E-30	1.77E-15	1.77E-15	1.77E-15	1.77E-15	1.77E-30
na 22	4.41E-12	1.08E-11	1.02E-11	1.08E-11	1.08E-11	4.41E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.52E+03	7.53E+03
na 24	6.40E-24	6.40E-09	6.40E-09	6.41E-09	6.41E-09	6.41E-24
na 24m	1.05E-36	1.05E-15	1.05E-15	1.05E-15	1.05E-15	1.05E-36
na 25	4.09E-39	4.20E-24	4.31E-24	4.43E-24	4.55E-24	4.67E-39
mg 24	1.25E-01	1.27E-01	1.29E-01	1.29E-01	1.32E-01	1.32E-01
mg 25	5.89E-07	6.05E-07	6.20E-07	6.37E-07	6.53E-07	6.53E-07
mg 26	2.85E-06	2.89E-06	2.93E-06	2.97E-06	3.01E-06	3.01E-06
mg 27	5.27E-28	5.27E-13	5.27E-13	5.27E-13	5.28E-13	5.28E-28

mg 28	.00E+00	2.61E-25	2.61E-25	2.61E-25	2.62E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	4.75E-26	4.74E-11	4.75E-11	4.75E-11	4.75E-11	4.75E-26
al 29	3.30E-37	3.38E-22	3.47E-22	3.57E-22	3.66E-22	3.66E-37
al 30	.00E+00	7.10E-32	7.39E-32	7.69E-32	8.00E-32	.00E+00
si 28	3.64E-01	3.69E-01	3.74E-01	3.79E-01	3.84E-01	3.84E-01
si 29	5.30E-06	5.44E-06	5.59E-06	5.73E-06	5.88E-06	5.88E-06
si 30	8.21E-11	8.55E-11	8.90E-11	9.25E-11	9.62E-11	9.62E-11
si 31	1.43E-38	1.49E-23	1.55E-23	1.61E-23	1.68E-23	1.68E-38
si 32	5.95E-30	6.27E-30	6.54E-30	6.81E-30	7.09E-30	6.99E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		6.00E+07	6.00E+07	6.00E+07	6.01E+07	6.01E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 129

power= 9.790E-04mw, burnup=1.6980E+04mwd, flux= 6.00E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	2.36E+01	2.42E+01	2.49E+01	2.56E+01	2.62E+01	2.62E+01
pb206	1.03E-01	1.07E-01	1.11E-01	1.15E-01	1.20E-01	1.20E-01
pb207	7.10E-03	7.35E-03	7.61E-03	7.87E-03	8.14E-03	8.14E-03
pb208	3.54E-04	3.63E-04	3.73E-04	3.83E-04	3.93E-04	3.94E-04
pb209	6.24E-10	6.40E-10	6.56E-10	6.71E-10	6.87E-10	6.87E-10
pb210	2.10E-04	2.14E-04	2.18E-04	2.22E-04	2.26E-04	2.26E-04
pb211	4.01E-11	4.06E-11	4.12E-11	4.18E-11	4.23E-11	4.24E-11
pb212	2.67E-11	2.74E-11	2.78E-11	2.82E-11	2.86E-11	2.82E-11
pb214	4.81E-10	4.90E-10	4.99E-10	5.08E-10	5.17E-10	5.17E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	1.55E-02	1.62E-02	1.70E-02	1.78E-02	1.85E-02	1.85E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.30E-07	1.32E-07	1.34E-07	1.37E-07	1.39E-07	1.39E-07
bi211	2.38E-12	2.41E-12	2.44E-12	2.48E-12	2.51E-12	2.51E-12
bi212	2.53E-12	2.60E-12	2.64E-12	2.67E-12	2.71E-12	2.68E-12
bi213	1.46E-10	1.49E-10	1.53E-10	1.57E-10	1.60E-10	1.60E-10
bi214	3.57E-10	3.64E-10	3.70E-10	3.77E-10	3.84E-10	3.84E-10
po210	3.55E-06	3.64E-06	3.71E-06	3.78E-06	3.84E-06	3.82E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	2.63E-17	2.66E-17	2.70E-17	2.74E-17	2.77E-17	2.78E-17
po212	1.33E-22	1.37E-22	1.39E-22	1.41E-22	1.42E-22	1.41E-22
po213	2.19E-19	2.25E-19	2.30E-19	2.36E-19	2.41E-19	2.41E-19
po214	4.91E-17	5.00E-17	5.10E-17	5.19E-17	5.28E-17	5.28E-17
po215	3.30E-17	3.34E-17	3.39E-17	3.43E-17	3.48E-17	3.49E-17
po216	1.01E-16	1.04E-16	1.05E-16	1.07E-16	1.08E-16	1.07E-16
po218	5.56E-11	5.67E-11	5.77E-11	5.88E-11	5.98E-11	5.98E-11
rn218	9.25E-44	9.66E-29	9.80E-29	9.94E-29	1.01E-28	9.81E-44
rn219	7.34E-14	7.43E-14	7.53E-14	7.64E-14	7.74E-14	7.75E-14
rn220	3.87E-14	3.98E-14	4.04E-14	4.09E-14	4.15E-14	4.09E-14
rn222	[illegible]	1.01E-07	[illegible]	[illegible]	[illegible]	[illegible]
ra222	[illegible]	1.05E-25	[illegible]	1.08E-25	1.10E-25	[illegible]
ra223	[illegible]	1.85E-08	[illegible]	1.91E-08	1.93E-08	[illegible]
ra224	2.20E-10	2.26E-10	2.30E-10	2.33E-10	2.36E-10	[illegible]
ra225	[illegible]	[illegible]	[illegible]	7.33E-08	7.51E-08	[illegible]
ra226	[illegible]	1.54E-02	[illegible]	[illegible]	1.62E-02	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	4.72E-08	[illegible]	4.95E-08	5.07E-08	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	1.32E-05	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	5.27E-24	[illegible]	[illegible]
th227	[illegible]	2.99E-08	3.05E-08	3.08E-08	3.12E-08	[illegible]
th228	4.20E-08	4.32E-03	4.38E-08	4.44E-08	4.51E-08	4.44E-08

th229	1.33E-02	1.36E-02	1.39E-02	1.43E-02	1.46E-02	1.46E-02
th230	7.61E-01	7.74E-01	7.87E-01	8.00E-01	8.13E-01	8.14E-01
th231	2.77E-09	3.62E-09	3.63E-09	3.64E-09	3.66E-09	2.76E-09
th232	1.74E-01	1.77E-01	1.81E-01	1.84E-01	1.88E-01	1.88E-01
th233	3.87E-28	3.94E-13	4.02E-13	4.10E-13	4.18E-13	4.18E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	1.91E-02	1.94E-02	1.97E-02	1.99E-02	2.02E-02	2.02E-02
pa232	7.96E-26	8.08E-11	8.20E-11	8.31E-11	8.43E-11	8.43E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 130
power= 9.790E-04mw, burnup=1.6980E+04mwd, flux= 6.00E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge *******	d *******	d *******	d *******	d *******	d *******
pa233	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.08E-12	8.08E-12	8.08E-12	8.08E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	4.77E-36	4.96E-21	5.03E-21	5.11E-21	5.18E-21	5.01E-36
u231	7.18E-32	7.30E-17	7.43E-17	7.55E-17	7.68E-17	7.68E-32
u232	1.50E-06	1.58E-06	1.60E-06	1.62E-06	1.64E-06	1.59E-06
u233	3.91E-01	3.97E-01	4.04E-01	4.11E-01	4.17E-01	4.17E-01
u234	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01
u235	6.69E+02	6.69E+02	6.68E+02	6.68E+02	6.67E+02	6.67E+02
u236	1.87E+02	1.87E+02	1.87E+02	1.87E+02	1.88E+02	1.88E+02
u237	1.33E-12	7.96E-07	7.97E-07	7.98E-07	7.99E-07	1.31E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	7.47E-23	7.47E-08	7.47E-08	7.47E-08	7.48E-08	7.48E-23
u240	1.15E-35	1.29E-35	1.43E-35	1.59E-35	1.75E-35	1.75E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	2.60E-13	2.07E-12	2.07E-12	2.07E-12	2.07E-12	2.21E-13
np236m	4.93E-28	4.92E-13	4.92E-13	4.92E-13	4.92E-13	4.92E-28
np236	1.91E-06	1.95E-06	1.96E-06	1.98E-06	2.00E-06	2.00E-06
np237	4.11E+01	4.11E+01	4.11E+01	4.10E+01	4.10E+01	4.10E+01
np238	3.09E-14	3.63E-07	3.63E-07	3.63E-07	3.63E-07	3.08E-14
np239	1.40E-13	1.08E-05	1.08E-05	1.08E-05	1.08E-05	1.51E-13
np240m	9.84E-38	1.10E-37	1.22E-37	1.35E-37	1.50E-37	1.50E-37
np240	7.90E-39	5.31E-16	5.32E-16	5.32E-16	5.33E-16	9.01E-39
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.27E-10	2.71E-10	2.71E-10	2.71E-10	2.71E-10	1.20E-10
pu237	9.16E-22	7.56E-14	7.58E-14	7.60E-14	7.63E-14	2.29E-22
pu238	5.36E-03	5.50E-03	5.50E-03	5.50E-03	5.50E-03	5.35E-03
pu239	2.95E+01	2.96E+01	2.97E+01	2.98E+01	2.98E+01	2.98E+01
pu240	5.11E-01	5.11E-01	5.11E-01	5.11E-01	5.11E-01	5.10E-01
pu241	4.30E-05	5.03E-05	5.03E-05	5.03E-05	5.03E-05	4.25E-05
pu242	3.09E-05	3.15E-05	3.21E-05	3.26E-05	3.32E-05	3.32E-05
pu243	1.66E-29	1.61E-14	1.64E-14	1.67E-14	1.70E-14	1.80E-29
pu244	5.74E-35	6.81E-25	7.13E-25	7.46E-25	8.72E-25	8.72E-25
pu245	.00E+00	6.57E-36	7.09E-36	7.66E-36	8.70E-36	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.81E-34	1.81E-19	1.81E-19	1.81E-19	1.81E-19	1.81E-34
am240	4.61E-32	4.59E-17	4.60E-17	4.60E-17	4.61E-17	4.60E-32
am241	1.49E-03	1.49E-03	1.49E-03	1.49E-03	1.49E-03	1.49E-03
am242m	1.87E-07	1.87E-07	1.87E-07	1.87E-07	1.87E-07	1.87E-07
am242	2.15E-12	1.35E-11	1.35E-11	1.35E-11	1.35E-11	2.15E-12
am243	1.60E-07	1.75E-07	1.76E-07	1.76E-07	1.77E-07	1.78E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	2.95E-31	2.59E-16	5.05E-16	5.11E-16	5.17E-16	2.17E-31
am245	8.80E-40	1.26E-36	1.40E-36	1.55E-36	1.71E-36	9.85E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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     cm241    2.43E-33  1.93E-22  1.93E-22  1.94E-22  1.94E-22  3.55E-34
     cm242    4.50E-10  2.73E-09  2.73E-09  2.73E-09  2.74E-09  4.45E-10
     cm243    1.40E-14  1.51E-14  1.52E-14  1.52E-14  1.52E-14  1.40E-14
     cm244    4.06E-12  4.69E-12  4.79E-12  4.89E-12  4.99E-12  4.36E-12
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     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                    actinides          page  131
       power= 9.790E-04mw, burnup=1.6980E+04mwd, flux= 6.00E+07n/cm**2-sec
0                                                  nuclide concentrations, gram atoms
                                                   basis = single reactor assembly
              charge ******* d ******* d ******* d ******* d ******* d
     cm245    1.02E-14  1.04E-14  1.05E-14  1.07E-14  1.09E-14  1.09E-14
     cm246    7.94E-17  8.11E-17  8.28E-17  8.45E-17  8.62E-17  8.62E-17
     cm247    2.35E-20  2.48E-20  2.61E-20  2.75E-20  2.89E-20  2.89E-20
     cm248    5.45E-23  5.90E-23  6.38E-23  6.88E-23  7.41E-23  7.41E-23
     cm249     .00E+00  4.49E-34  4.86E-34  5.24E-34  5.65E-34   .00E+00
     cm250    2.34E-38  2.55E-38  2.78E-38  3.02E-38  3.29E-38  3.29E-38
     cm251     .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals     3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux               6.00E+07  6.00E+07  6.00E+07  6.01E+07  6.01E-08
0        1q array has     20 entries.
0        3q array has      1 entries.
0        3q array has      1 entries.
0        3q array has      1 entries.
0        4q array has      1 entries.
0       54q array has     12 entries.
1library information...

          cross-section data taken from position number 15 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *             prelim lwr origen-s binary working library--id = 1143            *
          *          made from modified card-image origen-s libraries of scale 4.2       *
          *      data from the light element, actinide, and fission product libraries    *
          *        decay data, including gamma and total energy, are from endf/b-vi      *
          *                                                                              *
          *      neutron flux spectrum factors and cross sections were [illegible] from  *
          *      the "[illegible]" case [illegible] all nuclides on the [illegible] library *
          *                                                                              *
          *                  fission product yields are from endf/b-v                    *
          *                                                                              *
          *             photon libraries are an 18 energy-group [illegible]              *
          *             the photon [illegible] the neutron [illegible]                   *
          *             produced to include bremsstrahlung from uo2 matrix               *
          *                                                                              *
          *       see information above this box (if present) for later updates          *
```

```
       *                                                                          *
       ****************************************************************************
       *                                                                          *
0      ****************************************************************************
0                .other identification and sizes of library.
0                 data set name:  ft33f001
0             8/29/1996    date library was produced
0                  1697    total number of nuclides in library
                    689    number of light-element nuclides
                    129    number of actinide nuclides
                    879    number of fission product nuclides
0                  7993    number of nonzero off-diagonal matrix elements
0      ****************************************************************************
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                    page 132
        power=    .00mw, burnup=  17874.mwd, flux= 6.01E+07n/cm**2-sec
0                                   basis =
0   (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
```

	initial	******* d	******* d	******* d	******* d	******* d
productions	1.264834E+06	1.264255E+06	1.263673E+06	1.263090E+06	1.262504E+06	1.262498E+06
absorptions	1.026414E+06	1.026221E+06	1.026026E+06	1.025829E+06	1.025631E+06	1.025627E+06
k infinity	1.232285E+00	1.231952E+00	1.231620E+00	1.231287E+00	1.230953E+00	1.230952E+00
0	initial	******* d	******* d	******* d	******* d	******* d
actinide absorptions	1.009912E+06	1.009635E+06	1.009357E+06	1.009077E+06	1.008797E+06	1.008793E+06
non-actinide abs. fracs.	1.607716E-02	1.616246E-02	1.624632E-02	1.633036E-02	1.641381E-02	1.641315E-02

```
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2        fission products       page 133
0                                   fraction of total absorption rate
        power=    .00mw, burnup=  17874.mwd, flux= 6.01E+07n/cm**2-sec
0
```

	initial	******* d	******* d	******* d	******* d	******* d
sm149	5.44E-03	5.44E-03	5.44E-03	5.44E-03	5.44E-03	5.44E-03
nd143	1.64E-03	1.66E-03	1.68E-03	1.71E-03	1.73E-03	1.73E-03
eu151	1.63E-03	1.64E-03	1.65E-03	1.67E-03	1.68E-03	1.68E-03
rh103	7.97E-04	8.08E-04	8.18E-04	8.29E-04	8.40E-04	8.40E-04
xe131	5.34E-04	5.41E-04	5.48E-04	5.55E-04	5.62E-04	5.62E-04
cs133	4.15E-04	4.20E-04	4.26E-04	4.31E-04	4.37E-04	4.37E-04
sm147	3.05E-04	3.09E-04	3.13E-04	3.17E-04	3.21E-04	3.21E-04
tc 99	2.87E-04	2.90E-04	2.94E-04	2.97E-04	3.00E-04	3.00E-04
nd145	2.34E-04	2.37E-04	2.40E-04	2.43E-04	2.46E-04	2.46E-04
gd155	2.23E-04	2.23E-04	2.23E-04	2.23E-04	2.23E-04	2.23E-04
sm152	1.75E-04	1.78E-04	1.81E-04	1.83E-04	1.86E-04	1.86E-04
mo 95	1.62E-04	1.64E-04	1.67E-04	1.69E-04	1.71E-04	1.71E-04
sm150	1.21E-04	1.23E-04	1.24E-04	1.26E-04	1.28E-04	1.28E-04
kr 83	1.00E-04	1.01E-04	1.03E-04	1.04E-04	1.05E-04	1.05E-04
cd113	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04
cs135	9.39E-05	9.52E-05	9.64E-05	9.77E-05	9.89E-05	9.89E-05
eu153	7.29E-05	7.39E-05	7.50E-05	7.61E-05	7.71E-05	7.71E-05
ru101	7.31E-05	7.40E-05	7.50E-05	7.60E-05	7.70E-05	7.70E-05
pr141	6.99E-05	7.08E-05	7.17E-05	7.27E-05	[illegible]	7.36E-05
gd157	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6.05E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
pd105	2.87E-05	2.92E-05	2.96E-05	3.00E-05	[illegible]	3.04E-05
ag109	2.72E-05	2.77E-05	[illegible]	2.87E-05	[illegible]	2.92E-05
cs137	2.76E-05	[illegible]	[illegible]	[illegible]	[illegible]	2.91E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
i129	[illegible]	[illegible]	1.91E-05	1.94E-05	[illegible]	1.96E-05
nd144	1.76E-05	1.78E-05	1.80E-05	[illegible]	[illegible]	[illegible]
mo 97	[illegible]	[illegible]	1.33E-05	1.35E-05	[illegible]	1.37E-05
gd152	1.25E-05	1.27E-05	1.30E-05	1.33E-05	1.36E-05	1.36E-05

sm151	1.26E-05	1.29E-05	1.29E-05	1.29E-05	1.29E-05	1.26E-05
pd108	6.63E-06	6.75E-06	6.86E-06	6.98E-06	7.09E-06	7.09E-06
zr 91	5.98E-06	6.06E-06	6.14E-06	6.22E-06	6.29E-06	6.29E-06
y 89	5.72E-06	5.79E-06	5.87E-06	5.94E-06	6.02E-06	6.02E-06
ru102	5.42E-06	5.49E-06	5.56E-06	5.63E-06	5.71E-06	5.71E-06
ce142	4.76E-06	4.82E-06	4.88E-06	4.95E-06	5.01E-06	5.01E-06
nd148	4.59E-06	4.65E-06	4.71E-06	4.77E-06	4.83E-06	4.83E-06
nd146	3.86E-06	3.91E-06	3.96E-06	4.01E-06	4.07E-06	4.07E-06
pd107	3.36E-06	3.42E-06	3.47E-06	3.53E-06	3.59E-06	3.59E-06
in115	3.39E-06	3.43E-06	3.48E-06	3.53E-06	3.57E-06	3.57E-06
ba138	3.29E-06	3.33E-06	3.38E-06	3.42E-06	3.46E-06	3.46E-06
ce140	3.08E-06	3.12E-06	3.16E-06	3.20E-06	3.24E-06	3.24E-06
ru 99	2.86E-06	2.95E-06	3.04E-06	3.14E-06	3.24E-06	3.24E-06
xe132	2.82E-06	2.86E-06	2.90E-06	2.94E-06	2.98E-06	2.98E-06
mo 98	1.90E-06	1.92E-06	1.95E-06	1.97E-06	2.00E-06	2.00E-06
mo100	1.85E-06	1.87E-06	1.90E-06	1.92E-06	1.95E-06	1.95E-06
xe134	1.82E-06	1.84E-06	1.87E-06	1.89E-06	1.92E-06	1.92E-06
zr 92	1.45E-06	1.47E-06	1.48E-06	1.50E-06	1.52E-06	1.52E-06
i127	1.35E-06	1.37E-06	1.39E-06	1.41E-06	1.43E-06	1.43E-06
ru104	1.24E-06	1.26E-06	1.28E-06	1.29E-06	1.31E-06	1.31E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 134

0 fraction of total absorption rate

power= .00mw, burnup= 17874.mwd, flux= 6.01E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.14E-06	1.16E-06	1.17E-06	1.19E-06	1.20E-06	1.20E-06
nd150	1.04E-06	1.05E-06	1.07E-06	1.08E-06	1.09E-06	1.09E-06
xe136	9.87E-07	1.00E-06	1.01E-06	1.03E-06	1.04E-06	1.04E-06
cd111	7.63E-07	7.75E-07	7.87E-07	7.99E-07	8.12E-07	8.12E-07
br 81	7.32E-07	7.42E-07	7.52E-07	7.62E-07	7.71E-07	7.71E-07
rb 85	7.02E-07	7.12E-07	7.21E-07	7.30E-07	7.39E-07	7.39E-07
zr 94	6.14E-07	6.22E-07	6.30E-07	6.38E-07	6.46E-07	6.46E-07
gd154	5.44E-07	5.59E-07	5.74E-07	5.90E-07	6.06E-07	6.06E-07
zr 90	5.64E-07	5.71E-07	5.78E-07	5.86E-07	5.93E-07	5.93E-07
sm154	4.83E-07	4.90E-07	4.97E-07	5.04E-07	5.11E-07	5.11E-07
te130	4.55E-07	4.61E-07	4.67E-07	4.73E-07	4.79E-07	4.79E-07
rb 87	4.04E-07	4.10E-07	4.15E-07	4.20E-07	4.26E-07	4.26E-07
ba135	2.85E-07	2.95E-07	3.04E-07	3.14E-07	3.24E-07	3.24E-07
se 77	2.95E-07	2.99E-07	3.02E-07	3.06E-07	3.10E-07	3.10E-07
pd106	2.90E-07	2.95E-07	2.99E-07	3.04E-07	3.08E-07	3.08E-07
gd156	2.73E-07	2.78E-07	2.82E-07	2.86E-07	2.91E-07	2.91E-07
kr 84	1.93E-07	1.95E-07	1.98E-07	2.00E-07	2.03E-07	2.03E-07
dy161	1.64E-07	1.67E-07	1.70E-07	1.73E-07	1.76E-07	1.76E-07
ru100	1.53E-07	1.57E-07	1.61E-07	1.65E-07	1.69E-07	1.69E-07
sb121	1.56E-07	1.58E-07	1.60E-07	1.62E-07	1.64E-07	1.64E-07
se 79	1.47E-07	1.49E-07	1.51E-07	1.52E-07	1.54E-07	1.54E-07
sb123	1.26E-07	1.27E-07	1.29E-07	1.31E-07	1.33E-07	1.33E-07
nd142	1.11E-07	1.14E-07	1.17E-07	1.20E-07	1.23E-07	[illegible]
ba134	1.06E-07	1.09E-07	1.12E-07	1.15E-07	1.18E-07	[illegible]
kr 86	1.07E-07	1.08E-07	1.10E-07	1.11E-07	1.13E-07	[illegible]
te128	[illegible]	1.04E-07	[illegible]	1.07E-07	[illegible]	[illegible]
sm148	9.67E-08	9.93E-08	1.02E-07	1.05E-07	1.07E-07	[illegible]
eu152	[illegible]	1.05E-07	1.06E-07	1.06E-07	1.07E-07	[illegible]
pd104	[illegible]	7.47E-08	7.67E-08	7.87E-08	[illegible]	[illegible]
tb159	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
te125	[illegible]	7.07E-08	7.15E-08	7.23E-08	[illegible]	[illegible]
gd155	[illegible]	5.82E-08	[illegible]	6.00E-08	[illegible]	[illegible]
cd112	[illegible]	5.34E-08	[illegible]	[illegible]	5.57E-08	[illegible]
nb 93	4.55E-08	4.70E-08	4.85E-08	5.01E-08	5.16E-08	5.17E-08

sn117	3.75E-08	3.80E-08	3.86E-08	3.91E-08	3.96E-08	3.96E-08
dy164	3.69E-08	3.76E-08	3.82E-08	3.89E-08	3.95E-08	3.95E-08
li 6	3.73E-08	3.78E-08	3.82E-08	3.87E-08	3.91E-08	3.91E-08
dy162	3.60E-08	3.67E-08	3.75E-08	3.82E-08	3.89E-08	3.89E-08
cd114	3.16E-08	3.21E-08	3.25E-08	3.30E-08	3.35E-08	3.35E-08
sn119	2.87E-08	2.91E-08	2.95E-08	2.99E-08	3.03E-08	3.03E-08
sn115	2.63E-08	2.67E-08	2.70E-08	2.74E-08	2.78E-08	2.78E-08
pd110	2.54E-08	2.58E-08	2.62E-08	2.66E-08	2.71E-08	2.71E-08
mo 96	2.44E-08	2.51E-08	2.57E-08	2.64E-08	2.71E-08	2.71E-08
cd110	2.36E-08	2.43E-08	2.51E-08	2.59E-08	2.67E-08	2.67E-08
eu155	2.69E-08	4.52E-08	4.53E-08	4.53E-08	4.53E-08	2.60E-08
br 79	2.28E-08	2.35E-08	2.43E-08	2.51E-08	2.58E-08	2.58E-08
pm147	2.62E-08	6.54E-08	6.54E-08	6.54E-08	6.54E-08	2.45E-08
ag107	2.03E-08	2.10E-08	2.18E-08	2.26E-08	2.34E-08	2.34E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 135

0 fraction of total absorption rate

power= .00mw, burnup= 17874.mwd, flux= 6.01E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

sr 88	1.96E-08	1.99E-08	2.01E-08	2.04E-08	2.07E-08	2.07E-08
xe129	1.36E-08	1.41E-08	1.45E-08	1.50E-08	1.55E-08	1.55E-08
se 82	1.35E-08	1.37E-08	1.38E-08	1.40E-08	1.42E-08	1.42E-08
xe130	1.22E-08	1.25E-08	1.28E-08	1.31E-08	1.35E-08	1.35E-08
sn126	1.19E-08	1.20E-08	1.22E-08	1.23E-08	1.25E-08	1.25E-08
ba136	1.13E-08	1.15E-08	1.18E-08	1.20E-08	1.23E-08	1.23E-08
se 78	1.05E-08	1.07E-08	1.08E-08	1.10E-08	1.11E-08	1.11E-08
dy163	9.04E-09	9.22E-09	9.40E-09	9.58E-09	9.76E-09	9.76E-09
sn124	9.17E-09	9.30E-09	9.43E-09	9.55E-09	9.68E-09	9.68E-09
kr 82	8.58E-09	8.76E-09	8.93E-09	9.11E-09	9.29E-09	9.29E-09
te126	7.78E-09	8.03E-09	8.29E-09	8.55E-09	8.81E-09	8.81E-09
as 75	6.20E-09	6.28E-09	6.37E-09	6.45E-09	6.53E-09	6.53E-09
eu154	5.76E-09	7.76E-09	7.88E-09	7.99E-09	8.11E-09	5.99E-09
in113	5.23E-09	5.30E-09	5.38E-09	5.45E-09	5.53E-09	5.53E-09
sn118	3.70E-09	3.76E-09	3.81E-09	3.86E-09	3.91E-09	3.91E-09
sr 90	3.63E-09	3.96E-09	3.96E-09	3.96E-09	3.96E-09	3.61E-09
sn122	3.17E-09	3.21E-09	3.26E-09	3.30E-09	3.34E-09	3.34E-09
cd116	3.11E-09	3.16E-09	3.20E-09	3.24E-09	3.29E-09	3.29E-09
sn120	2.34E-09	2.37E-09	2.40E-09	2.43E-09	2.47E-09	2.47E-09
ge 73	1.77E-09	1.79E-09	1.81E-09	1.84E-09	1.86E-09	1.86E-09
ho165	8.20E-10	8.39E-10	8.58E-10	8.77E-10	8.96E-10	8.96E-10
gd160	7.94E-10	8.08E-10	8.22E-10	8.35E-10	8.49E-10	8.49E-10
cs137	8.41E-10	9.12E-10	9.13E-10	9.13E-10	9.13E-10	8.37E-10
dy160	6.87E-10	7.07E-10	7.28E-10	7.48E-10	7.69E-10	7.70E-10
ge 76	6.05E-10	6.13E-10	6.21E-10	6.29E-10	6.37E-10	6.37E-10
xe128	4.18E-10	4.30E-10	4.41E-10	4.53E-10	4.65E-10	4.65E-10
sr 86	2.06E-10	2.11E-10	2.17E-10	2.22E-10	2.27E-10	2.27E-10
cs134	2.31E-10	7.60E-10	7.70E-10	7.81E-10	7.91E-10	2.24E-10
te124	1.65E-10	1.68E-10	1.71E-10	1.75E-10	1.78E-10	1.78E-10
sn116	1.60E-10	1.64E-10	1.69E-10	1.73E-10	1.78E-10	1.78E-10
kr 85	1.06E-10	1.33E-10	[illegible]	1.33E-10	[illegible]	[illegible]
sr 87	8.62E-11	[illegible]	[illegible]	9.05E-11	[illegible]	[illegible]
nb 9?	7.5?E-11	7.7?E-11	7.97E-11	8.1?E-11	8.41E-11	8.41E-11
te12?	6.69E-11	6.8?E-11	[illegible]	7.25E-11	7.44E-11	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	4.1?E-11	4.22E-11	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
kr 80	[illegible]	1.93E-11	[illegible]	[illegible]	[illegible]	[illegible]
ce144	6.32E-12	1.42E-10	1.42E-10	1.42E-10	1.42E-10	[illegible]
er167	3.58E-12	3.70E-12	3.82E-12	3.95E-12	4.07E-12	4.07E-12

y 90	3.45E-12	3.77E-12	3.77E-12	3.77E-12	3.77E-12	3.43E-12
te123	2.48E-12	2.58E-12	2.68E-12	2.78E-12	2.88E-12	2.88E-12
sb125	1.77E-12	4.30E-12	4.30E-12	4.31E-12	4.31E-12	1.67E-12
cd108	1.18E-12	1.24E-12	1.30E-12	1.36E-12	1.42E-12	1.42E-12
ru106	8.89E-13	9.67E-12	9.69E-12	9.70E-12	9.71E-12	7.52E-13
be 9	7.62E-14	7.72E-14	7.83E-14	7.93E-14	8.03E-14	8.03E-14
sn114	4.16E-14	4.28E-14	4.39E-14	4.51E-14	4.63E-14	4.63E-14
li 7	3.11E-14	3.15E-14	3.20E-14	3.24E-14	3.28E-14	3.28E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 136

0 fraction of total absorption rate

power= .00mw, burnup= 17874.mwd, flux= 6.01E+07n/cm**2-sec

0	initial	******* d	******* d	******* d	******* d	******* d
sb126	1.37E-14	1.54E-14	1.55E-14	1.57E-14	1.59E-14	1.43E-14
te127m	6.64E-16	2.18E-12	2.18E-12	2.18E-12	2.18E-12	3.70E-16
nb 95	7.73E-17	3.62E-11	3.62E-11	3.62E-11	3.62E-11	2.84E-17
zr 95	3.78E-17	3.90E-11	3.90E-11	3.90E-11	3.90E-11	1.39E-17
y 91	8.83E-18	3.33E-11	3.33E-11	3.33E-11	3.33E-11	2.96E-18
cd109	1.93E-18	1.36E-17	1.42E-17	1.48E-17	1.54E-17	1.97E-18
sn123	2.69E-18	2.57E-15	2.57E-15	2.57E-15	2.57E-15	1.64E-18
tb160	2.05E-19	4.36E-14	4.42E-14	4.49E-14	4.56E-14	9.58E-20
sr 89	1.78E-19	7.09E-12	7.09E-12	7.09E-12	7.09E-12	5.47E-20

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 137

power= 9.790E-04mw, burnup=1.7874E+04mwd, flux= 6.01E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	1.01E-03	1.02E-03	1.04E-03	1.05E-03	1.06E-03	1.06E-03
h 2	3.01E-06	3.05E-06	3.09E-06	3.13E-06	3.17E-06	3.17E-06
h 3	1.11E-11	1.36E-11	1.37E-11	1.37E-11	1.38E-11	1.11E-11
h 4	.00E+00	1.35E-35	1.35E-35	1.36E-35	1.36E-35	.00E+00
he 3	1.50E-08	1.51E-08	1.52E-08	1.53E-08	1.55E-08	1.55E-08
he 4	1.67E-04	1.70E-04	1.72E-04	1.74E-04	1.76E-04	1.76E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.01E-05	2.04E-05	2.06E-05	2.09E-05	2.12E-05	2.12E-05
ne 21	6.28E-09	6.44E-09	6.60E-09	6.77E-09	6.93E-09	6.93E-09
ne 22	1.32E-07	1.34E-07	1.36E-07	1.38E-07	1.39E-07	1.39E-07
ne 23	1.77E-30	1.77E-15	1.77E-15	1.77E-15	1.77E-15	1.77E-30
na 22	4.13E-12	1.05E-11	1.05E-11	1.05E-11	1.05E-11	3.87E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	6.41E-24	6.41E-09	6.41E-09	6.41E-09	6.42E-09	6.42E-24
na 24m	1.05E-30	1.05E-15	1.05E-15	1.05E-15	1.05E-15	1.05E-30
na 25	4.54E-39	4.65E-24	4.77E-24	4.89E-24	5.01E-24	5.01E-39
mg 24	1.32E-01	1.33E-01	1.35E-01	1.37E-01	1.38E-01	1.38E-01
mg 25	6.53E-07	6.69E-07	6.86E-07	7.03E-07	7.20E-07	7.20E-07
mg 26	3.01E-06	3.05E-06	3.09E-06	3.13E-06	3.17E-06	3.17E-06
mg 27	[illegible]	[illegible]	5.28E-13	5.28E-13	5.28E-13	5.29E-28
mg 28	.00E+00	2.62E-25	2.62E-25	2.62E-25	2.62E-25	.00E+00
al 27	[illegible]	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	[illegible]	4.75E-11	4.75E-11	4.75E-11	4.75E-11	[illegible]
al 29	[illegible]	3.75E-22	3.85E-22	3.95E-22	4.05E-22	[illegible]
al 30	[illegible]	[illegible]	8.63E-32	8.97E-32	[illegible]	[illegible]
si 28	[illegible]	[illegible]	3.93E-01	[illegible]	[illegible]	[illegible]
si 29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
si 30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
si 31	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
si 32	[illegible]	7.27E-30	7.67E-30	7.97E-30	8.28E-30	[illegible]
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		6.01E+07	6.01E+07	6.01E+07	6.01E+07	6.02E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 138
power= 9.790E-04mw, burnup=1.7874E+04mwd, flux= 6.01E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	2.62E+01	2.69E+01	2.76E+01	2.82E+01	2.89E+01	2.89E+01
pb206	1.20E-01	1.24E-01	1.29E-01	1.33E-01	1.38E-01	1.38E-01
pb207	8.14E-03	8.41E-03	8.68E-03	8.96E-03	9.24E-03	9.24E-03
pb208	3.94E-04	4.04E-04	4.14E-04	4.25E-04	4.36E-04	4.36E-04
pb209	6.87E-10	7.03E-10	7.18E-10	7.34E-10	7.50E-10	7.50E-10
pb210	2.26E-04	2.30E-04	2.34E-04	2.38E-04	2.42E-04	2.42E-04
pb211	4.24E-11	4.29E-11	4.34E-11	4.40E-11	4.45E-11	4.46E-11
pb212	2.82E-11	2.90E-11	2.94E-11	2.98E-11	3.01E-11	2.97E-11
pb214	5.17E-10	5.26E-10	5.35E-10	5.43E-10	5.52E-10	5.52E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	1.85E-02	1.94E-02	2.02E-02	2.10E-02	2.19E-02	2.19E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.39E-07	1.42E-07	1.44E-07	1.46E-07	1.49E-07	1.49E-07
bi211	2.51E-12	2.54E-12	2.58E-12	2.61E-12	2.64E-12	2.65E-12
bi212	2.68E-12	2.75E-12	2.79E-12	2.82E-12	2.86E-12	2.81E-12
bi213	1.60E-10	1.64E-10	1.68E-10	1.71E-10	1.75E-10	1.75E-10
bi214	3.84E-10	3.90E-10	3.97E-10	4.03E-10	4.10E-10	4.10E-10
po210	3.82E-06	3.91E-06	3.98E-06	4.04E-06	4.11E-06	4.09E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	2.78E-17	2.81E-17	2.85E-17	2.88E-17	2.92E-17	2.92E-17
po212	1.41E-22	1.44E-22	1.46E-22	1.48E-22	1.50E-22	1.48E-22
po213	2.41E-19	2.47E-19	2.52E-19	2.58E-19	2.63E-19	2.63E-19
po214	5.28E-17	5.37E-17	5.46E-17	5.55E-17	5.64E-17	5.64E-17
po215	3.49E-17	3.52E-17	3.57E-17	3.62E-17	3.66E-17	3.67E-17
po216	1.07E-16	1.10E-16	1.11E-16	1.13E-16	1.14E-16	1.12E-16
po218	5.98E-11	6.08E-11	6.18E-11	6.29E-11	6.39E-11	6.39E-11
rn218	9.81E-44	1.02E-28	1.04E-28	1.05E-28	1.06E-28	1.02E-43
rn219	7.75E-14	7.84E-14	7.94E-14	8.04E-14	8.14E-14	8.16E-14
rn220	4.09E-14	4.21E-14	4.26E-14	4.32E-14	4.37E-14	4.31E-14
rn222	1.06E-07	1.08E-07	1.10E-07	1.12E-07	1.13E-07	1.13E-07
ra222	1.06E-40	1.11E-25	1.13E-25	1.14E-25	1.16E-25	1.11E-40
ra223	1.93E-08	1.96E-08	1.98E-08	2.01E-08	2.03E-08	2.04E-08
ra224	2.33E-10	2.39E-10	2.42E-10	2.46E-10	2.49E-10	2.45E-10
ra225	7.51E-08	7.68E-08	7.85E-08	8.02E-08	8.19E-08	8.19E-08
ra226	1.62E-02	1.65E-02	1.68E-02	1.71E-02	1.73E-02	1.73E-02
ra228	7.68E-11	7.83E-11	7.97E-11	8.11E-11	8.25E-11	8.25E-11
ac225	5.07E-08	5.19E-08	5.30E-08	5.42E-08	5.53E-08	5.53E-08
ac227	1.34E-05	1.36E-05	1.38E-05	1.40E-05	1.41E-05	1.41E-05
ac228	9.38E-15	9.55E-15	9.73E-15	9.90E-15	1.01E-14	1.01E-14
th226	5.17E-39	5.41E-24	5.49E-24	5.56E-24	5.64E-24	5.44E-39
th227	3.12E-08	3.16E-08	3.20E-08	3.24E-08	3.28E-08	3.29E-08
th228	4.44E-08	4.57E-08	4.63E-08	[illegible]	4.75E-08	[illegible]
th229	1.46E-02	1.49E-02	[illegible]	1.56E-02	1.59E-02	[illegible]
th230	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
th231	2.76E-09	3.67E-09	[illegible]	[illegible]	3.71E-09	2.75E-09
th232	1.88E-01	1.91E-01	1.95E-01	[illegible]	2.02E-01	[illegible]
th233	4.18E-22	[illegible]	4.34E-13	[illegible]	[illegible]	[illegible]
th234	[illegible]	5.36E-07	[illegible]	[illegible]	[illegible]	[illegible]
pa231	[illegible]	2.05E-02	[illegible]	[illegible]	[illegible]	[illegible]
pa232	8.43E-26	8.54E-11	[illegible]	8.77E-11	[illegible]	[illegible]

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 139
power= 9.790E-04mw, burnup=1.7874E+04mwd, flux= [illegible]

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	5.01E-36	5.25E-21	5.32E-21	5.39E-21	5.47E-21	5.27E-36
u231	7.68E-32	7.80E-17	7.92E-17	8.05E-17	8.17E-17	8.17E-32
u232	1.59E-06	1.67E-06	1.69E-06	1.71E-06	1.73E-06	1.67E-06
u233	4.17E-01	4.24E-01	4.31E-01	4.37E-01	4.44E-01	4.44E-01
u234	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01
u235	6.67E+02	6.67E+02	6.66E+02	6.66E+02	6.65E+02	6.65E+02
u236	1.88E+02	1.88E+02	1.88E+02	1.88E+02	1.88E+02	1.88E+02
u237	1.31E-12	7.99E-07	8.00E-07	8.01E-07	8.03E-07	1.30E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	7.48E-23	7.47E-08	7.48E-08	7.48E-08	7.48E-08	7.49E-23
u240	1.75E-35	1.93E-35	2.13E-35	2.34E-35	2.56E-35	2.56E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	2.21E-13	2.07E-12	2.07E-12	2.07E-12	2.07E-12	1.88E-13
np236m	4.92E-28	4.92E-13	4.92E-13	4.92E-13	4.92E-13	4.92E-28
np236	2.00E-06	2.02E-06	2.04E-06	2.07E-06	2.09E-06	2.09E-06
np237	4.10E+01	4.10E+01	4.10E+01	4.10E+01	4.10E+01	4.10E+01
np238	3.08E-14	3.63E-07	3.63E-07	3.63E-07	3.63E-07	3.09E-14
np239	1.51E-13	1.08E-05	1.08E-05	1.08E-05	1.08E-05	1.63E-13
np240m	1.50E-37	1.65E-37	1.82E-37	1.99E-37	2.18E-37	2.18E-37
np240	9.01E-39	5.33E-16	5.34E-16	5.34E-16	5.35E-16	1.03E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.20E-10	2.71E-10	2.71E-10	2.72E-10	2.72E-10	1.14E-10
pu237	2.29E-22	7.64E-14	7.66E-14	7.68E-14	7.70E-14	5.59E-23
pu238	5.35E-03	5.50E-03	5.50E-03	5.50E-03	5.50E-03	5.34E-03
pu239	2.98E+01	2.99E+01	3.00E+01	3.01E+01	3.01E+01	3.01E+01
pu240	5.10E-01	5.11E-01	5.11E-01	5.11E-01	5.11E-01	5.11E-01
pu241	4.25E-05	5.03E-05	5.04E-05	5.04E-05	5.05E-05	4.21E-05
pu242	3.32E-05	3.38E-05	3.43E-05	3.49E-05	3.55E-05	3.55E-05
pu243	1.80E-29	1.73E-14	1.76E-14	1.79E-14	1.82E-14	1.94E-29
pu244	8.74E-25	9.64E-25	1.06E-24	1.16E-24	1.27E-24	1.27E-24
pu245	.00E+00	9.60E-36	1.06E-35	1.16E-35	1.27E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.01E-34	1.00E-19	1.01E-19	1.01E-19	1.01E-19	1.01E-34
am240	4.60E-32	4.59E-17	4.60E-17	4.61E-17	4.62E-17	4.62E-32
am241	1.49E-03	1.49E-03	1.49E-03	1.49E-03	1.50E-03	1.49E-03
am242m	1.67E-07	1.69E-07	1.69E-07	1.70E-07	1.70E-07	1.67E-07
am242	2.15E-12	1.35E-11	1.35E-11	1.36E-11	1.36E-11	2.15E-12
am243	1.73E-07	1.76E-07	1.80E-07	1.83E-07	1.87E-07	1.87E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	3.17E-31	3.23E-16	3.30E-16	3.36E-16	3.43E-16	3.43E-31
am245	9.85E-40	1.89E-36	2.08E-36	2.29E-36	2.50E-36	1.06E-39
am246	.00E+00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
cm241	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
cm242	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
cm243	1.40E-14	[illegible]	1.52E-14	1.52E-14	[illegible]	[illegible]
cm244	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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sas2h: [illegible] page 110

power= [illegible]

nuclide concentrations, [illegible]

basis = single reactor assembly

	[illegible]	******* d	******* d	******* d	******* d	******* d
cm245	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
cm246	8.62E-17	8.79E-17	8.97E-17	9.14E-17	9.32E-17	9.32E-17

```
     cm247    2.89E-20  3.03E-20  3.17E-20  3.32E-20  3.47E-20  3.47E-20
     cm248    7.41E-23  7.97E-23  8.55E-23  9.16E-23  9.79E-23  9.79E-23
     cm249     .00E+00  6.07E-34  6.52E-34  6.99E-34  7.48E-34   .00E+00
     cm250    3.29E-38  3.57E-38  3.88E-38  4.20E-38  4.55E-38  4.55E-38
     cm251     .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals     3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux               6.01E+07  6.01E+07  6.01E+07  6.01E+07  6.02E-08
0        1q array has     20 entries.
0        3q array has      1 entries.
0        3q array has      1 entries.
0        3q array has      1 entries.
0        4q array has      1 entries.
0       54q array has     12 entries.
1library information...

         cross-section data taken from position number 16 of library on unit 33.

         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         ******************************************************************************
         *                                                                            *
         *             prelim lwr origen-s binary working library--id = 1143          *
         *          made from modified card-image origen-s libraries of scale 4.2     *
         *       data from the light element, actinide, and fission product libraries *
         *         decay data, including gamma and total energy, are from endf/b-vi   *
         *                                                                            *
         *       neutron flux spectrum factors and cross sections were produced from  *
         *      the "presas2" case updating all nuclides on the scale "burnup" library *
         *                                                                            *
         *                   fission product yields are from endf/b-v                 *
         *                                                                            *
         *               photon libraries use an 18-energy-group structure            *
         *              the photon data are from the master photon data base,         *
         *               produced to include bremsstrahlung from uo2 matrix           *
         *                                                                            *
         *         see information above this box (if present) for later updates     *
         *                                                                            *
         ******************************************************************************
         *                                                                            *
0        ******************************************************************************
0                  .other identification and [illegible] of library.
0                   data set name: [illegible]
0               [illegible]/29/1995    date library was produced
0                        1697    total number of nuclides in library
                         [illegible]    [illegible]
                          129    number of actinide nuclides
                          879    number of fission product nuclides
0                        7993    number of nonzero off-diagonal matrix elements
```

0 **********

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 page 141

power= .00mw, burnup= 18768.mwd, flux= 6.02E+07n/cm**2-sec

0 basis =

0 (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)

0	initial	******* d	******* d	******* d	******* d	******* d
productions	1.263346E+06	1.262756E+06	1.262165E+06	1.261571E+06	1.260976E+06	1.260969E+06
absorptions	1.026080E+06	1.025880E+06	1.025679E+06	1.025476E+06	1.025272E+06	1.025267E+06
k infinity	1.231235E+00	1.230900E+00	1.230565E+00	1.230230E+00	1.229894E+00	1.229893E+00
0	initial	******* d	******* d	******* d	******* d	******* d
actinide absorptions	1.009239E+06	1.008957E+06	1.008673E+06	1.008389E+06	1.008104E+06	1.008100E+06
non-actinide abs. fracs.	1.641309E-02	1.649696E-02	1.657957E-02	1.666236E-02	1.674503E-02	1.674443E-02

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 142

0 fraction of total absorption rate

power= .00mw, burnup= 18768.mwd, flux= 6.02E+07n/cm**2-sec

0 initial	******* d	******* d	******* d	******* d	******* d
sm149	5.44E-03	5.44E-03	5.44E-03	5.44E-03	5.44E-03	5.44E-03
nd143	1.73E-03	1.75E-03	1.77E-03	1.79E-03	1.81E-03	1.81E-03
eu151	1.68E-03	1.69E-03	1.70E-03	1.71E-03	1.72E-03	1.72E-03
rh103	8.40E-04	8.50E-04	8.61E-04	8.72E-04	8.82E-04	8.82E-04
xe131	5.62E-04	5.69E-04	5.76E-04	5.83E-04	5.90E-04	5.90E-04
cs133	4.37E-04	4.42E-04	4.48E-04	4.53E-04	4.59E-04	4.59E-04
sm147	3.20E-04	3.24E-04	3.28E-04	3.32E-04	3.36E-04	3.36E-04
tc 99	3.00E-04	3.04E-04	3.07E-04	3.11E-04	3.14E-04	3.14E-04
nd145	2.46E-04	2.49E-04	2.52E-04	2.55E-04	2.59E-04	2.59E-04
gd155	2.23E-04	2.23E-04	2.23E-04	2.23E-04	2.23E-04	2.24E-04
sm152	1.86E-04	1.89E-04	1.92E-04	1.94E-04	1.97E-04	1.97E-04
mo 95	1.71E-04	1.73E-04	1.75E-04	1.77E-04	1.79E-04	1.79E-04
sm150	1.28E-04	1.29E-04	1.31E-04	1.33E-04	1.35E-04	1.35E-04
kr 83	1.05E-04	1.07E-04	1.08E-04	1.09E-04	1.10E-04	1.10E-04
cs135	9.89E-05	1.00E-04	1.01E-04	1.03E-04	1.04E-04	1.04E-04
cd113	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.03E-04	1.03E-04
eu153	7.71E-05	7.82E-05	7.93E-05	8.04E-05	8.15E-05	8.15E-05
ru101	7.69E-05	7.79E-05	7.89E-05	7.99E-05	8.08E-05	8.08E-05
pr141	7.36E-05	7.45E-05	7.55E-05	7.64E-05	7.73E-05	7.73E-05
la139	6.02E-05	6.10E-05	6.17E-05	6.25E-05	6.32E-05	6.32E-05
gd157	6.03E-05	6.04E-05	6.04E-05	6.05E-05	6.06E-05	6.06E-05
pd105	3.04E-05	3.08E-05	3.12E-05	3.17E-05	3.21E-05	3.21E-05
ag109	2.91E-05	2.96E-05	3.01E-05	3.06E-05	3.11E-05	3.11E-05
ba137	2.91E-05	2.94E-05	2.98E-05	3.02E-05	3.06E-05	3.06E-05
zr 93	2.37E-05	2.40E-05	2.43E-05	2.46E-05	2.49E-05	2.49E-05
i129	1.96E-05	1.99E-05	2.01E-05	2.04E-05	2.07E-05	2.07E-05
nd144	1.85E-05	1.88E-05	1.90E-05	1.92E-05	1.95E-05	1.95E-05
gd152	1.36E-05	1.39E-05	1.42E-05	1.45E-05	1.48E-05	1.48E-05
mo 97	1.37E-05	1.39E-05	1.42E-05	1.42E-05	1.44E-05	1.44E-05
sm151	1.26E-05	1.30E-05	1.30E-05	1.30E-05	1.30E-05	1.29E-05
pd108	7.06E-06	7.30E-06	7.32E-06	7.44E-06	7.55E-06	7.55E-06
zr 91	6.21E-06	6.31E-06	6.45E-06	6.55E-06	6.61E-06	6.61E-06
y 89	6.02E-06	6.09E-06	6.17E-06	6.24E-06	6.31E-06	6.31E-06
ru102	5.71E-06	5.78E-06	5.86E-06	5.93E-06	6.00E-06	6.00E-06
ce142	5.01E-06	5.07E-06	5.14E-06	5.20E-06	5.27E-06	5.27E-06
nd146	4.75E-06	4.82E-06	4.90E-06	5.02E-06	5.08E-06	5.08E-06
nd148	4.37E-06	4.43E-06	4.49E-06	4.55E-06	4.61E-06	4.61E-06
pd107	3.15E-06	3.20E-06	3.24E-06	3.28E-06	3.32E-06	3.32E-06
in115	5.57E-06	5.64E-06	5.66E-06	5.71E-06	5.76E-06	5.76E-06
ba138	5.46E-06	5.51E-06	5.55E-06	5.62E-06	5.66E-06	5.66E-06
ru 99	3.24E-06	3.33E-06	3.43E-06	3.53E-06	3.64E-06	3.64E-06

ce140	3.24E-06	3.28E-06	3.33E-06	3.37E-06	3.41E-06	3.41E-06
xe132	2.98E-06	3.01E-06	3.05E-06	3.09E-06	3.13E-06	3.13E-06
mo 98	2.00E-06	2.02E-06	2.05E-06	2.08E-06	2.10E-06	2.10E-06
mo100	1.95E-06	1.97E-06	2.00E-06	2.02E-06	2.05E-06	2.05E-06
xe134	1.92E-06	1.94E-06	1.97E-06	1.99E-06	2.02E-06	2.02E-06
zr 92	1.52E-06	1.54E-06	1.56E-06	1.58E-06	1.60E-06	1.60E-06
i127	1.43E-06	1.45E-06	1.47E-06	1.49E-06	1.51E-06	1.51E-06
ru104	1.31E-06	1.33E-06	1.35E-06	1.36E-06	1.38E-06	1.38E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 143

0 fraction of total absorption rate

power= .00mw, burnup= 18768.mwd, flux= 6.02E+07n/cm**2-sec

0	initial	******* d	******* d	******* d	******* d	******* d
zr 96	1.20E-06	1.22E-06	1.23E-06	1.25E-06	1.26E-06	1.26E-06
nd150	1.09E-06	1.11E-06	1.12E-06	1.14E-06	1.15E-06	1.15E-06
xe136	1.04E-06	1.05E-06	1.07E-06	1.08E-06	1.09E-06	1.09E-06
cd111	8.12E-07	8.24E-07	8.37E-07	8.49E-07	8.61E-07	8.61E-07
br 81	7.71E-07	7.81E-07	7.91E-07	8.01E-07	8.10E-07	8.10E-07
rb 85	7.39E-07	7.49E-07	7.58E-07	7.67E-07	7.76E-07	7.76E-07
zr 94	6.46E-07	6.54E-07	6.62E-07	6.70E-07	6.79E-07	6.79E-07
gd154	6.06E-07	6.22E-07	6.38E-07	6.55E-07	6.71E-07	6.71E-07
zr 90	5.93E-07	6.01E-07	6.08E-07	6.16E-07	6.23E-07	6.23E-07
sm154	5.11E-07	5.18E-07	5.25E-07	5.31E-07	5.38E-07	5.38E-07
te130	4.79E-07	4.85E-07	4.91E-07	4.98E-07	5.04E-07	5.04E-07
rb 87	4.26E-07	4.31E-07	4.36E-07	4.42E-07	4.47E-07	4.47E-07
ba135	3.24E-07	3.34E-07	3.44E-07	3.55E-07	3.65E-07	3.65E-07
pd106	3.08E-07	3.13E-07	3.17E-07	3.22E-07	3.26E-07	3.26E-07
se 77	3.10E-07	3.14E-07	3.18E-07	3.22E-07	3.26E-07	3.26E-07
gd156	2.91E-07	2.95E-07	3.00E-07	3.04E-07	3.09E-07	3.09E-07
kr 84	2.03E-07	2.05E-07	2.08E-07	2.11E-07	2.13E-07	2.13E-07
dy161	1.76E-07	1.79E-07	1.81E-07	1.84E-07	1.87E-07	1.87E-07
ru100	1.69E-07	1.73E-07	1.78E-07	1.82E-07	1.86E-07	1.86E-07
sb121	1.64E-07	1.66E-07	1.68E-07	1.71E-07	1.73E-07	1.73E-07
se 79	1.54E-07	1.56E-07	1.58E-07	1.60E-07	1.62E-07	1.62E-07
sb123	1.33E-07	1.34E-07	1.36E-07	1.38E-07	1.40E-07	1.40E-07
nd142	1.23E-07	1.26E-07	1.29E-07	1.32E-07	1.35E-07	1.35E-07
ba134	1.18E-07	1.21E-07	1.24E-07	1.27E-07	1.30E-07	1.30E-07
sm148	1.07E-07	1.10E-07	1.13E-07	1.15E-07	1.18E-07	1.18E-07
kr 86	1.13E-07	1.14E-07	1.15E-07	1.17E-07	1.18E-07	1.18E-07
te128	1.08E-07	1.10E-07	1.11E-07	1.13E-07	1.14E-07	1.14E-07
eu152	8.82E-08	1.08E-07	1.09E-07	1.10E-07	1.10E-07	8.96E-08
pd104	8.07E-08	8.28E-08	8.49E-08	8.70E-08	8.92E-08	8.92E-08
tb159	7.68E-08	7.80E-08	7.92E-08	8.04E-08	8.16E-08	8.16E-08
se 80	7.43E-08	7.53E-08	7.62E-08	7.71E-08	7.81E-08	7.81E-08
te125	7.33E-08	7.42E-08	7.52E-08	7.62E-08	7.72E-08	7.72E-08
gd158	6.10E-08	6.19E-08	6.28E-08	6.38E-08	6.47E-08	6.47E-08
cd112	5.58E-08	5.65E-08	5.74E-08	5.82E-08	5.90E-08	5.90E-08
nb 93	[illegible]	[illegible]	5.49E-08	[illegible]	[illegible]	[illegible]
dy164	3.95E-08	4.02E-08	4.08E-08	[illegible]	4.21E-08	4.21E-08
sn117	[illegible]	[illegible]	4.07E-08	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
cd114	[illegible]	[illegible]	3.45E-08	[illegible]	[illegible]	[illegible]
sn119	[illegible]	[illegible]	3.12E-08	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
sn115	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
br 79	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
pd110	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ag107	2.34E-08	2.42E-08	2.50E-08	2.58E-08	2.67E-08	2.67E-08

	eu155	2.60E-08	4.54E-08	4.54E-08	4.54E-08	4.55E-08	2.51E-08
	pm147	2.45E-08	6.54E-08	6.54E-08	6.54E-08	6.55E-08	2.30E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 144
0 fraction of total absorption rate
power= .00mw, burnup= 18768.mwd, flux= 6.02E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sr 88	2.07E-08	2.09E-08	2.12E-08	2.14E-08	2.17E-08	2.17E-08
xe129	1.55E-08	1.60E-08	1.65E-08	1.70E-08	1.75E-08	1.75E-08
se 82	1.42E-08	1.44E-08	1.45E-08	1.47E-08	1.49E-08	1.49E-08
xe130	1.35E-08	1.38E-08	1.41E-08	1.44E-08	1.48E-08	1.48E-08
ba136	1.23E-08	1.25E-08	1.28E-08	1.30E-08	1.33E-08	1.33E-08
sn126	1.25E-08	1.26E-08	1.27E-08	1.29E-08	1.30E-08	1.30E-08
se 78	1.11E-08	1.12E-08	1.14E-08	1.15E-08	1.17E-08	1.17E-08
dy163	9.76E-09	9.94E-09	1.01E-08	1.03E-08	1.05E-08	1.05E-08
sn124	9.68E-09	9.81E-09	9.94E-09	1.01E-08	1.02E-08	1.02E-08
kr 82	9.30E-09	9.48E-09	9.66E-09	9.84E-09	1.00E-08	1.00E-08
te126	8.81E-09	9.07E-09	9.34E-09	9.61E-09	9.88E-09	9.88E-09
as 75	6.53E-09	6.62E-09	6.70E-09	6.78E-09	6.87E-09	6.87E-09
eu154	5.99E-09	8.22E-09	8.34E-09	8.46E-09	8.58E-09	6.21E-09
in113	5.53E-09	5.60E-09	5.68E-09	5.75E-09	5.83E-09	5.83E-09
sn118	3.91E-09	3.96E-09	4.01E-09	4.07E-09	4.12E-09	4.12E-09
sr 90	3.61E-09	3.96E-09	3.96E-09	3.96E-09	3.96E-09	3.59E-09
sn122	3.35E-09	3.39E-09	3.43E-09	3.48E-09	3.52E-09	3.52E-09
cd116	3.29E-09	3.33E-09	3.37E-09	3.42E-09	3.46E-09	3.46E-09
sn120	2.47E-09	2.52E-09	2.53E-09	2.57E-09	2.60E-09	2.60E-09
ge 73	1.86E-09	1.89E-09	1.91E-09	1.94E-09	1.96E-09	1.96E-09
hf176	8.97E-10	9.16E-10	9.36E-10	9.55E-10	9.75E-10	9.75E-10
gd160	8.49E-10	8.69E-10	8.76E-10	8.90E-10	9.04E-10	9.04E-10
dy160	7.69E-10	7.91E-10	8.13E-10	8.35E-10	8.57E-10	8.57E-10
cs137	8.37E-10	9.13E-10	9.13E-10	9.13E-10	9.14E-10	8.33E-10
ge 76	6.37E-10	6.45E-10	6.53E-10	6.61E-10	6.69E-10	6.69E-10
xe128	4.65E-10	4.77E-10	4.89E-10	5.02E-10	5.14E-10	5.14E-10
sr 86	2.27E-10	2.33E-10	2.38E-10	2.44E-10	2.50E-10	2.50E-10
cs134	2.24E-10	8.01E-10	8.12E-10	8.22E-10	8.32E-10	2.17E-10
sn116	1.78E-10	1.82E-10	1.87E-10	1.92E-10	1.97E-10	1.97E-10
te124	1.78E-10	1.82E-10	1.85E-10	1.89E-10	1.92E-10	1.92E-10
kr 85	1.05E-10	1.33E-10	1.33E-10	1.33E-10	1.33E-10	1.03E-10
sr 87	9.19E-11	9.33E-11	9.48E-11	9.62E-11	9.77E-11	9.77E-11
nb 94	8.40E-11	8.63E-11	8.86E-11	9.10E-11	9.35E-11	9.35E-11
te122	7.44E-11	7.63E-11	7.83E-11	8.03E-11	8.23E-11	8.23E-11
se 76	6.52E-11	6.66E-11	6.81E-11	6.96E-11	7.11E-11	7.11E-11
er166	4.48E-11	4.57E-11	4.66E-11	4.75E-11	4.83E-11	4.83E-11
ge 74	3.73E-11	3.77E-11	3.82E-11	3.87E-11	3.92E-11	3.92E-11
ge 72	2.73E-11	2.77E-11	2.80E-11	2.84E-11	2.88E-11	2.88E-11
kr 80	2.25E-11	2.34E-11	2.44E-11	2.53E-11	2.63E-11	2.63E-11
er167	4.07E-12	4.20E-12	4.34E-12	4.47E-12	4.61E-12	4.61E-12
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
y 90	5.43E-12	5.77E-12	5.77E-12	5.77E-12	5.77E-12	5.41E-12
te128	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ru104	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
sn114	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
li 7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1 sas2h: [illegible] fission products page 145
0 fraction of total absorption rate
power= .00mw, burnup= 18768.mwd, flux= 6.02E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

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     sb126     1.43E-14  1.60E-14  1.62E-14  1.64E-14  1.65E-14  1.50E-14
     te127m    3.70E-16  2.19E-12  2.19E-12  2.19E-12  2.19E-12  2.08E-16
     nb 95     2.84E-17  3.62E-11  3.62E-11  3.62E-11  3.62E-11  1.06E-17
     zr 95     1.39E-17  3.90E-11  3.90E-11  3.90E-11  3.90E-11  5.18E-18
     cd109     1.97E-18  1.60E-17  1.67E-17  1.74E-17  1.81E-17  2.02E-18
     sn123     1.64E-18  2.57E-15  2.57E-15  2.57E-15  2.57E-15  1.01E-18
      y 91     2.95E-18  3.33E-11  3.33E-11  3.33E-11  3.33E-11  9.98E-19
     tb160     9.56E-20  4.63E-14  4.70E-14  4.78E-14  4.85E-14  4.10E-20
     sr 89     5.46E-20  7.10E-12  7.10E-12  7.10E-12  7.10E-12  1.37E-20
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                light elements         page  146
       power= 9.790E-04mw, burnup=1.8768E+04mwd, flux= 6.02E+07n/cm**2-sec
0                                         nuclide concentrations, gram atoms
                                          basis = single reactor assembly
              charge ******* d ******* d ******* d ******* d ******* d
       h  1   1.06E-03  1.08E-03  1.09E-03  1.10E-03  1.12E-03  1.12E-03
       h  2   3.17E-06  3.21E-06  3.25E-06  3.29E-06  3.33E-06  3.33E-06
       h  3   1.11E-11  1.38E-11  1.38E-11  1.39E-11  1.39E-11  1.11E-11
       h  4    .00E+00  1.37E-35  1.37E-35  1.38E-35  1.38E-35   .00E+00
      he  3   1.55E-08  1.56E-08  1.57E-08  1.58E-08  1.59E-08  1.59E-08
      he  4   1.76E-04  1.78E-04  1.81E-04  1.83E-04  1.85E-04  1.85E-04
      he  6    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
      ne 20   2.12E-05  2.14E-05  2.17E-05  2.20E-05  2.22E-05  2.22E-05
      ne 21   6.93E-09  7.10E-09  7.27E-09  7.45E-09  7.62E-09  7.62E-09
      ne 22   1.39E-07  1.41E-07  1.43E-07  1.45E-07  1.46E-07  1.46E-07
      ne 23   1.77E-30  1.77E-15  1.77E-15  1.77E-15  1.77E-15  1.77E-30
      na 22   3.07E-12  1.05E-11  1.05E-11  1.05E-11  1.05E-11  3.62E-12
      na 23   7.53E+03  7.53E+03  7.53E+03  7.53E+03  7.53E+03  7.53E+03
      na 24   6.42E-24  6.41E-09  6.42E-09  6.42E-09  6.42E-09  6.42E-24
      na 24m  1.05E-30  1.05E-15  1.05E-15  1.05E-15  1.06E-15  1.06E-30
      na 25   5.01E-39  5.13E-24  5.25E-24  5.38E-24  5.51E-24  5.51E-39
      mg 24   1.38E-01  1.40E-01  1.42E-01  1.43E-01  1.45E-01  1.45E-01
      mg 25   7.20E-07  7.37E-07  7.55E-07  7.73E-07  7.91E-07  7.91E-07
      mg 26   3.17E-06  3.21E-06  3.25E-06  3.29E-06  3.33E-06  3.33E-06
      mg 27   5.29E-28  5.28E-13  5.29E-13  5.29E-13  5.29E-13  5.29E-28
      mg 28    .00E+00  2.63E-25  2.63E-25  2.63E-25  2.63E-25   .00E+00
      al 27   4.99E+04  4.99E+04  4.99E+04  4.99E+04  4.99E+04  4.99E+04
      al 28   4.76E-26  4.75E-11  4.76E-11  4.76E-11  4.76E-11  4.76E-26
      al 29   4.05E-37  4.15E-22  4.25E-22  4.35E-22  4.46E-22  4.46E-37
      al 30    .00E+00  9.65E-32  1.00E-31  1.04E-31  1.08E-31   .00E+00
      si 28   4.03E-01  4.08E-01  4.13E-01  4.17E-01  4.22E-01  4.22E-01
      si 29   6.50E-06  6.66E-06  6.82E-06  6.98E-06  7.15E-06  7.15E-06
      si 30   1.12E-10  1.16E-10  1.20E-10  1.25E-10  1.29E-10  1.29E-10
      si 31   1.96E-38  2.03E-23  2.10E-23  2.18E-23  2.26E-23  2.26E-38
      si 32   8.16E-30  8.59E-30  8.93E-30  9.26E-30  9.61E-30  9.45E-30
    totals    5.75E+04  5.75E+04  5.75E+04  5.75E+04  5.75E+04  5.75E+04
0     flux              6.01E+07  6.02E+07  6.02E+07  6.02E+07  6.02E-08
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                [illegible]            page  147
       power= 9.790E-04mw, burnup=1.8768E+04mwd, [illegible] 6.0[illegible]/cm**2-[illegible]
0                                         nuclide concentrations, [illegible]
                                          basis = single reactor assembly
              charge ******* d ******* d ******* d ******* d ******* d
      he  4   2.89E+01  2.96E+01  3.03E+01  3.10E+01  [illegible]  3.16E+01
      rb[illegible]  1.3[illegible]  [illegible]  1.41E-01  1.5[illegible]  [illegible]  [illegible]
      [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]
      pb208   4.36E-04  4.46E-04  4.57E-04  4.6[illegible]  [illegible]  4.8[illegible]
      pb209   7.50E-10  7.6[illegible]  7.81E-10  7.9[illegible]  [illegible]  8.1[illegible]
      pb210   2.42E-04  2.45E-04  2.49E-04  2.53E-04  2.57E-04  2.57E-04
```

pb211	4.46E-11	4.51E-11	4.56E-11	4.62E-11	4.67E-11	4.68E-11
pb212	2.97E-11	3.05E-11	3.09E-11	3.13E-11	3.17E-11	3.11E-11
pb214	5.52E-10	5.61E-10	5.70E-10	5.78E-10	5.87E-10	5.87E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	2.19E-02	2.28E-02	2.37E-02	2.46E-02	2.56E-02	2.56E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.49E-07	1.51E-07	1.53E-07	1.56E-07	1.58E-07	1.58E-07
bi211	2.65E-12	2.67E-12	2.70E-12	2.74E-12	2.77E-12	2.77E-12
bi212	2.81E-12	2.89E-12	2.93E-12	2.97E-12	3.00E-12	2.95E-12
bi213	1.75E-10	1.79E-10	1.82E-10	1.86E-10	1.90E-10	1.90E-10
bi214	4.10E-10	4.17E-10	4.23E-10	4.29E-10	4.36E-10	4.36E-10
po210	4.09E-06	4.17E-06	4.24E-06	4.30E-06	4.36E-06	4.37E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	2.92E-17	2.95E-17	2.99E-17	3.02E-17	3.06E-17	3.06E-17
po212	1.48E-22	1.52E-22	1.54E-22	1.56E-22	1.58E-22	1.55E-22
po213	2.63E-19	2.69E-19	2.74E-19	2.80E-19	2.85E-19	2.85E-19
po214	5.64E-17	5.73E-17	5.82E-17	5.91E-17	6.00E-17	6.00E-17
po215	3.67E-17	3.70E-17	3.75E-17	3.79E-17	3.84E-17	3.84E-17
po216	1.12E-16	1.16E-16	1.17E-16	1.18E-16	1.20E-16	1.18E-16
po218	6.39E-11	6.49E-11	6.59E-11	6.69E-11	6.79E-11	6.79E-11
rn218	1.02E-43	1.08E-28	1.09E-28	1.11E-28	1.12E-28	1.08E-43
rn219	8.16E-14	8.24E-14	8.34E-14	8.44E-14	8.54E-14	8.55E-14
rn220	4.31E-14	4.43E-14	4.49E-14	4.54E-14	4.59E-14	4.52E-14
rn222	1.13E-07	1.15E-07	1.17E-07	1.19E-07	1.21E-07	1.21E-07
ra222	1.11E-40	1.17E-25	1.19E-25	1.20E-25	1.22E-25	1.17E-40
ra223	2.04E-08	2.06E-08	2.08E-08	2.11E-08	[illegible]	[illegible]
ra224	[illegible]	[illegible]	[illegible]	2.58E-10	[illegible]	[illegible]
ra225	8.19E-08	8.36E-08	8.53E-08	8.70E-08	8.87E-08	8.87E-08
ra226	1.73E-02	1.76E-02	1.79E-02	1.82E-02	1.84E-02	1.84E-02
ra228	8.25E-11	8.40E-11	8.54E-11	8.68E-11	8.82E-11	8.82E-11
ac225	5.53E-08	5.65E-08	5.76E-08	5.88E-08	5.99E-08	5.99E-08
ac227	1.41E-05	1.43E-05	1.45E-05	1.46E-05	1.48E-05	1.48E-05
ac228	1.01E-14	1.02E-14	1.04E-14	1.06E-14	1.08E-14	1.08E-14
th226	5.44E-39	5.71E-24	5.78E-24	5.86E-24	5.93E-24	5.70E-39
th227	3.29E-08	3.32E-08	3.36E-08	3.40E-08	3.44E-08	3.44E-08
th228	4.67E-08	4.81E-08	4.87E-08	4.93E-08	4.99E-08	4.90E-08
th229	1.59E-02	1.63E-02	1.66E-02	1.69E-02	1.72E-02	1.72E-02
th230	8.65E-01	8.78E-01	8.90E-01	9.03E-01	9.16E-01	9.16E-01
th231	2.75E-09	3.72E-09	3.73E-09	3.74E-09	3.75E-09	2.74E-09
th232	2.02E-01	2.05E-01	2.09E-01	2.12E-01	2.16E-01	2.16E-01
th233	4.50E-28	4.58E-13	4.66E-13	4.74E-13	4.82E-13	4.82E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.12E-02	2.15E-02	2.18E-02	2.20E-02	2.23E-02	2.23E-02
pa232	8.89E-26	9.00E-11	9.11E-11	9.22E-11	9.33E-11	9.33E-26

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 148

power= 9.790E-04mw, burnup=1.8768E+04mwd, flux= 6.02E+07n/cm**2-sec

0

nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.42E-06	1.42E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06
pa234m	[illegible]	[illegible]	[illegible]	1.81E-11	1.81E-11	[illegible]
pa234	[illegible]	[illegible]	[illegible]	[illegible]	8.07E-12	[illegible]
pa235	[illegible]	[illegible]	[illegible]	[illegible]	.00E+00	[illegible]
u230	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
u231	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
u232	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
u233	[illegible]	[illegible]	4.57E-01	[illegible]	4.69E-01	[illegible]
u234	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
u235	6.65E+02	6.65E+02	6.64E+02	6.64E+02	6.63E+02	6.63E+02

u236	1.88E+02	1.88E+02	1.89E+02	1.89E+02	1.89E+02	1.89E+02
u237	1.30E-12	8.03E-07	8.04E-07	8.05E-07	8.06E-07	1.29E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	7.49E-23	7.48E-08	7.49E-08	7.49E-08	7.49E-08	7.50E-23
u240	2.56E-35	2.80E-35	3.05E-35	3.32E-35	3.61E-35	3.61E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.88E-13	2.07E-12	2.07E-12	2.07E-12	2.07E-12	1.60E-13
np236m	4.92E-28	4.92E-13	4.92E-13	4.92E-13	4.92E-13	4.92E-28
np236	2.09E-06	2.11E-06	2.13E-06	2.15E-06	2.17E-06	2.17E-06
np237	4.10E+01	4.09E+01	4.09E+01	4.09E+01	4.09E+01	4.09E+01
np238	3.09E-14	3.63E-07	3.63E-07	3.63E-07	3.64E-07	3.10E-14
np239	1.63E-13	1.08E-05	1.08E-05	1.08E-05	1.08E-05	1.76E-13
np240m	2.18E-37	2.39E-37	2.60E-37	2.83E-37	3.08E-37	3.08E-37
np240	1.03E-38	5.35E-16	5.35E-16	5.36E-16	5.36E-16	1.19E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.14E-10	2.71E-10	2.72E-10	2.72E-10	2.72E-10	1.07E-10
pu237	5.59E-23	7.71E-14	7.73E-14	7.75E-14	7.77E-14	1.40E-23
pu238	5.34E-03	5.50E-03	5.50E-03	5.50E-03	5.50E-03	5.33E-03
pu239	3.01E+01	3.02E+01	3.03E+01	3.04E+01	3.04E+01	3.04E+01
pu240	5.11E-01	5.12E-01	5.12E-01	5.13E-01	5.13E-01	5.13E-01
pu241	4.21E-05	5.05E-05	5.06E-05	5.06E-05	5.07E-05	4.18E-05
pu242	3.55E-05	3.60E-05	3.66E-05	3.71E-05	3.77E-05	3.77E-05
pu243	1.94E-29	1.84E-14	1.87E-14	1.90E-14	1.93E-14	2.08E-29
pu244	1.27E-24	1.39E-24	1.52E-24	1.65E-24	1.80E-24	1.80E-24
pu245	.00E+00	1.39E-35	1.52E-35	1.65E-35	1.80E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.01E-34	1.01E-19	1.01E-19	1.01E-19	1.01E-19	1.01E-34
am240	4.62E-32	4.61E-17	4.62E-17	4.64E-17	4.65E-17	4.65E-32
am241	1.49E-03	1.49E-03	1.50E-03	1.50E-03	1.50E-03	1.50E-03
am242m	1.67E-07	1.70E-07	1.70E-07	1.71E-07	1.71E-07	1.68E-07
am242	2.15E-12	1.36E-11	1.36E-11	1.36E-11	1.37E-11	2.16E-12
am243	1.87E-07	1.90E-07	1.94E-07	1.97E-07	2.01E-07	2.01E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	3.43E-31	3.49E-16	3.56E-16	3.62E-16	3.69E-16	3.69E-31
am245	1.06E-39	2.74E-36	2.99E-36	3.25E-36	3.54E-36	1.13E-39
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	5.06E-35	1.94E-22	1.95E-22	1.96E-22	1.96E-22	7.47E-36
cm242	4.43E-10	2.74E-09	2.75E-09	2.76E-09	2.76E-09	4.43E-10
cm243	1.39E-14	1.53E-14	1.53E-14	1.54E-14	1.54E-14	1.40E-14
cm244	4.67E-12	5.48E-12	5.59E-12	5.69E-12	5.80E-12	4.97E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 149
power= 9.790E-04mw, burnup=1.8768E+04mwd, flux= 6.02E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge *******	d *******	d *******	d *******	d *******	d
cm245	1.17E-14	1.19E-14	1.22E-14	1.24E-14	1.26E-14	1.26E-14
cm246	9.32E-17	9.50E-17	9.69E-17	9.88E-17	1.01E-16	1.01E-16
cm247	3.47E-20	3.62E-20	3.77E-20	3.93E-20	4.09E-20	4.09E-20
cm248	9.79E-23	1.05E-22	1.12E-22	1.19E-22	1.26E-22	1.26E-22
cm249	.00E+00	7.[illegible]E-34	8.52E-34	9.[illegible]E-34	[illegible]E-34	.00E+00
cm250	4.59E-38	4.9[illegible]E-38	5.31E-38	5.7[illegible]E-38	[illegible]E-38	6.10E-38
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
[illegible]	3.75E+04	3.75E+04	3.75E+04	3.75E+04	3.75E+04	3.75E+04
flux		6.01E+07	6.02E+07	6.02E+07	6.02E+07	6.02E+07

0 1q array has 25 entries.
0 2q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.

```
0    54q array has     12 entries.
1library information...

          cross-section data taken from position number 17 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ******************************************************************************
          *                                                                            *
          *             prelim lwr origen-s binary working library--id = 1143         *
          *          made from modified card-image origen-s libraries of scale 4.2    *
          *       data from the light element, actinide, and fission product libraries *
          *         decay data, including gamma and total energy, are from endf/b-vi  *
          *                                                                            *
          *       neutron flux spectrum factors and cross sections were produced from *
          *      the "presas2" case updating all nuclides on the scale "burnup" library *
          *                                                                            *
          *                    fission product yields are from endf/b-v                *
          *                                                                            *
          *                photon libraries use an 18-energy-group structure           *
          *               the photon data are from the master photon data base,        *
          *                produced to include bremsstrahlung from uo2 matrix          *
          *                                                                            *
          *         see information above this box (if present) for later updates     *
          *                                                                            *
          ******************************************************************************
          *                                                                            *
0         ******************************************************************************
0                   .other identification and sizes of library.
0                    data set name:  ft33f001
0                8/29/1996    date library was produced
0                     1697    total number of nuclides in library
                       689    number of light-element nuclides
                       129    number of actinide nuclides
                       879    number of fission product nuclides
0                     [illegible]    number of [illegible] off-diagonal matrix elements
0         ******************************************************************************
1    sas2h: far-field [illegible] based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ [illegible] uo2                                   page  150
        [illegible], burnup [illegible], flux [illegible]E+07n/cm**2-[illegible]
0                                         [illegible]
0    (note, k-infinity, [illegible] and [illegible] are correct, [illegible], if [illegible] weighted [illegible] sections are applied.)
0                   [illegible]        [illegible]        [illegible]        [illegible]        [illegible]        [illegible]
     [illegible]    [illegible]        [illegible]        [illegible]        [illegible]        [illegible]        [illegible]
     absorptions    [illegible]        [illegible]        [illegible]        [illegible]        [illegible]        [illegible]
     k infinity     [illegible]        [illegible]        [illegible]        [illegible]        [illegible]        [illegible]
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions    1.008513E+06   1.008226E+06   1.007939E+06   1.007650E+06   1.007360E+06   1.007356E+06
```

non-actinide
abs. fracs. 1.674420E-02 1.682734E-02 1.690948E-02 1.699156E-02 1.707327E-02 1.707256E-02

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 151

0 fraction of total absorption rate

power= .00mw, burnup= 19662.mwd, flux= 6.03E+07n/cm**2-sec

0	initial	******* d	******* d	******* d	******* d	******* d
sm149	5.44E-03	5.44E-03	5.44E-03	5.44E-03	5.44E-03	5.44E-03
nd143	1.81E-03	1.83E-03	1.85E-03	1.88E-03	1.90E-03	1.90E-03
eu151	1.72E-03	1.74E-03	1.75E-03	1.76E-03	1.77E-03	1.77E-03
rh103	8.82E-04	8.93E-04	9.04E-04	9.14E-04	9.25E-04	9.25E-04
xe131	5.90E-04	5.97E-04	6.04E-04	6.11E-04	6.18E-04	6.18E-04
cs133	4.58E-04	4.64E-04	4.70E-04	4.75E-04	4.81E-04	4.81E-04
sm147	3.36E-04	3.40E-04	3.44E-04	3.48E-04	3.52E-04	3.52E-04
tc 99	3.14E-04	3.17E-04	3.21E-04	3.24E-04	3.27E-04	3.27E-04
nd145	2.59E-04	2.62E-04	2.65E-04	2.68E-04	2.71E-04	2.71E-04
gd155	2.24E-04	2.24E-04	2.24E-04	2.24E-04	2.24E-04	2.24E-04
sm152	1.97E-04	2.00E-04	2.03E-04	2.06E-04	2.08E-04	2.08E-04
mo 95	1.79E-04	1.82E-04	1.84E-04	1.86E-04	1.88E-04	1.88E-04
sm150	1.35E-04	1.36E-04	1.38E-04	1.40E-04	1.42E-04	1.42E-04
kr 83	1.10E-04	1.12E-04	1.13E-04	1.14E-04	1.16E-04	1.16E-04
cs135	1.04E-04	1.05E-04	1.06E-04	1.08E-04	1.09E-04	1.09E-04
cd113	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04
eu153	8.14E-05	8.25E-05	8.36E-05	8.47E-05	8.58E-05	8.58E-05
ru101	8.08E-05	8.18E-05	8.28E-05	8.37E-05	8.47E-05	8.47E-05
pr141	7.73E-05	7.83E-05	7.92E-05	8.01E-05	8.11E-05	8.11E-05
la139	6.33E-05	6.40E-05	6.48E-05	6.55E-05	6.63E-05	6.63E-05
gd157	6.06E-05	[illegible]	6.07E-05	6.07E-05	[illegible]	6.08E-05
pd105	3.21E-05	3.25E-05	3.29E-05	3.33E-05	[illegible]	[illegible]
ag109	3.11E-05	3.16E-05	3.21E-05	3.26E-05	3.31E-05	3.31E-05
ba137	3.06E-05	3.09E-05	3.13E-05	3.17E-05	3.21E-05	3.21E-05
zr 93	2.49E-05	2.52E-05	2.55E-05	2.58E-05	2.61E-05	2.61E-05
i129	2.07E-05	2.09E-05	2.12E-05	2.14E-05	2.17E-05	2.17E-05
nd144	1.95E-05	1.97E-05	2.00E-05	2.02E-05	2.05E-05	2.05E-05
gd152	1.48E-05	1.51E-05	1.54E-05	1.57E-05	1.60E-05	1.60E-05
mo 97	1.44E-05	1.45E-05	1.47E-05	1.49E-05	1.51E-05	1.51E-05
sm151	1.26E-05	1.30E-05	1.30E-05	1.31E-05	1.31E-05	1.26E-05
pd108	7.55E-06	7.67E-06	7.78E-06	7.90E-06	8.02E-06	8.02E-06
zr 91	6.61E-06	6.69E-06	6.77E-06	6.85E-06	6.93E-06	6.93E-06
y 89	6.32E-06	6.40E-06	6.47E-06	6.55E-06	6.62E-06	6.62E-06
ru102	6.00E-06	6.08E-06	6.15E-06	6.22E-06	6.30E-06	6.30E-06
ce142	5.27E-06	5.33E-06	5.39E-06	5.46E-06	5.52E-06	5.52E-06
nd148	5.08E-06	5.14E-06	5.20E-06	5.26E-06	5.32E-06	5.32E-06
nd146	4.28E-06	4.33E-06	4.38E-06	4.43E-06	4.48E-06	4.48E-06
ru 99	3.64E-06	3.74E-06	3.84E-06	3.95E-06	4.05E-06	4.05E-06
pd107	3.81E-06	3.87E-06	3.93E-06	3.98E-06	4.04E-06	4.04E-06
in115	3.76E-06	3.80E-06	3.85E-06	3.90E-06	3.94E-06	3.94E-06
ba138	3.64E-06	[illegible]	3.73E-06	3.77E-06	[illegible]	[illegible]
ce140	3.41E-06	[illegible]	[illegible]	3.53E-06	[illegible]	3.57E-06
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	2.02E-06	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

fraction of total absorption rate

power= [illegible], burnup= 19662.mwd, flux= [illegible]

0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.26E-06	1.28E-06	1.29E-06	1.31E-06	1.32E-06	1.32E-06
nd150	1.15E-06	1.16E-06	1.18E-06	1.19E-06	1.21E-06	1.21E-06
xe136	1.09E-06	1.11E-06	1.12E-06	1.13E-06	1.15E-06	1.15E-06
cd111	8.62E-07	8.74E-07	8.86E-07	8.99E-07	9.11E-07	9.11E-07
br 81	8.10E-07	8.20E-07	8.30E-07	8.40E-07	8.49E-07	8.49E-07
rb 85	7.76E-07	7.86E-07	7.95E-07	8.04E-07	8.13E-07	8.13E-07
gd154	6.72E-07	6.88E-07	7.06E-07	7.23E-07	7.41E-07	7.41E-07
zr 94	6.78E-07	6.87E-07	6.95E-07	7.03E-07	7.11E-07	7.11E-07
zr 90	6.23E-07	6.31E-07	6.38E-07	6.45E-07	6.53E-07	6.53E-07
sm154	5.38E-07	5.45E-07	5.52E-07	5.59E-07	5.66E-07	5.66E-07
te130	5.04E-07	5.10E-07	5.16E-07	5.22E-07	5.28E-07	5.28E-07
rb 87	4.47E-07	4.52E-07	4.57E-07	4.63E-07	4.68E-07	4.68E-07
ba135	3.65E-07	3.76E-07	3.87E-07	3.97E-07	4.08E-07	4.08E-07
pd106	3.26E-07	3.31E-07	3.35E-07	3.40E-07	3.44E-07	3.44E-07
se 77	3.26E-07	3.30E-07	3.34E-07	3.38E-07	3.42E-07	3.42E-07
gd156	3.08E-07	3.13E-07	3.17E-07	3.22E-07	3.26E-07	3.26E-07
kr 84	2.13E-07	2.16E-07	2.18E-07	2.21E-07	2.23E-07	2.23E-07
ru100	1.86E-07	1.91E-07	1.95E-07	2.00E-07	2.04E-07	2.04E-07
dy161	1.87E-07	1.90E-07	1.93E-07	1.96E-07	1.99E-07	1.99E-07
sb121	1.73E-07	1.75E-07	1.77E-07	1.79E-07	1.81E-07	1.81E-07
se 79	1.62E-07	1.64E-07	1.65E-07	1.67E-07	1.69E-07	1.69E-07
nd142	1.36E-07	1.39E-07	1.42E-07	1.46E-07	1.49E-07	1.49E-07
sb123	1.40E-07	1.41E-07	1.43E-07	1.45E-07	1.47E-07	1.47E-07
ba134	1.30E-07	1.33E-07	1.36E-07	1.39E-07	1.43E-07	1.43E-07
sm148	1.18E-07	1.21E-07	1.24E-07	1.27E-07	1.30E-07	1.30E-07
kr 86	1.18E-07	1.20E-07	1.21E-07	1.22E-07	1.24E-07	1.24E-07
te128	[illegible]	1.15E-07	1.17E-07	[illegible]	1.20E-07	[illegible]
pd104	[illegible]	9.13E-08	9.35E-08	9.58E-08	9.80E-08	9.80E-08
eu152	8.97E-08	1.11E-07	1.12E-07	1.13E-07	1.13E-07	9.09E-08
tb159	8.16E-08	8.28E-08	8.40E-08	8.53E-08	8.65E-08	8.65E-08
se 80	7.81E-08	7.90E-08	8.00E-08	8.09E-08	8.19E-08	8.19E-08
te125	7.72E-08	7.82E-08	7.92E-08	8.02E-08	8.12E-08	8.12E-08
gd158	6.47E-08	6.56E-08	6.66E-08	6.75E-08	6.85E-08	6.85E-08
nb 93	5.82E-08	5.98E-08	6.15E-08	6.33E-08	6.50E-08	6.50E-08
cd112	5.90E-08	5.98E-08	6.06E-08	6.14E-08	6.22E-08	6.22E-08
dy162	4.18E-08	4.26E-08	4.33E-08	4.41E-08	4.48E-08	4.48E-08
dy164	4.21E-08	4.28E-08	4.35E-08	4.41E-08	4.48E-08	4.48E-08
sn117	4.18E-08	4.24E-08	4.29E-08	4.35E-08	4.40E-08	4.40E-08
li 6	4.10E-08	4.14E-08	4.19E-08	4.23E-08	4.28E-08	4.28E-08
cd114	3.54E-08	3.59E-08	3.64E-08	3.69E-08	3.73E-08	3.73E-08
cd110	3.01E-08	3.10E-08	3.19E-08	3.28E-08	3.37E-08	3.37E-08
sn119	3.20E-08	3.24E-08	3.28E-08	3.32E-08	3.36E-08	3.36E-08
mo 96	2.98E-08	3.05E-08	3.12E-08	3.20E-08	3.27E-08	3.27E-08
br 79	2.91E-08	2.99E-08	3.07E-08	3.16E-08	3.25E-08	3.25E-08
sn115	2.93E-08	2.96E-08	3.00E-08	3.04E-08	3.07E-08	3.07E-08
pd110	2.87E-08	2.92E-08	2.96E-08	3.00E-08	3.05E-08	3.05E-08
ag107	2.67E-08	2.76E-08	2.84E-08	2.93E-08	3.02E-08	3.02E-08
eu155	2.51E-08	4.55E-08	4.55E-08	4.56E-08	4.56E-08	2.43E-08
sr 88	[illegible]	2.20E-08	2.22E-08	2.25E-08	2.27E-08	2.27E-08

1 [illegible]

fraction of total absorption rate

power= [illegible] burnup= [illegible] flux= [illegible]07n/cm**2 [illegible]

0 initial ******* d ******* d ******* d ******* d ******* d

pm147	[illegible]	[illegible]	6.59E-08	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
xe130	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
se 82	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ba136	1.33E-08	1.36E-08	1.38E-08	1.41E-08	1.44E-08	1.44E-08

sn126	1.30E-08	1.32E-08	1.33E-08	1.35E-08	1.36E-08	1.36E-08
se 78	1.17E-08	1.18E-08	1.20E-08	1.21E-08	1.22E-08	1.22E-08
dy163	1.05E-08	1.07E-08	1.09E-08	1.10E-08	1.12E-08	1.12E-08
te126	9.88E-09	1.02E-08	1.04E-08	1.07E-08	1.10E-08	1.10E-08
kr 82	1.00E-08	1.02E-08	1.04E-08	1.06E-08	1.08E-08	1.08E-08
sn124	1.02E-08	1.03E-08	1.05E-08	1.06E-08	1.07E-08	1.07E-08
as 75	6.87E-09	6.95E-09	7.03E-09	7.12E-09	7.20E-09	7.20E-09
eu154	6.21E-09	8.70E-09	8.81E-09	8.93E-09	9.05E-09	6.42E-09
in113	5.83E-09	5.90E-09	5.98E-09	6.05E-09	6.13E-09	6.13E-09
sn118	4.12E-09	4.17E-09	4.22E-09	4.27E-09	4.33E-09	4.33E-09
sn122	3.52E-09	3.57E-09	3.61E-09	3.66E-09	3.70E-09	3.70E-09
cd116	3.46E-09	3.50E-09	3.55E-09	3.59E-09	3.63E-09	3.63E-09
sr 90	3.59E-09	3.96E-09	3.96E-09	3.96E-09	3.96E-09	3.56E-09
sn120	2.60E-09	2.63E-09	2.66E-09	2.70E-09	2.73E-09	2.73E-09
ge 73	1.96E-09	1.99E-09	2.01E-09	2.03E-09	2.06E-09	2.06E-09
ho165	9.75E-10	9.95E-10	1.02E-09	1.04E-09	1.06E-09	1.06E-09
gd160	9.04E-10	9.18E-10	9.32E-10	9.46E-10	9.60E-10	9.60E-10
dy160	8.57E-10	8.80E-10	9.03E-10	9.26E-10	9.50E-10	9.50E-10
cs137	8.33E-10	9.14E-10	9.14E-10	9.14E-10	9.14E-10	8.29E-10
ge 76	6.69E-10	6.77E-10	6.85E-10	6.93E-10	7.01E-10	7.01E-10
xe128	5.14E-10	5.27E-10	5.40E-10	5.53E-10	5.66E-10	5.66E-10
sr 86	2.50E-10	2.55E-10	2.61E-10	2.67E-10	2.73E-10	2.73E-10
sn116	1.96E-10	2.01E-10	2.06E-10	2.11E-10	2.16E-10	2.16E-10
cs134	2.17E-10	8.42E-10	8.53E-10	8.63E-10	8.74E-10	2.09E-10
te124	1.92E-10	1.96E-10	2.00E-10	2.03E-10	2.07E-10	2.07E-10
nb 94	9.35E-11	9.60E-11	9.85E-11	1.01E-10	1.04E-10	1.04E-10
sr 87	9.77E-11	9.91E-11	1.01E-10	1.02E-10	1.04E-10	1.04E-10
kr 85	1.03E-10	1.33E-10	1.34E-10	1.34E-10	1.34E-10	1.01E-10
te122	8.23E-11	8.43E-11	8.64E-11	8.85E-11	9.06E-11	9.06E-11
se 76	7.12E-11	7.27E-11	7.42E-11	7.58E-11	7.74E-11	7.74E-11
er166	4.84E-11	4.93E-11	5.02E-11	5.11E-11	5.20E-11	5.20E-11
ge 74	3.92E-11	3.97E-11	4.02E-11	4.07E-11	4.11E-11	4.11E-11
kr 80	2.63E-11	2.74E-11	2.84E-11	2.95E-11	3.06E-11	3.06E-11
ge 72	2.83E-11	2.92E-11	2.95E-11	2.99E-11	3.03E-11	3.03E-11
er167	4.61E-12	4.75E-12	4.89E-12	5.03E-12	5.18E-12	5.18E-12
te123	3.32E-12	3.43E-12	3.55E-12	3.67E-12	3.80E-12	3.80E-12
y 90	3.41E-12	3.77E-12	3.77E-12	3.77E-12	3.77E-12	3.39E-12
ce144	4.05E-12	1.42E-10	1.42E-10	1.42E-10	1.42E-10	3.23E-12
cd108	1.71E-12	1.79E-12	1.87E-12	1.95E-12	2.03E-12	2.03E-12
sb125	1.57E-12	4.32E-12	4.33E-12	4.33E-12	4.33E-12	1.47E-12
ru106	6.38E-13	9.77E-12	9.78E-12	9.79E-12	9.80E-12	5.39E-13
be 9	8.43E-14	8.53E-14	8.63E-14	8.73E-14	8.84E-14	8.84E-14
sn114	5.14E-14	5.26E-14	5.39E-14	5.53E-14	5.66E-14	5.66E-14
li 7	3.45E-14	3.49E-14	3.53E-14	3.57E-14	3.61E-14	3.61E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 154

0 fraction of total absorption rate

power= .00mw, burnup= 19662.mwd, flux= 6.03E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.50E-14	1.67E-14	1.69E-14	1.70E-14	1.70E-14	1.56E-14
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
cd109	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1 [illegible]

power= 9.790E-04mw, burnup=1.9662E+04mwd, flux= 6.03E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	1.12E-03	1.13E-03	1.14E-03	1.16E-03	1.17E-03	1.17E-03
h 2	3.33E-06	3.37E-06	3.41E-06	3.45E-06	3.50E-06	3.50E-06
h 3	1.11E-11	1.40E-11	1.40E-11	1.41E-11	1.41E-11	1.11E-11
h 4	.00E+00	1.39E-35	1.39E-35	1.40E-35	1.40E-35	.00E+00
he 3	1.59E-08	1.60E-08	1.61E-08	1.62E-08	1.63E-08	1.64E-08
he 4	1.85E-04	1.87E-04	1.90E-04	1.92E-04	1.94E-04	1.94E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.22E-05	2.25E-05	2.28E-05	2.30E-05	2.33E-05	2.33E-05
ne 21	7.62E-09	7.80E-09	7.98E-09	8.16E-09	8.34E-09	8.34E-09
ne 22	1.46E-07	1.48E-07	1.50E-07	1.52E-07	1.53E-07	1.54E-07
ne 23	1.77E-30	1.77E-15	1.77E-15	1.78E-15	1.78E-15	1.78E-30
na 22	3.62E-12	1.05E-11	1.05E-11	1.05E-11	1.05E-11	3.39E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	6.42E-24	6.42E-09	6.42E-09	6.43E-09	6.43E-09	6.43E-24
na 24m	1.06E-30	1.06E-15	1.06E-15	1.06E-15	1.06E-15	1.06E-30
na 25	5.51E-39	5.63E-24	5.76E-24	5.90E-24	6.03E-24	6.03E-39
mg 24	1.45E-01	1.47E-01	1.48E-01	1.50E-01	1.52E-01	1.52E-01
mg 25	7.91E-07	8.09E-07	8.27E-07	8.46E-07	8.65E-07	8.65E-07
mg 26	3.33E-06	3.37E-06	3.41E-06	3.45E-06	3.49E-06	3.49E-06
mg 27	5.29E-28	5.29E-13	5.29E-13	5.29E-13	5.30E-13	5.30E-28
mg 28	.00E+00	2.63E-25	2.64E-25	2.64E-25	2.64E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	4.76E-26	4.76E-11	4.76E-11	4.76E-11	4.77E-11	4.77E-26
al 29	4.46E-37	4.56E-22	4.67E-22	4.78E-22	4.89E-22	4.89E-37
al 30	.00E+00	1.11E-31	1.15E-31	1.19E-31	1.24E-31	.00E+00
si 28	4.22E-01	4.27E-01	4.32E-01	4.37E-01	4.42E-01	4.42E-01
si 29	7.15E-06	7.31E-06	7.48E-06	7.65E-06	7.83E-06	7.83E-06
si 30	1.29E-10	1.34E-10	1.38E-10	1.43E-10	1.48E-10	1.48E-10
si 31	2.26E-38	2.34E-23	2.43E-23	2.51E-23	2.60E-23	2.60E-38
si 32	9.45E-30	9.95E-30	1.03E-29	1.07E-29	1.11E-29	1.09E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		6.02E+07	6.02E+07	6.03E+07	6.03E+07	6.03E-08

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% us2 actinides page 156
power= 9.799E-04mw, burnup=1.9662E+04mwd, flux= 6.03E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	3.16E+01	3.23E+01	3.30E+01	3.37E+01	3.44E+01	3.44E+01
pb206	1.57E-01	1.63E-01	1.68E-01	1.73E-01	1.78E-01	1.78E-01
pb207	1.04E-02	1.07E-02	1.10E-02	1.13E-02	1.16E-02	1.16E-02
pb208	4.80E-04	4.91E-04	5.03E-04	5.15E-04	5.26E-04	5.26E-04
pb209	8.12E-10	8.27E-10	8.43E-10	8.58E-10	8.73E-10	8.73E-10
pb210	2.57E-04	2.61E-04	2.64E-04	2.68E-04	2.72E-04	2.72E-04
pb211	4.69E-11	4.72E-11	4.77E-11	4.83E-11	4.88E-11	4.89E-11
pb212	3.11E-11	3.20E-11	3.24E-11	3.28E-11	3.31E-11	3.25E-11
pb214	5.87E-10	5.9 E-10	6.04E-10	6.13E-10	6.21E-10	6.21E-10
bi208	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
bi209	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
bi210m	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
bi210	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
bi211	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
bi212	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
bi213	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
bi214	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
po210	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

po211	3.06E-17	3.09E-17	3.13E-17	3.16E-17	3.20E-17	3.20E-17
po212	1.55E-22	1.60E-22	1.61E-22	1.63E-22	1.65E-22	1.62E-22
po213	2.85E-19	2.90E-19	2.96E-19	3.01E-19	3.07E-19	3.07E-19
po214	6.00E-17	6.08E-17	6.17E-17	6.26E-17	6.34E-17	6.35E-17
po215	3.84E-17	3.88E-17	3.92E-17	3.97E-17	4.01E-17	4.02E-17
po216	1.18E-16	1.21E-16	1.23E-16	1.24E-16	1.25E-16	1.23E-16
po218	6.79E-11	6.89E-11	6.99E-11	7.09E-11	7.19E-11	7.19E-11
rn218	1.08E-43	1.13E-28	1.15E-28	1.16E-28	1.17E-28	1.12E-43
rn219	8.55E-14	8.63E-14	8.73E-14	8.82E-14	8.92E-14	8.94E-14
rn220	4.52E-14	4.65E-14	4.70E-14	4.76E-14	4.81E-14	4.72E-14
rn222	1.21E-07	1.22E-07	1.24E-07	1.26E-07	1.28E-07	1.28E-07
ra222	1.17E-40	1.23E-25	1.24E-25	1.26E-25	1.27E-25	1.22E-40
ra223	2.13E-08	2.15E-08	2.18E-08	2.20E-08	2.22E-08	2.23E-08
ra224	2.57E-10	2.64E-10	2.67E-10	2.71E-10	2.74E-10	2.68E-10
ra225	8.87E-08	9.04E-08	9.20E-08	9.37E-08	9.54E-08	9.54E-08
ra226	1.84E-02	1.87E-02	1.90E-02	1.92E-02	1.95E-02	1.95E-02
ra228	8.82E-11	8.97E-11	9.11E-11	9.25E-11	9.40E-11	9.40E-11
ac225	5.99E-08	6.10E-08	6.22E-08	6.33E-08	6.44E-08	6.45E-08
ac227	1.48E-05	1.50E-05	1.51E-05	1.53E-05	1.55E-05	1.55E-05
ac228	1.08E-14	1.09E-14	1.11E-14	1.13E-14	1.15E-14	1.15E-14
th226	5.70E-39	6.00E-24	6.07E-24	6.14E-24	6.21E-24	5.96E-39
th227	3.44E-08	3.48E-08	3.52E-08	3.55E-08	3.59E-08	3.60E-08
th228	4.90E-08	5.05E-08	5.11E-08	5.16E-08	5.22E-08	5.12E-08
th229	1.72E-02	1.76E-02	1.79E-02	1.82E-02	1.86E-02	1.86E-02
th230	9.16E-01	9.28E-01	9.41E-01	9.53E-01	9.65E-01	9.65E-01
th231	2.74E-09	3.77E-09	3.78E-09	3.79E-09	3.80E-09	2.73E-09
th232	2.16E-01	2.19E-01	2.23E-01	2.26E-01	2.30E-01	2.30E-01
th233	4.82E-28	4.90E-13	4.98E-13	5.06E-13	5.14E-13	5.14E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.23E-02	2.25E-02	2.28E-02	2.30E-02	2.33E-02	2.33E-02
pa232	9.33E-26	9.44E-11	9.55E-11	9.66E-11	9.77E-11	9.77E-26

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 157

power= 9.790E-04mw, burnup=1.9662E+04mwd, flux= 6.05E+07n/cm**2-sec

0

nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.41E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	5.53E-36	5.81E-21	5.88E-21	5.95E-21	6.02E-21	5.78E-36
u231	8.66E-32	8.77E-17	8.89E-17	9.01E-17	9.13E-17	9.13E-32
u232	1.75E-06	1.84E-06	1.86E-06	1.88E-06	1.90E-06	1.83E-06
u233	4.69E-01	4.76E-01	4.82E-01	4.88E-01	4.95E-01	4.95E-01
u234	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01
u235	6.63E+02	6.63E+02	6.62E+02	6.61E+02	6.61E+02	6.61E+02
u236	1.89E+02	1.89E+02	1.89E+02	1.90E+02	1.90E+02	1.90E+02
u237	1.29E-12	8.06E-07	8.08E-07	8.09E-07	8.10E-07	1.28E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	.00E+00	.00E+00	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
np240m	3.06E-37	3.34E-37	3.62E-37	3.91E-37	4.22E-37	4.23E-37

np240	1.19E-38	5.36E-16	5.37E-16	5.37E-16	5.38E-16	1.37E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.07E-10	2.72E-10	2.72E-10	2.72E-10	2.72E-10	1.02E-10
pu237	1.40E-23	7.78E-14	7.80E-14	7.82E-14	7.84E-14	3.41E-24
pu238	5.33E-03	5.50E-03	5.50E-03	5.50E-03	5.50E-03	5.32E-03
pu239	3.04E+01	3.05E+01	3.06E+01	3.06E+01	3.07E+01	3.07E+01
pu240	5.13E-01	5.14E-01	5.15E-01	5.15E-01	5.16E-01	5.16E-01
pu241	4.18E-05	5.08E-05	5.09E-05	5.10E-05	5.11E-05	4.16E-05
pu242	3.77E-05	3.83E-05	3.88E-05	3.94E-05	4.00E-05	4.00E-05
pu243	2.08E-29	1.96E-14	1.99E-14	2.02E-14	2.05E-14	2.22E-29
pu244	1.80E-24	1.95E-24	2.11E-24	2.28E-24	2.46E-24	2.47E-24
pu245	.00E+00	1.95E-35	2.11E-35	2.29E-35	2.47E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.02E-34	1.01E-19	1.02E-19	1.02E-19	1.02E-19	1.02E-34
am240	4.65E-32	4.64E-17	4.66E-17	4.67E-17	4.68E-17	4.68E-32
am241	1.50E-03	1.50E-03	1.50E-03	1.51E-03	1.51E-03	1.51E-03
am242m	1.68E-07	1.71E-07	1.71E-07	1.72E-07	1.72E-07	1.69E-07
am242	2.16E-12	1.37E-11	1.37E-11	1.38E-11	1.38E-11	2.18E-12
am243	2.01E-07	2.04E-07	2.08E-07	2.11E-07	2.15E-07	2.15E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	3.69E-31	3.75E-16	3.82E-16	3.89E-16	3.96E-16	3.96E-31
am245	1.13E-39	3.84E-36	4.16E-36	4.50E-36	4.85E-36	1.16E-39
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	7.47E-36	1.96E-22	1.97E-22	1.97E-22	1.98E-22	1.10E-36
cm242	4.43E-10	2.76E-09	2.77E-09	2.78E-09	2.78E-09	4.44E-10
cm243	1.40E-14	1.54E-14	1.54E-14	1.55E-14	1.55E-14	1.40E-14
cm244	4.97E-12	5.90E-12	6.00E-12	6.11E-12	6.22E-12	5.28E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 158

power= 9.790E-04mw, burnup=1.9662E+04mwd, flux= 6.03E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
cm245	1.26E-14	1.28E-14	1.31E-14	1.33E-14	1.36E-14	1.36E-14
cm246	1.01E-16	1.03E-16	1.05E-16	1.07E-16	1.09E-16	1.09E-16
cm247	4.09E-20	4.26E-20	4.43E-20	4.60E-20	4.77E-20	4.77E-20
cm248	1.26E-22	1.34E-22	1.42E-22	1.51E-22	1.60E-22	1.60E-22
cm249	.00E+00	1.03E-33	1.09E-33	1.15E-33	1.22E-33	.00E+00
cm250	6.18E-38	6.65E-38	7.14E-38	7.67E-38	8.22E-38	8.22E-38
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		6.02E+07	6.02E+07	6.03E+07	6.03E+07	6.03E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 13 of library on unit [illegible].

pass 1
pass 2
[illegible] control module [illegible] library
[illegible]
[illegible]
pass [illegible] time constants of nth library interval
first library updated was...
pass 1

```
        pass   0
        *scale-system control module sas2 library*
        used a time-dependent neutron spectrum, for each of the above passes
          pass 0 applies start-up fuel densiities
          pass n applies mid time densities of nth library interval
        first library updated was...
        ********************************************************************************
        *                                                                              *
        *             prelim lwr origen-s binary working library--id = 1143            *
        *          made from modified card-image origen-s libraries of scale 4.2       *
        *       data from the light element, actinide, and fission product libraries   *
        *         decay data, including gamma and total energy, are from endf/b-vi     *
        *                                                                              *
        *       neutron flux spectrum factors and cross sections were produced from    *
        *      the "presas2" case updating all nuclides on the scale "burnup" library  *
        *                                                                              *
        *                   fission product yields are from endf/b-v                   *
        *                                                                              *
        *               photon libraries use an 18-energy-group structure              *
        *              the photon data are from the master photon data base,           *
        *               produced to include bremsstrahlung from uo2 matrix             *
        *                                                                              *
        *         see information above this box (if present) for later updates       *
        *                                                                              *
        ********************************************************************************
        *                                                                              *
0       ********************************************************************************
0                 .other identification and sizes of library.
0                  data set name:  ft33f001
0              8/29/1996    date library was produced
0                   1697    total number of nuclides in library
                     689    number of light-element nuclides
                     129    number of actinide nuclides
                     879    number of fission product nuclides
0                   7993    number of nonzero off-diagonal matrix elements
0       ********************************************************************************
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                          .page  159
      power=     .00mw, burnup=  20556.mwd, flux= 6.03E+07n/cm**2-sec
0                                    basis =
0   (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                 initial     ******* d      ******* d      ******* d      ******* d      ******* d
    productions   1.260138E+06   1.259530E+06   1.258921E+06   1.258311E+06   1.257699E+06   1.257691E+06
    absorptions   1.025244E+06   1.025033E+06   1.024821E+06   1.024607E+06   1.024393E+06   1.024388E+06
    k infinity    1.229110E+00   1.228770E+00   1.228431E+00   1.228091E+00   1.227750E+00   1.227749E+00
0                 initial     ******* d      ******* d      ******* d      ******* d      ******* d
    actinide
    absorptions   1.007740E+06   1.007449E+06   1.007157E+06   1.006864E+06   1.006570E+06   1.006566E+06
    non-actinide
    abs. fracs.   1.707274E-02   1.715409E-02   1.723617E-02   1.731755E-02   1.739866E-02   1.739806E-02
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2          fission products           page  160
0                                fraction of total absorption rate
      power=     .00mw, burnup= [illegible]
0          initial ******* d ******* d ******* d ******* d ******* d

    [illegible]
    [illegible]
    [illegible]
    [illegible]
    [illegible]
    cs133     [illegible]   4.86E-04   4.91E-04   4.97E-04   5.02E-04   5.02E-04
```

sm147	3.52E-04	3.56E-04	3.60E-04	3.64E-04	3.68E-04	3.68E-04
tc 99	3.27E-04	3.31E-04	3.34E-04	3.37E-04	3.41E-04	3.41E-04
nd145	2.71E-04	2.74E-04	2.77E-04	2.80E-04	2.83E-04	2.83E-04
gd155	2.24E-04	2.24E-04	2.24E-04	2.24E-04	2.24E-04	2.24E-04
sm152	2.08E-04	2.11E-04	2.14E-04	2.17E-04	2.20E-04	2.20E-04
mo 95	1.88E-04	1.90E-04	1.92E-04	1.94E-04	1.97E-04	1.97E-04
sm150	1.42E-04	1.43E-04	1.45E-04	1.47E-04	1.49E-04	1.49E-04
kr 83	1.16E-04	1.17E-04	1.18E-04	1.19E-04	1.21E-04	1.21E-04
cs135	1.09E-04	1.10E-04	1.11E-04	1.13E-04	1.14E-04	1.14E-04
cd113	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04
eu153	8.58E-05	8.69E-05	8.80E-05	8.91E-05	9.02E-05	9.02E-05
ru101	8.47E-05	8.57E-05	8.66E-05	8.76E-05	8.86E-05	8.86E-05
pr141	8.11E-05	8.20E-05	8.29E-05	8.39E-05	8.48E-05	8.48E-05
la139	6.63E-05	6.71E-05	6.78E-05	6.86E-05	6.94E-05	6.94E-05
gd157	6.08E-05	6.09E-05	6.09E-05	6.10E-05	6.10E-05	6.10E-05
pd105	3.37E-05	3.42E-05	3.46E-05	3.50E-05	3.54E-05	3.54E-05
ag109	3.31E-05	3.36E-05	3.41E-05	3.46E-05	3.51E-05	3.51E-05
ba137	3.21E-05	3.24E-05	3.28E-05	3.32E-05	3.35E-05	3.35E-05
zr 93	2.61E-05	2.64E-05	2.67E-05	2.70E-05	2.73E-05	2.73E-05
i129	2.17E-05	2.19E-05	2.22E-05	2.24E-05	2.27E-05	2.27E-05
nd144	2.05E-05	2.07E-05	2.09E-05	2.12E-05	2.14E-05	2.14E-05
gd152	1.60E-05	1.64E-05	1.67E-05	1.70E-05	1.73E-05	1.73E-05
mo 97	1.51E-05	1.52E-05	1.54E-05	1.56E-05	1.58E-05	1.58E-05
sm151	1.27E-05	1.31E-05	1.31E-05	1.31E-05	1.31E-05	1.27E-05
pd108	8.01E-06	8.13E-06	8.25E-06	8.37E-06	8.49E-06	8.49E-06
zr 91	6.93E-06	7.01E-06	7.08E-06	7.16E-06	7.24E-06	7.24E-06
y 89	6.62E-06	6.70E-06	6.77E-06	6.85E-06	6.92E-06	6.92E-06
ru102	6.30E-06	6.37E-06	6.45E-06	6.52E-06	6.59E-06	6.59E-06
ce142	5.52E-06	5.59E-06	5.65E-06	5.71E-06	5.78E-06	5.78E-06
nd148	5.32E-06	5.38E-06	5.45E-06	5.51E-06	5.57E-06	5.57E-06
nd146	4.48E-06	4.54E-06	4.59E-06	4.64E-06	4.69E-06	4.69E-06
ru 99	4.05E-06	4.16E-06	4.27E-06	4.38E-06	4.49E-06	4.49E-06
pd107	4.04E-06	4.10E-06	4.16E-06	4.21E-06	4.27E-06	4.27E-06
in115	3.94E-06	3.99E-06	4.03E-06	4.08E-06	4.13E-06	4.13E-06
ba138	3.82E-06	3.86E-06	3.91E-06	3.95E-06	3.99E-06	3.99E-06
ce140	3.57E-06	3.62E-06	3.66E-06	3.70E-06	3.74E-06	3.74E-06
xe132	3.28E-06	3.32E-06	3.36E-06	3.40E-06	3.44E-06	3.44E-06
mo 98	2.20E-06	2.23E-06	2.25E-06	2.28E-06	2.30E-06	2.30E-06
mo100	2.15E-06	2.17E-06	2.19E-06	2.22E-06	2.24E-06	2.24E-06
xe134	2.11E-06	2.14E-06	2.16E-06	2.19E-06	2.21E-06	2.21E-06
zr 92	1.68E-06	1.70E-06	1.71E-06	1.73E-06	1.75E-06	1.75E-06
i127	1.58E-06	1.60E-06	1.62E-06	1.64E-06	1.66E-06	1.66E-06
ru104	1.45E-06	1.47E-06	1.49E-06	1.50E-06	1.52E-06	1.52E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 161

0 fraction of total absorption rate

power= .00mw, burnup= 20556.mwd, flux= 6.03E+07n/cm**2-sec

	0 initial	******* d	******* d	******* d	******* d	******* d
zr 96	1.32E-06	1.34E-06	1.35E-06	1.37E-06	1.38E-06	1.38E-06
nd150	1.21E-06	1.22E-06	1.23E-06	1.25E-06	1.26E-06	1.26E-06
xe136	[illegible]	1.16E-06	1.17E-06	1.19E-06	1.20E-06	[illegible]
cd111	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
rb 87	[illegible]	4.75E-07	4.79E-07	4.84E-07	4.89E-07	4.89E-07

ba135	4.08E-07	4.19E-07	4.31E-07	4.42E-07	4.54E-07	4.54E-07
pd106	3.44E-07	3.49E-07	3.53E-07	3.58E-07	3.62E-07	3.62E-07
se 77	3.42E-07	3.46E-07	3.50E-07	3.54E-07	3.58E-07	3.58E-07
gd156	3.26E-07	3.31E-07	3.35E-07	3.40E-07	3.44E-07	3.44E-07
kr 84	2.23E-07	2.26E-07	2.28E-07	2.31E-07	2.34E-07	2.34E-07
ru100	2.04E-07	2.09E-07	2.14E-07	2.18E-07	2.23E-07	2.23E-07
dy161	1.99E-07	2.02E-07	2.05E-07	2.08E-07	2.11E-07	2.11E-07
sb121	1.81E-07	1.84E-07	1.86E-07	1.88E-07	1.90E-07	1.90E-07
se 79	1.69E-07	1.71E-07	1.73E-07	1.75E-07	1.76E-07	1.76E-07
nd142	1.49E-07	1.52E-07	1.56E-07	1.59E-07	1.63E-07	1.63E-07
ba134	1.43E-07	1.46E-07	1.49E-07	1.53E-07	1.56E-07	1.56E-07
sb123	1.47E-07	1.48E-07	1.50E-07	1.52E-07	1.54E-07	1.54E-07
sm148	1.30E-07	1.33E-07	1.36E-07	1.39E-07	1.42E-07	1.42E-07
kr 86	1.24E-07	1.25E-07	1.27E-07	1.28E-07	1.29E-07	1.29E-07
te128	1.20E-07	1.21E-07	1.22E-07	1.24E-07	1.25E-07	1.25E-07
pd104	9.80E-08	1.00E-07	1.03E-07	1.05E-07	1.07E-07	1.07E-07
eu152	9.09E-08	1.14E-07	1.15E-07	1.16E-07	1.16E-07	9.20E-08
tb159	8.65E-08	8.77E-08	8.89E-08	9.01E-08	9.13E-08	9.13E-08
se 80	8.19E-08	8.28E-08	8.38E-08	8.47E-08	8.57E-08	8.57E-08
te125	8.12E-08	8.21E-08	8.31E-08	8.41E-08	8.51E-08	8.51E-08
gd158	6.85E-08	6.94E-08	7.03E-08	7.13E-08	7.22E-08	7.22E-08
nb 93	6.50E-08	6.68E-08	6.85E-08	7.03E-08	7.22E-08	7.22E-08
cd112	6.22E-08	6.30E-08	6.38E-08	6.46E-08	6.54E-08	6.54E-08
dy162	4.48E-08	4.56E-08	4.63E-08	4.71E-08	4.78E-08	4.78E-08
dy164	4.48E-08	4.54E-08	4.61E-08	4.67E-08	4.74E-08	4.74E-08
sn117	4.40E-08	4.46E-08	4.51E-08	4.57E-08	4.62E-08	4.62E-08
li 6	4.28E-08	4.32E-08	4.37E-08	4.41E-08	4.46E-08	4.46E-08
cd114	3.73E-08	3.78E-08	3.83E-08	3.88E-08	3.93E-08	3.93E-08
cd110	3.37E-08	3.46E-08	3.56E-08	3.65E-08	3.75E-08	3.75E-08
br 79	3.25E-08	3.33E-08	3.42E-08	3.51E-08	3.60E-08	3.60E-08
mo 96	3.27E-08	3.34E-08	3.42E-08	3.49E-08	3.57E-08	3.57E-08
sn119	3.36E-08	3.40E-08	3.44E-08	3.48E-08	3.52E-08	3.52E-08
ag107	3.02E-08	3.12E-08	3.21E-08	3.30E-08	3.40E-08	3.40E-08
sn115	3.08E-08	3.11E-08	3.15E-08	3.19E-08	3.22E-08	3.22E-08
pd110	3.04E-08	3.09E-08	3.13E-08	3.17E-08	3.22E-08	3.22E-08
sr 88	2.27E-08	2.30E-08	2.33E-08	2.35E-08	2.38E-08	2.38E-08
eu155	2.43E-08	4.56E-08	4.57E-08	4.57E-08	4.58E-08	2.35E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 162

0 fraction of total absorption rate

power= .00mw, burnup= 20556.mwd, flux= 6.03E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

xe129	1.96E-08	2.01E-08	2.06E-08	2.12E-08	2.18E-08	2.18E-08
pm147	2.15E-08	6.55E-08	6.55E-08	6.55E-08	6.55E-08	2.01E-08
xe130	1.62E-08	1.65E-08	1.69E-08	1.72E-08	1.76E-08	1.76E-08
se 82	1.56E-08	1.58E-08	1.60E-08	1.62E-08	1.63E-08	1.63E-08
ba136	1.44E-08	1.46E-08	1.49E-08	1.52E-08	1.55E-08	1.55E-08
sn126	1.34E-08	1.37E-08	1.39E-08	[illegible]	1.43E-08	[illegible]
se 78	1.22E-08	1.24E-08	1.25E-08	1.27E-08	1.28E-08	[illegible]
te126	[illegible]	1.13E-08	1.16E-08	1.19E-08	1.22E-08	1.22E-08
[illegible]	[illegible]	1.14E-08	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
sr 90	3.57E-09	3.96E-09	3.96E-09	3.96E-09	3.96E-09	3.54E-09

sn120	2.73E-09	2.76E-09	2.80E-09	2.83E-09	2.86E-09	2.86E-09
ge 73	2.06E-09	2.08E-09	2.11E-09	2.13E-09	2.16E-09	2.16E-09
ho165	1.06E-09	1.08E-09	1.10E-09	1.12E-09	1.14E-09	1.14E-09
dy160	9.50E-10	9.74E-10	9.98E-10	1.02E-09	1.05E-09	1.05E-09
gd160	9.60E-10	9.74E-10	9.88E-10	1.00E-09	1.02E-09	1.02E-09
cs137	8.28E-10	9.14E-10	9.15E-10	9.15E-10	9.15E-10	8.24E-10
ge 76	7.01E-10	7.09E-10	7.17E-10	7.26E-10	7.34E-10	7.34E-10
xe128	5.67E-10	5.80E-10	5.94E-10	6.07E-10	6.21E-10	6.21E-10
sr 86	2.73E-10	2.79E-10	2.85E-10	2.91E-10	2.97E-10	2.98E-10
sn116	2.16E-10	2.21E-10	2.26E-10	2.32E-10	2.37E-10	2.37E-10
te124	2.07E-10	2.11E-10	2.15E-10	2.18E-10	2.22E-10	2.22E-10
cs134	2.09E-10	8.84E-10	8.94E-10	9.05E-10	9.15E-10	2.01E-10
nb 94	1.04E-10	1.07E-10	1.09E-10	1.12E-10	1.15E-10	1.15E-10
sr 87	1.04E-10	1.05E-10	1.07E-10	1.08E-10	1.10E-10	1.10E-10
kr 85	1.01E-10	1.34E-10	1.34E-10	1.34E-10	1.34E-10	9.98E-11
te122	9.06E-11	9.27E-11	9.49E-11	9.71E-11	9.93E-11	9.93E-11
se 76	7.74E-11	7.90E-11	8.07E-11	8.23E-11	8.40E-11	8.40E-11
er166	5.20E-11	5.29E-11	5.38E-11	5.47E-11	5.56E-11	5.56E-11
ge 74	4.12E-11	4.16E-11	4.21E-11	4.26E-11	4.31E-11	4.31E-11
kr 80	3.06E-11	3.18E-11	3.29E-11	3.41E-11	3.54E-11	3.54E-11
ge 72	3.03E-11	3.06E-11	3.10E-11	3.14E-11	3.18E-11	3.18E-11
er167	5.18E-12	5.33E-12	5.48E-12	5.63E-12	5.79E-12	5.79E-12
te123	3.80E-12	3.93E-12	4.06E-12	4.19E-12	4.32E-12	4.32E-12
y 90	3.40E-12	3.77E-12	3.77E-12	3.77E-12	3.77E-12	3.38E-12
ce144	3.23E-12	1.42E-10	1.42E-10	1.42E-10	1.42E-10	2.59E-12
cd108	2.03E-12	2.12E-12	2.21E-12	2.30E-12	2.40E-12	2.40E-12
sb125	1.47E-12	4.33E-12	4.34E-12	4.34E-12	4.34E-12	1.39E-12
ru106	5.39E-13	9.81E-12	9.82E-12	9.83E-12	9.85E-12	4.57E-13
be 9	8.83E-14	8.93E-14	9.03E-14	9.14E-14	9.24E-14	9.24E-14
sn114	5.66E-14	5.80E-14	5.94E-14	6.08E-14	6.22E-14	6.22E-14
li 7	3.62E-14	3.66E-14	3.70E-14	3.74E-14	3.78E-14	3.78E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 163
0 fraction of total absorption rate
power= .00mw, burnup= 20556.mwd, flux= 6.03E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.56E-14	1.74E-14	1.75E-14	1.77E-14	1.78E-14	1.63E-14
te127m	1.16E-16	2.20E-12	2.20E-12	2.20E-12	2.20E-12	6.50E-17
cd109	2.06E-18	2.20E-17	2.28E-17	2.37E-17	2.46E-17	2.09E-18
nb 95	3.90E-18	3.63E-11	3.63E-11	3.63E-11	3.63E-11	1.46E-18
zr 95	1.91E-18	3.90E-11	3.90E-11	3.90E-11	3.90E-11	7.10E-19
sn123	6.13E-19	2.58E-15	2.58E-15	2.58E-15	2.58E-15	3.82E-19
y 91	3.41E-19	3.34E-11	3.34E-11	3.34E-11	3.34E-11	1.09E-19
tb160	1.36E-20	5.20E-14	5.27E-14	5.35E-14	5.42E-14	1.36E-20

1
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 164
power= 9.790E-04mw, burnup=2.0556E+04mwd, flux= 6.03E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
h 1	1.17E-03	1.18E-03	1.20E-03	1.21E-03	1.22E-03	1.22E-03
h 2	3.50E-06	3.54E-06	3.58E-06	3.62E-06	3.66E-06	3.66E-06
h 3	1.11E-11	1.42E-11	1.42E-11	1.42E-11	1.43E-11	1.11E-11
h 4	.00E+00	1.41E-35	1.41E-35	1.42E-35	1.42E-35	.00E+00
he 3	1.64E-08	1.65E-08	1.66E-08	1.67E-08	1.68E-08	1.68E-08
he 4	1.94E-04	1.96E-04	1.98E-04	2.01E-04	2.03E-04	2.03E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.33E-05	2.36E-05	2.38E-05	2.41E-05	2.44E-05	2.44E-05
ne 21	8.34E-09	8.53E-09	8.72E-09	8.91E-09	9.10E-09	9.10E-09
ne 22	1.54E-07	1.55E-07	1.57E-07	1.59E-07	1.61E-07	1.61E-07

ne 23	1.78E-30	1.78E-15	1.78E-15	1.78E-15	1.78E-15	1.78E-30
na 22	3.39E-12	1.05E-11	1.05E-11	1.05E-11	1.06E-11	3.18E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	6.43E-24	6.43E-09	6.43E-09	6.44E-09	6.44E-09	6.44E-24
na 24m	1.06E-30	1.06E-15	1.06E-15	1.06E-15	1.06E-15	1.06E-30
na 25	6.03E-39	6.16E-24	6.30E-24	6.44E-24	6.58E-24	6.58E-39
mg 24	1.52E-01	1.53E-01	1.55E-01	1.57E-01	1.58E-01	1.58E-01
mg 25	8.65E-07	8.84E-07	9.03E-07	9.23E-07	9.42E-07	9.42E-07
mg 26	3.49E-06	3.53E-06	3.57E-06	3.61E-06	3.65E-06	3.65E-06
mg 27	5.30E-28	5.29E-13	5.30E-13	5.30E-13	5.30E-13	5.30E-28
mg 28	.00E+00	2.64E-25	2.65E-25	2.65E-25	2.65E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	4.77E-26	4.77E-11	4.77E-11	4.77E-11	4.77E-11	4.77E-26
al 29	4.89E-37	4.99E-22	5.11E-22	5.22E-22	5.34E-22	5.34E-37
al 30	.00E+00	1.28E-31	1.32E-31	1.36E-31	1.41E-31	.00E+00
si 28	4.42E-01	4.46E-01	4.51E-01	4.56E-01	4.61E-01	4.61E-01
si 29	7.83E-06	8.00E-06	8.18E-06	8.36E-06	8.54E-06	8.54E-06
si 30	1.48E-10	1.53E-10	1.58E-10	1.63E-10	1.69E-10	1.69E-10
si 31	2.60E-38	2.69E-23	2.78E-23	2.87E-23	2.97E-23	2.97E-38
si 32	1.09E-29	1.14E-29	1.19E-29	1.23E-29	1.27E-29	1.25E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		6.03E+07	6.03E+07	6.04E+07	6.04E+07	6.04E-08

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 165

power= 9.790E-04mw, burnup=2.0556E+04mwd, flux= 6.03E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
he 4	3.44E+01	3.51E+01	3.58E+01	3.65E+01	3.71E+01	3.72E+01
pb206	1.78E-01	1.84E-01	1.89E-01	1.94E-01	2.00E-01	2.00E-01
pb207	1.16E-02	1.19E-02	1.22E-02	1.25E-02	1.29E-02	1.29E-02
pb208	5.26E-04	5.38E-04	5.50E-04	5.63E-04	5.75E-04	5.75E-04
pb209	8.73E-10	8.89E-10	9.04E-10	9.19E-10	9.34E-10	9.34E-10
pb210	2.72E-04	2.75E-04	2.79E-04	2.83E-04	2.86E-04	2.86E-04
pb211	4.89E-11	4.93E-11	4.98E-11	5.03E-11	5.08E-11	5.09E-11
pb212	3.25E-11	3.35E-11	3.39E-11	3.42E-11	3.46E-11	3.39E-11
pb214	6.21E-10	6.30E-10	6.38E-10	6.46E-10	6.55E-10	6.55E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	2.95E-02	3.05E-02	3.16E-02	3.26E-02	3.37E-02	3.37E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.67E-07	1.70E-07	1.72E-07	1.74E-07	1.76E-07	1.76E-07
bi211	2.90E-12	2.92E-12	2.95E-12	2.98E-12	3.01E-12	3.02E-12
bi212	3.08E-12	3.18E-12	3.21E-12	3.25E-12	3.28E-12	3.21E-12
bi213	2.04E-10	2.08E-10	2.11E-10	2.15E-10	2.18E-10	2.18E-10
bi214	4.61E-10	4.67E-10	4.74E-10	4.80E-10	4.86E-10	4.86E-10
po210	4.62E-06	4.68E-06	4.74E-06	4.81E-06	4.87E-06	4.87E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.20E-17	3.23E-17	3.26E-17	3.30E-17	3.33E-17	3.34E-17
po212	1.62E-22	1.67E-22	1.69E-22	1.71E-22	1.72E-22	1.69E-22
po213	3.07E-19	3.12E-19	3.17E-19	3.23E-19	3.28E-19	3.28E-19
po214	6.35E-17	6.43E-17	6.52E-17	6.60E-17	6.69E-17	6.69E-17
po215	4.02E-17	4.05E-17	4.09E-17	4.14E-17	4.18E-17	4.18E-17
po216	1.23E-16	1.27E-16	1.28E-16	1.30E-16	1.31E-16	1.28E-16
po218	7.19E-11	7.28E-11	7.38E-11	7.48E-11	7.57E-11	7.57E-11
rn218	1.12E-43	1.19E-28	1.20E-28	1.21E-28	1.23E-28	1.18E-43
rn219	8.94E-14	9.01E-14	9.11E-14	9.20E-14	9.29E-14	9.31E-14
rn220	4.72E-14	4.86E-14	4.92E-14	4.97E-14	5.02E-14	4.91E-14
rn222	1.28E-07	1.29E-07	1.31E-07	1.33E-07	1.35E-07	1.35E-07
ra222	1.22E-40	1.29E-25	1.30E-25	1.32E-25	1.33E-25	1.27E-40
ra223	2.23E-08	2.25E-08	2.27E-08	2.29E-08	2.32E-08	2.32E-08

ra224	2.68E-10	2.77E-10	2.80E-10	2.83E-10	2.86E-10	2.79E-10
ra225	9.54E-08	9.71E-08	9.87E-08	1.00E-07	1.02E-07	1.02E-07
ra226	1.95E-02	1.98E-02	2.00E-02	2.03E-02	2.06E-02	2.06E-02
ra228	9.40E-11	9.54E-11	9.69E-11	9.83E-11	9.97E-11	9.97E-11
ac225	6.45E-08	6.56E-08	6.67E-08	6.78E-08	6.89E-08	6.89E-08
ac227	1.55E-05	1.56E-05	1.58E-05	1.60E-05	1.61E-05	1.61E-05
ac228	1.15E-14	1.16E-14	1.18E-14	1.20E-14	1.22E-14	1.22E-14
th226	5.96E-39	6.28E-24	6.35E-24	6.42E-24	6.49E-24	6.21E-39
th227	3.60E-08	3.63E-08	3.67E-08	3.70E-08	3.74E-08	3.75E-08
th228	5.12E-08	5.28E-08	5.34E-08	5.39E-08	5.45E-08	5.33E-08
th229	1.86E-02	1.89E-02	1.92E-02	1.95E-02	1.98E-02	1.98E-02
th230	9.65E-01	9.78E-01	9.90E-01	1.00E+00	1.01E+00	1.01E+00
th231	2.73E-09	3.81E-09	3.82E-09	3.84E-09	3.85E-09	2.73E-09
th232	2.30E-01	2.33E-01	2.37E-01	2.40E-01	2.44E-01	2.44E-01
th233	5.14E-28	5.22E-13	5.30E-13	5.38E-13	5.46E-13	5.46E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.33E-02	2.35E-02	2.38E-02	2.40E-02	2.42E-02	2.42E-02
pa232	9.77E-26	9.88E-11	9.98E-11	1.01E-10	1.02E-10	1.02E-25

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 166
power= 9.790E-04mw, burnup=2.0556E+04mwd, flux= 6.03E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.41E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	5.78E-36	6.09E-21	6.15E-21	6.22E-21	6.29E-21	6.02E-36
u231	9.13E-32	9.24E-17	9.36E-17	9.48E-17	9.60E-17	9.60E-32
u232	1.83E-06	1.93E-06	1.95E-06	1.97E-06	1.99E-06	1.90E-06
u233	4.95E-01	5.01E-01	5.07E-01	5.13E-01	5.19E-01	5.19E-01
u234	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01
u235	6.61E+02	6.60E+02	6.60E+02	6.59E+02	6.59E+02	6.59E+02
u236	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02	1.90E+02
u237	1.28E-12	8.10E-07	8.11E-07	8.12E-07	8.14E-07	1.28E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	7.51E-23	7.50E-08	7.51E-08	7.51E-08	7.51E-08	7.52E-23
u240	4.95E-35	5.34E-35	5.74E-35	6.17E-35	6.63E-35	6.63E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.36E-13	2.07E-12	2.07E-12	2.07E-12	2.07E-12	1.16E-13
np236m	4.92E-28	4.92E-13	4.92E-13	4.92E-13	4.92E-13	4.92E-28
np236	2.25E-06	2.28E-06	2.30E-06	2.32E-06	2.34E-06	2.34E-06
np237	4.08E+01	4.08E+01	4.08E+01	4.08E+01	4.08E+01	4.08E+01
np238	3.12E-14	3.64E-07	3.64E-07	3.64E-07	3.64E-07	3.15E-14
np239	1.88E-13	1.08E-05	1.09E-05	1.09E-05	1.09E-05	2.01E-13
np240m	4.23E-37	4.55E-37	4.90E-37	5.27E-37	5.65E-37	5.66E-37
np240	1.37E-38	5.38E-16	5.39E-16	5.39E-16	5.40E-16	1.58E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.02E-10	2.72E-10	2.72E-10	2.72E-10	2.72E-10	9.62E-11
pu237	3.41E-24	7.85E-14	7.87E-14	7.88E-14	7.90E-14	8.49E-25
pu238	5.32E-03	5.50E-03	5.50E-03	5.50E-03	5.50E-03	5.31E-03
pu239	3.07E+01	3.08E+01	3.08E+01	3.09E+01	3.10E+01	3.10E+01
pu240	5.16E-01	5.17E-01	5.18E-01	5.19E-01	5.20E-01	5.19E-01
pu241	4.16E-05	5.11E-05	5.12E-05	5.14E-05	5.15E-05	4.14E-05
pu242	4.00E-05	4.05E-05	4.11E-05	4.16E-05	4.22E-05	4.22E-05
pu243	2.22E-29	2.08E-14	2.11E-14	2.14E-14	2.17E-14	2.36E-29
pu244	2.47E-24	2.66E-24	2.86E-24	3.07E-24	3.30E-24	3.30E-24
pu245	.00E+00	2.66E-35	2.87E-35	3.08E-35	3.31E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

```
     am239   1.02E-34  1.02E-19  1.03E-19  1.03E-19  1.03E-19  1.03E-34
     am240   4.68E-32  4.68E-17  4.69E-17  4.71E-17  4.72E-17  4.72E-32
     am241   1.51E-03  1.51E-03  1.52E-03  1.52E-03  1.52E-03  1.52E-03
     am242m  1.69E-07  1.72E-07  1.73E-07  1.73E-07  1.74E-07  1.70E-07
     am242   2.18E-12  1.38E-11  1.38E-11  1.39E-11  1.39E-11  2.20E-12
     am243   2.15E-07  2.18E-07  2.22E-07  2.26E-07  2.29E-07  2.29E-07
     am244m   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am244   3.96E-31  4.02E-16  4.09E-16  4.16E-16  4.23E-16  4.23E-31
     am245   1.16E-39  5.24E-36  5.64E-36  6.06E-36  6.51E-36  1.19E-39
     am246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm241   1.10E-36  1.98E-22  1.99E-22  2.00E-22  2.00E-22  1.91E-37
     cm242   4.44E-10  2.78E-09  2.79E-09  2.80E-09  2.81E-09  4.46E-10
     cm243   1.40E-14  1.55E-14  1.56E-14  1.57E-14  1.57E-14  1.41E-14
     cm244   5.28E-12  6.32E-12  6.42E-12  6.53E-12  6.64E-12  5.59E-12
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                actinides        page  167
       power= 9.790E-04mw, burnup=2.0556E+04mwd, flux= 6.03E+07n/cm**2-sec
0                                        nuclide concentrations, gram atoms
                                         basis = single reactor assembly
          charge ******* d ******* d ******* d ******* d ******* d
     cm245   1.36E-14  1.38E-14  1.41E-14  1.43E-14  1.46E-14  1.46E-14
     cm246   1.09E-16  1.11E-16  1.13E-16  1.15E-16  1.17E-16  1.17E-16
     cm247   4.77E-20  4.95E-20  5.13E-20  5.31E-20  5.50E-20  5.50E-20
     cm248   1.60E-22  1.69E-22  1.78E-22  1.88E-22  1.98E-22  1.98E-22
     cm249    .00E+00  1.29E-33  1.36E-33  1.44E-33  1.52E-33   .00E+00
     cm250   8.22E-38  8.81E-38  9.42E-38  1.01E-37  1.08E-37  1.08E-37
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              6.03E+07  6.03E+07  6.04E+07  6.04E+07  6.04E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

         cross-section data taken from position number 19 of library on unit 33.

         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         ********************************************************************************
         *                                                                              *
         *           prelim lwr origen-s binary working library--id = 1143              *
         *         made from modified card-image origen-s libraries of scale 4.2        *
         *       data from the light element, actinide, and fission product libraries   *
         *         decay data, including gamma and total energy, are from endf/b-vi     *
         *                                                                              *
```

```
*      neutron flux spectrum factors and cross sections were produced from     *
*     the "presas2" case updating all nuclides on the scale "burnup" library   *
*                                                                              *
*                  fission product yields are from endf/b-v                    *
*                                                                              *
*             photon libraries use an 18-energy-group structure                *
*            the photon data are from the master photon data base,             *
*             produced to include bremsstrahlung from uo2 matrix               *
*                                                                              *
*       see information above this box (if present) for later updates          *
*                                                                              *
********************************************************************************
*                                                                              *
0       ********************************************************************************
0                .other identification and sizes of library.
0                 data set name:  ft33f001
0               8/29/1996    date library was produced
0                   1697    total number of nuclides in library
                     689    number of light-element nuclides
                     129    number of actinide nuclides
                     879    number of fission product nuclides
0                   7993    number of nonzero off-diagonal matrix elements
0       ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                page  168
        power=    .00mw, burnup=  21450.mwd, flux= 6.04E+07n/cm**2-sec
0                                    basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.258714E+06   1.258098E+06   1.257482E+06   1.256863E+06   1.256244E+06   1.256236E+06
     absorptions   1.024958E+06   1.024742E+06   1.024525E+06   1.024306E+06   1.024087E+06   1.024082E+06
     k infinity    1.228064E+00   1.227722E+00   1.227381E+00   1.227039E+00   1.226696E+00   1.226695E+00
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   1.007127E+06   1.006832E+06   1.006536E+06   1.006239E+06   1.005941E+06   1.005936E+06
     non-actinide
     abs. fracs.   1.739621E-02   1.747781E-02   1.755846E-02   1.763892E-02   1.771957E-02   1.771897E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                 fission products  page  169
0                              fraction of total absorption rate
        power=    .00mw, burnup=  21450.mwd, flux= 6.04E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d ******* d

     sm149     5.43E-03  5.43E-03  5.43E-03  5.43E-03  5.43E-03  5.43E-03
     nd143     1.98E-03  2.00E-03  2.02E-03  2.05E-03  2.07E-03  2.07E-03
     eu151     1.81E-03  1.82E-03  1.83E-03  1.84E-03  1.85E-03  1.85E-03
     rh103     9.67E-04  9.78E-04  9.89E-04  1.00E-03  1.01E-03  1.01E-03
     xe131     6.46E-04  6.53E-04  6.60E-04  6.67E-04  6.74E-04  6.74E-04
     cs133     5.02E-04  5.08E-04  5.13E-04  5.19E-04  5.24E-04  5.24E-04
     sm147     3.68E-04  3.72E-04  3.76E-04  3.80E-04  3.84E-04  3.84E-04
     tc 99     3.41E-04  3.44E-04  3.47E-04  3.51E-04  3.54E-04  3.54E-04
     nd145     2.83E-04  2.86E-04  2.89E-04  2.93E-04  2.96E-04  2.96E-04
     sm152     2.20E-04  2.22E-04  2.25E-04  2.28E-04  2.31E-04  2.31E-04
     gd155     2.25E-04  2.25E-04  2.25E-04  2.25E-04  2.25E-04  2.25E-04
     mo 95     1.97E-04  1.99E-04  2.01E-04  2.03E-04  2.05E-04  2.05E-04
     sm150     1.49E-04  1.50E-04  1.52E-04  1.54E-04  1.55E-04  1.55E-04
     kr 83     1.21E-04  1.22E-04  1.23E-04  1.25E-04  1.26E-04  1.26E-04
     cs135     1.14E-04  1.15E-04  1.16E-04  1.18E-04  1.19E-04  1.19E-04
     cd113     1.03E-04  1.03E-04  1.03E-04  1.03E-04  1.03E-04  1.03E-04
     eu153     9.02E-05  9.13E-05  9.24E-05  9.36E-05  9.47E-05  9.47E-05
     ru101     8.86E-05  8.95E-05  9.05E-05  9.15E-05  9.25E-05  9.25E-05
     pr141     8.48E-05  8.58E-05  8.67E-05  8.76E-05  8.86E-05  8.86E-05
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la139	6.94E-05	7.02E-05	7.09E-05	7.17E-05	7.25E-05	7.25E-05
gd157	6.11E-05	6.11E-05	6.11E-05	6.12E-05	6.12E-05	6.12E-05
ag109	3.51E-05	3.56E-05	3.61E-05	3.66E-05	3.71E-05	3.71E-05
pd105	3.54E-05	3.59E-05	3.63E-05	3.67E-05	3.71E-05	3.71E-05
ba137	3.36E-05	3.39E-05	3.43E-05	3.47E-05	3.50E-05	3.51E-05
zr 93	2.73E-05	2.76E-05	2.78E-05	2.81E-05	2.84E-05	2.84E-05
i129	2.27E-05	2.30E-05	2.32E-05	2.35E-05	2.37E-05	2.37E-05
nd144	2.14E-05	2.17E-05	2.19E-05	2.22E-05	2.24E-05	2.24E-05
gd152	1.73E-05	1.76E-05	1.79E-05	1.83E-05	1.86E-05	1.86E-05
mo 97	1.58E-05	1.59E-05	1.61E-05	1.63E-05	1.65E-05	1.65E-05
sm151	1.27E-05	1.31E-05	1.32E-05	1.32E-05	1.32E-05	1.27E-05
pd108	8.48E-06	8.60E-06	8.72E-06	8.84E-06	8.96E-06	8.96E-06
zr 91	7.24E-06	7.32E-06	7.40E-06	7.48E-06	7.56E-06	7.56E-06
y 89	6.93E-06	7.00E-06	7.08E-06	7.15E-06	7.23E-06	7.23E-06
ru102	6.60E-06	6.67E-06	6.74E-06	6.82E-06	6.89E-06	6.89E-06
ce142	5.78E-06	5.84E-06	5.91E-06	5.97E-06	6.03E-06	6.03E-06
nd148	5.57E-06	5.63E-06	5.69E-06	5.75E-06	5.82E-06	5.82E-06
ru 99	4.49E-06	4.60E-06	4.71E-06	4.82E-06	4.94E-06	4.94E-06
nd146	4.69E-06	4.75E-06	4.80E-06	4.85E-06	4.90E-06	4.90E-06
pd107	4.27E-06	4.33E-06	4.39E-06	4.45E-06	4.51E-06	4.51E-06
in115	4.13E-06	4.17E-06	4.22E-06	4.27E-06	4.31E-06	4.31E-06
ba138	4.00E-06	4.04E-06	4.08E-06	4.13E-06	4.17E-06	4.17E-06
ce140	3.74E-06	3.78E-06	3.82E-06	3.86E-06	3.91E-06	3.91E-06
xe132	3.44E-06	3.48E-06	3.52E-06	3.56E-06	3.59E-06	3.59E-06
mo 98	2.30E-06	2.33E-06	2.35E-06	2.38E-06	2.40E-06	2.40E-06
mo100	2.24E-06	2.27E-06	2.29E-06	2.32E-06	2.34E-06	2.34E-06
xe134	2.21E-06	2.24E-06	2.26E-06	2.29E-06	2.31E-06	2.31E-06
zr 92	1.75E-06	1.77E-06	1.79E-06	1.81E-06	1.83E-06	1.83E-06
i127	1.66E-06	1.68E-06	1.70E-06	1.72E-06	1.74E-06	1.74E-06
ru104	1.52E-06	1.54E-06	1.56E-06	1.57E-06	1.59E-06	1.59E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 170
0 fraction of total absorption rate
power= .00mw, burnup= 21450.mwd, flux= 6.04E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.38E-06	1.40E-06	1.41E-06	1.43E-06	1.44E-06	1.44E-06
nd150	1.26E-06	1.28E-06	1.29E-06	1.30E-06	1.32E-06	1.32E-06
xe136	1.20E-06	1.21E-06	1.23E-06	1.24E-06	1.25E-06	1.25E-06
cd111	9.62E-07	9.75E-07	9.87E-07	1.00E-06	1.01E-06	1.01E-06
br 81	8.88E-07	8.98E-07	9.08E-07	9.18E-07	9.28E-07	9.28E-07
gd154	8.14E-07	8.33E-07	8.52E-07	8.71E-07	8.91E-07	8.91E-07
rb 85	8.50E-07	8.60E-07	8.69E-07	8.78E-07	8.88E-07	8.88E-07
zr 94	7.43E-07	7.51E-07	7.60E-07	7.68E-07	7.76E-07	7.76E-07
zr 90	6.83E-07	6.90E-07	6.98E-07	7.05E-07	7.13E-07	7.13E-07
sm154	5.94E-07	6.01E-07	6.08E-07	6.14E-07	6.21E-07	6.21E-07
te130	5.53E-07	5.60E-07	5.66E-07	5.72E-07	5.78E-07	5.78E-07
rb 87	4.89E-07	4.95E-07	5.00E-07	5.05E-07	5.11E-07	5.11E-07
ba135	4.54E-07	4.65E-07	4.77E-07	4.89E-07	5.01E-07	5.01E-07
pd106	3.62E-07	3.67E-07	3.72E-07	3.76E-07	3.81E-07	3.81E-07
se 77	3.58E-07	3.62E-07	3.66E-07	3.69E-07	3.73E-07	3.73E-07
gd156	3.44E-07	3.49E-07	3.53E-07	3.58E-07	3.62E-07	3.62E-07
kr 84	2.33E-07	2.36E-07	2.39E-07	2.41E-07	2.44E-07	2.44E-07
ru100	2.23E-07	2.28E-07	2.33E-07	2.38E-07	2.43E-07	2.43E-07
dy161	2.11E-07	2.14E-07	2.17E-07	2.20E-07	2.22E-07	2.22E-07
sb121	1.90E-07	1.92E-07	1.95E-07	1.97E-07	1.99E-07	1.99E-07
se 79	1.76E-07	1.78E-07	1.80E-07	1.82E-07	1.84E-07	1.84E-07
nd142	1.63E-07	1.67E-07	1.70E-07	1.74E-07	1.78E-07	1.78E-07
ba134	1.56E-07	1.60E-07	1.63E-07	1.67E-07	1.70E-07	1.70E-07
sb123	1.54E-07	1.55E-07	1.57E-07	1.59E-07	1.61E-07	1.61E-07
sm148	1.42E-07	1.45E-07	1.48E-07	1.52E-07	1.55E-07	1.55E-07

kr 86	1.30E-07	1.31E-07	1.32E-07	1.34E-07	1.35E-07	1.35E-07
te128	1.25E-07	1.27E-07	1.28E-07	1.30E-07	1.31E-07	1.31E-07
pd104	1.07E-07	1.10E-07	1.12E-07	1.15E-07	1.17E-07	1.17E-07
tb159	9.13E-08	9.25E-08	9.38E-08	9.50E-08	9.62E-08	9.62E-08
eu152	9.20E-08	1.17E-07	1.18E-07	1.18E-07	1.19E-07	9.30E-08
se 80	8.57E-08	8.66E-08	8.76E-08	8.85E-08	8.95E-08	8.95E-08
te125	8.51E-08	8.61E-08	8.71E-08	8.81E-08	8.91E-08	8.91E-08
nb 93	7.22E-08	7.40E-08	7.59E-08	7.77E-08	7.96E-08	7.96E-08
gd158	7.22E-08	7.32E-08	7.41E-08	7.51E-08	7.60E-08	7.60E-08
cd112	6.54E-08	6.63E-08	6.71E-08	6.79E-08	6.87E-08	6.87E-08
dy162	4.78E-08	4.86E-08	4.94E-08	5.01E-08	5.09E-08	5.09E-08
dy164	4.74E-08	4.80E-08	4.87E-08	4.93E-08	5.00E-08	5.00E-08
sn117	4.62E-08	4.68E-08	4.73E-08	4.79E-08	4.84E-08	4.84E-08
li 6	4.46E-08	4.50E-08	4.55E-08	4.59E-08	4.64E-08	4.64E-08
cd110	3.75E-08	3.85E-08	3.95E-08	4.05E-08	4.16E-08	4.16E-08
cd114	3.93E-08	3.97E-08	4.02E-08	4.07E-08	4.12E-08	4.12E-08
br 79	3.60E-08	3.69E-08	3.78E-08	3.87E-08	3.97E-08	3.97E-08
mo 96	3.57E-08	3.65E-08	3.73E-08	3.81E-08	3.89E-08	3.89E-08
ag107	3.40E-08	3.50E-08	3.59E-08	3.69E-08	3.79E-08	3.79E-08
sn119	3.52E-08	3.57E-08	3.61E-08	3.65E-08	3.69E-08	3.69E-08
pd110	3.22E-08	3.26E-08	3.30E-08	3.35E-08	3.39E-08	3.39E-08
sn115	3.23E-08	3.26E-08	3.30E-08	3.34E-08	3.37E-08	3.37E-08
sr 88	2.38E-08	2.40E-08	2.43E-08	2.46E-08	2.48E-08	2.48E-08
xe129	2.18E-08	2.23E-08	2.29E-08	2.35E-08	2.40E-08	2.40E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 171
0 fraction of total absorption rate
power= .00mw, burnup= 21450.mwd, flux= 6.04E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

eu155	2.35E-08	4.58E-08	4.58E-08	4.59E-08	4.59E-08	2.27E-08
xe130	1.76E-08	1.80E-08	1.84E-08	1.87E-08	1.91E-08	1.91E-08
pm147	2.01E-08	6.55E-08	6.55E-08	6.55E-08	6.55E-08	1.89E-08
se 82	1.63E-08	1.65E-08	1.67E-08	1.69E-08	1.71E-08	1.71E-08
ba136	1.55E-08	1.58E-08	1.60E-08	1.63E-08	1.66E-08	1.66E-08
sn126	1.42E-08	1.43E-08	1.44E-08	1.46E-08	1.47E-08	1.47E-08
te126	1.22E-08	1.25E-08	1.28E-08	1.31E-08	1.34E-08	1.34E-08
se 78	1.28E-08	1.30E-08	1.31E-08	1.32E-08	1.34E-08	1.34E-08
dy163	1.20E-08	1.22E-08	1.24E-08	1.26E-08	1.28E-08	1.28E-08
kr 82	1.16E-08	1.18E-08	1.19E-08	1.21E-08	1.23E-08	1.23E-08
sn124	1.12E-08	1.14E-08	1.15E-08	1.16E-08	1.17E-08	1.17E-08
as 75	7.53E-09	7.62E-09	7.70E-09	7.78E-09	7.87E-09	7.87E-09
eu154	6.63E-09	9.66E-09	9.78E-09	9.90E-09	1.00E-08	6.83E-09
in113	6.43E-09	6.50E-09	6.58E-09	6.65E-09	6.73E-09	6.73E-09
sn118	4.53E-09	4.58E-09	4.64E-09	4.69E-09	4.74E-09	4.74E-09
sn122	3.88E-09	3.93E-09	3.97E-09	4.02E-09	4.06E-09	4.06E-09
cd116	3.81E-09	3.85E-09	3.89E-09	3.94E-09	3.98E-09	3.98E-09
sr 90	3.55E-09	3.96E-09	3.96E-09	3.96E-09	3.96E-09	3.53E-09
sn120	2.86E-09	2.89E-09	2.93E-09	2.96E-09	2.99E-09	2.99E-09
ge 73	2.16E-09	2.18E-09	2.21E-09	2.23E-09	2.25E-09	2.25E-09
ho165	1.14E-09	1.16E-09	1.18E-09	1.21E-09	1.23E-09	1.23E-09
dy160	1.05E-09	1.07E-09	1.10E-09	1.12E-09	1.15E-09	1.15E-09
gd160	1.02E-09	1.03E-09	1.04E-09	1.06E-09	1.07E-09	1.07E-09
cs137	8.24E-10	9.15E-10	9.15E-10	9.15E-10	9.16E-10	8.20E-10
ge 76	7.34E-10	7.42E-10	7.50E-10	7.58E-10	7.66E-10	7.66E-10
xe128	6.21E-10	6.36E-10	6.50E-10	6.64E-10	6.79E-10	6.79E-10
sr 86	2.98E-10	3.04E-10	3.10E-10	3.17E-10	3.23E-10	3.23E-10
sn116	2.37E-10	2.42E-10	2.47E-10	2.53E-10	2.58E-10	2.58E-10
te124	2.22E-10	2.26E-10	2.30E-10	2.34E-10	2.38E-10	2.38E-10
cs134	2.01E-10	9.25E-10	9.36E-10	9.47E-10	9.57E-10	1.94E-10
nb 94	1.15E-10	1.18E-10	1.21E-10	1.24E-10	1.27E-10	1.27E-10

sr 87	1.10E-10	1.11E-10	1.13E-10	1.14E-10	1.16E-10	1.16E-10
te122	9.93E-11	1.02E-10	1.04E-10	1.06E-10	1.08E-10	1.08E-10
kr 85	9.99E-11	1.34E-10	1.34E-10	1.34E-10	1.34E-10	9.83E-11
se 76	8.40E-11	8.57E-11	8.73E-11	8.90E-11	9.08E-11	9.08E-11
er166	5.57E-11	5.66E-11	5.75E-11	5.85E-11	5.94E-11	5.94E-11
ge 74	4.31E-11	4.36E-11	4.41E-11	4.46E-11	4.51E-11	4.51E-11
kr 80	3.54E-11	3.67E-11	3.80E-11	3.93E-11	4.07E-11	4.07E-11
ge 72	3.18E-11	3.21E-11	3.25E-11	3.29E-11	3.33E-11	3.33E-11
er167	5.79E-12	5.95E-12	6.11E-12	6.27E-12	6.44E-12	6.44E-12
te123	4.32E-12	4.46E-12	4.61E-12	4.75E-12	4.90E-12	4.90E-12
y 90	3.38E-12	3.77E-12	3.77E-12	3.77E-12	3.77E-12	3.36E-12
cd108	2.40E-12	2.50E-12	2.60E-12	2.70E-12	2.81E-12	2.81E-12
ce144	2.59E-12	1.42E-10	1.42E-10	1.42E-10	1.42E-10	2.09E-12
sb125	1.39E-12	4.34E-12	4.35E-12	4.35E-12	4.35E-12	1.31E-12
ru106	4.57E-13	9.85E-12	9.86E-12	9.87E-12	9.89E-12	3.88E-13
be 9	9.23E-14	9.34E-14	9.44E-14	9.54E-14	9.64E-14	9.64E-14
sn114	6.22E-14	6.36E-14	6.51E-14	6.65E-14	6.80E-14	6.80E-14
li 7	3.78E-14	3.83E-14	3.87E-14	3.91E-14	3.95E-14	3.95E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 172
0 fraction of total absorption rate
power= .00mw, burnup= 21450.mwd, flux= 6.04E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.63E-14	1.80E-14	1.82E-14	1.83E-14	1.85E-14	1.69E-14
te127m	6.51E-17	2.21E-12	2.21E-12	2.21E-12	2.21E-12	3.69E-17
cd109	2.08E-18	2.55E-17	2.65E-17	2.75E-17	2.85E-17	2.11E-18
nb 95	1.46E-18	3.63E-11	3.63E-11	3.63E-11	3.63E-11	5.59E-19
zr 95	7.08E-19	3.90E-11	3.90E-11	3.90E-11	3.91E-11	2.73E-19
sn123	3.81E-19	2.58E-15	2.58E-15	2.58E-15	2.58E-15	2.32E-19
y 91	1.09E-19	3.34E-11	3.34E-11	3.34E-11	3.34E-11	4.09E-20

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 173
power= 9.790E-04mw, burnup=2.1450E+04mwd, flux= 6.04E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly
charge ******* d ******* d ******* d ******* d ******* d

h 1	1.22E-03	1.24E-03	1.25E-03	1.26E-03	1.28E-03	1.28E-03
h 2	3.66E-06	3.70E-06	3.74E-06	3.78E-06	3.82E-06	3.82E-06
h 3	1.11E-11	1.43E-11	1.44E-11	1.44E-11	1.44E-11	1.11E-11
h 4	.00E+00	1.43E-35	1.43E-35	1.44E-35	1.44E-35	.00E+00
he 3	1.68E-08	1.69E-08	1.70E-08	1.71E-08	1.72E-08	1.72E-08
he 4	2.03E-04	2.05E-04	2.07E-04	2.10E-04	2.12E-04	2.12E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.44E-05	2.46E-05	2.49E-05	2.52E-05	2.54E-05	2.54E-05
ne 21	9.10E-09	9.29E-09	9.49E-09	9.68E-09	9.88E-09	9.88E-09
ne 22	1.61E-07	1.62E-07	1.64E-07	1.66E-07	1.68E-07	1.68E-07
ne 23	1.78E-30	1.78E-15	1.78E-15	1.78E-15	1.78E-15	1.78E-30
na 22	3.18E-12	1.05E-11	1.06E-11	1.06E-11	1.06E-11	2.98E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	6.44E-24	6.43E-09	6.44E-09	6.44E-09	6.44E-09	6.44E-24
na 24m	1.06E-30	1.06E-15	1.06E-15	1.06E-15	1.06E-15	1.06E-30
na 25	6.58E-39	6.71E-24	6.86E-24	7.00E-24	7.15E-24	7.15E-39
mg 24	1.58E-01	1.60E-01	1.62E-01	1.63E-01	1.65E-01	1.65E-01
mg 25	9.42E-07	9.62E-07	9.82E-07	1.00E-06	1.02E-06	1.02E-06
mg 26	3.65E-06	3.69E-06	3.73E-06	3.77E-06	3.81E-06	3.81E-06
mg 27	5.30E-28	5.30E-13	5.30E-13	5.31E-13	5.31E-13	5.31E-28
mg 28	.00E+00	2.65E-25	2.65E-25	2.66E-25	2.66E-25	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	4.77E-26	4.77E-11	4.77E-11	4.77E-11	4.77E-11	4.78E-26
al 29	5.34E-37	5.45E-22	5.57E-22	5.69E-22	5.81E-22	5.81E-37

al 30	.00E+00	1.45E-31	1.50E-31	1.55E-31	1.60E-31	.00E+00
si 28	4.61E-01	4.66E-01	4.71E-01	4.76E-01	4.80E-01	4.80E-01
si 29	8.54E-06	8.72E-06	8.91E-06	9.09E-06	9.28E-06	9.28E-06
si 30	1.69E-10	1.74E-10	1.80E-10	1.86E-10	1.91E-10	1.91E-10
si 31	2.97E-38	3.07E-23	3.17E-23	3.27E-23	3.38E-23	3.38E-38
si 32	1.25E-29	1.31E-29	1.36E-29	1.40E-29	1.45E-29	1.42E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		6.04E+07	6.04E+07	6.04E+07	6.05E+07	6.05E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 174
power= 9.790E-04mw, burnup=2.1450E+04mwd, flux= 6.04E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
he 4	3.72E+01	3.78E+01	3.85E+01	3.92E+01	3.99E+01	4.00E+01
pb206	2.00E-01	2.06E-01	2.11E-01	2.17E-01	2.23E-01	2.23E-01
pb207	1.29E-02	1.32E-02	1.35E-02	1.38E-02	1.42E-02	1.42E-02
pb208	5.75E-04	5.87E-04	6.00E-04	6.13E-04	6.26E-04	6.26E-04
pb209	9.34E-10	9.49E-10	9.65E-10	9.80E-10	9.94E-10	9.95E-10
pb210	2.86E-04	2.90E-04	2.94E-04	2.97E-04	3.01E-04	3.01E-04
pb211	5.09E-11	5.13E-11	5.18E-11	5.23E-11	5.28E-11	5.29E-11
pb212	3.39E-11	3.49E-11	3.53E-11	3.57E-11	3.60E-11	3.52E-11
pb214	6.55E-10	6.63E-10	6.71E-10	6.79E-10	6.87E-10	6.88E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	3.37E-02	3.48E-02	3.59E-02	3.71E-02	3.82E-02	3.82E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.76E-07	1.79E-07	1.81E-07	1.83E-07	1.85E-07	1.85E-07
bi211	3.02E-12	3.04E-12	3.07E-12	3.10E-12	3.13E-12	3.14E-12
bi212	3.21E-12	3.31E-12	3.35E-12	3.38E-12	3.42E-12	3.34E-12
bi213	2.18E-10	2.22E-10	2.25E-10	2.29E-10	2.32E-10	2.32E-10
bi214	4.86E-10	4.92E-10	4.98E-10	5.04E-10	5.10E-10	5.11E-10
po210	4.87E-06	4.93E-06	4.99E-06	5.05E-06	5.11E-06	5.12E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.34E-17	3.36E-17	3.39E-17	3.43E-17	3.46E-17	3.47E-17
po212	1.69E-22	1.74E-22	1.76E-22	1.78E-22	1.79E-22	1.75E-22
po213	3.28E-19	3.33E-19	3.39E-19	3.44E-19	3.49E-19	3.49E-19
po214	6.69E-17	6.77E-17	6.86E-17	6.94E-17	7.02E-17	7.02E-17
po215	4.18E-17	4.22E-17	4.26E-17	4.30E-17	4.34E-17	4.35E-17
po216	1.28E-16	1.32E-16	1.34E-16	1.35E-16	1.36E-16	1.33E-16
po218	7.57E-11	7.67E-11	7.76E-11	7.86E-11	7.95E-11	7.95E-11
rn218	1.18E-43	1.24E-28	1.25E-28	1.26E-28	1.28E-28	1.22E-43
rn219	9.31E-14	9.38E-14	9.47E-14	9.56E-14	9.65E-14	9.67E-14
rn220	4.91E-14	5.07E-14	5.12E-14	5.18E-14	5.23E-14	5.11E-14
rn222	1.35E-07	1.36E-07	1.38E-07	1.40E-07	1.41E-07	1.41E-07
ra222	1.27E-40	1.34E-25	1.36E-25	1.37E-25	1.39E-25	1.32E-40
ra223	2.32E-08	2.34E-08	2.36E-08	2.39E-08	2.41E-08	2.41E-08
ra224	2.79E-10	2.88E-10	2.91E-10	2.94E-10	2.97E-10	2.90E-10
ra225	1.02E-07	1.04E-07	1.05E-07	1.07E-07	1.09E-07	1.09E-07
ra226	2.06E-02	2.08E-02	2.11E-02	2.13E-02	2.16E-02	2.16E-02
ra228	9.97E-11	1.01E-10	1.03E-10	1.04E-10	1.06E-10	1.06E-10
ac225	6.89E-08	7.01E-08	7.12E-08	7.23E-08	7.34E-08	7.34E-08
ac227	1.61E-05	1.63E-05	1.64E-05	1.66E-05	1.67E-05	1.67E-05
ac228	1.22E-14	1.23E-14	1.25E-14	1.27E-14	1.29E-14	1.29E-14
th226	6.21E-39	6.56E-24	6.63E-24	6.70E-24	6.77E-24	6.46E-39
th227	3.75E-08	3.78E-08	3.82E-08	3.85E-08	3.89E-08	3.90E-08
th228	5.33E-08	5.51E-08	5.56E-08	5.62E-08	5.68E-08	5.54E-08
th229	1.98E-02	2.02E-02	2.05E-02	2.08E-02	2.11E-02	2.11E-02
th230	1.01E+00	1.03E+00	1.04E+00	1.05E+00	1.06E+00	1.06E+00
th231	2.73E-09	3.86E-09	3.87E-09	3.88E-09	3.89E-09	2.72E-09
th232	2.44E-01	2.47E-01	2.51E-01	2.54E-01	2.58E-01	2.58E-01

th233	5.46E-28	5.54E-13	5.62E-13	5.71E-13	5.79E-13	5.79E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.42E-02	2.45E-02	2.47E-02	2.50E-02	2.52E-02	2.52E-02
pa232	1.02E-25	1.03E-10	1.04E-10	1.05E-10	1.06E-10	1.06E-25

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 175
power= 9.790E-04mw, burnup=2.1450E+04mwd, flux= 6.04E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.41E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	6.02E-36	6.35E-21	6.42E-21	6.49E-21	6.56E-21	6.26E-36
u231	9.60E-32	9.70E-17	9.82E-17	9.94E-17	1.01E-16	1.01E-31
u232	1.90E-06	2.01E-06	2.03E-06	2.05E-06	2.07E-06	1.97E-06
u233	5.19E-01	5.26E-01	5.32E-01	5.38E-01	5.44E-01	5.44E-01
u234	1.02E+01	1.02E+01	1.02E+01	1.03E+01	1.03E+01	1.03E+01
u235	6.59E+02	6.58E+02	6.58E+02	6.57E+02	6.57E+02	6.57E+02
u236	1.90E+02	1.91E+02	1.91E+02	1.91E+02	1.91E+02	1.91E+02
u237	1.28E-12	8.14E-07	8.15E-07	8.16E-07	8.17E-07	1.27E-12
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	7.52E-23	7.51E-08	7.52E-08	7.52E-08	7.52E-08	7.53E-23
u240	6.63E-35	7.11E-35	7.61E-35	8.14E-35	8.69E-35	8.70E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.16E-13	2.07E-12	2.07E-12	2.07E-12	2.07E-12	9.94E-14
np236m	4.92E-28	4.91E-13	4.91E-13	4.92E-13	4.92E-13	4.92E-28
np236	2.34E-06	2.36E-06	2.38E-06	2.40E-06	2.42E-06	2.42E-06
np237	4.08E+01	4.08E+01	4.08E+01	4.07E+01	4.07E+01	4.07E+01
np238	3.15E-14	3.64E-07	3.64E-07	3.64E-07	3.64E-07	3.18E-14
np239	2.01E-13	1.09E-05	1.09E-05	1.09E-05	1.09E-05	2.13E-13
np240m	5.66E-37	6.06E-37	6.49E-37	6.94E-37	7.42E-37	7.42E-37
np240	1.58E-38	5.40E-16	5.40E-16	5.41E-16	5.41E-16	1.83E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	9.62E-11	2.72E-10	2.72E-10	2.72E-10	2.72E-10	9.11E-11
pu237	8.49E-25	7.91E-14	7.93E-14	7.94E-14	7.96E-14	2.17E-25
pu238	5.31E-03	5.50E-03	5.50E-03	5.50E-03	5.50E-03	5.30E-03
pu239	3.10E+01	3.10E+01	3.11E+01	3.11E+01	3.12E+01	3.12E+01
pu240	5.19E-01	5.20E-01	5.21E-01	5.22E-01	5.24E-01	5.23E-01
pu241	4.14E-05	5.15E-05	5.17E-05	5.18E-05	5.19E-05	4.13E-05
pu242	4.22E-05	4.28E-05	4.33E-05	4.39E-05	4.45E-05	4.45E-05
pu243	2.36E-29	2.20E-14	2.23E-14	2.26E-14	2.29E-14	2.51E-29
pu244	3.30E-24	3.54E-24	3.79E-24	4.05E-24	4.33E-24	4.33E-24
pu245	.00E+00	3.56E-35	3.81E-35	4.08E-35	4.36E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.03E-34	1.03E-19	1.04E-19	1.04E-19	1.04E-19	1.04E-34
am240	4.72E-32	4.72E-17	4.74E-17	4.75E-17	4.77E-17	4.77E-32
am241	1.52E-03	1.52E-03	1.53E-03	1.53E-03	1.54E-03	1.54E-03
am242m	1.70E-07	1.74E-07	1.75E-07	1.75E-07	1.76E-07	1.72E-07
am242	2.20E-12	1.39E-11	1.40E-11	1.40E-11	1.41E-11	2.22E-12
am243	2.29E-07	2.33E-07	2.37E-07	2.40E-07	2.44E-07	2.44E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	4.23E-31	4.29E-16	4.36E-16	4.43E-16	4.50E-16	4.50E-31
am245	1.19E-39	6.99E-36	7.48E-36	8.01E-36	8.56E-36	1.21E-39
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.91E-37	2.00E-22	2.01E-22	2.02E-22	2.02E-22	5.83E-38
cm242	4.46E-10	2.81E-09	2.82E-09	2.83E-09	2.84E-09	4.49E-10
cm243	1.41E-14	1.57E-14	1.58E-14	1.58E-14	1.59E-14	1.42E-14
cm244	5.59E-12	6.74E-12	6.85E-12	6.96E-12	7.08E-12	5.90E-12

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1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                    actinides        page  176
       power= 9.790E-04mw, burnup=2.1450E+04mwd, flux= 6.04E+07n/cm**2-sec
0                                          nuclide concentrations, gram atoms
                                           basis = single reactor assembly
              charge ******* d ******* d ******* d ******* d ******* d ******* d
     cm245    1.46E-14  1.48E-14  1.51E-14  1.54E-14  1.56E-14  1.56E-14
     cm246    1.17E-16  1.19E-16  1.22E-16  1.24E-16  1.26E-16  1.26E-16
     cm247    5.50E-20  5.69E-20  5.89E-20  6.08E-20  6.29E-20  6.29E-20
     cm248    1.98E-22  2.09E-22  2.19E-22  2.31E-22  2.42E-22  2.42E-22
     cm249     .00E+00  1.60E-33  1.68E-33  1.77E-33  1.86E-33   .00E+00
     cm250    1.08E-37  1.15E-37  1.22E-37  1.30E-37  1.38E-37  1.38E-37
     cm251     .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals     3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux               6.04E+07  6.04E+07  6.04E+07  6.05E+07  6.05E-08
0        1q array has       20 entries.
0        3q array has        1 entries.
0        3q array has        1 entries.
0        3q array has        1 entries.
0        4q array has        1 entries.
0       54q array has       12 entries.
1library information...

          cross-section data taken from position number 20 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr.origen-s binary working library--id = 1143             *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *      neutron flux spectrum factors and cross sections were produced from     *
          *     the "presas2" case updating all nuclides on the scale "burnup" library   *
          *                                                                              *
          *                  fission product yields are from endf/b-v                    *
          *                                                                              *
          *              photon libraries use an 18-energy-group structure               *
          *             the photon data are from the master photon data base,            *
          *              produced to include bremsstrahlung from uo2 matrix              *
          *                                                                              *
          *         see information above this box (if present) for later updates        *
          *                                                                              *
          ********************************************************************************
          *                                                                              *
0         ********************************************************************************
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```
0                .other identification and sizes of library.
0                 data set name:  ft33f001
0              8/29/1996    date library was produced
0                  1697    total number of nuclides in library
                    689    number of light-element nuclides
                    129    number of actinide nuclides
                    879    number of fission product nuclides
0                  7993    number of nonzero off-diagonal matrix elements
0       ********************************************************************************
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page  177
      power=    .00mw, burnup=  22344.mwd, flux= 6.05E+07n/cm**2-sec
0                                    basis =
0   (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                  initial      ******* d      ******* d      ******* d      ******* d      ******* d
    productions   1.256850E+06   1.256228E+06   1.255605E+06   1.254980E+06   1.254355E+06   1.254355E+06
    absorptions   1.024347E+06   1.024127E+06   1.023905E+06   1.023683E+06   1.023460E+06   1.023460E+06
    k infinity    1.226977E+00   1.226633E+00   1.226290E+00   1.225946E+00   1.225602E+00   1.225602E+00
0                  initial      ******* d      ******* d      ******* d      ******* d      ******* d
    actinide
    absorptions   1.006195E+06   1.005896E+06   1.005597E+06   1.005296E+06   1.004996E+06   1.004996E+06
    non-actinide
    abs. fracs.   1.772010E-02   1.780099E-02   1.788104E-02   1.796150E-02   1.804131E-02   1.804131E-02
1   sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2             fission products        page  178
0                          fraction of total absorption rate
      power=    .00mw, burnup=  22344.mwd, flux= 6.05E+07n/cm**2-sec
0             initial ******* d ******* d ******* d ******* d ******* d

    sm149     5.43E-03  5.43E-03  5.43E-03  5.43E-03  5.42E-03  5.42E-03
    nd143     2.07E-03  2.09E-03  2.11E-03  2.13E-03  2.15E-03  2.15E-03
    eu151     1.85E-03  1.86E-03  1.87E-03  1.88E-03  1.89E-03  1.89E-03
    rh103     1.01E-03  1.02E-03  1.03E-03  1.04E-03  1.05E-03  1.05E-03
    xe131     6.74E-04  6.81E-04  6.88E-04  6.95E-04  7.02E-04  7.02E-04
    cs133     5.24E-04  5.30E-04  5.35E-04  5.41E-04  5.46E-04  5.46E-04
    sm147     3.84E-04  3.88E-04  3.92E-04  3.96E-04  4.00E-04  4.00E-04
    tc 99     3.54E-04  3.57E-04  3.60E-04  3.64E-04  3.67E-04  3.67E-04
    nd145     2.96E-04  2.99E-04  3.02E-04  3.05E-04  3.08E-04  3.08E-04
    sm152     2.31E-04  2.34E-04  2.37E-04  2.39E-04  2.42E-04  2.42E-04
    gd155     2.25E-04  2.25E-04  2.25E-04  2.25E-04  2.25E-04  2.25E-04
    mo 95     2.05E-04  2.07E-04  2.09E-04  2.12E-04  2.14E-04  2.14E-04
    sm150     1.55E-04  1.57E-04  1.59E-04  1.61E-04  1.62E-04  1.62E-04
    kr 83     1.26E-04  1.27E-04  1.29E-04  1.30E-04  1.31E-04  1.31E-04
    cs135     1.19E-04  1.20E-04  1.21E-04  1.23E-04  1.24E-04  1.24E-04
    cd113     1.03E-04  1.03E-04  1.03E-04  1.03E-04  1.03E-04  1.03E-04
    eu153     9.47E-05  9.58E-05  9.69E-05  9.80E-05  9.92E-05  9.92E-05
    ru101     9.24E-05  9.34E-05  9.44E-05  9.54E-05  9.64E-05  9.64E-05
    pr141     8.86E-05  8.95E-05  9.05E-05  9.14E-05  9.23E-05  9.23E-05
    la139     7.25E-05  7.32E-05  7.40E-05  7.48E-05  7.55E-05  7.55E-05
    gd157     6.13E-05  6.13E-05  6.14E-05  6.14E-05  6.14E-05  6.14E-05
    ag109     3.71E-05  3.76E-05  3.82E-05  3.87E-05  3.92E-05  3.92E-05
    pd105     3.71E-05  3.75E-05  3.80E-05  3.84E-05  3.88E-05  3.88E-05
    ba137     3.51E-05  3.54E-05  3.58E-05  3.62E-05  3.66E-05  3.66E-05
    zr 93     2.84E-05  2.87E-05  2.90E-05  2.93E-05  2.96E-05  2.96E-05
     i129     2.37E-05  2.40E-05  2.43E-05  2.45E-05  2.48E-05  2.48E-05
    nd144     2.24E-05  2.27E-05  2.29E-05  2.32E-05  2.34E-05  2.34E-05
    gd152     1.86E-05  1.89E-05  1.93E-05  1.96E-05  1.99E-05  1.99E-05
    mo 97     1.65E-05  1.66E-05  1.68E-05  1.70E-05  1.72E-05  1.72E-05
    sm151     1.27E-05  1.32E-05  1.32E-05  1.32E-05  1.33E-05  1.33E-05
    pd108     8.95E-06  9.07E-06  9.19E-06  9.31E-06  9.43E-06  9.43E-06
    zr 91     7.56E-06  7.64E-06  7.72E-06  7.80E-06  7.88E-06  7.88E-06
     y 89     7.23E-06  7.30E-06  7.38E-06  7.46E-06  7.53E-06  7.53E-06
```

ru102	6.89E-06	6.97E-06	7.04E-06	7.11E-06	7.19E-06	7.19E-06
ce142	6.04E-06	6.10E-06	6.16E-06	6.23E-06	6.29E-06	6.29E-06
nd148	5.82E-06	5.88E-06	5.94E-06	6.00E-06	6.06E-06	6.06E-06
ru 99	4.94E-06	5.05E-06	5.17E-06	5.29E-06	5.41E-06	5.41E-06
nd146	4.90E-06	4.96E-06	5.01E-06	5.06E-06	5.11E-06	5.11E-06
pd107	4.51E-06	4.56E-06	4.62E-06	4.68E-06	4.74E-06	4.74E-06
in115	4.31E-06	4.36E-06	4.41E-06	4.45E-06	4.50E-06	4.50E-06
ba138	4.17E-06	4.22E-06	4.26E-06	4.31E-06	4.35E-06	4.35E-06
ce140	3.91E-06	3.95E-06	3.99E-06	4.03E-06	4.07E-06	4.07E-06
xe132	3.59E-06	3.63E-06	3.67E-06	3.71E-06	3.75E-06	3.75E-06
mo 98	2.40E-06	2.43E-06	2.45E-06	2.48E-06	2.51E-06	2.51E-06
mo100	2.34E-06	2.37E-06	2.39E-06	2.42E-06	2.44E-06	2.44E-06
xe134	2.31E-06	2.33E-06	2.36E-06	2.38E-06	2.41E-06	2.41E-06
zr 92	1.83E-06	1.85E-06	1.87E-06	1.89E-06	1.91E-06	1.91E-06
i127	1.74E-06	1.76E-06	1.78E-06	1.80E-06	1.82E-06	1.82E-06
ru104	1.59E-06	1.61E-06	1.63E-06	1.64E-06	1.66E-06	1.66E-06

1 sas2h; far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 179
0 fraction of total absorption rate
power= .00mw, burnup= 22344.mwd, flux= 6.05E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.44E-06	1.46E-06	1.47E-06	1.49E-06	1.50E-06	1.50E-06
nd150	1.32E-06	1.33E-06	1.35E-06	1.36E-06	1.37E-06	1.37E-06
xe136	1.25E-06	1.27E-06	1.28E-06	1.29E-06	1.31E-06	1.31E-06
cd111	1.01E-06	1.03E-06	1.04E-06	1.05E-06	1.06E-06	1.06E-06
gd154	8.91E-07	9.11E-07	9.31E-07	9.51E-07	9.72E-07	9.72E-07
br 81	9.27E-07	9.37E-07	9.47E-07	9.57E-07	9.67E-07	9.67E-07
rb 85	8.87E-07	8.97E-07	9.06E-07	9.15E-07	9.25E-07	9.25E-07
zr 94	7.76E-07	7.84E-07	7.92E-07	8.00E-07	8.09E-07	8.09E-07
zr 90	7.13E-07	7.20E-07	7.28E-07	7.35E-07	7.42E-07	7.42E-07
sm154	6.21E-07	6.28E-07	6.35E-07	6.42E-07	6.49E-07	6.49E-07
te130	5.78E-07	5.85E-07	5.91E-07	5.97E-07	6.03E-07	6.03E-07
xe135	.00E+00	5.67E-07	5.67E-07	5.67E-07	5.68E-07	5.68E-07
ba135	5.01E-07	5.13E-07	5.25E-07	5.38E-07	5.50E-07	5.50E-07
rb 87	5.11E-07	5.16E-07	5.21E-07	5.27E-07	5.32E-07	5.32E-07
pd106	3.81E-07	3.85E-07	3.90E-07	3.95E-07	3.99E-07	3.99E-07
se 77	3.74E-07	3.77E-07	3.81E-07	3.85E-07	3.89E-07	3.89E-07
gd156	3.62E-07	3.67E-07	3.71E-07	3.76E-07	3.80E-07	3.80E-07
ru100	2.43E-07	2.48E-07	2.53E-07	2.58E-07	2.63E-07	2.63E-07
kr 84	2.44E-07	2.46E-07	2.49E-07	2.51E-07	2.54E-07	2.54E-07
dy161	2.23E-07	2.25E-07	2.28E-07	2.31E-07	2.34E-07	2.34E-07
sb121	1.99E-07	2.01E-07	2.03E-07	2.05E-07	2.08E-07	2.08E-07
nd142	1.78E-07	1.82E-07	1.86E-07	1.90E-07	1.93E-07	1.93E-07
se 79	1.84E-07	1.86E-07	1.87E-07	1.89E-07	1.91E-07	1.91E-07
ba134	1.70E-07	1.74E-07	1.77E-07	1.81E-07	1.85E-07	1.85E-07
sm148	1.55E-07	1.58E-07	1.62E-07	1.65E-07	1.68E-07	1.68E-07
sb123	1.61E-07	1.62E-07	1.64E-07	1.66E-07	1.68E-07	1.68E-07
kr 86	1.35E-07	1.37E-07	1.38E-07	1.39E-07	1.41E-07	1.41E-07
te128	1.31E-07	1.32E-07	1.34E-07	1.35E-07	1.37E-07	1.37E-07
pd104	1.17E-07	1.19E-07	1.22E-07	1.25E-07	1.27E-07	1.27E-07
eu152	9.31E-08	1.20E-07	1.20E-07	1.21E-07	1.22E-07	1.22E-07
tb159	9.62E-08	9.75E-08	9.87E-08	9.99E-08	1.01E-07	1.01E-07
se 80	8.95E-08	9.05E-08	9.14E-08	9.24E-08	9.33E-08	9.33E-08
te125	8.91E-08	9.01E-08	9.11E-08	9.21E-08	9.31E-08	9.31E-08
nb 93	7.97E-08	8.16E-08	8.35E-08	8.55E-08	8.74E-08	8.74E-08
gd158	7.60E-08	7.70E-08	7.79E-08	7.89E-08	7.99E-08	7.99E-08
cd112	6.87E-08	6.95E-08	7.04E-08	7.12E-08	7.20E-08	7.20E-08
pm147	1.89E-08	6.55E-08	6.55E-08	6.55E-08	6.56E-08	6.56E-08
dy162	5.09E-08	5.17E-08	5.25E-08	5.33E-08	5.40E-08	5.40E-08
dy164	5.00E-08	5.06E-08	5.13E-08	5.19E-08	5.26E-08	5.26E-08

sn117	4.85E-08	4.90E-08	4.96E-08	5.01E-08	5.07E-08	5.07E-08
li 6	4.64E-08	4.68E-08	4.73E-08	4.77E-08	4.82E-08	4.82E-08
eu155	2.27E-08	4.59E-08	4.60E-08	4.60E-08	4.60E-08	4.60E-08
cd110	4.16E-08	4.26E-08	4.37E-08	4.48E-08	4.59E-08	4.59E-08
br 79	3.97E-08	4.06E-08	4.16E-08	4.25E-08	4.35E-08	4.35E-08
cd114	4.12E-08	4.17E-08	4.22E-08	4.27E-08	4.31E-08	4.31E-08
mo 96	3.89E-08	3.97E-08	4.05E-08	4.13E-08	4.22E-08	4.22E-08
ag107	3.80E-08	3.90E-08	4.00E-08	4.11E-08	4.21E-08	4.21E-08
sn119	3.69E-08	3.73E-08	3.77E-08	3.81E-08	3.85E-08	3.85E-08
pd110	3.39E-08	3.43E-08	3.48E-08	3.52E-08	3.56E-08	3.56E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 180
0 fraction of total absorption rate
power= .00mw, burnup= 22344.mwd, flux= 6.05E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sn115	3.38E-08	3.41E-08	3.45E-08	3.49E-08	3.52E-08	3.52E-08
xe129	2.41E-08	2.46E-08	2.52E-08	2.58E-08	2.64E-08	2.64E-08
sr 88	2.48E-08	2.51E-08	2.53E-08	2.56E-08	2.59E-08	2.59E-08
xe130	1.91E-08	1.95E-08	1.99E-08	2.03E-08	2.07E-08	2.07E-08
ba136	1.66E-08	1.69E-08	1.72E-08	1.75E-08	1.78E-08	1.78E-08
se 82	1.71E-08	1.72E-08	1.74E-08	1.76E-08	1.78E-08	1.78E-08
sn126	1.47E-08	1.49E-08	1.50E-08	1.51E-08	1.53E-08	1.53E-08
te126	1.34E-08	1.37E-08	1.40E-08	1.43E-08	1.47E-08	1.47E-08
se 78	1.34E-08	1.35E-08	1.37E-08	1.38E-08	1.40E-08	1.40E-08
dy163	1.28E-08	1.29E-08	1.31E-08	1.33E-08	1.35E-08	1.35E-08
kr 82	1.23E-08	1.25E-08	1.27E-08	1.30E-08	1.32E-08	1.32E-08
sn124	1.17E-08	1.19E-08	1.20E-08	1.21E-08	1.23E-08	1.23E-08
eu154	6.84E-09	1.02E-08	1.03E-08	1.04E-08	1.05E-08	1.05E-08
as 75	7.87E-09	7.95E-09	8.04E-09	8.12E-09	8.20E-09	8.20E-09
in113	6.73E-09	6.81E-09	6.88E-09	6.96E-09	7.03E-09	7.03E-09
sn118	4.74E-09	4.79E-09	4.84E-09	4.90E-09	4.95E-09	4.95E-09
sn122	4.06E-09	4.11E-09	4.16E-09	4.20E-09	4.25E-09	4.25E-09
cd116	3.98E-09	4.02E-09	4.07E-09	4.11E-09	4.16E-09	4.16E-09
sr 90	3.53E-09	3.96E-09	3.96E-09	3.96E-09	3.96E-09	3.96E-09
sn120	2.99E-09	3.03E-09	3.06E-09	3.09E-09	3.13E-09	3.13E-09
rh105	.00E+00	2.66E-09	2.66E-09	2.66E-09	2.66E-09	2.66E-09
ge 73	2.25E-09	2.28E-09	2.30E-09	2.33E-09	2.35E-09	2.35E-09
ho165	1.23E-09	1.25E-09	1.27E-09	1.29E-09	1.32E-09	1.32E-09
dy160	1.15E-09	1.18E-09	1.20E-09	1.23E-09	1.26E-09	1.26E-09
gd160	1.07E-09	1.09E-09	1.10E-09	1.11E-09	1.13E-09	1.13E-09
cs134	1.94E-10	9.67E-10	9.78E-10	9.89E-10	9.99E-10	9.99E-10
cs137	8.20E-10	9.16E-10	9.16E-10	9.16E-10	9.16E-10	9.16E-10
ge 76	7.66E-10	7.74E-10	7.82E-10	7.90E-10	7.98E-10	7.98E-10
xe128	6.79E-10	6.94E-10	7.09E-10	7.24E-10	7.39E-10	7.39E-10
pr143	.00E+00	6.35E-10	6.35E-10	6.35E-10	6.35E-10	6.35E-10
xe133	.00E+00	4.92E-10	4.92E-10	4.92E-10	4.92E-10	4.92E-10
ce141	.00E+00	3.86E-10	3.86E-10	3.86E-10	3.86E-10	3.86E-10
sr 86	3.23E-10	3.30E-10	3.36E-10	3.43E-10	3.50E-10	3.50E-10
sn116	2.58E-10	2.64E-10	2.70E-10	2.75E-10	2.81E-10	2.81E-10
te124	2.38E-10	2.42E-10	2.46E-10	2.50E-10	2.54E-10	2.54E-10
pm149	.00E+00	2.40E-10	2.41E-10	2.41E-10	2.41E-10	2.41E-10
nd147	.00E+00	2.24E-10	2.24E-10	2.24E-10	2.24E-10	2.24E-10
ce144	2.09E-12	1.42E-10	1.42E-10	1.42E-10	1.42E-10	1.42E-10
nb 94	1.27E-10	1.30E-10	1.34E-10	1.37E-10	1.40E-10	1.40E-10
kr 85	9.83E-11	1.34E-10	1.34E-10	1.34E-10	1.34E-10	1.34E-10
sr 87	1.16E-10	1.17E-10	1.19E-10	1.20E-10	1.22E-10	1.22E-10
te122	1.08E-10	1.11E-10	1.13E-10	1.16E-10	1.18E-10	1.18E-10
se 76	9.08E-11	9.25E-11	9.43E-11	9.61E-11	9.79E-11	9.79E-11
ru103	.00E+00	9.48E-11	9.48E-11	9.48E-11	9.49E-11	9.49E-11
er166	5.94E-11	6.04E-11	6.13E-11	6.23E-11	6.32E-11	6.32E-11

	ge 74	4.51E-11	4.56E-11	4.60E-11	4.65E-11	4.70E-11	4.70E-11
	kr 80	4.07E-11	4.21E-11	4.35E-11	4.50E-11	4.65E-11	4.65E-11
	zr 95	2.72E-19	3.90E-11	3.91E-11	3.91E-11	3.91E-11	3.91E-11
	nb 95	5.58E-19	3.63E-11	3.63E-11	3.63E-11	3.63E-11	3.63E-11

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 181
0 fraction of total absorption rate

power= .00mw, burnup= 22344.mwd, flux= 6.05E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d ******* d

ge 72	3.33E-11	3.37E-11	3.40E-11	3.44E-11	3.48E-11	3.48E-11
y 91	4.08E-20	3.34E-11	3.34E-11	3.34E-11	3.34E-11	3.34E-11
pm151	.00E+00	2.84E-11	2.84E-11	2.84E-11	2.84E-11	2.84E-11
sm153	.00E+00	1.27E-11	1.27E-11	1.27E-11	1.28E-11	1.28E-11
eu156	.00E+00	1.27E-11	1.27E-11	1.28E-11	1.28E-11	1.28E-11
ba140	.00E+00	1.14E-11	1.14E-11	1.14E-11	1.14E-11	1.14E-11
ru106	3.88E-13	9.89E-12	9.90E-12	9.91E-12	9.92E-12	9.92E-12
er167	6.44E-12	6.61E-12	6.78E-12	6.95E-12	7.13E-12	7.13E-12
sr 89	.00E+00	7.11E-12	7.11E-12	7.11E-12	7.11E-12	7.11E-12
te123	4.90E-12	5.05E-12	5.21E-12	5.36E-12	5.53E-12	5.53E-12
kr 87	.00E+00	5.34E-12	5.34E-12	5.34E-12	5.34E-12	5.34E-12
sb125	1.31E-12	4.35E-12	4.36E-12	4.36E-12	4.36E-12	4.36E-12
ce143	.00E+00	4.16E-12	4.16E-12	4.16E-12	4.16E-12	4.16E-12
y 90	3.36E-12	3.77E-12	3.78E-12	3.78E-12	3.78E-12	3.78E-12
la140	.00E+00	3.67E-12	3.67E-12	3.67E-12	3.67E-12	3.67E-12
cd108	2.81E-12	2.92E-12	3.03E-12	3.15E-12	3.27E-12	3.27E-12
mo 99	.00E+00	3.18E-12	3.18E-12	3.18E-12	3.18E-12	3.18E-12
te127m	3.69E-17	2.21E-12	2.21E-12	2.21E-12	2.22E-12	2.22E-12
i131	.00E+00	1.68E-12	1.68E-12	1.68E-12	1.68E-12	1.68E-12
pm148m	.00E+00	7.28E-13	7.29E-13	7.30E-13	7.31E-13	7.31E-13
te129m	.00E+00	4.71E-13	4.71E-13	4.71E-13	4.71E-13	4.71E-13
ag111	.00E+00	1.51E-13	1.52E-13	1.52E-13	1.52E-13	1.52E-13
eu157	.00E+00	1.24E-13	1.24E-13	1.24E-13	1.24E-13	1.24E-13
be 9	9.64E-14	9.74E-14	9.84E-14	9.94E-14	1.00E-13	1.00E-13
cs136	.00E+00	8.90E-14	8.97E-14	9.05E-14	9.12E-14	9.12E-14
sn114	6.80E-14	6.95E-14	7.11E-14	7.26E-14	7.42E-14	7.42E-14
cd115m	.00E+00	6.74E-14	6.75E-14	6.75E-14	6.76E-14	6.76E-14
tb160	.00E+00	5.78E-14	5.86E-14	5.93E-14	6.00E-14	6.00E-14
li 7	3.95E-14	3.99E-14	4.04E-14	4.08E-14	4.12E-14	4.12E-14
pr142	.00E+00	2.49E-14	2.52E-14	2.54E-14	2.57E-14	2.57E-14
pm148	.00E+00	2.37E-14	2.37E-14	2.38E-14	2.38E-14	2.38E-14
sb126	1.69E-14	1.87E-14	1.88E-14	1.90E-14	1.91E-14	1.91E-14
ru105	.00E+00	9.33E-15	9.34E-15	9.35E-15	9.36E-15	9.36E-15
sn125	.00E+00	7.97E-15	7.97E-15	7.98E-15	7.98E-15	7.98E-15
i130	.00E+00	4.38E-15	4.43E-15	4.47E-15	4.52E-15	4.52E-15
rb 88	.00E+00	3.00E-15	3.00E-15	3.00E-15	3.00E-15	3.00E-15
sn123	2.31E-19	2.58E-15	2.58E-15	2.58E-15	2.58E-15	2.58E-15
i135	.00E+00	2.47E-15	2.47E-15	2.48E-15	2.48E-15	2.48E-15
te132	.00E+00	2.36E-15	2.36E-15	2.36E-15	2.36E-15	2.36E-15
sb124	.00E+00	2.19E-15	2.20E-15	2.22E-15	2.24E-15	2.24E-15
rb 86	.00E+00	1.45E-15	1.47E-15	1.48E-15	1.50E-15	1.50E-15
te134	.00E+00	1.39E-15	1.39E-15	1.39E-15	1.39E-15	1.39E-15
dy165	.00E+00	7.14E-16	7.20E-16	7.25E-16	7.30E-16	7.30E-16
in117m	.00E+00	6.54E-16	6.55E-16	6.55E-16	6.56E-16	6.56E-16
in117	.00E+00	1.96E-16	1.96E-16	1.96E-16	1.96E-16	1.96E-16
cs134m	.00E+00	1.83E-16	1.85E-16	1.87E-16	1.89E-16	1.89E-16
cd118	.00E+00	3.41E-17	3.41E-17	3.41E-17	3.42E-17	3.42E-17
cd109	2.12E-18	2.95E-17	3.06E-17	3.17E-17	3.28E-17	3.28E-17
ge 75	.00E+00	2.12E-17	2.13E-17	2.13E-17	2.13E-17	2.13E-17

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 182
0 fraction of total absorption rate

power= .00mw, burnup= 22344.mwd, flux= 6.05E+07n/cm**2-sec

0	initial ******* d	******* d	******* d	******* d	******* d
ag110	.00E+00	1.22E-17	1.23E-17	1.25E-17	1.27E-17	1.27E-17
in119m	.00E+00	8.34E-18	8.34E-18	8.35E-18	8.36E-18	8.36E-18
in119	.00E+00	6.81E-19	6.81E-19	6.81E-19	6.81E-19	6.81E-19

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 183

power= 9.790E-04mw, burnup=2.2344E+04mwd, flux= 6.05E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge ******* d	******* d	******* d	******* d	******* d	******* d
h 1	1.28E-03	1.29E-03	1.30E-03	1.32E-03	1.33E-03	1.33E-03
h 2	3.82E-06	3.86E-06	3.90E-06	3.94E-06	3.98E-06	3.98E-06
h 3	1.11E-11	1.45E-11	1.45E-11	1.46E-11	1.46E-11	1.46E-11
h 4	.00E+00	1.45E-35	1.45E-35	1.46E-35	1.46E-35	1.46E-35
he 3	1.72E-08	1.73E-08	1.73E-08	1.74E-08	1.75E-08	1.75E-08
he 4	2.12E-04	2.14E-04	2.16E-04	2.19E-04	2.21E-04	2.21E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.54E-05	2.57E-05	2.60E-05	2.63E-05	2.65E-05	2.65E-05
ne 21	9.88E-09	1.01E-08	1.03E-08	1.05E-08	1.07E-08	1.07E-08
ne 22	1.68E-07	1.69E-07	1.71E-07	1.73E-07	1.75E-07	1.75E-07
ne 23	1.78E-30	1.78E-15	1.78E-15	1.78E-15	1.78E-15	1.78E-15
na 22	2.98E-12	1.06E-11	1.06E-11	1.06E-11	1.06E-11	1.06E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	6.44E-24	6.44E-09	6.44E-09	6.45E-09	6.45E-09	6.45E-09
na 24m	1.06E-30	1.06E-15	1.06E-15	1.06E-15	1.06E-15	1.06E-15
na 25	7.15E-39	7.29E-24	7.44E-24	7.59E-24	7.75E-24	7.75E-24
mg 24	1.65E-01	1.67E-01	1.68E-01	1.70E-01	1.72E-01	1.72E-01
mg 25	1.02E-06	1.04E-06	1.06E-06	1.09E-06	1.11E-06	1.11E-06
mg 26	3.81E-06	3.85E-06	3.89E-06	3.93E-06	3.97E-06	3.97E-06
mg 27	5.31E-28	5.31E-13	5.31E-13	5.31E-13	5.31E-13	5.31E-13
mg 28	.00E+00	2.66E-25	2.66E-25	2.67E-25	2.67E-25	2.67E-25
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	4.78E-26	4.77E-11	4.78E-11	4.78E-11	4.78E-11	4.78E-11
al 29	5.81E-37	5.93E-22	6.05E-22	6.17E-22	6.30E-22	6.30E-22
al 30	.00E+00	1.65E-31	1.70E-31	1.75E-31	1.81E-31	1.81E-31
si 28	4.80E-01	4.85E-01	4.90E-01	4.95E-01	5.00E-01	5.00E-01
si 29	9.28E-06	9.47E-06	9.67E-06	9.86E-06	1.01E-05	1.01E-05
si 30	1.91E-10	1.97E-10	2.04E-10	2.10E-10	2.16E-10	2.16E-10
si 31	3.38E-38	3.48E-23	3.59E-23	3.70E-23	3.82E-23	3.82E-23
si 32	1.42E-29	1.49E-29	1.54E-29	1.59E-29	1.64E-29	1.64E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		6.05E+07	6.05E+07	6.05E+07	6.06E+07	6.06E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 184

power= 9.790E-04mw, burnup=2.2344E+04mwd, flux= 6.05E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge ******* d	******* d	******* d	******* d	******* d	******* d
he 4	4.00E+01	4.07E+01	4.14E+01	4.21E+01	4.28E+01	4.28E+01
pb206	2.23E-01	2.29E-01	2.35E-01	2.41E-01	2.47E-01	2.47E-01
pb207	1.42E-02	1.45E-02	1.48E-02	1.52E-02	1.55E-02	1.55E-02
pb208	6.26E-04	6.39E-04	6.52E-04	6.65E-04	6.78E-04	6.78E-04
pb209	9.95E-10	1.01E-09	1.02E-09	1.04E-09	1.05E-09	1.05E-09
pb210	3.01E-04	3.04E-04	3.08E-04	3.11E-04	3.15E-04	3.15E-04
pb211	5.29E-11	5.33E-11	5.38E-11	5.43E-11	5.47E-11	5.47E-11
pb212	3.52E-11	3.64E-11	3.67E-11	3.71E-11	3.74E-11	3.74E-11
pb214	6.88E-10	6.96E-10	7.04E-10	7.12E-10	7.20E-10	7.20E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

bi209	3.82E-02	3.94E-02	4.06E-02	4.18E-02	4.30E-02	4.30E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.85E-07	1.87E-07	1.90E-07	1.92E-07	1.94E-07	1.94E-07
bi211	3.14E-12	3.16E-12	3.19E-12	3.22E-12	3.25E-12	3.25E-12
bi212	3.34E-12	3.45E-12	3.48E-12	3.52E-12	3.55E-12	3.55E-12
bi213	2.32E-10	2.36E-10	2.39E-10	2.43E-10	2.46E-10	2.46E-10
bi214	5.11E-10	5.17E-10	5.23E-10	5.28E-10	5.34E-10	5.34E-10
po210	5.12E-06	5.17E-06	5.23E-06	5.29E-06	5.35E-06	5.35E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.47E-17	3.49E-17	3.52E-17	3.55E-17	3.59E-17	3.59E-17
po212	1.75E-22	1.81E-22	1.83E-22	1.85E-22	1.86E-22	1.86E-22
po213	3.49E-19	3.54E-19	3.60E-19	3.65E-19	3.70E-19	3.70E-19
po214	7.02E-17	7.11E-17	7.19E-17	7.27E-17	7.35E-17	7.35E-17
po215	4.35E-17	4.38E-17	4.42E-17	4.46E-17	4.50E-17	4.50E-17
po216	1.33E-16	1.38E-16	1.39E-16	1.40E-16	1.42E-16	1.42E-16
po218	7.95E-11	8.05E-11	8.14E-11	8.23E-11	8.33E-11	8.33E-11
rn218	1.22E-43	1.29E-28	1.30E-28	1.32E-28	1.33E-28	1.33E-28
rn219	9.67E-14	9.74E-14	9.83E-14	9.92E-14	1.00E-13	1.00E-13
rn220	5.11E-14	5.28E-14	5.33E-14	5.38E-14	5.43E-14	5.43E-14
rn222	1.41E-07	1.43E-07	1.45E-07	1.46E-07	1.48E-07	1.48E-07
ra222	1.32E-40	1.40E-25	1.41E-25	1.43E-25	1.44E-25	1.44E-25
ra223	2.41E-08	2.43E-08	2.45E-08	2.47E-08	2.50E-08	2.50E-08
ra224	2.90E-10	3.00E-10	3.03E-10	3.06E-10	3.09E-10	3.09E-10
ra225	1.09E-07	1.10E-07	1.12E-07	1.14E-07	1.15E-07	1.15E-07
ra226	2.16E-02	2.18E-02	2.21E-02	2.24E-02	2.26E-02	2.26E-02
ra228	1.06E-10	1.07E-10	1.08E-10	1.10E-10	1.11E-10	1.11E-10
ac225	7.34E-08	7.45E-08	7.56E-08	7.67E-08	7.78E-08	7.78E-08
ac227	1.67E-05	1.69E-05	1.71E-05	1.72E-05	1.74E-05	1.74E-05
ac228	1.29E-14	1.31E-14	1.32E-14	1.34E-14	1.36E-14	1.36E-14
th226	6.46E-39	6.83E-24	6.90E-24	6.97E-24	7.04E-24	7.04E-24
th227	3.90E-08	3.92E-08	3.96E-08	4.00E-08	4.03E-08	4.03E-08
th228	5.54E-08	5.73E-08	5.79E-08	5.84E-08	5.90E-08	5.90E-08
th229	2.11E-02	2.14E-02	2.18E-02	2.21E-02	2.24E-02	2.24E-02
th230	1.06E+00	1.07E+00	1.09E+00	1.10E+00	1.11E+00	1.11E+00
th231	2.72E-09	3.91E-09	3.92E-09	3.93E-09	3.94E-09	3.94E-09
th232	2.58E-01	2.61E-01	2.65E-01	2.69E-01	2.72E-01	2.72E-01
th233	5.79E-28	5.87E-13	5.95E-13	6.04E-13	6.12E-13	6.12E-13
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.52E-02	2.54E-02	2.57E-02	2.59E-02	2.61E-02	2.61E-02
pa232	1.06E-25	1.07E-10	1.08E-10	1.09E-10	1.10E-10	1.10E-10

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 185
power= 9.790E-04mw, burnup=2.2344E+04mwd, flux= 6.05E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.41E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06	1.41E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	6.26E-36	6.62E-21	6.69E-21	6.75E-21	6.82E-21	6.82E-21
u231	1.01E-31	1.02E-16	1.03E-16	1.04E-16	1.05E-16	1.05E-16
u232	1.97E-06	2.09E-06	2.11E-06	2.13E-06	2.15E-06	2.15E-06
u233	5.44E-01	5.50E-01	5.56E-01	5.62E-01	5.68E-01	5.68E-01
u234	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01
u235	6.57E+02	6.56E+02	6.56E+02	6.55E+02	6.55E+02	6.55E+02
u236	1.91E+02	1.91E+02	1.92E+02	1.92E+02	1.92E+02	1.92E+02
u237	1.27E-12	8.17E-07	8.19E-07	8.20E-07	8.21E-07	8.21E-07
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	7.53E-23	7.52E-08	7.53E-08	7.53E-08	7.53E-08	7.53E-08

u240	8.70E-35	9.28E-35	9.89E-35	1.05E-34	1.12E-34	1.12E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	9.94E-14	2.07E-12	2.07E-12	2.07E-12	2.07E-12	2.07E-12
np236m	4.92E-28	4.91E-13	4.91E-13	4.91E-13	4.91E-13	4.91E-13
np236	2.42E-06	2.44E-06	2.46E-06	2.48E-06	2.50E-06	2.50E-06
np237	4.07E+01	4.07E+01	4.07E+01	4.07E+01	4.07E+01	4.07E+01
np238	3.18E-14	3.64E-07	3.64E-07	3.64E-07	3.64E-07	3.64E-07
np239	2.13E-13	1.09E-05	1.09E-05	1.09E-05	1.09E-05	1.09E-05
np240m	7.42E-37	7.92E-37	8.44E-37	8.99E-37	9.56E-37	9.56E-37
np240	1.83E-38	5.42E-16	5.42E-16	5.43E-16	5.43E-16	5.43E-16
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	9.11E-11	2.72E-10	2.72E-10	2.72E-10	2.72E-10	2.72E-10
pu237	2.17E-25	7.97E-14	7.99E-14	8.00E-14	8.02E-14	8.02E-14
pu238	5.30E-03	5.50E-03	5.50E-03	5.51E-03	5.51E-03	5.51E-03
pu239	3.12E+01	3.12E+01	3.13E+01	3.13E+01	3.14E+01	3.14E+01
pu240	5.23E-01	5.24E-01	5.25E-01	5.26E-01	5.28E-01	5.28E-01
pu241	4.13E-05	5.20E-05	5.21E-05	5.23E-05	5.24E-05	5.24E-05
pu242	4.45E-05	4.51E-05	4.56E-05	4.62E-05	4.68E-05	4.68E-05
pu243	2.51E-29	2.32E-14	2.35E-14	2.38E-14	2.41E-14	2.41E-14
pu244	4.33E-24	4.62E-24	4.93E-24	5.24E-24	5.58E-24	5.58E-24
pu245	.00E+00	4.65E-35	4.96E-35	5.29E-35	5.63E-35	5.63E-35
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.04E-34	1.04E-19	1.05E-19	1.05E-19	1.05E-19	1.05E-19
am240	4.77E-32	4.76E-17	4.79E-17	4.80E-17	4.82E-17	4.82E-17
am241	1.54E-03	1.53E-03	1.54E-03	1.55E-03	1.55E-03	1.55E-03
am242m	1.72E-07	1.75E-07	1.76E-07	1.77E-07	1.78E-07	1.78E-07
am242	2.22E-12	1.40E-11	1.41E-11	1.42E-11	1.42E-11	1.42E-11
am243	2.44E-07	2.48E-07	2.51E-07	2.55E-07	2.59E-07	2.59E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	4.50E-31	4.57E-16	4.64E-16	4.71E-16	4.79E-16	4.79E-16
am245	1.21E-39	9.14E-36	9.74E-36	1.04E-35	1.10E-35	1.10E-35
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	5.83E-38	2.02E-22	2.03E-22	2.04E-22	2.05E-22	2.05E-22
cm242	4.49E-10	2.84E-09	2.85E-09	2.86E-09	2.87E-09	2.87E-09
cm243	1.42E-14	1.59E-14	1.60E-14	1.60E-14	1.61E-14	1.61E-14
cm244	5.90E-12	7.18E-12	7.29E-12	7.40E-12	7.52E-12	7.52E-12

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 186
power= 9.790E-04mw, burnup=2.2344E+04mwd, flux= 6.05E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d
cm245	1.56E-14	1.59E-14	1.62E-14	1.64E-14	1.67E-14	1.67E-14
cm246	1.26E-16	1.29E-16	1.31E-16	1.33E-16	1.36E-16	1.36E-16
cm247	6.29E-20	6.49E-20	6.70E-20	6.92E-20	7.13E-20	7.13E-20
cm248	2.42E-22	2.54E-22	2.67E-22	2.80E-22	2.93E-22	2.93E-22
cm249	.00E+00	1.95E-33	2.05E-33	2.15E-33	2.25E-33	2.25E-33
cm250	1.38E-37	1.47E-37	1.56E-37	1.65E-37	1.75E-37	1.75E-37
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		6.05E+07	6.05E+07	6.05E+07	6.06E+07	6.06E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 21 of library on unit 33.

```
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr origen-s binary working library--id = 1143             *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *      data from the light element, actinide, and fission product libraries    *
          *        decay data, including gamma and total energy, are from endf/b-vi      *
          *                                                                              *
          *      neutron flux spectrum factors and cross sections were produced from     *
          *     the "presas2" case updating all nuclides on the scale "burnup" library   *
          *                                                                              *
          *                    fission product yields are from endf/b-v                  *
          *                                                                              *
          *              photon libraries use an 18-energy-group structure               *
          *             the photon data are from the master photon data base,            *
          *              produced to include bremsstrahlung from uo2 matrix              *
          *                                                                              *
          *        see information above this box (if present) for later updates         *
          *                                                                              *
          ********************************************************************************
          *                                                                              *
0         ********************************************************************************
0                   .other identification and sizes of library.
0                   data set name:  .ft33f001
0                 8/29/1996     date library was produced
0                      1697     total number of nuclides in library
                        689     number of light-element nuclides
                        129     number of actinide nuclides
                        879     number of fission product nuclides
0                      7993     number of nonzero off-diagonal matrix elements
0         ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page  187
         power=     .00mw, burnup=  22791.mwd, flux= 2.94E+07n/cm**2-sec
0                                        basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.292597E+06   1.291740E+06   1.290894E+06   1.290058E+06   1.289232E+06   1.289224E+06
     absorptions   1.050823E+06   1.050404E+06   1.049996E+06   1.049592E+06   1.049194E+06   1.049188E+06
     k infinity    1.230081E+00   1.229756E+00   1.229428E+00   1.229104E+00   1.228783E+00   1.228782E+00
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   1.031996E+06   1.031525E+06   1.031063E+06   1.030608E+06   1.030158E+06   1.030153E+06
     non-actinide
     abs. fracs.   1.791602E-02   1.797271E-02   1.803118E-02   1.808763E-02   1.814312E-02   1.814258E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2              fission products        page  188
0                              fraction of total absorption rate
```

0 power= .00mw, burnup= 22791.mwd, flux= 2.94E+07n/cm**2-sec

	initial ******* d	******* d	******* d	******* d	******* d
sm149	5.27E-03	5.28E-03	5.30E-03	5.31E-03	5.32E-03	5.32E-03
nd143	2.16E-03	2.17E-03	2.18E-03	2.19E-03	2.20E-03	2.20E-03
eu151	1.89E-03	1.90E-03	1.91E-03	1.91E-03	1.91E-03	1.92E-03
rh103	1.05E-03	1.06E-03	1.06E-03	1.07E-03	1.07E-03	1.07E-03
xe131	7.03E-04	7.06E-04	7.10E-04	7.14E-04	7.18E-04	7.18E-04
cs133	5.47E-04	5.50E-04	5.53E-04	5.56E-04	5.59E-04	5.59E-04
sm147	4.01E-04	4.03E-04	4.05E-04	4.07E-04	4.09E-04	4.09E-04
tc 99	3.68E-04	3.69E-04	3.70E-04	3.72E-04	3.73E-04	3.73E-04
nd145	3.09E-04	3.10E-04	3.12E-04	3.13E-04	3.15E-04	3.15E-04
sm152	2.43E-04	2.44E-04	2.46E-04	2.47E-04	2.49E-04	2.49E-04
gd155	2.31E-04	2.31E-04	2.30E-04	2.30E-04	2.30E-04	2.30E-04
mo 95	2.14E-04	2.15E-04	2.16E-04	2.17E-04	2.19E-04	2.19E-04
sm150	1.63E-04	1.64E-04	1.65E-04	1.66E-04	1.66E-04	1.66E-04
kr 83	1.32E-04	1.32E-04	1.33E-04	1.34E-04	1.34E-04	1.34E-04
cs135	1.24E-04	1.25E-04	1.25E-04	1.26E-04	1.27E-04	1.27E-04
cd113	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04
eu153	9.98E-05	1.00E-04	1.01E-04	1.02E-04	1.02E-04	1.02E-04
ru101	9.65E-05	9.70E-05	9.75E-05	9.80E-05	9.86E-05	9.86E-05
pr141	9.25E-05	9.30E-05	9.35E-05	9.40E-05	9.45E-05	9.45E-05
la139	7.57E-05	7.61E-05	7.65E-05	7.69E-05	7.73E-05	7.73E-05
gd157	6.16E-05	6.15E-05	6.15E-05	6.14E-05	6.13E-05	6.13E-05
ag109	3.92E-05	3.95E-05	3.98E-05	4.00E-05	4.03E-05	4.03E-05
pd105	3.89E-05	3.91E-05	3.93E-05	3.95E-05	3.98E-05	3.98E-05
ba137	3.66E-05	3.68E-05	3.70E-05	3.72E-05	3.74E-05	3.74E-05
zr 93	2.96E-05	2.98E-05	2.99E-05	3.01E-05	3.02E-05	3.02E-05
i129	2.48E-05	2.50E-05	2.51E-05	2.52E-05	2.54E-05	2.54E-05
nd144	2.35E-05	2.36E-05	2.37E-05	2.38E-05	2.40E-05	2.40E-05
gd152	2.00E-05	2.01E-05	2.03E-05	2.05E-05	2.07E-05	2.07E-05
mo 97	1.72E-05	1.73E-05	1.74E-05	1.75E-05	1.76E-05	1.76E-05
pd108	9.44E-06	9.50E-06	9.56E-06	9.62E-06	9.68E-06	9.68E-06
zr 91	7.89E-06	7.93E-06	7.98E-06	8.02E-06	8.06E-06	8.06E-06
y 89	7.55E-06	7.59E-06	7.63E-06	7.67E-06	7.71E-06	7.71E-06
ru102	7.20E-06	7.24E-06	7.28E-06	7.32E-06	7.36E-06	7.36E-06
sm151	1.37E-05	6.92E-06	6.87E-06	6.87E-06	6.87E-06	6.60E-06
ce142	6.31E-06	6.34E-06	6.37E-06	6.41E-06	6.44E-06	6.44E-06
nd148	6.07E-06	6.11E-06	6.14E-06	6.17E-06	6.21E-06	6.21E-06
ru 99	5.41E-06	5.54E-06	5.66E-06	5.78E-06	5.90E-06	5.90E-06
nd146	5.12E-06	5.15E-06	5.18E-06	5.21E-06	5.24E-06	5.24E-06
pd107	4.75E-06	4.78E-06	4.81E-06	4.84E-06	4.87E-06	4.87E-06
in115	4.50E-06	4.53E-06	4.55E-06	4.58E-06	4.60E-06	4.60E-06
ba138	4.36E-06	4.38E-06	4.41E-06	4.43E-06	4.45E-06	4.45E-06
ce140	4.08E-06	4.10E-06	4.13E-06	4.15E-06	4.17E-06	4.17E-06
xe132	3.75E-06	3.78E-06	3.80E-06	3.82E-06	3.84E-06	3.84E-06
mo 98	2.51E-06	2.52E-06	2.53E-06	2.55E-06	2.56E-06	2.56E-06
mo100	2.45E-06	2.46E-06	2.47E-06	2.49E-06	2.50E-06	2.50E-06
xe134	2.41E-06	2.43E-06	2.44E-06	2.45E-06	2.47E-06	2.47E-06
zr 92	1.91E-06	1.92E-06	1.93E-06	1.94E-06	1.95E-06	1.95E-06
i127	1.82E-06	1.83E-06	1.84E-06	1.85E-06	1.86E-06	1.86E-06
ru104	1.66E-06	1.67E-06	1.68E-06	1.69E-06	1.70E-06	1.70E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 189
0 fraction of total absorption rate

0 power= .00mw, burnup= 22791.mwd, flux= 2.94E+07n/cm**2-sec

	initial ******* d	******* d	******* d	******* d	******* d
zr 96	1.50E-06	1.51E-06	1.52E-06	1.52E-06	1.53E-06	1.53E-06
nd150	1.38E-06	1.38E-06	1.39E-06	1.40E-06	1.41E-06	1.41E-06
xe136	1.31E-06	1.32E-06	1.32E-06	1.33E-06	1.34E-06	1.34E-06

cd111	1.07E-06	1.07E-06	1.08E-06	1.09E-06	1.09E-06	1.09E-06
gd154	9.74E-07	9.85E-07	9.95E-07	1.01E-06	1.02E-06	1.02E-06
br 81	9.68E-07	9.73E-07	9.78E-07	9.84E-07	9.89E-07	9.89E-07
rb 85	9.26E-07	9.31E-07	9.36E-07	9.41E-07	9.46E-07	9.46E-07
zr 94	8.09E-07	8.14E-07	8.18E-07	8.22E-07	8.27E-07	8.27E-07
zr 90	7.44E-07	7.48E-07	7.52E-07	7.56E-07	7.60E-07	7.60E-07
sm154	6.50E-07	6.54E-07	6.58E-07	6.61E-07	6.65E-07	6.65E-07
te130	6.04E-07	6.08E-07	6.11E-07	6.14E-07	6.17E-07	6.17E-07
ba135	5.51E-07	5.64E-07	5.76E-07	5.89E-07	6.02E-07	6.02E-07
rb 87	5.33E-07	5.36E-07	5.38E-07	5.41E-07	5.44E-07	5.44E-07
pd106	4.00E-07	4.02E-07	4.04E-07	4.07E-07	4.09E-07	4.09E-07
se 77	3.90E-07	3.92E-07	3.94E-07	3.96E-07	3.99E-07	3.99E-07
gd156	3.80E-07	3.83E-07	3.85E-07	3.88E-07	3.90E-07	3.90E-07
ru100	2.64E-07	2.66E-07	2.69E-07	2.72E-07	2.74E-07	2.74E-07
kr 84	2.54E-07	2.56E-07	2.57E-07	2.58E-07	2.60E-07	2.60E-07
dy161	2.35E-07	2.36E-07	2.38E-07	2.39E-07	2.41E-07	2.41E-07
sb121	2.08E-07	2.09E-07	2.10E-07	2.11E-07	2.12E-07	2.12E-07
nd142	1.94E-07	1.96E-07	1.98E-07	2.00E-07	2.02E-07	2.02E-07
se 79	1.92E-07	1.92E-07	1.93E-07	1.94E-07	1.95E-07	1.95E-07
ba134	1.85E-07	1.87E-07	1.89E-07	1.91E-07	1.93E-07	1.93E-07
sm148	1.68E-07	1.70E-07	1.72E-07	1.74E-07	1.76E-07	1.76E-07
sb123	1.68E-07	1.69E-07	1.70E-07	1.71E-07	1.72E-07	1.72E-07
kr 86	1.41E-07	1.42E-07	1.43E-07	1.43E-07	1.44E-07	1.44E-07
te128	1.37E-07	1.38E-07	1.38E-07	1.39E-07	1.40E-07	1.40E-07
pd104	1.27E-07	1.29E-07	1.30E-07	1.31E-07	1.33E-07	1.33E-07
tb159	1.01E-07	1.02E-07	1.03E-07	1.03E-07	1.04E-07	1.04E-07
nb 93	8.76E-08	8.96E-08	9.16E-08	9.36E-08	9.57E-08	9.57E-08
se 80	9.35E-08	9.40E-08	9.45E-08	9.50E-08	9.55E-08	9.55E-08
te125	9.32E-08	9.38E-08	9.43E-08	9.48E-08	9.53E-08	9.53E-08
gd158	8.00E-08	8.05E-08	8.10E-08	8.15E-08	8.20E-08	8.20E-08
cd112	7.21E-08	7.26E-08	7.30E-08	7.34E-08	7.38E-08	7.38E-08
dy162	5.41E-08	5.45E-08	5.49E-08	5.53E-08	5.57E-08	5.57E-08
dy164	5.27E-08	5.30E-08	5.34E-08	5.37E-08	5.40E-08	5.40E-08
sn117	5.08E-08	5.11E-08	5.13E-08	5.16E-08	5.19E-08	5.19E-08
li 6	4.83E-08	4.85E-08	4.87E-08	4.90E-08	4.92E-08	4.92E-08
cd110	4.60E-08	4.65E-08	4.71E-08	4.77E-08	4.83E-08	4.83E-08
br 79	4.36E-08	4.46E-08	4.56E-08	4.66E-08	4.76E-08	4.76E-08
eu152	1.22E-07	6.12E-08	6.14E-08	6.16E-08	6.18E-08	4.70E-08
ag107	4.22E-08	4.33E-08	4.44E-08	4.55E-08	4.66E-08	4.66E-08
cd114	4.32E-08	4.34E-08	4.37E-08	4.39E-08	4.42E-08	4.42E-08
mo 96	4.22E-08	4.27E-08	4.31E-08	4.35E-08	4.40E-08	4.40E-08
sn119	3.86E-08	3.88E-08	3.90E-08	3.93E-08	3.95E-08	3.95E-08
pd110	3.57E-08	3.59E-08	3.61E-08	3.63E-08	3.66E-08	3.66E-08
sn115	3.53E-08	3.55E-08	3.57E-08	3.59E-08	3.61E-08	3.61E-08
xe129	2.65E-08	2.71E-08	2.77E-08	2.83E-08	2.90E-08	2.90E-08
sr 88	2.59E-08	2.60E-08	2.62E-08	2.63E-08	2.65E-08	2.65E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 190
0 fraction of total absorption rate
power= .00mw, burnup= 22791.mwd, flux= 2.94E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

xe130	2.07E-08	2.09E-08	2.11E-08	2.14E-08	2.16E-08	2.16E-08
ba136	1.78E-08	1.80E-08	1.81E-08	1.83E-08	1.84E-08	1.84E-08
se 82	1.78E-08	1.79E-08	1.80E-08	1.81E-08	1.82E-08	1.82E-08
te126	1.47E-08	1.50E-08	1.53E-08	1.56E-08	1.60E-08	1.60E-08
sn126	1.53E-08	1.53E-08	1.54E-08	1.54E-08	1.55E-08	1.55E-08
se 78	1.40E-08	1.41E-08	1.41E-08	1.42E-08	1.43E-08	1.43E-08
dy163	1.36E-08	1.37E-08	1.38E-08	1.38E-08	1.39E-08	1.39E-08
kr 82	1.32E-08	1.33E-08	1.34E-08	1.35E-08	1.36E-08	1.36E-08
sn124	1.23E-08	1.23E-08	1.24E-08	1.25E-08	1.26E-08	1.26E-08

eu155	4.57E-08	2.27E-08	2.27E-08	2.26E-08	2.26E-08	1.04E-08
as 75	8.21E-09	8.26E-09	8.30E-09	8.35E-09	8.39E-09	8.39E-09
pm147	6.57E-08	3.28E-08	3.29E-08	3.29E-08	3.29E-08	8.30E-09
in113	7.04E-09	7.08E-09	7.12E-09	7.16E-09	7.20E-09	7.20E-09
sn118	4.95E-09	4.98E-09	5.01E-09	5.03E-09	5.06E-09	5.06E-09
sn122	4.25E-09	4.28E-09	4.30E-09	4.33E-09	4.35E-09	4.35E-09
cd116	4.16E-09	4.18E-09	4.20E-09	4.23E-09	4.25E-09	4.25E-09
eu154	1.02E-08	5.15E-09	5.19E-09	5.22E-09	5.25E-09	3.44E-09
sn120	3.13E-09	3.15E-09	3.17E-09	3.18E-09	3.20E-09	3.20E-09
ge 73	2.36E-09	2.37E-09	2.38E-09	2.40E-09	2.41E-09	2.41E-09
sr 90	3.97E-09	1.99E-09	1.99E-09	1.99E-09	1.99E-09	1.75E-09
ho165	1.32E-09	1.33E-09	1.34E-09	1.35E-09	1.37E-09	1.37E-09
dy160	1.26E-09	1.28E-09	1.29E-09	1.30E-09	1.32E-09	1.32E-09
gd160	1.13E-09	1.14E-09	1.15E-09	1.15E-09	1.16E-09	1.16E-09
ge 76	8.00E-10	8.04E-10	8.08E-10	8.12E-10	8.17E-10	8.17E-10
xe128	7.41E-10	7.49E-10	7.57E-10	7.65E-10	7.73E-10	7.73E-10
cs137	9.17E-10	4.58E-10	4.59E-10	4.59E-10	4.59E-10	4.06E-10
sr 86	3.50E-10	3.54E-10	3.57E-10	3.61E-10	3.64E-10	3.64E-10
sn116	2.81E-10	2.84E-10	2.87E-10	2.90E-10	2.93E-10	2.93E-10
te124	2.55E-10	2.57E-10	2.59E-10	2.61E-10	2.63E-10	2.63E-10
nb 94	1.41E-10	1.41E-10	1.41E-10	1.42E-10	1.42E-10	1.42E-10
sr 87	1.22E-10	1.23E-10	1.24E-10	1.25E-10	1.26E-10	1.26E-10
te122	1.18E-10	1.19E-10	1.21E-10	1.22E-10	1.23E-10	1.23E-10
se 76	9.81E-11	9.90E-11	1.00E-10	1.01E-10	1.02E-10	1.02E-10
cs134	1.00E-09	5.02E-10	5.05E-10	5.08E-10	5.11E-10	8.73E-11
er166	6.33E-11	6.38E-11	6.43E-11	6.48E-11	6.53E-11	6.53E-11
kr 80	4.66E-11	4.73E-11	4.81E-11	4.89E-11	4.98E-11	4.98E-11
ge 74	4.71E-11	4.74E-11	4.76E-11	4.79E-11	4.81E-11	4.81E-11
kr 85	1.34E-10	6.71E-11	6.71E-11	6.72E-11	6.72E-11	4.79E-11
ge 72	3.48E-11	3.50E-11	3.52E-11	3.54E-11	3.56E-11	3.56E-11
er167	7.14E-12	7.23E-12	7.33E-12	7.42E-12	7.51E-12	7.51E-12
te123	5.53E-12	5.62E-12	5.70E-12	5.79E-12	5.87E-12	5.87E-12
cd108	3.27E-12	3.33E-12	3.40E-12	3.46E-12	3.53E-12	3.53E-12
y 90	3.78E-12	1.89E-12	1.90E-12	1.90E-12	1.90E-12	1.67E-12
ce144	1.43E-10	7.13E-11	7.13E-11	7.14E-11	7.14E-11	6.71E-13
sb125	4.37E-12	2.17E-12	2.17E-12	2.17E-12	2.17E-12	5.72E-13
ru106	9.93E-12	4.91E-12	4.90E-12	4.88E-12	4.87E-12	1.36E-13
be 9	1.00E-13	1.01E-13	1.02E-13	1.02E-13	1.03E-13	1.03E-13
sn114	7.43E-14	7.51E-14	7.59E-14	7.67E-14	7.76E-14	7.76E-14
li 7	4.13E-14	4.15E-14	4.17E-14	4.20E-14	4.22E-14	4.22E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 191
0 fraction of total absorption rate
power= .00mw, burnup= 22791.mwd, flux= 2.94E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.92E-14	1.84E-14	1.84E-14	1.85E-14	1.85E-14	1.77E-14
te127m	2.22E-12	1.10E-12	1.10E-12	1.10E-12	1.10E-12	5.72E-18
cd109	3.29E-17	1.67E-17	1.70E-17	1.73E-17	1.76E-17	9.85E-19
sn123	2.58E-15	1.29E-15	1.29E-15	1.29E-15	1.29E-15	5.47E-20
nb 95	3.64E-11	1.82E-11	1.82E-11	1.82E-11	1.82E-11	2.73E-20
zr 95	3.91E-11	1.96E-11	1.96E-11	1.96E-11	1.96E-11	2.73E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 192
power= 4.890E-04mw, burnup=2.2791E+04mwd, flux= 2.94E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
h 1	1.33E-03	1.34E-03	1.34E-03	1.35E-03	1.36E-03	1.36E-03
h 2	3.98E-06	4.00E-06	4.02E-06	4.04E-06	4.06E-06	4.06E-06
h 3	1.46E-11	7.28E-12	7.29E-12	7.30E-12	7.31E-12	5.44E-12

h 4	1.46E-35	3.63E-36	3.64E-36	3.65E-36	3.66E-36	.00E+00
he 3	1.75E-08	1.76E-08	1.76E-08	1.77E-08	1.77E-08	1.77E-08
he 4	2.21E-04	2.22E-04	2.23E-04	2.24E-04	2.25E-04	2.25E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.65E-05	2.67E-05	2.68E-05	2.69E-05	2.71E-05	2.71E-05
ne 21	1.07E-08	1.08E-08	1.09E-08	1.10E-08	1.11E-08	1.11E-08
ne 22	1.75E-07	1.76E-07	1.76E-07	1.77E-07	1.78E-07	1.78E-07
ne 23	1.78E-15	8.86E-16	8.86E-16	8.87E-16	8.87E-16	8.87E-31
na 22	1.06E-11	5.26E-12	5.26E-12	5.26E-12	5.27E-12	1.30E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	6.45E-09	3.22E-09	3.22E-09	3.23E-09	3.23E-09	3.23E-24
na 24m	1.06E-15	5.29E-16	5.30E-16	5.30E-16	5.30E-16	5.31E-31
na 25	7.75E-24	3.89E-24	3.93E-24	3.97E-24	4.01E-24	4.01E-39
mg 24	1.72E-01	1.73E-01	1.73E-01	1.74E-01	1.75E-01	1.75E-01
mg 25	1.11E-06	1.12E-06	1.13E-06	1.14E-06	1.15E-06	1.15E-06
mg 26	3.97E-06	3.99E-06	4.01E-06	4.03E-06	4.05E-06	4.05E-06
mg 27	5.31E-13	2.64E-13	2.64E-13	2.64E-13	2.65E-13	2.65E-28
mg 28	2.67E-25	6.62E-26	6.62E-26	6.63E-26	6.64E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	4.78E-11	2.39E-11	2.39E-11	2.39E-11	2.39E-11	2.39E-26
al 29	6.30E-22	3.17E-22	3.20E-22	3.23E-22	3.27E-22	3.27E-37
al 30	1.81E-31	9.14E-32	9.28E-32	9.42E-32	9.56E-32	.00E+00
si 28	5.00E-01	5.02E-01	5.05E-01	5.07E-01	5.10E-01	5.10E-01
si 29	1.01E-05	1.02E-05	1.03E-05	1.04E-05	1.05E-05	1.05E-05
si 30	2.16E-10	2.19E-10	2.23E-10	2.26E-10	2.29E-10	2.29E-10
si 31	3.82E-23	1.93E-23	1.96E-23	1.99E-23	2.02E-23	2.02E-38
si 32	1.64E-29	5.16E-30	4.31E-30	4.31E-30	4.37E-30	4.28E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		2.94E+07	2.94E+07	2.94E+07	2.94E+07	2.94E-08

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 193
power= 4.890E-04mw, burnup=2.2791E+04mwd, flux= 2.94E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	4.28E+01	4.35E+01	4.42E+01	4.48E+01	4.55E+01	4.55E+01
pb206	2.47E-01	2.53E-01	2.60E-01	2.66E-01	2.72E-01	2.72E-01
pb207	1.55E-02	1.59E-02	1.62E-02	1.66E-02	1.69E-02	1.69E-02
pb208	6.78E-04	6.86E-04	6.93E-04	7.00E-04	7.06E-04	7.06E-04
pb209	1.05E-09	1.07E-09	1.08E-09	1.10E-09	1.11E-09	1.11E-09
pb210	3.15E-04	3.18E-04	3.22E-04	3.25E-04	3.29E-04	3.29E-04
pb211	5.47E-11	5.50E-11	5.53E-11	5.56E-11	5.59E-11	5.60E-11
pb212	3.74E-11	1.88E-11	1.89E-11	1.90E-11	1.91E-11	1.86E-11
pb214	7.20E-10	7.28E-10	7.36E-10	7.44E-10	7.51E-10	7.52E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	4.30E-02	4.43E-02	4.55E-02	4.68E-02	4.81E-02	4.81E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.94E-07	1.96E-07	1.98E-07	2.00E-07	2.02E-07	2.02E-07
bi211	3.25E-12	3.26E-12	3.28E-12	3.30E-12	3.32E-12	3.32E-12
bi212	3.55E-12	1.79E-12	1.79E-12	1.80E-12	1.81E-12	1.76E-12
bi213	2.46E-10	2.50E-10	2.53E-10	2.56E-10	2.60E-10	2.60E-10
bi214	5.34E-10	5.40E-10	5.46E-10	5.52E-10	5.58E-10	5.58E-10
po210	5.35E-06	5.41E-06	5.47E-06	5.53E-06	5.59E-06	5.59E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.59E-17	3.61E-17	3.63E-17	3.64E-17	3.66E-17	3.67E-17
po212	1.86E-22	9.38E-23	9.42E-23	9.47E-23	9.53E-23	9.27E-23
po213	3.70E-19	3.75E-19	3.80E-19	3.86E-19	3.91E-19	3.91E-19
po214	7.35E-17	7.43E-17	7.52E-17	7.60E-17	7.68E-17	7.68E-17
po215	4.50E-17	4.52E-17	4.55E-17	4.57E-17	4.60E-17	4.60E-17
po216	1.42E-16	7.13E-17	7.15E-17	7.20E-17	7.24E-17	7.04E-17

po218	8.33E-11	8.42E-11	8.51E-11	8.60E-11	8.69E-11	8.69E-11
rn218	1.33E-28	3.32E-29	3.34E-29	3.36E-29	3.38E-29	3.22E-44
rn219	1.00E-13	1.01E-13	1.01E-13	1.02E-13	1.02E-13	1.02E-13
rn220	5.43E-14	2.73E-14	2.74E-14	2.76E-14	2.78E-14	2.70E-14
rn222	1.48E-07	1.50E-07	1.51E-07	1.53E-07	1.54E-07	1.54E-07
ra222	1.44E-25	3.61E-26	3.63E-26	3.65E-26	3.67E-26	3.49E-41
ra223	2.50E-08	2.51E-08	2.52E-08	2.54E-08	2.55E-08	2.56E-08
ra224	3.09E-10	1.55E-10	1.56E-10	1.57E-10	1.58E-10	1.54E-10
ra225	1.15E-07	1.17E-07	1.18E-07	1.20E-07	1.22E-07	1.22E-07
ra226	2.26E-02	2.29E-02	2.31E-02	2.34E-02	2.36E-02	2.36E-02
ra228	1.11E-10	1.13E-10	1.14E-10	1.16E-10	1.17E-10	1.17E-10
ac225	7.78E-08	7.89E-08	7.99E-08	8.10E-08	8.21E-08	8.21E-08
ac227	1.74E-05	1.75E-05	1.76E-05	1.76E-05	1.77E-05	1.77E-05
ac228	1.36E-14	1.38E-14	1.39E-14	1.41E-14	1.43E-14	1.43E-14
th226	7.04E-24	1.76E-24	1.77E-24	1.78E-24	1.79E-24	1.70E-39
th227	4.03E-08	4.05E-08	4.07E-08	4.10E-08	4.12E-08	4.13E-08
th228	5.90E-08	2.97E-08	2.98E-08	3.00E-08	3.01E-08	2.93E-08
th229	2.24E-02	2.27E-02	2.30E-02	2.33E-02	2.36E-02	2.36E-02
th230	1.11E+00	1.12E+00	1.13E+00	1.14E+00	1.15E+00	1.15E+00
th231	3.94E-09	3.33E-09	3.34E-09	3.34E-09	3.35E-09	2.71E-09
th232	2.72E-01	2.76E-01	2.79E-01	2.83E-01	2.86E-01	2.86E-01
th233	6.12E-13	3.09E-13	3.13E-13	3.17E-13	3.22E-13	3.22E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.61E-02	2.63E-02	2.64E-02	2.65E-02	2.67E-02	2.67E-02
pa232	1.10E-10	5.53E-11	5.57E-11	5.60E-11	5.63E-11	5.63E-26

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 194
power= 4.890E-04mw, burnup=2.2791E+04mwd, flux= 2.94E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.41E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	6.82E-21	1.71E-21	1.71E-21	1.73E-21	1.74E-21	1.65E-36
u231	1.05E-16	5.28E-17	5.35E-17	5.41E-17	5.47E-17	5.47E-32
u232	2.15E-06	1.08E-06	1.09E-06	1.09E-06	1.10E-06	1.04E-06
u233	5.68E-01	5.74E-01	5.80E-01	5.86E-01	5.93E-01	5.93E-01
u234	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01
u235	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02
u236	1.92E+02	1.92E+02	1.92E+02	1.92E+02	1.92E+02	1.92E+02
u237	8.21E-07	4.09E-07	4.09E-07	4.09E-07	4.10E-07	5.51E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	7.53E-08	3.73E-08	3.74E-08	3.74E-08	3.74E-08	3.74E-23
u240	1.12E-34	1.19E-34	1.26E-34	1.33E-34	1.41E-34	1.41E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	2.07E-12	1.03E-12	1.03E-12	1.03E-12	1.03E-12	3.59E-14
np236m	4.91E-13	2.44E-13	2.45E-13	2.45E-13	2.45E-13	2.45E-28
np236	2.50E-06	2.50E-06	2.51E-06	2.51E-06	2.52E-06	2.52E-06
np237	4.07E+01	4.07E+01	4.06E+01	4.06E+01	4.06E+01	4.06E+01
np238	3.64E-07	1.81E-07	1.81E-07	1.81E-07	1.82E-07	7.53E-15
np239	1.09E-05	5.40E-06	5.40E-06	5.40E-06	5.41E-06	2.08E-13
np240m	9.56E-37	1.02E-36	1.08E-36	1.14E-36	1.20E-36	1.20E-36
np240	5.43E-16	1.34E-16	1.34E-16	1.35E-16	1.35E-16	1.75E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	2.72E-10	1.38E-10	1.38E-10	1.38E-10	1.38E-10	4.35E-11
pu237	8.02E-14	3.63E-14	3.61E-14	3.58E-14	3.56E-14	5.83E-27
pu238	5.51E-03	2.76E-03	2.75E-03	2.75E-03	2.75E-03	2.64E-03
pu239	3.14E+01	3.11E+01	3.09E+01	3.06E+01	3.04E+01	3.04E+01

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     pu240   5.28E-01  5.11E-01  4.95E-01  4.79E-01  4.65E-01  4.65E-01
     pu241   5.24E-05  2.52E-05  2.45E-05  2.37E-05  2.30E-05  1.79E-05
     pu242   4.68E-05  4.70E-05  4.71E-05  4.72E-05  4.73E-05  4.73E-05
     pu243   2.41E-14  1.21E-14  1.21E-14  1.21E-14  1.22E-14  1.48E-29
     pu244   5.58E-24  5.92E-24  6.28E-24  6.64E-24  7.01E-24  7.01E-24
     pu245   5.63E-35  2.98E-35  3.16E-35  3.35E-35  3.53E-35   .00E+00
     pu246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am239   1.05E-19  3.58E-20  2.89E-20  2.59E-20  2.44E-20  2.44E-35
     am240   4.82E-17  1.64E-17  1.32E-17  1.19E-17  1.11E-17  1.11E-32
     am241   1.55E-03  1.06E-03  8.55E-04  7.65E-04  7.19E-04  7.18E-04
     am242m  1.78E-07  7.15E-08  5.21E-08  4.51E-08  4.18E-08  4.07E-08
     am242   1.42E-11  4.95E-12  3.92E-12  3.50E-12  3.28E-12  5.26E-13
     am243   2.59E-07  2.53E-07  2.48E-07  2.43E-07  2.38E-07  2.38E-07
     am244m   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am244   4.79E-16  2.33E-16  2.28E-16  2.24E-16  2.19E-16  2.19E-31
     am245   1.10E-35  5.85E-36  6.20E-36  6.56E-36  6.93E-36  5.37E-40
     am246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm241   2.05E-22  3.55E-23  2.82E-23  2.51E-23  2.36E-23  5.79E-39
     cm242   2.87E-09  1.00E-09  7.92E-10  7.06E-10  6.62E-10  1.06E-10
     cm243   1.61E-14  2.80E-15  2.22E-15  1.98E-15  1.86E-15  1.63E-15
     cm244   7.52E-12  3.66E-12  3.58E-12  3.51E-12  3.44E-12  2.82E-12
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                actinides        page  195
       power= 4.890E-04mw, burnup=2.2791E+04mwd, flux= 2.94E+07n/cm**2-sec
0                                          nuclide concentrations, gram atoms
                                           basis = single reactor assembly
            charge ******* d ******* d ******* d ******* d ******* d
     cm245   1.67E-14  1.62E-14  1.56E-14  1.51E-14  1.46E-14  1.46E-14
     cm246   1.36E-16  1.31E-16  1.26E-16  1.22E-16  1.17E-16  1.17E-16
     cm247   7.13E-20  7.24E-20  7.35E-20  7.44E-20  7.54E-20  7.54E-20
     cm248   2.93E-22  2.99E-22  3.06E-22  3.13E-22  3.19E-22  3.19E-22
     cm249   2.25E-33  1.15E-33  1.17E-33  1.20E-33  1.22E-33   .00E+00
     cm250   1.75E-37  1.74E-37  1.74E-37  1.73E-37  1.73E-37  1.73E-37
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              2.94E+07  2.94E+07  2.94E+07  2.94E+07  2.94E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number 22 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densities
            pass n applies mid time densities of nth library interval
          first library updated was...
```

```
         ***************************************************************************
         *                                                                         *
         *           prelim lwr origen-s binary working library--id = 1143         *
         *         made from modified card-image origen-s libraries of scale 4.2   *
         *      data from the light element, actinide, and fission product libraries *
         *        decay data, including gamma and total energy, are from endf/b-vi  *
         *                                                                         *
         *      neutron flux spectrum factors and cross sections were produced from *
         *     the "presas2" case updating all nuclides on the scale "burnup" library *
         *                                                                         *
         *                fission product yields are from endf/b-v                 *
         *                                                                         *
         *              photon libraries use an 18-energy-group structure          *
         *             the photon data are from the master photon data base,       *
         *              produced to include bremsstrahlung from uo2 matrix         *
         *                                                                         *
         *        see information above this box (if present) for later updates   *
         *                                                                         *
         ***************************************************************************
         *                                                                         *
0        ***************************************************************************
0                  .other identification and sizes of library.
0                   data set name:  ft33f001
0               8/29/1996    date library was produced
0                    1697    total number of nuclides in library
                      689    number of light-element nuclides
                      129    number of actinide nuclides
                      879    number of fission product nuclides
0                    7993    number of nonzero off-diagonal matrix elements
0        ***************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                         page  196
         power=     .00mw, burnup=  23237.mwd, flux= 2.94E+07n/cm**2-sec
0                                            basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                   initial        ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.291305E+06   1.290486E+06   1.289677E+06   1.288876E+06   1.288085E+06   1.288077E+06
     absorptions   1.050426E+06   1.050032E+06   1.049643E+06   1.049258E+06   1.048878E+06   1.048872E+06
     k infinity    1.229316E+00   1.228997E+00   1.228682E+00   1.228370E+00   1.228061E+00   1.228059E+00
0                   initial        ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   1.031377E+06   1.030934E+06   1.030496E+06   1.030064E+06   1.029638E+06   1.029633E+06
     non-actinide
     abs. fracs.   1.813418E-02   1.818848E-02   1.824141E-02   1.829273E-02   1.834309E-02   1.834273E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2          fission products      page  197
0                                    fraction of total absorption rate
         power=     .00mw, burnup=  23237.mwd, flux= 2.94E+07n/cm**2-sec
0               initial ******* d ******* d ******* d ******* d ******* d

     sm149      5.33E-03  5.34E-03  5.35E-03  5.35E-03  5.36E-03  5.36E-03
     nd143      2.20E-03  2.21E-03  2.22E-03  2.24E-03  2.25E-03  2.25E-03
     eu151      1.92E-03  1.92E-03  1.93E-03  1.93E-03  1.94E-03  1.94E-03
     rh103      1.07E-03  1.08E-03  1.08E-03  1.09E-03  1.10E-03  1.10E-03
     xe131      7.17E-04  7.21E-04  7.25E-04  7.28E-04  7.32E-04  7.32E-04
     cs133      5.59E-04  5.62E-04  5.65E-04  5.67E-04  5.70E-04  5.70E-04
     sm147      4.09E-04  4.11E-04  4.13E-04  4.16E-04  4.18E-04  4.18E-04
     tc 99      3.73E-04  3.74E-04  3.76E-04  3.77E-04  3.78E-04  3.78E-04
     nd145      3.15E-04  3.17E-04  3.18E-04  3.20E-04  3.22E-04  3.22E-04
     sm152      2.49E-04  2.50E-04  2.52E-04  2.53E-04  2.55E-04  2.55E-04
     gd155      2.30E-04  2.30E-04  2.30E-04  2.29E-04  2.29E-04  2.29E-04
     mo 95      2.19E-04  2.20E-04  2.21E-04  2.22E-04  2.23E-04  2.23E-04
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sm150	1.66E-04	1.67E-04	1.68E-04	1.69E-04	1.70E-04	1.70E-04
kr 83	1.34E-04	1.35E-04	1.36E-04	1.36E-04	1.37E-04	1.37E-04
cs135	1.27E-04	1.27E-04	1.28E-04	1.29E-04	1.29E-04	1.29E-04
eu153	1.02E-04	1.03E-04	1.03E-04	1.04E-04	1.05E-04	1.05E-04
cd113	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04
ru101	9.85E-05	9.90E-05	9.95E-05	1.00E-04	1.01E-04	1.01E-04
pr141	9.45E-05	9.50E-05	9.55E-05	9.60E-05	9.65E-05	9.65E-05
la139	7.73E-05	7.77E-05	7.82E-05	7.86E-05	7.90E-05	7.90E-05
gd157	6.13E-05	6.12E-05	6.11E-05	6.09E-05	6.08E-05	6.08E-05
ag109	4.03E-05	4.05E-05	4.08E-05	4.10E-05	4.13E-05	4.13E-05
pd105	3.98E-05	4.00E-05	4.02E-05	4.04E-05	4.06E-05	4.06E-05
ba137	3.75E-05	3.77E-05	3.79E-05	3.80E-05	3.82E-05	3.82E-05
zr 93	3.02E-05	3.04E-05	3.05E-05	3.07E-05	3.08E-05	3.08E-05
i129	2.54E-05	2.55E-05	2.56E-05	2.58E-05	2.59E-05	2.59E-05
nd144	2.40E-05	2.41E-05	2.43E-05	2.44E-05	2.45E-05	2.45E-05
gd152	2.07E-05	2.08E-05	2.10E-05	2.12E-05	2.14E-05	2.14E-05
mo 97	1.76E-05	1.77E-05	1.77E-05	1.78E-05	1.79E-05	1.79E-05
pd108	9.68E-06	9.74E-06	9.80E-06	9.86E-06	9.92E-06	9.92E-06
zr 91	8.06E-06	8.10E-06	8.15E-06	8.19E-06	8.23E-06	8.23E-06
y 89	7.71E-06	7.75E-06	7.79E-06	7.83E-06	7.87E-06	7.87E-06
ru102	7.36E-06	7.40E-06	7.44E-06	7.48E-06	7.52E-06	7.52E-06
sm151	6.60E-06	6.88E-06	6.88E-06	6.88E-06	6.89E-06	6.60E-06
ce142	6.45E-06	6.48E-06	6.51E-06	6.55E-06	6.58E-06	6.58E-06
ru 99	5.90E-06	6.02E-06	6.15E-06	6.27E-06	6.39E-06	6.40E-06
nd148	6.21E-06	6.24E-06	6.27E-06	6.30E-06	6.34E-06	6.34E-06
nd146	5.24E-06	5.27E-06	5.29E-06	5.32E-06	5.35E-06	5.35E-06
pd107	4.87E-06	4.90E-06	4.93E-06	4.96E-06	4.99E-06	4.99E-06
in115	4.60E-06	4.63E-06	4.65E-06	4.67E-06	4.70E-06	4.70E-06
ba138	4.46E-06	4.48E-06	4.50E-06	4.53E-06	4.55E-06	4.55E-06
ce140	4.17E-06	4.19E-06	4.22E-06	4.24E-06	4.26E-06	4.26E-06
xe132	3.84E-06	3.86E-06	3.88E-06	3.90E-06	3.92E-06	3.92E-06
mo 98	2.56E-06	2.57E-06	2.59E-06	2.60E-06	2.61E-06	2.61E-06
mo100	2.50E-06	2.51E-06	2.52E-06	2.54E-06	2.55E-06	2.55E-06
xe134	2.47E-06	2.48E-06	2.49E-06	2.51E-06	2.52E-06	2.52E-06
zr 92	1.95E-06	1.96E-06	1.97E-06	1.98E-06	1.99E-06	1.99E-06
i127	1.86E-06	1.87E-06	1.88E-06	1.89E-06	1.90E-06	1.90E-06
ru104	1.70E-06	1.71E-06	1.72E-06	1.73E-06	1.74E-06	1.74E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 198
0 fraction of total absorption rate
power= .00mw, burnup= 23237.mwd, flux= 2.94E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.53E-06	1.54E-06	1.55E-06	1.56E-06	1.56E-06	1.56E-06
nd150	1.41E-06	1.41E-06	1.42E-06	1.43E-06	1.44E-06	1.44E-06
xe136	1.34E-06	1.34E-06	1.35E-06	1.36E-06	1.37E-06	1.37E-06
cd111	1.09E-06	1.10E-06	1.11E-06	1.11E-06	1.12E-06	1.12E-06
gd154	1.02E-06	1.03E-06	1.04E-06	1.05E-06	1.06E-06	1.06E-06
br 81	9.89E-07	9.94E-07	9.99E-07	1.00E-06	1.01E-06	1.01E-06
rb 85	9.46E-07	9.51E-07	9.55E-07	9.60E-07	9.65E-07	9.65E-07
zr 94	8.26E-07	8.30E-07	8.35E-07	8.39E-07	8.43E-07	8.43E-07
zr 90	7.60E-07	7.64E-07	7.68E-07	7.72E-07	7.76E-07	7.76E-07
sm154	6.65E-07	6.69E-07	6.73E-07	6.76E-07	6.80E-07	6.80E-07
ba135	6.02E-07	6.15E-07	6.28E-07	6.41E-07	6.55E-07	6.55E-07
te130	6.18E-07	6.21E-07	6.24E-07	6.28E-07	6.31E-07	6.31E-07
rb 87	5.44E-07	5.47E-07	5.50E-07	5.52E-07	5.55E-07	5.55E-07
pd106	4.09E-07	4.11E-07	4.14E-07	4.16E-07	4.18E-07	4.18E-07
se 77	3.99E-07	4.01E-07	4.03E-07	4.05E-07	4.07E-07	4.07E-07
gd156	3.90E-07	3.92E-07	3.94E-07	3.97E-07	3.99E-07	3.99E-07
ru100	2.75E-07	2.77E-07	2.80E-07	2.83E-07	2.86E-07	2.86E-07
kr 84	2.60E-07	2.61E-07	2.62E-07	2.64E-07	2.65E-07	2.65E-07

dy161	2.41E-07	2.42E-07	2.44E-07	2.45E-07	2.47E-07	2.47E-07
sb121	2.12E-07	2.14E-07	2.15E-07	2.16E-07	2.17E-07	2.17E-07
nd142	2.02E-07	2.04E-07	2.06E-07	2.08E-07	2.11E-07	2.11E-07
ba134	1.93E-07	1.95E-07	1.97E-07	1.99E-07	2.01E-07	2.01E-07
se 79	1.95E-07	1.96E-07	1.97E-07	1.97E-07	1.98E-07	1.98E-07
sm148	1.76E-07	1.77E-07	1.79E-07	1.81E-07	1.83E-07	1.83E-07
sb123	1.72E-07	1.73E-07	1.73E-07	1.74E-07	1.75E-07	1.75E-07
kr 86	1.44E-07	1.45E-07	1.46E-07	1.46E-07	1.47E-07	1.47E-07
te128	1.40E-07	1.41E-07	1.41E-07	1.42E-07	1.43E-07	1.43E-07
pd104	1.33E-07	1.34E-07	1.35E-07	1.37E-07	1.38E-07	1.38E-07
tb159	1.04E-07	1.04E-07	1.05E-07	1.06E-07	1.06E-07	1.06E-07
nb 93	9.57E-08	9.78E-08	9.98E-08	1.02E-07	1.04E-07	1.04E-07
se 80	9.56E-08	9.61E-08	9.66E-08	9.71E-08	9.76E-08	9.76E-08
te125	9.53E-08	9.59E-08	9.64E-08	9.69E-08	9.74E-08	9.74E-08
gd158	8.19E-08	8.24E-08	8.29E-08	8.34E-08	8.39E-08	8.39E-08
cd112	7.38E-08	7.43E-08	7.47E-08	7.51E-08	7.55E-08	7.55E-08
dy162	5.57E-08	5.61E-08	5.65E-08	5.69E-08	5.73E-08	5.73E-08
dy164	5.40E-08	5.43E-08	5.47E-08	5.50E-08	5.53E-08	5.53E-08
sn117	5.19E-08	5.22E-08	5.25E-08	5.28E-08	5.31E-08	5.31E-08
br 79	4.76E-08	4.86E-08	4.96E-08	5.06E-08	5.16E-08	5.16E-08
ag107	4.66E-08	4.77E-08	4.88E-08	4.99E-08	5.11E-08	5.11E-08
cd110	4.83E-08	4.89E-08	4.95E-08	5.00E-08	5.06E-08	5.06E-08
li 6	4.92E-08	4.95E-08	4.97E-08	4.99E-08	5.02E-08	5.02E-08
eu152	4.70E-08	6.20E-08	6.22E-08	6.24E-08	6.26E-08	4.70E-08
mo 96	4.40E-08	4.44E-08	4.49E-08	4.53E-08	4.58E-08	4.58E-08
cd114	4.42E-08	4.44E-08	4.47E-08	4.49E-08	4.52E-08	4.52E-08
sn119	3.95E-08	3.97E-08	3.99E-08	4.01E-08	4.03E-08	4.03E-08
pd110	3.65E-08	3.68E-08	3.70E-08	3.72E-08	3.74E-08	3.74E-08
sn115	3.61E-08	3.63E-08	3.65E-08	3.67E-08	3.69E-08	3.69E-08
xe129	2.90E-08	2.96E-08	3.02E-08	3.09E-08	3.15E-08	3.15E-08
sr 88	2.65E-08	2.66E-08	2.67E-08	2.69E-08	2.70E-08	2.70E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 199
0 fraction of total absorption rate
power= .00mw, burnup= 23237.mwd, flux= 2.94E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

xe130	2.16E-08	2.18E-08	2.20E-08	2.22E-08	2.24E-08	2.24E-08
ba136	1.84E-08	1.86E-08	1.88E-08	1.89E-08	1.91E-08	1.91E-08
se 82	1.82E-08	1.83E-08	1.84E-08	1.85E-08	1.86E-08	1.86E-08
te126	1.60E-08	1.63E-08	1.66E-08	1.69E-08	1.73E-08	1.73E-08
sn126	1.55E-08	1.55E-08	1.55E-08	1.56E-08	1.56E-08	1.56E-08
se 78	1.43E-08	1.44E-08	1.44E-08	1.45E-08	1.46E-08	1.46E-08
dy163	1.39E-08	1.40E-08	1.41E-08	1.42E-08	1.43E-08	1.43E-08
kr 82	1.36E-08	1.37E-08	1.38E-08	1.39E-08	1.40E-08	1.40E-08
sn124	1.25E-08	1.26E-08	1.27E-08	1.27E-08	1.28E-08	1.28E-08
eu155	1.04E-08	2.26E-08	2.25E-08	2.25E-08	2.25E-08	9.95E-09
as 75	8.39E-09	8.44E-09	8.48E-09	8.52E-09	8.57E-09	8.57E-09
pm147	8.30E-09	3.29E-08	3.29E-08	3.29E-08	3.29E-08	7.77E-09
in113	7.20E-09	7.24E-09	7.28E-09	7.32E-09	7.36E-09	7.36E-09
sn118	5.06E-09	5.08E-09	5.11E-09	5.14E-09	5.17E-09	5.17E-09
sn122	4.35E-09	4.37E-09	4.40E-09	4.42E-09	4.44E-09	4.44E-09
cd116	4.25E-09	4.27E-09	4.29E-09	4.32E-09	4.34E-09	4.34E-09
eu154	3.44E-09	5.29E-09	5.32E-09	5.35E-09	5.39E-09	3.45E-09
sn120	3.20E-09	3.22E-09	3.24E-09	3.25E-09	3.27E-09	3.27E-09
ge 73	2.41E-09	2.42E-09	2.44E-09	2.45E-09	2.46E-09	2.46E-09
sr 90	1.75E-09	2.00E-09	2.00E-09	2.00E-09	2.00E-09	1.75E-09
ho165	1.37E-09	1.38E-09	1.39E-09	1.40E-09	1.41E-09	1.41E-09
dy160	1.32E-09	1.33E-09	1.35E-09	1.36E-09	1.38E-09	1.38E-09
gd160	1.16E-09	1.17E-09	1.17E-09	1.18E-09	1.19E-09	1.19E-09
ge 76	8.17E-10	8.21E-10	8.25E-10	8.30E-10	8.34E-10	8.34E-10

xe128	7.73E-10	7.81E-10	7.89E-10	7.97E-10	8.06E-10	8.06E-10
cs137	4.06E-10	4.59E-10	4.59E-10	4.59E-10	4.60E-10	4.05E-10
sr 86	3.65E-10	3.68E-10	3.72E-10	3.75E-10	3.79E-10	3.79E-10
sn116	2.93E-10	2.96E-10	2.99E-10	3.02E-10	3.05E-10	3.05E-10
te124	2.63E-10	2.66E-10	2.68E-10	2.70E-10	2.72E-10	2.72E-10
nb 94	1.42E-10	1.43E-10	1.43E-10	1.44E-10	1.44E-10	1.44E-10
sr 87	1.26E-10	1.27E-10	1.28E-10	1.29E-10	1.31E-10	1.31E-10
te122	1.23E-10	1.24E-10	1.26E-10	1.27E-10	1.28E-10	1.28E-10
se 76	1.02E-10	1.03E-10	1.04E-10	1.05E-10	1.06E-10	1.06E-10
cs134	8.74E-11	5.13E-10	5.16E-10	5.19E-10	5.22E-10	8.20E-11
er166	6.53E-11	6.58E-11	6.63E-11	6.68E-11	6.72E-11	6.72E-11
kr 80	4.98E-11	5.06E-11	5.15E-11	5.24E-11	5.33E-11	5.33E-11
ge 74	4.82E-11	4.84E-11	4.87E-11	4.89E-11	4.92E-11	4.92E-11
kr 85	4.79E-11	6.73E-11	6.73E-11	6.74E-11	6.74E-11	4.72E-11
ge 72	3.57E-11	3.59E-11	3.60E-11	3.62E-11	3.64E-11	3.64E-11
er167	7.51E-12	7.61E-12	7.70E-12	7.80E-12	7.89E-12	7.89E-12
te123	5.87E-12	5.96E-12	6.05E-12	6.14E-12	6.22E-12	6.22E-12
cd108	3.53E-12	3.60E-12	3.67E-12	3.74E-12	3.81E-12	3.81E-12
y 90	1.67E-12	1.90E-12	1.90E-12	1.90E-12	1.91E-12	1.66E-12
ce144	6.71E-13	7.15E-11	7.15E-11	7.15E-11	7.16E-11	5.37E-13
sb125	5.72E-13	2.16E-12	2.16E-12	2.16E-12	2.16E-12	5.35E-13
ru106	1.36E-13	4.86E-12	4.85E-12	4.83E-12	4.82E-12	1.13E-13
be 9	1.02E-13	1.03E-13	1.04E-13	1.04E-13	1.05E-13	1.05E-13
sn114	7.76E-14	7.84E-14	7.93E-14	8.01E-14	8.09E-14	8.09E-14
li 7	4.22E-14	4.24E-14	4.27E-14	4.29E-14	4.31E-14	4.31E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 200
0 fraction of total absorption rate
power= .00mw, burnup= 23237.mwd, flux= 2.94E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.77E-14	1.86E-14	1.86E-14	1.86E-14	1.87E-14	1.79E-14
te127m	5.73E-18	1.10E-12	1.10E-12	1.10E-12	1.10E-12	3.17E-18
cd109	9.83E-19	1.79E-17	1.83E-17	1.86E-17	1.89E-17	9.30E-19
sn123	5.46E-20	1.29E-15	1.29E-15	1.29E-15	1.29E-15	2.73E-20
nb 95	2.73E-20	1.82E-11	1.82E-11	1.82E-11	1.82E-11	2.73E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 201
power= 4.890E-04mw, burnup=2.3237E+04mwd, flux= 2.94E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d	******* d
h 1	1.36E-03	1.36E-03	1.37E-03	1.38E-03	1.38E-03	1.38E-03
h 2	4.06E-06	4.08E-06	4.10E-06	4.12E-06	4.14E-06	4.14E-06
h 3	5.44E-12	7.31E-12	7.32E-12	7.33E-12	7.34E-12	5.39E-12
h 4	.00E+00	3.66E-36	3.67E-36	3.67E-36	3.68E-36	.00E+00
he 3	1.77E-08	1.78E-08	1.78E-08	1.79E-08	1.79E-08	1.79E-08
he 4	2.25E-04	2.26E-04	2.27E-04	2.29E-04	2.30E-04	2.30E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.71E-05	2.72E-05	2.73E-05	2.75E-05	2.76E-05	2.76E-05
ne 21	1.11E-08	1.12E-08	1.13E-08	1.14E-08	1.16E-08	1.16E-08
ne 22	1.78E-07	1.79E-07	1.80E-07	1.81E-07	1.82E-07	1.82E-07
ne 23	8.87E-31	8.85E-16	8.85E-16	8.85E-16	8.86E-16	8.86E-31
na 22	1.30E-12	5.25E-12	5.25E-12	5.26E-12	5.26E-12	1.21E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.23E-24	3.22E-09	3.22E-09	3.22E-09	3.22E-09	3.22E-24
na 24m	5.31E-31	5.28E-16	5.29E-16	5.29E-16	5.29E-16	5.29E-31
na 25	4.01E-39	4.05E-24	4.09E-24	4.13E-24	4.17E-24	4.17E-39
mg 24	1.75E-01	1.76E-01	1.77E-01	1.78E-01	1.78E-01	1.78E-01
mg 25	1.15E-06	1.16E-06	1.17E-06	1.18E-06	1.20E-06	1.20E-06
mg 26	4.05E-06	4.07E-06	4.09E-06	4.11E-06	4.13E-06	4.13E-06

mg 27	2.65E-28	2.64E-13	2.64E-13	2.64E-13	2.64E-13	2.64E-28
mg 28	.00E+00	6.62E-26	6.63E-26	6.64E-26	6.65E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.39E-26	2.38E-11	2.38E-11	2.39E-11	2.39E-11	2.39E-26
al 29	3.27E-37	3.29E-22	3.33E-22	3.36E-22	3.39E-22	3.39E-37
al 30	.00E+00	9.69E-32	9.84E-32	9.98E-32	1.01E-31	.00E+00
si 28	5.10E-01	5.12E-01	5.14E-01	5.17E-01	5.19E-01	5.19E-01
si 29	1.05E-05	1.06E-05	1.07E-05	1.08E-05	1.09E-05	1.09E-05
si 30	2.29E-10	2.33E-10	2.36E-10	2.39E-10	2.43E-10	2.43E-10
si 31	2.02E-38	2.05E-23	2.09E-23	2.12E-23	2.15E-23	2.15E-38
si 32	4.28E-30	4.43E-30	4.51E-30	4.58E-30	4.65E-30	4.55E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		2.94E+07	2.94E+07	2.94E+07	2.94E+07	2.94E-08

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 202
power= 4.890E-04mw, burnup=2.3237E+04mwd, flux= 2.94E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	4.55E+01	4.62E+01	4.69E+01	4.75E+01	4.82E+01	4.82E+01
pb206	2.72E-01	2.79E-01	2.85E-01	2.92E-01	2.99E-01	2.99E-01
pb207	1.69E-02	1.73E-02	1.76E-02	1.80E-02	1.83E-02	1.84E-02
pb208	7.06E-04	7.13E-04	7.20E-04	7.27E-04	7.34E-04	7.34E-04
pb209	1.11E-09	1.13E-09	1.14E-09	1.16E-09	1.17E-09	1.17E-09
pb210	3.29E-04	3.32E-04	3.36E-04	3.39E-04	3.42E-04	3.42E-04
pb211	5.60E-11	5.62E-11	5.65E-11	5.68E-11	5.71E-11	5.72E-11
pb212	1.86E-11	1.92E-11	1.93E-11	1.94E-11	1.96E-11	1.90E-11
pb214	7.52E-10	7.59E-10	7.67E-10	7.75E-10	7.83E-10	7.83E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	4.81E-02	4.94E-02	5.07E-02	5.21E-02	5.34E-02	5.34E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.02E-07	2.04E-07	2.07E-07	2.09E-07	2.11E-07	2.11E-07
bi211	3.32E-12	3.33E-12	3.35E-12	3.37E-12	3.38E-12	3.39E-12
bi212	1.76E-12	1.82E-12	1.83E-12	1.84E-12	1.86E-12	1.80E-12
bi213	2.60E-10	2.63E-10	2.67E-10	2.70E-10	2.74E-10	2.74E-10
bi214	5.58E-10	5.64E-10	5.70E-10	5.75E-10	5.81E-10	5.81E-10
po210	5.59E-06	5.65E-06	5.70E-06	5.76E-06	5.82E-06	5.82E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.67E-17	3.68E-17	3.70E-17	3.72E-17	3.74E-17	3.75E-17
po212	9.27E-23	9.58E-23	9.64E-23	9.69E-23	9.75E-23	9.46E-23
po213	3.91E-19	3.96E-19	4.01E-19	4.06E-19	4.11E-19	4.11E-19
po214	7.68E-17	7.76E-17	7.84E-17	7.92E-17	7.99E-17	8.00E-17
po215	4.60E-17	4.62E-17	4.64E-17	4.67E-17	4.69E-17	4.70E-17
po216	7.04E-17	7.28E-17	7.32E-17	7.36E-17	7.40E-17	7.18E-17
po218	8.69E-11	8.79E-11	8.88E-11	8.96E-11	9.05E-11	9.05E-11
rn218	3.22E-44	3.40E-29	3.42E-29	3.44E-29	3.46E-29	3.22E-44
rn219	1.02E-13	1.03E-13	1.03E-13	1.04E-13	1.04E-13	1.05E-13
rn220	2.70E-14	2.79E-14	2.81E-14	2.82E-14	2.84E-14	2.76E-14
rn222	1.54E-07	1.56E-07	1.58E-07	1.59E-07	1.61E-07	1.61E-07
ra222	3.49E-41	3.69E-26	3.71E-26	3.73E-26	3.76E-26	3.56E-41
ra223	2.56E-08	2.56E-08	2.58E-08	2.59E-08	2.60E-08	2.61E-08
ra224	1.54E-10	1.59E-10	1.60E-10	1.61E-10	1.61E-10	1.57E-10
ra225	1.22E-07	1.23E-07	1.25E-07	1.26E-07	1.28E-07	1.28E-07
ra226	2.36E-02	2.38E-02	2.41E-02	2.43E-02	2.46E-02	2.46E-02
ra228	1.17E-10	1.19E-10	1.20E-10	1.21E-10	1.23E-10	1.23E-10
ac225	8.21E-08	8.32E-08	8.43E-08	8.54E-08	8.65E-08	8.65E-08
ac227	1.77E-05	1.78E-05	1.79E-05	1.80E-05	1.81E-05	1.81E-05
ac228	1.43E-14	1.45E-14	1.47E-14	1.48E-14	1.50E-14	1.50E-14
th226	1.70E-39	1.80E-24	1.81E-24	1.82E-24	1.83E-24	1.74E-39
th227	4.13E-08	4.14E-08	4.16E-08	4.18E-08	4.20E-08	4.21E-08

th228	2.93E-08	3.03E-08	3.05E-08	3.07E-08	3.08E-08	2.99E-08
th229	2.36E-02	2.40E-02	2.43E-02	2.46E-02	2.49E-02	2.49E-02
th230	1.15E+00	1.17E+00	1.18E+00	1.19E+00	1.20E+00	1.20E+00
th231	2.71E-09	3.36E-09	3.36E-09	3.37E-09	3.38E-09	2.71E-09
th232	2.86E-01	2.90E-01	2.93E-01	2.97E-01	3.01E-01	3.01E-01
th233	3.22E-28	3.26E-13	3.30E-13	3.34E-13	3.38E-13	3.38E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.67E-02	2.68E-02	2.70E-02	2.71E-02	2.72E-02	2.72E-02
pa232	5.63E-26	5.66E-11	5.70E-11	5.73E-11	5.76E-11	5.76E-26

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 203
power= 4.890E-04mw, burnup=2.3237E+04mwd, flux= 2.94E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.65E-36	1.74E-21	1.75E-21	1.77E-21	1.78E-21	1.68E-36
u231	5.47E-32	5.52E-17	5.58E-17	5.64E-17	5.69E-17	5.70E-32
u232	1.04E-06	1.10E-06	1.11E-06	1.12E-06	1.12E-06	1.06E-06
u233	5.93E-01	5.99E-01	6.05E-01	6.11E-01	6.17E-01	6.17E-01
u234	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01
u235	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02
u236	1.92E+02	1.92E+02	1.93E+02	1.93E+02	1.93E+02	1.93E+02
u237	5.51E-13	4.10E-07	4.10E-07	4.11E-07	4.11E-07	4.87E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.74E-23	3.74E-08	3.74E-08	3.74E-08	3.75E-08	3.75E-23
u240	1.41E-34	1.48E-34	1.56E-34	1.64E-34	1.72E-34	1.72E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	3.59E-14	1.03E-12	1.03E-12	1.03E-12	1.03E-12	3.05E-14
np236m	2.45E-28	2.44E-13	2.44E-13	2.44E-13	2.44E-13	2.44E-28
np236	2.52E-06	2.52E-06	2.53E-06	2.53E-06	2.54E-06	2.54E-06
np237	4.06E+01	4.06E+01	4.06E+01	4.06E+01	4.06E+01	4.06E+01
np238	7.53E-15	1.81E-07	1.82E-07	1.82E-07	1.82E-07	6.53E-15
np239	2.08E-13	5.40E-06	5.41E-06	5.41E-06	5.41E-06	1.93E-13
np240m	1.20E-36	1.27E-36	1.33E-36	1.40E-36	1.47E-36	1.47E-36
np240	1.75E-38	1.35E-16	1.35E-16	1.35E-16	1.35E-16	1.99E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	4.35E-11	1.38E-10	1.38E-10	1.38E-10	1.38E-10	4.13E-11
pu237	5.83E-27	3.53E-14	3.51E-14	3.48E-14	3.46E-14	1.40E-27
pu238	2.64E-03	2.75E-03	2.75E-03	2.75E-03	2.75E-03	2.63E-03
pu239	3.04E+01	3.02E+01	2.99E+01	2.97E+01	2.95E+01	2.95E+01
pu240	4.65E-01	4.52E-01	4.39E-01	4.27E-01	4.16E-01	4.15E-01
pu241	1.79E-05	2.23E-05	2.17E-05	2.12E-05	2.06E-05	1.58E-05
pu242	4.73E-05	4.74E-05	4.75E-05	4.75E-05	4.76E-05	4.76E-05
pu243	1.48E-29	1.22E-14	1.22E-14	1.22E-14	1.22E-14	1.50E-29
pu244	7.01E-24	7.39E-24	7.78E-24	8.17E-24	8.57E-24	8.57E-24
pu245	.00E+00	3.73E-35	3.92E-35	4.13E-35	4.33E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	2.44E-35	2.32E-20	2.25E-20	2.19E-20	2.13E-20	2.13E-35
am240	1.11E-32	1.06E-17	1.03E-17	1.00E-17	9.74E-18	9.73E-33
am241	7.18E-04	6.87E-04	6.65E-04	6.46E-04	6.29E-04	6.28E-04
am242m	4.07E-08	3.96E-08	3.84E-08	3.73E-08	3.62E-08	3.53E-08
am242	5.26E-13	3.13E-12	3.03E-12	2.95E-12	2.87E-12	4.55E-13
am243	2.38E-07	2.33E-07	2.29E-07	2.25E-07	2.21E-07	2.21E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	2.19E-31	2.15E-16	2.11E-16	2.08E-16	2.04E-16	2.04E-31
am245	5.37E-40	7.31E-36	7.70E-36	8.09E-36	8.49E-36	4.77E-40

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     am246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm241   5.79E-39  2.24E-23  2.18E-23  2.12E-23  2.06E-23  5.74E-39
     cm242   1.06E-10  6.32E-10  6.12E-10  5.95E-10  5.79E-10  9.20E-11
     cm243   1.63E-15  1.77E-15  1.72E-15  1.67E-15  1.63E-15  1.42E-15
     cm244   2.82E-12  3.38E-12  3.32E-12  3.26E-12  3.21E-12  2.60E-12
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                    actinides      page  204
       power= 4.890E-04mw, burnup=2.3237E+04mwd, flux= 2.94E+07n/cm**2-sec
0                                        nuclide concentrations, gram atoms
                                         basis = single reactor assembly
          charge ******* d ******* d ******* d ******* d ******* d
     cm245   1.46E-14  1.41E-14  1.36E-14  1.31E-14  1.27E-14  1.27E-14
     cm246   1.17E-16  1.13E-16  1.09E-16  1.05E-16  1.02E-16  1.01E-16
     cm247   7.54E-20  7.63E-20  7.72E-20  7.81E-20  7.89E-20  7.89E-20
     cm248   3.19E-22  3.26E-22  3.33E-22  3.40E-22  3.48E-22  3.48E-22
     cm249    .00E+00  1.25E-33  1.28E-33  1.31E-33  1.33E-33   .00E+00
     cm250   1.73E-37  1.72E-37  1.72E-37  1.72E-37  1.72E-37  1.72E-37
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              2.94E+07  2.94E+07  2.94E+07  2.94E+07  2.94E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number 23 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *           prelim lwr origen-s binary working library--id = 1143              *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *       neutron flux spectrum factors and cross sections were produced from    *
          *      the "presas2" case updating all nuclides on the scale "burnup" library  *
          *                                                                              *
          *                   fission product yields are from endf/b-v                   *
          *                                                                              *
          *              photon libraries use an 18-energy-group structure               *
          *             the photon data are from the master photon data base,            *
          *              produced to include bremsstrahlung from uo2 matrix              *
          *                                                                              *
```

```
         *       see information above this box (if present) for later updates         *
         *                                                                             *
         *******************************************************************************
         *                                                                             *
0        *******************************************************************************
0                 .other identification and sizes of library.
0                  data set name:  ft33f001
0               8/29/1996    date library was produced
0                   1697    total number of nuclides in library
                     689    number of light-element nuclides
                     129    number of actinide nuclides
                     879    number of fission product nuclides
0                   7993    number of nonzero off-diagonal matrix elements
0        *******************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page  205
        power=    .00mw, burnup=  23684.mwd, flux= 2.95E+07n/cm**2-sec
0                                  basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                  initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions  1.288924E+06  1.288140E+06  1.287365E+06  1.286599E+06  1.285841E+06  1.285832E+06
     absorptions  1.049175E+06  1.048800E+06  1.048429E+06  1.048062E+06  1.047700E+06  1.047695E+06
     k infinity   1.228512E+00  1.228204E+00  1.227900E+00  1.227597E+00  1.227298E+00  1.227296E+00
0                  initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions  1.029930E+06  1.029509E+06  1.029093E+06  1.028683E+06  1.028278E+06  1.028273E+06
     non-actinide
     abs. fracs.  1.834297E-02  1.839298E-02  1.844198E-02  1.849020E-02  1.853782E-02  1.853758E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2              fission products         page  206
0                               fraction of total absorption rate
        power=    .00mw, burnup=  23684.mwd, flux= 2.95E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d ******* d

     sm149     5.36E-03  5.37E-03  5.38E-03  5.38E-03  5.39E-03  5.39E-03
     nd143     2.25E-03  2.26E-03  2.27E-03  2.28E-03  2.29E-03  2.29E-03
     eu151     1.94E-03  1.94E-03  1.95E-03  1.95E-03  1.95E-03  1.95E-03
     rh103     1.10E-03  1.10E-03  1.11E-03  1.11E-03  1.12E-03  1.12E-03
     xe131     7.32E-04  7.35E-04  7.39E-04  7.43E-04  7.46E-04  7.46E-04
     cs133     5.70E-04  5.73E-04  5.76E-04  5.79E-04  5.82E-04  5.82E-04
     sm147     4.17E-04  4.20E-04  4.22E-04  4.24E-04  4.26E-04  4.26E-04
     tc 99     3.78E-04  3.79E-04  3.81E-04  3.82E-04  3.84E-04  3.84E-04
     nd145     3.22E-04  3.23E-04  3.25E-04  3.26E-04  3.28E-04  3.28E-04
     sm152     2.55E-04  2.56E-04  2.58E-04  2.59E-04  2.61E-04  2.61E-04
     gd155     2.29E-04  2.29E-04  2.29E-04  2.29E-04  2.28E-04  2.28E-04
     mo 95     2.23E-04  2.24E-04  2.25E-04  2.26E-04  2.28E-04  2.28E-04
     sm150     1.70E-04  1.71E-04  1.72E-04  1.73E-04  1.74E-04  1.74E-04
     kr 83     1.37E-04  1.38E-04  1.39E-04  1.39E-04  1.40E-04  1.40E-04
     cs135     1.29E-04  1.30E-04  1.30E-04  1.31E-04  1.32E-04  1.32E-04
     eu153     1.05E-04  1.05E-04  1.06E-04  1.06E-04  1.07E-04  1.07E-04
     cd113     1.03E-04  1.03E-04  1.03E-04  1.03E-04  1.03E-04  1.03E-04
     ru101     1.00E-04  1.01E-04  1.02E-04  1.02E-04  1.03E-04  1.03E-04
     pr141     9.65E-05  9.70E-05  9.75E-05  9.80E-05  9.85E-05  9.85E-05
     la139     7.90E-05  7.94E-05  7.98E-05  8.02E-05  8.06E-05  8.06E-05
     gd157     6.08E-05  6.07E-05  6.05E-05  6.04E-05  6.02E-05  6.02E-05
     ag109     4.13E-05  4.15E-05  4.18E-05  4.20E-05  4.23E-05  4.23E-05
     pd105     4.06E-05  4.09E-05  4.11E-05  4.13E-05  4.15E-05  4.15E-05
     ba137     3.83E-05  3.85E-05  3.87E-05  3.89E-05  3.91E-05  3.91E-05
     zr 93     3.08E-05  3.10E-05  3.11E-05  3.13E-05  3.14E-05  3.14E-05
      i129     2.59E-05  2.61E-05  2.62E-05  2.63E-05  2.65E-05  2.65E-05
     nd144     2.45E-05  2.47E-05  2.48E-05  2.49E-05  2.50E-05  2.50E-05
     gd152     2.14E-05  2.16E-05  2.17E-05  2.19E-05  2.21E-05  2.21E-05
```

mo 97	1.79E-05	1.80E-05	1.81E-05	1.82E-05	1.83E-05	1.83E-05
pd108	9.91E-06	9.97E-06	1.00E-05	1.01E-05	1.01E-05	1.01E-05
zr 91	8.23E-06	8.27E-06	8.32E-06	8.36E-06	8.40E-06	8.40E-06
y 89	7.87E-06	7.91E-06	7.95E-06	7.99E-06	8.03E-06	8.03E-06
ru102	7.52E-06	7.56E-06	7.60E-06	7.64E-06	7.68E-06	7.68E-06
ru 99	6.39E-06	6.52E-06	6.64E-06	6.77E-06	6.90E-06	6.90E-06
ce142	6.58E-06	6.62E-06	6.65E-06	6.69E-06	6.72E-06	6.72E-06
sm151	6.60E-06	6.89E-06	6.90E-06	6.90E-06	6.90E-06	6.60E-06
nd148	6.34E-06	6.37E-06	6.40E-06	6.44E-06	6.47E-06	6.47E-06
nd146	5.35E-06	5.38E-06	5.41E-06	5.43E-06	5.46E-06	5.46E-06
pd107	4.99E-06	5.02E-06	5.05E-06	5.07E-06	5.10E-06	5.10E-06
in115	4.70E-06	4.72E-06	4.75E-06	4.77E-06	4.80E-06	4.80E-06
ba138	4.55E-06	4.58E-06	4.60E-06	4.62E-06	4.65E-06	4.65E-06
ce140	4.26E-06	4.28E-06	4.31E-06	4.33E-06	4.35E-06	4.35E-06
xe132	3.92E-06	3.94E-06	3.96E-06	3.98E-06	4.00E-06	4.00E-06
mo 98	2.61E-06	2.62E-06	2.64E-06	2.65E-06	2.67E-06	2.67E-06
mo100	2.55E-06	2.56E-06	2.58E-06	2.59E-06	2.60E-06	2.60E-06
xe134	2.52E-06	2.53E-06	2.55E-06	2.56E-06	2.57E-06	2.57E-06
zr 92	1.99E-06	2.00E-06	2.01E-06	2.02E-06	2.03E-06	2.03E-06
i127	1.90E-06	1.91E-06	1.92E-06	1.93E-06	1.94E-06	1.94E-06
ru104	1.74E-06	1.75E-06	1.76E-06	1.77E-06	1.78E-06	1.78E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 207
0 fraction of total absorption rate
power= .00mw, burnup= 23684.mwd, flux= 2.95E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.56E-06	1.57E-06	1.58E-06	1.59E-06	1.59E-06	1.59E-06
nd150	1.44E-06	1.44E-06	1.45E-06	1.46E-06	1.47E-06	1.47E-06
xe136	1.37E-06	1.37E-06	1.38E-06	1.39E-06	1.39E-06	1.39E-06
cd111	1.12E-06	1.13E-06	1.13E-06	1.14E-06	1.15E-06	1.15E-06
gd154	1.06E-06	1.07E-06	1.08E-06	1.10E-06	1.11E-06	1.11E-06
br 81	1.01E-06	1.01E-06	1.02E-06	1.02E-06	1.03E-06	1.03E-06
rb 85	9.65E-07	9.70E-07	9.75E-07	9.80E-07	9.85E-07	9.85E-07
zr 94	8.43E-07	8.47E-07	8.52E-07	8.56E-07	8.60E-07	8.60E-07
zr 90	7.76E-07	7.80E-07	7.84E-07	7.88E-07	7.92E-07	7.92E-07
ba135	6.55E-07	6.68E-07	6.81E-07	6.95E-07	7.08E-07	7.08E-07
sm154	6.80E-07	6.84E-07	6.87E-07	6.91E-07	6.94E-07	6.94E-07
te130	6.31E-07	6.34E-07	6.38E-07	6.41E-07	6.44E-07	6.44E-07
rb 87	5.55E-07	5.58E-07	5.61E-07	5.64E-07	5.67E-07	5.67E-07
pd106	4.18E-07	4.21E-07	4.23E-07	4.25E-07	4.28E-07	4.28E-07
se 77	4.07E-07	4.09E-07	4.11E-07	4.14E-07	4.16E-07	4.16E-07
gd156	3.99E-07	4.01E-07	4.04E-07	4.06E-07	4.08E-07	4.08E-07
ru100	2.86E-07	2.88E-07	2.91E-07	2.94E-07	2.97E-07	2.97E-07
kr 84	2.65E-07	2.66E-07	2.68E-07	2.69E-07	2.70E-07	2.70E-07
dy161	2.47E-07	2.48E-07	2.50E-07	2.51E-07	2.53E-07	2.53E-07
sb121	2.17E-07	2.18E-07	2.19E-07	2.20E-07	2.22E-07	2.22E-07
nd142	2.11E-07	2.13E-07	2.15E-07	2.17E-07	2.19E-07	2.19E-07
ba134	2.01E-07	2.03E-07	2.05E-07	2.07E-07	2.09E-07	2.09E-07
se 79	1.98E-07	1.99E-07	2.00E-07	2.01E-07	2.02E-07	2.02E-07
sm148	1.83E-07	1.85E-07	1.87E-07	1.88E-07	1.90E-07	1.90E-07
sb123	1.75E-07	1.76E-07	1.77E-07	1.78E-07	1.79E-07	1.79E-07
kr 86	1.47E-07	1.48E-07	1.49E-07	1.50E-07	1.50E-07	1.50E-07
te128	1.43E-07	1.44E-07	1.44E-07	1.45E-07	1.46E-07	1.46E-07
pd104	1.38E-07	1.39E-07	1.41E-07	1.42E-07	1.44E-07	1.44E-07
nb 93	1.04E-07	1.06E-07	1.08E-07	1.10E-07	1.12E-07	1.12E-07
tb159	1.06E-07	1.07E-07	1.08E-07	1.08E-07	1.09E-07	1.09E-07
se 80	9.76E-08	9.81E-08	9.86E-08	9.91E-08	9.96E-08	9.96E-08
te125	9.74E-08	9.79E-08	9.85E-08	9.90E-08	9.95E-08	9.95E-08
gd158	8.39E-08	8.44E-08	8.49E-08	8.54E-08	8.59E-08	8.59E-08
cd112	7.56E-08	7.60E-08	7.64E-08	7.68E-08	7.72E-08	7.72E-08

dy162	5.73E-08	5.77E-08	5.81E-08	5.85E-08	5.89E-08	5.89E-08
dy164	5.53E-08	5.56E-08	5.59E-08	5.62E-08	5.65E-08	5.65E-08
br 79	5.16E-08	5.27E-08	5.37E-08	5.47E-08	5.58E-08	5.58E-08
ag107	5.11E-08	5.22E-08	5.34E-08	5.45E-08	5.57E-08	5.57E-08
sn117	5.31E-08	5.34E-08	5.37E-08	5.40E-08	5.42E-08	5.42E-08
cd110	5.07E-08	5.13E-08	5.19E-08	5.25E-08	5.31E-08	5.31E-08
li 6	5.02E-08	5.04E-08	5.07E-08	5.09E-08	5.11E-08	5.11E-08
mo 96	4.58E-08	4.62E-08	4.67E-08	4.71E-08	4.76E-08	4.76E-08
eu152	4.70E-08	6.28E-08	6.30E-08	6.31E-08	6.33E-08	4.69E-08
cd114	4.51E-08	4.54E-08	4.57E-08	4.59E-08	4.62E-08	4.62E-08
sn119	4.04E-08	4.06E-08	4.08E-08	4.10E-08	4.12E-08	4.12E-08
pd110	3.74E-08	3.76E-08	3.79E-08	3.81E-08	3.83E-08	3.83E-08
sn115	3.69E-08	3.71E-08	3.73E-08	3.75E-08	3.77E-08	3.77E-08
xe129	3.15E-08	3.22E-08	3.28E-08	3.35E-08	3.41E-08	3.41E-08
sr 88	2.70E-08	2.72E-08	2.73E-08	2.74E-08	2.76E-08	2.76E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 208
0 fraction of total absorption rate
power= .00mw, burnup= 23684.mwd, flux= 2.95E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

xe130	2.24E-08	2.26E-08	2.29E-08	2.31E-08	2.33E-08	2.33E-08
ba136	1.91E-08	1.92E-08	1.94E-08	1.95E-08	1.97E-08	1.97E-08
se 82	1.86E-08	1.87E-08	1.88E-08	1.89E-08	1.90E-08	1.90E-08
te126	1.73E-08	1.76E-08	1.79E-08	1.82E-08	1.86E-08	1.86E-08
sn126	1.56E-08	1.57E-08	1.57E-08	1.57E-08	1.58E-08	1.58E-08
se 78	1.46E-08	1.47E-08	1.47E-08	1.48E-08	1.49E-08	1.49E-08
dy163	1.43E-08	1.44E-08	1.45E-08	1.46E-08	1.47E-08	1.47E-08
kr 82	1.40E-08	1.41E-08	1.42E-08	1.43E-08	1.44E-08	1.44E-08
sn124	1.28E-08	1.29E-08	1.29E-08	1.30E-08	1.31E-08	1.31E-08
eu155	9.95E-09	2.25E-08	2.24E-08	2.24E-08	2.24E-08	9.56E-09
as 75	8.57E-09	8.61E-09	8.66E-09	8.70E-09	8.75E-09	8.75E-09
in113	7.36E-09	7.40E-09	7.44E-09	7.48E-09	7.52E-09	7.52E-09
pm147	7.77E-09	3.29E-08	3.29E-08	3.30E-08	3.30E-08	7.30E-09
sn118	5.16E-09	5.19E-09	5.22E-09	5.25E-09	5.27E-09	5.27E-09
sn122	4.45E-09	4.47E-09	4.49E-09	4.52E-09	4.54E-09	4.54E-09
cd116	4.34E-09	4.36E-09	4.38E-09	4.41E-09	4.43E-09	4.43E-09
eu154	3.46E-09	5.42E-09	5.45E-09	5.49E-09	5.52E-09	3.47E-09
sn120	3.27E-09	3.29E-09	3.30E-09	3.32E-09	3.34E-09	3.34E-09
ge 73	2.46E-09	2.48E-09	2.49E-09	2.50E-09	2.51E-09	2.51E-09
sr 90	1.75E-09	2.00E-09	2.00E-09	2.01E-09	2.01E-09	1.74E-09
ho165	1.41E-09	1.42E-09	1.44E-09	1.45E-09	1.46E-09	1.46E-09
dy160	1.38E-09	1.39E-09	1.41E-09	1.42E-09	1.44E-09	1.44E-09
gd160	1.19E-09	1.20E-09	1.20E-09	1.21E-09	1.22E-09	1.22E-09
ge 76	8.34E-10	8.38E-10	8.43E-10	8.47E-10	8.51E-10	8.51E-10
xe128	8.06E-10	8.14E-10	8.22E-10	8.31E-10	8.39E-10	8.39E-10
cs137	4.05E-10	4.60E-10	4.60E-10	4.60E-10	4.60E-10	4.03E-10
sr 86	3.79E-10	3.83E-10	3.86E-10	3.90E-10	3.94E-10	3.94E-10
sn116	3.05E-10	3.08E-10	3.11E-10	3.14E-10	3.18E-10	3.18E-10
te124	2.72E-10	2.74E-10	2.76E-10	2.79E-10	2.81E-10	2.81E-10
nb 94	1.44E-10	1.45E-10	1.46E-10	1.47E-10	1.48E-10	1.48E-10
sr 87	1.31E-10	1.32E-10	1.33E-10	1.34E-10	1.35E-10	1.35E-10
te122	1.28E-10	1.30E-10	1.31E-10	1.32E-10	1.34E-10	1.34E-10
se 76	1.06E-10	1.07E-10	1.08E-10	1.09E-10	1.10E-10	1.10E-10
cs134	8.20E-11	5.25E-10	5.28E-10	5.31E-10	5.34E-10	7.72E-11
er166	6.73E-11	6.77E-11	6.82E-11	6.87E-11	6.91E-11	6.91E-11
kr 80	5.33E-11	5.42E-11	5.52E-11	5.61E-11	5.71E-11	5.71E-11
ge 74	4.92E-11	4.95E-11	4.97E-11	5.00E-11	5.03E-11	5.03E-11
kr 85	4.72E-11	6.75E-11	6.75E-11	6.76E-11	6.76E-11	4.66E-11
ge 72	3.65E-11	3.67E-11	3.68E-11	3.70E-11	3.72E-11	3.72E-11
er167	7.89E-12	7.99E-12	8.09E-12	8.18E-12	8.28E-12	8.28E-12

te123	6.22E-12	6.32E-12	6.41E-12	6.50E-12	6.59E-12	6.59E-12
cd108	3.81E-12	3.89E-12	3.96E-12	4.04E-12	4.12E-12	4.12E-12
y 90	1.66E-12	1.91E-12	1.91E-12	1.91E-12	1.91E-12	1.66E-12
sb125	5.35E-13	2.16E-12	2.16E-12	2.15E-12	2.15E-12	5.01E-13
ce144	5.37E-13	7.16E-11	7.17E-11	7.17E-11	7.17E-11	4.33E-13
be 9	1.05E-13	1.05E-13	1.06E-13	1.06E-13	1.07E-13	1.07E-13
ru106	1.13E-13	4.81E-12	4.80E-12	4.79E-12	4.78E-12	9.50E-14
sn114	8.10E-14	8.18E-14	8.27E-14	8.35E-14	8.44E-14	8.44E-14
li 7	4.31E-14	4.34E-14	4.36E-14	4.38E-14	4.40E-14	4.40E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 209
0 fraction of total absorption rate
power= .00mw, burnup= 23684.mwd, flux= 2.95E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.79E-14	1.87E-14	1.88E-14	1.88E-14	1.88E-14	1.81E-14
te127m	3.17E-18	1.10E-12	1.10E-12	1.10E-12	1.09E-12	1.78E-18
cd109	9.28E-19	1.93E-17	1.96E-17	2.00E-17	2.04E-17	8.75E-19
sn123	2.73E-20	1.29E-15	1.29E-15	1.29E-15	1.29E-15	2.73E-20

1
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 210
power= 4.890E-04mw, burnup=2.3684E+04mwd, flux= 2.95E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d	******* d
h 1	1.38E-03	1.39E-03	1.40E-03	1.40E-03	1.41E-03	1.41E-03
h 2	4.14E-06	4.16E-06	4.18E-06	4.20E-06	4.22E-06	4.22E-06
h 3	5.39E-12	7.35E-12	7.36E-12	7.37E-12	7.38E-12	5.34E-12
h 4	.00E+00	3.68E-36	3.69E-36	3.70E-36	3.71E-36	.00E+00
he 3	1.79E-08	1.79E-08	1.80E-08	1.80E-08	1.81E-08	1.81E-08
he 4	2.30E-04	2.31E-04	2.32E-04	2.33E-04	2.34E-04	2.34E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.76E-05	2.77E-05	2.79E-05	2.80E-05	2.81E-05	2.81E-05
ne 21	1.16E-08	1.17E-08	1.18E-08	1.19E-08	1.20E-08	1.20E-08
ne 22	1.82E-07	1.83E-07	1.84E-07	1.84E-07	1.85E-07	1.85E-07
ne 23	8.86E-31	8.85E-16	8.85E-16	8.86E-16	8.86E-16	8.86E-31
na 22	1.21E-12	5.25E-12	5.25E-12	5.26E-12	5.26E-12	1.14E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.22E-24	3.22E-09	3.22E-09	3.22E-09	3.22E-09	3.22E-24
na 24m	5.29E-31	5.29E-16	5.29E-16	5.29E-16	5.30E-16	5.30E-31
na 25	4.17E-39	4.20E-24	4.24E-24	4.29E-24	4.33E-24	4.33E-39
mg 24	1.78E-01	1.79E-01	1.80E-01	1.81E-01	1.82E-01	1.82E-01
mg 25	1.20E-06	1.21E-06	1.22E-06	1.23E-06	1.24E-06	1.24E-06
mg 26	4.13E-06	4.15E-06	4.17E-06	4.19E-06	4.21E-06	4.21E-06
mg 27	2.64E-28	2.64E-13	2.64E-13	2.64E-13	2.64E-13	2.64E-28
mg 28	.00E+00	6.64E-26	6.65E-26	6.66E-26	6.66E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.39E-26	2.39E-11	2.39E-11	2.39E-11	2.39E-11	2.39E-26
al 29	3.39E-37	3.42E-22	3.46E-22	3.49E-22	3.53E-22	3.53E-37
al 30	.00E+00	1.03E-31	1.04E-31	1.06E-31	1.07E-31	.00E+00
si 28	5.19E-01	5.22E-01	5.24E-01	5.27E-01	5.29E-01	5.29E-01
si 29	1.09E-05	1.10E-05	1.11E-05	1.12E-05	1.13E-05	1.13E-05
si 30	2.43E-10	2.46E-10	2.50E-10	2.53E-10	2.57E-10	2.57E-10
si 31	2.15E-38	2.18E-23	2.21E-23	2.25E-23	2.28E-23	2.28E-38
si 32	4.55E-30	4.72E-30	4.80E-30	4.87E-30	4.95E-30	4.83E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		2.94E+07	2.94E+07	2.95E+07	2.95E+07	2.95E-08

1
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 211
power= 4.890E-04mw, burnup=2.3684E+04mwd, flux= 2.95E+07n/cm**2-sec
0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	4.82E+01	4.88E+01	4.95E+01	5.01E+01	5.08E+01	5.08E+01
pb206	2.99E-01	3.05E-01	3.12E-01	3.19E-01	3.26E-01	3.26E-01
pb207	1.84E-02	1.87E-02	1.91E-02	1.94E-02	1.98E-02	1.98E-02
pb208	7.34E-04	7.41E-04	7.48E-04	7.55E-04	7.63E-04	7.63E-04
pb209	1.17E-09	1.19E-09	1.20E-09	1.22E-09	1.23E-09	1.23E-09
pb210	3.42E-04	3.46E-04	3.49E-04	3.52E-04	3.56E-04	3.56E-04
pb211	5.72E-11	5.74E-11	5.76E-11	5.79E-11	5.82E-11	5.83E-11
pb212	1.90E-11	1.97E-11	1.98E-11	1.99E-11	2.00E-11	1.94E-11
pb214	7.83E-10	7.90E-10	7.98E-10	8.06E-10	8.13E-10	8.13E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	5.34E-02	5.48E-02	5.62E-02	5.76E-02	5.91E-02	5.91E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.11E-07	2.13E-07	2.15E-07	2.17E-07	2.19E-07	2.19E-07
bi211	3.39E-12	3.40E-12	3.42E-12	3.43E-12	3.45E-12	3.46E-12
bi212	1.80E-12	1.87E-12	1.88E-12	1.89E-12	1.90E-12	1.84E-12
bi213	2.74E-10	2.77E-10	2.81E-10	2.84E-10	2.87E-10	2.87E-10
bi214	5.81E-10	5.87E-10	5.92E-10	5.98E-10	6.04E-10	6.04E-10
po210	5.82E-06	5.88E-06	5.93E-06	5.99E-06	6.05E-06	6.05E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.75E-17	3.76E-17	3.78E-17	3.79E-17	3.81E-17	3.82E-17
po212	9.46E-23	9.80E-23	9.85E-23	9.91E-23	9.96E-23	9.64E-23
po213	4.11E-19	4.17E-19	4.22E-19	4.27E-19	4.32E-19	4.32E-19
po214	8.00E-17	8.07E-17	8.15E-17	8.23E-17	8.31E-17	8.31E-17
po215	4.70E-17	4.71E-17	4.74E-17	4.76E-17	4.78E-17	4.79E-17
po216	7.18E-17	7.44E-17	7.49E-17	7.53E-17	7.57E-17	7.33E-17
po218	9.05E-11	9.14E-11	9.23E-11	9.32E-11	9.41E-11	9.41E-11
rn218	3.22E-44	3.47E-29	3.50E-29	3.52E-29	3.54E-29	3.36E-44
rn219	1.05E-13	1.05E-13	1.05E-13	1.06E-13	1.06E-13	1.07E-13
rn220	2.76E-14	2.85E-14	2.87E-14	2.89E-14	2.90E-14	2.81E-14
rn222	1.61E-07	1.62E-07	1.64E-07	1.66E-07	1.67E-07	1.67E-07
ra222	3.56E-41	3.77E-26	3.79E-26	3.82E-26	3.84E-26	3.63E-41
ra223	2.61E-08	2.62E-08	2.63E-08	2.64E-08	2.65E-08	2.66E-08
ra224	1.57E-10	1.62E-10	1.63E-10	1.64E-10	1.65E-10	1.60E-10
ra225	1.28E-07	1.30E-07	1.31E-07	1.33E-07	1.34E-07	1.34E-07
ra226	2.46E-02	2.48E-02	2.51E-02	2.53E-02	2.55E-02	2.55E-02
ra228	1.23E-10	1.24E-10	1.26E-10	1.27E-10	1.29E-10	1.29E-10
ac225	8.65E-08	8.75E-08	8.86E-08	8.97E-08	9.08E-08	9.08E-08
ac227	1.81E-05	1.82E-05	1.83E-05	1.84E-05	1.85E-05	1.85E-05
ac228	1.50E-14	1.52E-14	1.54E-14	1.55E-14	1.57E-14	1.57E-14
th226	1.74E-39	1.84E-24	1.85E-24	1.86E-24	1.87E-24	1.77E-39
th227	4.21E-08	4.22E-08	4.24E-08	4.26E-08	4.28E-08	4.29E-08
th228	2.99E-08	3.10E-08	3.12E-08	3.13E-08	3.15E-08	3.05E-08
th229	2.49E-02	2.52E-02	2.55E-02	2.58E-02	2.61E-02	2.61E-02
th230	1.20E+00	1.21E+00	1.22E+00	1.23E+00	1.24E+00	1.24E+00
th231	2.71E-09	3.38E-09	3.39E-09	3.39E-09	3.40E-09	2.71E-09
th232	3.01E-01	3.04E-01	3.08E-01	3.11E-01	3.15E-01	3.15E-01
th233	3.38E-28	3.42E-13	3.47E-13	3.51E-13	3.55E-13	3.55E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.72E-02	2.74E-02	2.75E-02	2.76E-02	2.78E-02	2.78E-02
pa232	5.76E-26	5.79E-11	5.82E-11	5.85E-11	5.88E-11	5.89E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 212
power= 4.890E-04mw, burnup=2.3684E+04mwd, flux= 2.95E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11

pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.68E-36	1.78E-21	1.79E-21	1.81E-21	1.82E-21	1.72E-36
u231	5.70E-32	5.74E-17	5.80E-17	5.86E-17	5.92E-17	5.92E-32
u232	1.06E-06	1.13E-06	1.14E-06	1.14E-06	1.15E-06	1.08E-06
u233	6.17E-01	6.24E-01	6.30E-01	6.36E-01	6.42E-01	6.42E-01
u234	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01
u235	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02
u236	1.93E+02	1.93E+02	1.93E+02	1.93E+02	1.93E+02	1.93E+02
u237	4.87E-13	4.11E-07	4.11E-07	4.12E-07	4.12E-07	4.36E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.75E-23	3.74E-08	3.75E-08	3.75E-08	3.75E-08	3.75E-23
u240	1.72E-34	1.80E-34	1.89E-34	1.97E-34	2.06E-34	2.06E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	3.05E-14	1.03E-12	1.03E-12	1.03E-12	1.03E-12	2.60E-14
np236m	2.44E-28	2.44E-13	2.44E-13	2.44E-13	2.44E-13	2.44E-28
np236	2.54E-06	2.54E-06	2.55E-06	2.55E-06	2.56E-06	2.56E-06
np237	4.06E+01	4.06E+01	4.05E+01	4.05E+01	4.05E+01	4.05E+01
np238	6.53E-15	1.82E-07	1.82E-07	1.82E-07	1.82E-07	5.89E-15
np239	1.93E-13	5.41E-06	5.41E-06	5.42E-06	5.42E-06	1.82E-13
np240m	1.47E-36	1.54E-36	1.61E-36	1.68E-36	1.76E-36	1.76E-36
np240	1.99E-38	1.35E-16	1.35E-16	1.35E-16	1.36E-16	2.27E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	4.13E-11	1.38E-10	1.38E-10	1.38E-10	1.38E-10	3.92E-11
pu237	1.40E-27	3.43E-14	3.41E-14	3.39E-14	3.37E-14	3.70E-28
pu238	2.63E-03	2.75E-03	2.75E-03	2.75E-03	2.75E-03	2.63E-03
pu239	2.95E+01	2.93E+01	2.91E+01	2.89E+01	2.86E+01	2.86E+01
pu240	4.15E-01	4.05E-01	3.95E-01	3.85E-01	3.76E-01	3.76E-01
pu241	1.58E-05	2.01E-05	1.96E-05	1.91E-05	1.87E-05	1.41E-05
pu242	4.76E-05	4.77E-05	4.77E-05	4.78E-05	4.78E-05	4.78E-05
pu243	1.50E-29	1.23E-14	1.23E-14	1.23E-14	1.23E-14	1.52E-29
pu244	8.57E-24	8.98E-24	9.40E-24	9.83E-24	1.03E-23	1.03E-23
pu245	.00E+00	4.54E-35	4.76E-35	4.98E-35	5.20E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	2.13E-35	2.06E-20	2.02E-20	1.97E-20	1.92E-20	1.92E-35
am240	9.73E-33	9.43E-18	9.22E-18	9.00E-18	8.79E-18	8.79E-33
am241	6.28E-04	6.10E-04	5.95E-04	5.81E-04	5.68E-04	5.67E-04
am242m	3.53E-08	3.51E-08	3.43E-08	3.35E-08	3.27E-08	3.18E-08
am242	4.55E-13	2.78E-12	2.72E-12	2.65E-12	2.59E-12	4.11E-13
am243	2.21E-07	2.18E-07	2.14E-07	2.11E-07	2.08E-07	2.08E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	2.04E-31	2.01E-16	1.98E-16	1.95E-16	1.92E-16	1.92E-31
am245	4.77E-40	8.91E-36	9.33E-36	9.76E-36	1.02E-35	4.18E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	5.74E-39	1.99E-23	1.95E-23	1.91E-23	1.86E-23	5.73E-39
cm242	9.20E-11	5.61E-10	5.49E-10	5.36E-10	5.24E-10	8.30E-11
cm243	1.42E-15	1.58E-15	1.54E-15	1.51E-15	1.47E-15	1.28E-15
cm244	2.60E-12	3.15E-12	3.11E-12	3.06E-12	3.02E-12	2.43E-12

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 213
power= 4.890E-04mw, burnup=2.3684E+04mwd, flux= 2.95E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
cm245	1.27E-14	1.23E-14	1.19E-14	1.15E-14	1.12E-14	1.12E-14
cm246	1.01E-16	9.79E-17	9.45E-17	9.13E-17	8.81E-17	8.81E-17
cm247	7.89E-20	7.97E-20	8.05E-20	8.12E-20	8.19E-20	8.19E-20
cm248	3.48E-22	3.55E-22	3.62E-22	3.69E-22	3.77E-22	3.77E-22
cm249	.00E+00	1.36E-33	1.39E-33	1.42E-33	1.45E-33	.00E+00
cm250	1.72E-37	1.72E-37	1.72E-37	1.72E-37	1.72E-37	1.72E-37

```
    cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
  totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0   flux              2.94E+07  2.94E+07  2.95E+07  2.95E+07  2.95E-08
0       1q array has     20 entries.
0       3q array has      1 entries.
0       3q array has      1 entries.
0       3q array has      1 entries.
0       4q array has      1 entries.
0      54q array has     12 entries.
1library information...

         cross-section data taken from position number 24 of library on unit 33.

         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         ********************************************************************************
         *                                                                              *
         *            prelim lwr origen-s binary working library--id = 1143             *
         *          made from modified card-image origen-s libraries of scale 4.2       *
         *       data from the light element, actinide, and fission product libraries   *
         *         decay data, including gamma and total energy, are from endf/b-vi     *
         *                                                                              *
         *       neutron flux spectrum factors and cross sections were produced from    *
         *      the "presas2" case updating all nuclides on the scale "burnup" library  *
         *                                                                              *
         *                    fission product yields are from endf/b-v                  *
         *                                                                              *
         *              photon libraries use an 18-energy-group structure               *
         *             the photon data are from the master photon data base,            *
         *              produced to include bremsstrahlung from uo2 matrix              *
         *                                                                              *
         *         see information above this box (if present) for later updates        *
         *                                                                              *
         ********************************************************************************
         *                                                                              *
0        ********************************************************************************
0                  .other identification and sizes of library.
0                   data set name:  ft33f001
0                 8/29/1996    date library was produced
0                      1697    total number of nuclides in library
                        689    number of light-element nuclides
                        129    number of actinide nuclides
                        879    number of fission product nuclides
0                      7993    number of nonzero off-diagonal matrix elements
0        ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                page  214
       power=    .00mw, burnup=  24130.mwd, flux= 2.95E+07n/cm**2-sec
0                                    basis =
```

0 (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)

0	initial	******* d	******* d	******* d	******* d	******* d
productions	1.286968E+06	1.286217E+06	1.285473E+06	1.284738E+06	1.284011E+06	1.284001E+06
absorptions	1.048220E+06	1.047862E+06	1.047508E+06	1.047158E+06	1.046813E+06	1.046807E+06
k infinity	1.227765E+00	1.227468E+00	1.227173E+00	1.226880E+00	1.226590E+00	1.226588E+00

0	initial	******* d	******* d	******* d	******* d	******* d
actinide absorptions	1.028791E+06	1.028390E+06	1.027995E+06	1.027604E+06	1.027218E+06	1.027212E+06
non-actinide abs. fracs.	1.853555E-02	1.858240E-02	1.862854E-02	1.867402E-02	1.871920E-02	1.871884E-02

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 215

0 fraction of total absorption rate

power= .00mw, burnup= 24130.mwd, flux= 2.95E+07n/cm**2-sec

0	initial	******* d	******* d	******* d	******* d	******* d
sm149	5.39E-03	5.40E-03	5.40E-03	5.40E-03	5.41E-03	5.41E-03
nd143	2.29E-03	2.30E-03	2.32E-03	2.33E-03	2.34E-03	2.34E-03
eu151	1.96E-03	1.96E-03	1.96E-03	1.97E-03	1.97E-03	1.97E-03
rh103	1.12E-03	1.12E-03	1.13E-03	1.13E-03	1.14E-03	1.14E-03
xe131	7.46E-04	7.50E-04	7.54E-04	7.57E-04	7.61E-04	7.61E-04
cs133	5.82E-04	5.84E-04	5.87E-04	5.90E-04	5.93E-04	5.93E-04
sm147	4.26E-04	4.28E-04	4.30E-04	4.32E-04	4.34E-04	4.34E-04
tc 99	3.83E-04	3.85E-04	3.86E-04	3.87E-04	3.89E-04	3.89E-04
nd145	3.28E-04	3.30E-04	3.31E-04	3.33E-04	3.35E-04	3.35E-04
sm152	2.60E-04	2.62E-04	2.63E-04	2.65E-04	2.66E-04	2.66E-04
mo 95	2.28E-04	2.29E-04	2.30E-04	2.31E-04	2.32E-04	2.32E-04
gd155	2.28E-04	2.28E-04	2.28E-04	2.28E-04	2.27E-04	2.27E-04
sm150	1.74E-04	1.75E-04	1.75E-04	1.76E-04	1.77E-04	1.77E-04
kr 83	1.40E-04	1.41E-04	1.41E-04	1.42E-04	1.43E-04	1.43E-04
cs135	1.32E-04	1.32E-04	1.33E-04	1.34E-04	1.34E-04	1.34E-04
eu153	1.07E-04	1.08E-04	1.08E-04	1.09E-04	1.09E-04	1.09E-04
ru101	1.02E-04	1.03E-04	1.03E-04	1.04E-04	1.05E-04	1.05E-04
cd113	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04
pr141	9.85E-05	9.90E-05	9.95E-05	1.00E-04	1.01E-04	1.01E-04
la139	8.06E-05	8.10E-05	8.14E-05	8.19E-05	8.23E-05	8.23E-05
gd157	6.02E-05	6.01E-05	5.99E-05	5.98E-05	5.96E-05	5.96E-05
ag109	4.22E-05	4.25E-05	4.27E-05	4.30E-05	4.32E-05	4.32E-05
pd105	4.15E-05	4.17E-05	4.19E-05	4.22E-05	4.24E-05	4.24E-05
ba137	3.91E-05	3.93E-05	3.95E-05	3.97E-05	3.99E-05	3.99E-05
zr 93	3.14E-05	3.16E-05	3.17E-05	3.19E-05	3.20E-05	3.20E-05
i129	2.65E-05	2.66E-05	2.68E-05	2.69E-05	2.70E-05	2.70E-05
nd144	2.51E-05	2.52E-05	2.53E-05	2.55E-05	2.56E-05	2.56E-05
gd152	2.21E-05	2.23E-05	2.25E-05	2.26E-05	2.28E-05	2.28E-05
mo 97	1.83E-05	1.84E-05	1.85E-05	1.86E-05	1.87E-05	1.87E-05
pd108	1.01E-05	1.02E-05	1.03E-05	1.03E-05	1.04E-05	1.04E-05
zr 91	8.40E-06	8.44E-06	8.49E-06	8.53E-06	8.57E-06	8.57E-06
y 89	8.04E-06	8.08E-06	8.12E-06	8.16E-06	8.20E-06	8.20E-06
ru102	7.68E-06	7.72E-06	7.76E-06	7.80E-06	7.84E-06	7.84E-06
ru 99	6.90E-06	7.02E-06	7.15E-06	7.28E-06	7.40E-06	7.40E-06
ce142	6.72E-06	6.76E-06	6.79E-06	6.82E-06	6.86E-06	6.86E-06
sm151	6.61E-06	6.91E-06	6.91E-06	6.91E-06	6.92E-06	6.60E-06
nd148	6.47E-06	6.50E-06	6.53E-06	6.57E-06	6.60E-06	6.60E-06
nd146	5.46E-06	5.49E-06	5.52E-06	5.55E-06	5.58E-06	5.58E-06
pd107	5.10E-06	5.13E-06	5.16E-06	5.19E-06	5.22E-06	5.22E-06
in115	4.80E-06	4.82E-06	4.84E-06	4.87E-06	4.89E-06	4.89E-06
ba138	4.65E-06	4.67E-06	4.70E-06	4.72E-06	4.74E-06	4.74E-06
ce140	4.35E-06	4.37E-06	4.40E-06	4.42E-06	4.44E-06	4.44E-06
xe132	4.00E-06	4.02E-06	4.04E-06	4.06E-06	4.08E-06	4.08E-06
mo 98	2.66E-06	2.68E-06	2.69E-06	2.70E-06	2.72E-06	2.72E-06
mo100	2.60E-06	2.62E-06	2.63E-06	2.64E-06	2.66E-06	2.66E-06

xe134	2.57E-06	2.59E-06	2.60E-06	2.61E-06	2.62E-06	2.62E-06
zr 92	2.04E-06	2.05E-06	2.06E-06	2.07E-06	2.08E-06	2.08E-06
i127	1.94E-06	1.95E-06	1.96E-06	1.97E-06	1.98E-06	1.98E-06
ru104	1.77E-06	1.78E-06	1.79E-06	1.80E-06	1.81E-06	1.81E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 216
0 fraction of total absorption rate
power= .00mw, burnup= 24130.mwd, flux= 2.95E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.59E-06	1.60E-06	1.61E-06	1.62E-06	1.62E-06	1.62E-06
nd150	1.47E-06	1.47E-06	1.48E-06	1.49E-06	1.50E-06	1.50E-06
xe136	1.39E-06	1.40E-06	1.41E-06	1.42E-06	1.42E-06	1.42E-06
cd111	1.15E-06	1.15E-06	1.16E-06	1.16E-06	1.17E-06	1.17E-06
gd154	1.11E-06	1.12E-06	1.13E-06	1.14E-06	1.15E-06	1.15E-06
br 81	1.03E-06	1.04E-06	1.04E-06	1.05E-06	1.05E-06	1.05E-06
rb 85	9.85E-07	9.90E-07	9.95E-07	1.00E-06	1.00E-06	1.00E-06
zr 94	8.60E-07	8.64E-07	8.69E-07	8.73E-07	8.77E-07	8.77E-07
zr 90	7.92E-07	7.96E-07	8.00E-07	8.04E-07	8.08E-07	8.08E-07
ba135	7.08E-07	7.22E-07	7.35E-07	7.49E-07	7.63E-07	7.63E-07
sm154	6.95E-07	6.98E-07	7.02E-07	7.06E-07	7.09E-07	7.09E-07
te130	6.45E-07	6.48E-07	6.51E-07	6.54E-07	6.58E-07	6.58E-07
rb 87	5.66E-07	5.69E-07	5.72E-07	5.75E-07	5.78E-07	5.78E-07
pd106	4.28E-07	4.30E-07	4.32E-07	4.35E-07	4.37E-07	4.37E-07
se 77	4.16E-07	4.18E-07	4.20E-07	4.22E-07	4.24E-07	4.24E-07
gd156	4.08E-07	4.10E-07	4.13E-07	4.15E-07	4.18E-07	4.18E-07
ru100	2.97E-07	3.00E-07	3.03E-07	3.05E-07	3.08E-07	3.08E-07
kr 84	2.70E-07	2.72E-07	2.73E-07	2.74E-07	2.76E-07	2.76E-07
dy161	2.53E-07	2.54E-07	2.56E-07	2.57E-07	2.58E-07	2.58E-07
nd142	2.19E-07	2.22E-07	2.24E-07	2.26E-07	2.28E-07	2.28E-07
sb121	2.21E-07	2.23E-07	2.24E-07	2.25E-07	2.26E-07	2.26E-07
ba134	2.09E-07	2.11E-07	2.13E-07	2.15E-07	2.18E-07	2.18E-07
se 79	2.02E-07	2.03E-07	2.03E-07	2.04E-07	2.05E-07	2.05E-07
sm148	1.90E-07	1.92E-07	1.94E-07	1.96E-07	1.98E-07	1.98E-07
sb123	1.79E-07	1.80E-07	1.81E-07	1.82E-07	1.83E-07	1.83E-07
kr 86	1.50E-07	1.51E-07	1.52E-07	1.53E-07	1.53E-07	1.53E-07
pd104	1.43E-07	1.45E-07	1.46E-07	1.48E-07	1.49E-07	1.49E-07
te128	1.46E-07	1.47E-07	1.47E-07	1.48E-07	1.49E-07	1.49E-07
nb 93	1.12E-07	1.15E-07	1.17E-07	1.19E-07	1.21E-07	1.21E-07
tb159	1.09E-07	1.09E-07	1.10E-07	1.11E-07	1.11E-07	1.11E-07
se 80	9.97E-08	1.00E-07	1.01E-07	1.01E-07	1.02E-07	1.02E-07
te125	9.95E-08	1.00E-07	1.01E-07	1.01E-07	1.02E-07	1.02E-07
gd158	8.58E-08	8.63E-08	8.68E-08	8.73E-08	8.78E-08	8.78E-08
cd112	7.73E-08	7.77E-08	7.81E-08	7.85E-08	7.89E-08	7.89E-08
dy162	5.89E-08	5.93E-08	5.96E-08	6.00E-08	6.04E-08	6.04E-08
ag107	5.57E-08	5.69E-08	5.80E-08	5.92E-08	6.04E-08	6.04E-08
br 79	5.58E-08	5.68E-08	5.79E-08	5.89E-08	6.00E-08	6.00E-08
dy164	5.65E-08	5.68E-08	5.71E-08	5.74E-08	5.77E-08	5.77E-08
cd110	5.31E-08	5.37E-08	5.43E-08	5.49E-08	5.56E-08	5.56E-08
sn117	5.43E-08	5.45E-08	5.48E-08	5.51E-08	5.54E-08	5.54E-08
li 6	5.11E-08	5.14E-08	5.16E-08	5.18E-08	5.21E-08	5.21E-08
mo 96	4.76E-08	4.80E-08	4.85E-08	4.90E-08	4.94E-08	4.94E-08
cd114	4.61E-08	4.64E-08	4.66E-08	4.69E-08	4.72E-08	4.72E-08
eu152	4.70E-08	6.35E-08	6.37E-08	6.39E-08	6.41E-08	4.69E-08
sn119	4.12E-08	4.15E-08	4.17E-08	4.19E-08	4.21E-08	4.21E-08
pd110	3.83E-08	3.85E-08	3.87E-08	3.89E-08	3.91E-08	3.91E-08
sn115	3.77E-08	3.79E-08	3.81E-08	3.83E-08	3.85E-08	3.85E-08
xe129	3.41E-08	3.48E-08	3.55E-08	3.61E-08	3.68E-08	3.68E-08
sr 88	2.76E-08	2.77E-08	2.79E-08	2.80E-08	2.81E-08	2.81E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 217
0 fraction of total absorption rate

power= .00mw, burnup= 24130.mwd, flux= 2.95E+07n/cm**2-sec

0	initial	******* d	******* d	******* d	******* d	******* d
xe130	2.33E-08	2.35E-08	2.37E-08	2.40E-08	2.42E-08	2.42E-08
ba136	1.97E-08	1.99E-08	2.00E-08	2.02E-08	2.03E-08	2.03E-08
te126	1.86E-08	1.89E-08	1.92E-08	1.96E-08	1.99E-08	1.99E-08
se 82	1.90E-08	1.91E-08	1.92E-08	1.93E-08	1.94E-08	1.94E-08
sn126	1.58E-08	1.58E-08	1.58E-08	1.59E-08	1.59E-08	1.59E-08
se 78	1.49E-08	1.50E-08	1.50E-08	1.51E-08	1.52E-08	1.52E-08
dy163	1.47E-08	1.48E-08	1.49E-08	1.50E-08	1.51E-08	1.51E-08
kr 82	1.44E-08	1.45E-08	1.46E-08	1.47E-08	1.49E-08	1.49E-08
sn124	1.31E-08	1.31E-08	1.32E-08	1.33E-08	1.33E-08	1.33E-08
eu155	9.55E-09	2.24E-08	2.24E-08	2.23E-08	2.23E-08	9.17E-09
as 75	8.75E-09	8.79E-09	8.83E-09	8.88E-09	8.92E-09	8.92E-09
in113	7.52E-09	7.56E-09	7.60E-09	7.64E-09	7.68E-09	7.68E-09
pm147	7.29E-09	3.30E-08	3.30E-08	3.30E-08	3.30E-08	6.83E-09
sn118	5.27E-09	5.30E-09	5.32E-09	5.35E-09	5.38E-09	5.38E-09
sn122	4.54E-09	4.57E-09	4.59E-09	4.61E-09	4.64E-09	4.64E-09
cd116	4.43E-09	4.45E-09	4.47E-09	4.50E-09	4.52E-09	4.52E-09
eu154	3.47E-09	5.56E-09	5.59E-09	5.62E-09	5.66E-09	3.48E-09
sn120	3.34E-09	3.36E-09	3.37E-09	3.39E-09	3.41E-09	3.41E-09
ge 73	2.51E-09	2.53E-09	2.54E-09	2.55E-09	2.57E-09	2.57E-09
sr 90	1.74E-09	2.01E-09	2.01E-09	2.01E-09	2.01E-09	1.74E-09
ho165	1.46E-09	1.47E-09	1.48E-09	1.49E-09	1.51E-09	1.51E-09
dy160	1.44E-09	1.45E-09	1.47E-09	1.48E-09	1.50E-09	1.50E-09
gd160	1.22E-09	1.22E-09	1.23E-09	1.24E-09	1.25E-09	1.25E-09
xe128	8.40E-10	8.48E-10	8.56E-10	8.65E-10	8.74E-10	8.74E-10
ge 76	8.51E-10	8.56E-10	8.60E-10	8.64E-10	8.68E-10	8.68E-10
sr 86	3.94E-10	3.98E-10	4.01E-10	4.05E-10	4.09E-10	4.09E-10
cs137	4.03E-10	4.60E-10	4.60E-10	4.60E-10	4.61E-10	4.01E-10
sn116	3.17E-10	3.20E-10	3.24E-10	3.27E-10	3.30E-10	3.30E-10
te124	2.81E-10	2.83E-10	2.85E-10	2.88E-10	2.90E-10	2.90E-10
nb 94	1.48E-10	1.48E-10	1.49E-10	1.50E-10	1.52E-10	1.52E-10
sr 87	1.35E-10	1.36E-10	1.37E-10	1.38E-10	1.39E-10	1.39E-10
te122	1.34E-10	1.35E-10	1.36E-10	1.38E-10	1.39E-10	1.39E-10
se 76	1.10E-10	1.11E-10	1.12E-10	1.13E-10	1.14E-10	1.14E-10
cs134	7.72E-11	5.36E-10	5.39E-10	5.42E-10	5.45E-10	7.24E-11
er166	6.92E-11	6.96E-11	7.01E-11	7.05E-11	7.10E-11	7.10E-11
kr 80	5.71E-11	5.81E-11	5.91E-11	6.01E-11	6.12E-11	6.12E-11
ge 74	5.03E-11	5.05E-11	5.08E-11	5.11E-11	5.13E-11	5.13E-11
kr 85	4.66E-11	6.77E-11	6.77E-11	6.78E-11	6.78E-11	4.60E-11
ge 72	3.73E-11	3.75E-11	3.76E-11	3.78E-11	3.80E-11	3.80E-11
er167	8.28E-12	8.38E-12	8.48E-12	8.58E-12	8.68E-12	8.68E-12
te123	6.59E-12	6.69E-12	6.78E-12	6.88E-12	6.97E-12	6.97E-12
cd108	4.12E-12	4.21E-12	4.29E-12	4.37E-12	4.46E-12	4.46E-12
y 90	1.66E-12	1.91E-12	1.91E-12	1.92E-12	1.92E-12	1.65E-12
sb125	5.01E-13	2.15E-12	2.15E-12	2.15E-12	2.15E-12	4.69E-13
ce144	4.33E-13	7.18E-11	7.18E-11	7.19E-11	7.19E-11	3.46E-13
be 9	1.07E-13	1.07E-13	1.08E-13	1.08E-13	1.09E-13	1.09E-13
sn114	8.44E-14	8.53E-14	8.62E-14	8.70E-14	8.79E-14	8.79E-14
ru106	9.49E-14	4.77E-12	4.76E-12	4.75E-12	4.74E-12	7.92E-14
li 7	4.40E-14	4.43E-14	4.45E-14	4.47E-14	4.49E-14	4.49E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 218

0 fraction of total absorption rate

power= .00mw, burnup= 24130.mwd, flux= 2.95E+07n/cm**2-sec

0	initial	******* d	******* d	******* d	******* d	******* d
sb126	1.81E-14	1.89E-14	1.89E-14	1.89E-14	1.90E-14	1.82E-14
te127m	1.80E-18	1.09E-12	1.09E-12	1.09E-12	1.09E-12	9.84E-19
cd109	8.73E-19	2.08E-17	2.12E-17	2.16E-17	2.20E-17	8.20E-19

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 219
power= 4.890E-04mw, burnup=2.4130E+04mwd, flux= 2.95E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
h 1	1.41E-03	1.42E-03	1.42E-03	1.43E-03	1.44E-03	1.44E-03
h 2	4.22E-06	4.24E-06	4.26E-06	4.28E-06	4.30E-06	4.30E-06
h 3	5.34E-12	7.38E-12	7.39E-12	7.40E-12	7.42E-12	5.29E-12
h 4	.00E+00	3.71E-36	3.72E-36	3.73E-36	3.73E-36	.00E+00
he 3	1.81E-08	1.81E-08	1.81E-08	1.82E-08	1.82E-08	1.82E-08
he 4	2.34E-04	2.35E-04	2.36E-04	2.37E-04	2.39E-04	2.39E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.81E-05	2.83E-05	2.84E-05	2.85E-05	2.87E-05	2.87E-05
ne 21	1.20E-08	1.21E-08	1.22E-08	1.23E-08	1.24E-08	1.24E-08
ne 22	1.85E-07	1.86E-07	1.87E-07	1.88E-07	1.89E-07	1.89E-07
ne 23	8.86E-31	8.85E-16	8.85E-16	8.86E-16	8.86E-16	8.86E-31
na 22	1.14E-12	5.25E-12	5.25E-12	5.26E-12	5.26E-12	1.06E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.22E-24	3.22E-09	3.22E-09	3.22E-09	3.22E-09	3.22E-24
na 24m	5.30E-31	5.29E-16	5.29E-16	5.29E-16	5.30E-16	5.30E-31
na 25	4.33E-39	4.36E-24	4.41E-24	4.45E-24	4.49E-24	4.49E-39
mg 24	1.82E-01	1.83E-01	1.83E-01	1.84E-01	1.85E-01	1.85E-01
mg 25	1.24E-06	1.25E-06	1.26E-06	1.28E-06	1.29E-06	1.29E-06
mg 26	4.21E-06	4.23E-06	4.25E-06	4.27E-06	4.29E-06	4.29E-06
mg 27	2.64E-28	2.64E-13	2.64E-13	2.64E-13	2.64E-13	2.64E-28
mg 28	.00E+00	6.66E-26	6.67E-26	6.67E-26	6.68E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.39E-26	2.39E-11	2.39E-11	2.39E-11	2.39E-11	2.39E-26
al 29	3.53E-37	3.55E-22	3.59E-22	3.62E-22	3.66E-22	3.66E-37
al 30	.00E+00	1.09E-31	1.10E-31	1.12E-31	1.14E-31	.00E+00
si 28	5.29E-01	5.31E-01	5.34E-01	5.36E-01	5.39E-01	5.39E-01
si 29	1.13E-05	1.14E-05	1.15E-05	1.16E-05	1.17E-05	1.17E-05
si 30	2.57E-10	2.61E-10	2.64E-10	2.68E-10	2.72E-10	2.72E-10
si 31	2.28E-38	2.31E-23	2.35E-23	2.38E-23	2.42E-23	2.42E-38
si 32	4.83E-30	5.01E-30	5.10E-30	5.18E-30	5.25E-30	5.13E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		2.95E+07	2.95E+07	2.95E+07	2.95E+07	2.95E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 220
power= 4.890E-04mw, burnup=2.4130E+04mwd, flux= 2.95E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	5.08E+01	5.14E+01	5.21E+01	5.27E+01	5.33E+01	5.33E+01
pb206	3.26E-01	3.33E-01	3.40E-01	3.47E-01	3.54E-01	3.54E-01
pb207	1.98E-02	2.02E-02	2.05E-02	2.09E-02	2.13E-02	2.13E-02
pb208	7.63E-04	7.70E-04	7.77E-04	7.84E-04	7.91E-04	7.92E-04
pb209	1.23E-09	1.24E-09	1.26E-09	1.27E-09	1.29E-09	1.29E-09
pb210	3.56E-04	3.59E-04	3.62E-04	3.66E-04	3.69E-04	3.69E-04
pb211	5.83E-11	5.85E-11	5.87E-11	5.90E-11	5.93E-11	5.94E-11
pb212	1.94E-11	2.01E-11	2.02E-11	2.03E-11	2.04E-11	1.97E-11
pb214	8.13E-10	8.21E-10	8.28E-10	8.35E-10	8.43E-10	8.43E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	5.91E-02	6.05E-02	6.20E-02	6.35E-02	6.49E-02	6.50E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.19E-07	2.21E-07	2.23E-07	2.25E-07	2.27E-07	2.27E-07
bi211	3.46E-12	3.47E-12	3.48E-12	3.50E-12	3.51E-12	3.52E-12
bi212	1.84E-12	1.91E-12	1.92E-12	1.93E-12	1.93E-12	1.87E-12
bi213	2.87E-10	2.91E-10	2.94E-10	2.98E-10	3.01E-10	3.01E-10

bi214	6.04E-10	6.09E-10	6.15E-10	6.20E-10	6.26E-10	6.26E-10
po210	6.05E-06	6.10E-06	6.16E-06	6.21E-06	6.27E-06	6.27E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.82E-17	3.83E-17	3.85E-17	3.87E-17	3.88E-17	3.89E-17
po212	9.64E-23	1.00E-22	1.01E-22	1.01E-22	1.02E-22	9.82E-23
po213	4.32E-19	4.37E-19	4.42E-19	4.47E-19	4.52E-19	4.52E-19
po214	8.31E-17	8.38E-17	8.46E-17	8.53E-17	8.61E-17	8.61E-17
po215	4.79E-17	4.81E-17	4.83E-17	4.85E-17	4.87E-17	4.88E-17
po216	7.33E-17	7.60E-17	7.64E-17	7.68E-17	7.72E-17	7.46E-17
po218	9.41E-11	9.49E-11	9.58E-11	9.67E-11	9.75E-11	9.75E-11
rn218	3.36E-44	3.55E-29	3.57E-29	3.59E-29	3.61E-29	3.36E-44
rn219	1.07E-13	1.07E-13	1.07E-13	1.08E-13	1.08E-13	1.09E-13
rn220	2.81E-14	2.92E-14	2.93E-14	2.95E-14	2.96E-14	2.86E-14
rn222	1.67E-07	1.69E-07	1.70E-07	1.72E-07	1.73E-07	1.73E-07
ra222	3.63E-41	3.85E-26	3.88E-26	3.90E-26	3.92E-26	3.70E-41
ra223	2.66E-08	2.67E-08	2.68E-08	2.69E-08	2.70E-08	2.71E-08
ra224	1.60E-10	1.66E-10	1.67E-10	1.68E-10	1.68E-10	1.63E-10
ra225	1.34E-07	1.36E-07	1.38E-07	1.39E-07	1.41E-07	1.41E-07
ra226	2.55E-02	2.58E-02	2.60E-02	2.62E-02	2.65E-02	2.65E-02
ra228	1.29E-10	1.30E-10	1.32E-10	1.33E-10	1.35E-10	1.35E-10
ac225	9.08E-08	9.19E-08	9.29E-08	9.40E-08	9.51E-08	9.51E-08
ac227	1.85E-05	1.85E-05	1.86E-05	1.87E-05	1.88E-05	1.88E-05
ac228	1.57E-14	1.59E-14	1.61E-14	1.63E-14	1.64E-14	1.64E-14
th226	1.77E-39	1.88E-24	1.89E-24	1.90E-24	1.91E-24	1.80E-39
th227	4.29E-08	4.30E-08	4.32E-08	4.34E-08	4.36E-08	4.37E-08
th228	3.05E-08	3.17E-08	3.18E-08	3.20E-08	3.22E-08	3.10E-08
th229	2.61E-02	2.64E-02	2.67E-02	2.71E-02	2.74E-02	2.74E-02
th230	1.24E+00	1.25E+00	1.27E+00	1.28E+00	1.29E+00	1.29E+00
th231	2.71E-09	3.41E-09	3.41E-09	3.42E-09	3.42E-09	2.71E-09
th232	3.15E-01	3.18E-01	3.22E-01	3.26E-01	3.29E-01	3.29E-01
th233	3.55E-28	3.59E-13	3.63E-13	3.68E-13	3.72E-13	3.72E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.78E-02	2.79E-02	2.80E-02	2.82E-02	2.83E-02	2.83E-02
pa232	5.89E-26	5.92E-11	5.95E-11	5.98E-11	6.01E-11	6.01E-26

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 221
power= 4.890E-04mw, burnup=2.4130E+04mwd, flux= 2.95E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge *******	d *******	d *******	d *******	d *******	d *******
pa233	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.72E-36	1.82E-21	1.83E-21	1.84E-21	1.85E-21	1.75E-36
u231	5.92E-32	5.97E-17	6.03E-17	6.09E-17	6.14E-17	6.15E-32
u232	1.08E-06	1.15E-06	1.16E-06	1.17E-06	1.17E-06	1.10E-06
u233	6.42E-01	6.48E-01	6.54E-01	6.60E-01	6.66E-01	6.66E-01
u234	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01	1.03E+01
u235	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02
u236	1.93E+02	1.93E+02	1.93E+02	1.93E+02	1.94E+02	1.94E+02
u237	4.36E-13	4.12E-07	4.12E-07	4.13E-07	4.13E-07	3.95E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.75E-23	3.75E-08	3.75E-08	3.75E-08	3.75E-08	3.75E-23
u240	2.06E-34	2.15E-34	2.24E-34	2.34E-34	2.43E-34	2.43E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	2.60E-14	1.03E-12	1.03E-12	1.03E-12	1.03E-12	2.21E-14
np236m	2.44E-28	2.44E-13	2.44E-13	2.44E-13	2.44E-13	2.44E-28
np236	2.56E-06	2.56E-06	2.57E-06	2.57E-06	2.58E-06	2.58E-06
np237	4.05E+01	4.05E+01	4.05E+01	4.05E+01	4.05E+01	4.05E+01

```
     np238   5.89E-15  1.82E-07  1.82E-07  1.82E-07  1.82E-07  5.38E-15
     np239   1.82E-13  5.42E-06  5.42E-06  5.42E-06  5.42E-06  1.73E-13
     np240m  1.76E-36  1.84E-36  1.91E-36  1.99E-36  2.07E-36  2.07E-36
     np240   2.27E-38  1.35E-16  1.36E-16  1.36E-16  1.36E-16  2.57E-38
     np241    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     pu236   3.92E-11  1.38E-10  1.38E-10  1.38E-10  1.38E-10  3.73E-11
     pu237   3.70E-28  3.35E-14  3.33E-14  3.31E-14  3.29E-14  1.12E-28
     pu238   2.63E-03  2.75E-03  2.75E-03  2.75E-03  2.75E-03  2.62E-03
     pu239   2.86E+01  2.84E+01  2.82E+01  2.81E+01  2.79E+01  2.79E+01
     pu240   3.76E-01  3.67E-01  3.59E-01  3.52E-01  3.44E-01  3.44E-01
     pu241   1.41E-05  1.82E-05  1.78E-05  1.75E-05  1.71E-05  1.28E-05
     pu242   4.78E-05  4.79E-05  4.79E-05  4.80E-05  4.80E-05  4.80E-05
     pu243   1.52E-29  1.23E-14  1.23E-14  1.24E-14  1.24E-14  1.54E-29
     pu244   1.03E-23  1.07E-23  1.12E-23  1.16E-23  1.21E-23  1.21E-23
     pu245    .00E+00  5.43E-35  5.66E-35  5.90E-35  6.14E-35   .00E+00
     pu246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am239   1.92E-35  1.87E-20  1.83E-20  1.79E-20  1.76E-20  1.76E-35
     am240   8.79E-33  8.54E-18  8.37E-18  8.20E-18  8.04E-18  8.03E-33
     am241   5.67E-04  5.52E-04  5.41E-04  5.30E-04  5.19E-04  5.18E-04
     am242m  3.18E-08  3.18E-08  3.12E-08  3.06E-08  3.00E-08  2.91E-08
     am242   4.11E-13  2.52E-12  2.47E-12  2.42E-12  2.37E-12  3.75E-13
     am243   2.08E-07  2.05E-07  2.03E-07  2.01E-07  1.98E-07  1.98E-07
     am244m   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am244   1.92E-31  1.90E-16  1.87E-16  1.85E-16  1.83E-16  1.83E-31
     am245   4.18E-40  1.06E-35  1.11E-35  1.16E-35  1.20E-35  3.73E-40
     am246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm241   5.73E-39  1.81E-23  1.77E-23  1.74E-23  1.71E-23  1.26E-43
     cm242   8.30E-11  5.09E-10  4.99E-10  4.89E-10  4.79E-10  7.58E-11
     cm243   1.28E-15  1.43E-15  1.40E-15  1.38E-15  1.35E-15  1.17E-15
     cm244   2.43E-12  2.98E-12  2.95E-12  2.91E-12  2.88E-12  2.29E-12
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                actinides        page  222
       power= 4.890E-04mw, burnup=2.4130E+04mwd, flux= 2.95E+07n/cm**2-sec
0                                          nuclide concentrations, gram atoms
                                           basis = single reactor assembly
            charge ******* d ******* d ******* d ******* d ******* d
     cm245   1.12E-14  1.08E-14  1.05E-14  1.02E-14  9.86E-15  9.85E-15
     cm246   8.81E-17  8.50E-17  8.22E-17  7.94E-17  7.67E-17  7.67E-17
     cm247   8.19E-20  8.26E-20  8.33E-20  8.39E-20  8.45E-20  8.45E-20
     cm248   3.77E-22  3.84E-22  3.92E-22  3.99E-22  4.07E-22  4.07E-22
     cm249    .00E+00  1.48E-33  1.51E-33  1.54E-33  1.57E-33   .00E+00
     cm250   1.72E-37  1.73E-37  1.73E-37  1.74E-37  1.74E-37  1.74E-37
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              2.95E+07  2.95E+07  2.95E+07  2.95E+07  2.95E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number 25 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
```

```
          pass n applies mid time densities of nth library interval
         first library updated was...
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         ********************************************************************************
         *                                                                              *
         *            prelim lwr origen-s binary working library--id = 1143             *
         *          made from modified card-image origen-s libraries of scale 4.2       *
         *       data from the light element, actinide, and fission product libraries   *
         *         decay data, including gamma and total energy, are from endf/b-vi     *
         *                                                                              *
         *       neutron flux spectrum factors and cross sections were produced from    *
         *      the "presas2" case updating all nuclides on the scale "burnup" library  *
         *                                                                              *
         *                    fission product yields are from endf/b-v                  *
         *                                                                              *
         *              photon libraries use an 18-energy-group structure               *
         *             the photon data are from the master photon data base,            *
         *              produced to include bremsstrahlung from uo2 matrix              *
         *                                                                              *
         *        see information above this box (if present) for later updates         *
         *                                                                              *
         ********************************************************************************
         *                                                                              *
0        ********************************************************************************
0                  .other identification and sizes of library.
0                   data set name:  ft33f001
0                 8/29/1996    date library was produced
0                      1697    total number of nuclides in library
                        689    number of light-element nuclides
                        129    number of actinide nuclides
                        879    number of fission product nuclides
0                      7993    number of nonzero off-diagonal matrix elements
0        ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page  223
         power=    .00mw, burnup=  24577.mwd, flux= 2.95E+07n/cm**2-sec
0                                    basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.284710E+06   1.283989E+06   1.283275E+06   1.282569E+06   1.281870E+06   1.281861E+06
     absorptions   1.047033E+06   1.046691E+06   1.046354E+06   1.046020E+06   1.045690E+06   1.045685E+06
     k infinity    1.227001E+00   1.226712E+00   1.226426E+00   1.226142E+00   1.225860E+00   1.225858E+00
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   1.027433E+06   1.027051E+06   1.026673E+06   1.026300E+06   1.025931E+06   1.025926E+06
     non-actinide
     abs. fracs.   1.871938E-02   1.876444E-02   1.880848E-02   1.885235E-02   1.889551E-02   1.889545E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2              fission products         page  224
0                             fraction of total absorption rate
         power=    .00mw, burnup=  24577.mwd, flux= 2.95E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d ******* d

     sm149     5.41E-03  5.41E-03  5.41E-03  5.41E-03  5.42E-03  5.42E-03
     nd143     2.34E-03  2.35E-03  2.36E-03  2.37E-03  2.38E-03  2.38E-03
     eu151     1.97E-03  1.98E-03  1.98E-03  1.99E-03  1.99E-03  1.99E-03
```

rh103	1.14E-03	1.15E-03	1.15E-03	1.16E-03	1.16E-03	1.16E-03
xe131	7.61E-04	7.64E-04	7.68E-04	7.72E-04	7.75E-04	7.75E-04
cs133	5.93E-04	5.96E-04	5.99E-04	6.02E-04	6.05E-04	6.05E-04
sm147	4.34E-04	4.36E-04	4.38E-04	4.40E-04	4.42E-04	4.42E-04
tc 99	3.88E-04	3.90E-04	3.91E-04	3.92E-04	3.94E-04	3.94E-04
nd145	3.35E-04	3.36E-04	3.38E-04	3.40E-04	3.41E-04	3.41E-04
sm152	2.66E-04	2.68E-04	2.69E-04	2.71E-04	2.72E-04	2.72E-04
mo 95	2.32E-04	2.33E-04	2.34E-04	2.35E-04	2.37E-04	2.37E-04
gd155	2.27E-04	2.27E-04	2.27E-04	2.26E-04	2.26E-04	2.26E-04
sm150	1.77E-04	1.78E-04	1.79E-04	1.80E-04	1.81E-04	1.81E-04
kr 83	1.43E-04	1.43E-04	1.44E-04	1.45E-04	1.45E-04	1.45E-04
cs135	1.34E-04	1.35E-04	1.36E-04	1.36E-04	1.37E-04	1.37E-04
eu153	1.09E-04	1.10E-04	1.11E-04	1.11E-04	1.12E-04	1.12E-04
ru101	1.04E-04	1.05E-04	1.05E-04	1.06E-04	1.07E-04	1.07E-04
cd113	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04
pr141	1.01E-04	1.01E-04	1.02E-04	1.02E-04	1.03E-04	1.03E-04
la139	8.23E-05	8.27E-05	8.31E-05	8.35E-05	8.39E-05	8.39E-05
gd157	5.96E-05	5.95E-05	5.93E-05	5.92E-05	5.90E-05	5.90E-05
ag109	4.32E-05	4.34E-05	4.37E-05	4.39E-05	4.42E-05	4.42E-05
pd105	4.24E-05	4.26E-05	4.28E-05	4.30E-05	4.32E-05	4.32E-05
ba137	3.99E-05	4.01E-05	4.03E-05	4.05E-05	4.07E-05	4.07E-05
zr 93	3.20E-05	3.21E-05	3.23E-05	3.24E-05	3.26E-05	3.26E-05
i129	2.70E-05	2.72E-05	2.73E-05	2.74E-05	2.76E-05	2.76E-05
nd144	2.56E-05	2.57E-05	2.59E-05	2.60E-05	2.61E-05	2.61E-05
gd152	2.28E-05	2.30E-05	2.32E-05	2.34E-05	2.36E-05	2.36E-05
mo 97	1.87E-05	1.88E-05	1.89E-05	1.90E-05	1.91E-05	1.91E-05
pd108	1.04E-05	1.04E-05	1.05E-05	1.05E-05	1.06E-05	1.06E-05
zr 91	8.57E-06	8.61E-06	8.66E-06	8.70E-06	8.74E-06	8.74E-06
y 89	8.20E-06	8.24E-06	8.28E-06	8.32E-06	8.36E-06	8.36E-06
ru102	7.84E-06	7.88E-06	7.92E-06	7.96E-06	7.99E-06	7.99E-06
ru 99	7.40E-06	7.53E-06	7.66E-06	7.79E-06	7.92E-06	7.92E-06
ce142	6.86E-06	6.90E-06	6.93E-06	6.96E-06	7.00E-06	7.00E-06
nd148	6.60E-06	6.63E-06	6.67E-06	6.70E-06	6.73E-06	6.73E-06
sm151	6.61E-06	6.92E-06	6.93E-06	6.93E-06	6.93E-06	6.61E-06
nd146	5.58E-06	5.61E-06	5.63E-06	5.66E-06	5.69E-06	5.69E-06
pd107	5.22E-06	5.25E-06	5.28E-06	5.30E-06	5.33E-06	5.33E-06
in115	4.89E-06	4.92E-06	4.94E-06	4.96E-06	4.99E-06	4.99E-06
ba138	4.74E-06	4.77E-06	4.79E-06	4.81E-06	4.84E-06	4.84E-06
ce140	4.44E-06	4.46E-06	4.49E-06	4.51E-06	4.53E-06	4.53E-06
xe132	4.08E-06	4.10E-06	4.12E-06	4.14E-06	4.16E-06	4.16E-06
mo 98	2.72E-06	2.73E-06	2.74E-06	2.76E-06	2.77E-06	2.77E-06
mo100	2.66E-06	2.67E-06	2.68E-06	2.69E-06	2.71E-06	2.71E-06
xe134	2.62E-06	2.64E-06	2.65E-06	2.66E-06	2.68E-06	2.68E-06
zr 92	2.08E-06	2.09E-06	2.10E-06	2.11E-06	2.12E-06	2.12E-06
i127	1.98E-06	1.99E-06	2.00E-06	2.01E-06	2.02E-06	2.02E-06
ru104	1.81E-06	1.82E-06	1.83E-06	1.84E-06	1.85E-06	1.85E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 225
0 fraction of total absorption rate
power= .00mw, burnup= 24577.mwd, flux= 2.95E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.62E-06	1.63E-06	1.64E-06	1.65E-06	1.65E-06	1.65E-06
nd150	1.50E-06	1.50E-06	1.51E-06	1.52E-06	1.53E-06	1.53E-06
xe136	1.42E-06	1.43E-06	1.44E-06	1.44E-06	1.45E-06	1.45E-06
gd154	1.15E-06	1.17E-06	1.18E-06	1.19E-06	1.20E-06	1.20E-06
cd111	1.17E-06	1.18E-06	1.18E-06	1.19E-06	1.20E-06	1.20E-06
br 81	1.05E-06	1.06E-06	1.06E-06	1.07E-06	1.07E-06	1.07E-06
rb 85	1.00E-06	1.01E-06	1.01E-06	1.02E-06	1.02E-06	1.02E-06
zr 94	8.77E-07	8.81E-07	8.86E-07	8.90E-07	8.94E-07	8.94E-07
zr 90	8.08E-07	8.12E-07	8.16E-07	8.20E-07	8.24E-07	8.24E-07

ba135	7.63E-07	7.77E-07	7.91E-07	8.04E-07	8.18E-07	8.19E-07
sm154	7.09E-07	7.13E-07	7.16E-07	7.20E-07	7.24E-07	7.24E-07
te130	6.58E-07	6.61E-07	6.64E-07	6.68E-07	6.71E-07	6.71E-07
rb 87	5.78E-07	5.81E-07	5.83E-07	5.86E-07	5.89E-07	5.89E-07
pd106	4.37E-07	4.39E-07	4.41E-07	4.44E-07	4.46E-07	4.46E-07
se 77	4.24E-07	4.26E-07	4.29E-07	4.31E-07	4.33E-07	4.33E-07
gd156	4.17E-07	4.20E-07	4.22E-07	4.24E-07	4.27E-07	4.27E-07
ru100	3.08E-07	3.11E-07	3.14E-07	3.17E-07	3.20E-07	3.20E-07
kr 84	2.76E-07	2.77E-07	2.78E-07	2.80E-07	2.81E-07	2.81E-07
dy161	2.58E-07	2.60E-07	2.61E-07	2.63E-07	2.64E-07	2.64E-07
nd142	2.28E-07	2.30E-07	2.33E-07	2.35E-07	2.37E-07	2.37E-07
sb121	2.26E-07	2.27E-07	2.28E-07	2.29E-07	2.31E-07	2.31E-07
ba134	2.18E-07	2.20E-07	2.22E-07	2.24E-07	2.26E-07	2.26E-07
se 79	2.05E-07	2.06E-07	2.07E-07	2.08E-07	2.08E-07	2.08E-07
sm148	1.98E-07	2.00E-07	2.02E-07	2.04E-07	2.05E-07	2.05E-07
sb123	1.83E-07	1.83E-07	1.84E-07	1.85E-07	1.86E-07	1.86E-07
kr 86	1.53E-07	1.54E-07	1.55E-07	1.56E-07	1.56E-07	1.56E-07
pd104	1.49E-07	1.51E-07	1.52E-07	1.53E-07	1.55E-07	1.55E-07
te128	1.49E-07	1.50E-07	1.50E-07	1.51E-07	1.52E-07	1.52E-07
nb 93	1.21E-07	1.23E-07	1.25E-07	1.28E-07	1.30E-07	1.30E-07
tb159	1.11E-07	1.12E-07	1.12E-07	1.13E-07	1.14E-07	1.14E-07
se 80	1.02E-07	1.02E-07	1.03E-07	1.03E-07	1.04E-07	1.04E-07
te125	1.02E-07	1.02E-07	1.03E-07	1.03E-07	1.04E-07	1.04E-07
gd158	8.78E-08	8.83E-08	8.87E-08	8.92E-08	8.97E-08	8.97E-08
cd112	7.89E-08	7.94E-08	7.98E-08	8.02E-08	8.06E-08	8.06E-08
ag107	6.04E-08	6.16E-08	6.28E-08	6.40E-08	6.52E-08	6.52E-08
br 79	6.00E-08	6.10E-08	6.21E-08	6.32E-08	6.42E-08	6.42E-08
dy162	6.04E-08	6.08E-08	6.12E-08	6.16E-08	6.19E-08	6.19E-08
dy164	5.77E-08	5.80E-08	5.83E-08	5.86E-08	5.88E-08	5.88E-08
cd110	5.56E-08	5.62E-08	5.68E-08	5.75E-08	5.81E-08	5.81E-08
sn117	5.54E-08	5.57E-08	5.60E-08	5.63E-08	5.65E-08	5.65E-08
li 6	5.21E-08	5.23E-08	5.25E-08	5.28E-08	5.30E-08	5.30E-08
mo 96	4.94E-08	4.99E-08	5.04E-08	5.09E-08	5.13E-08	5.13E-08
cd114	4.71E-08	4.74E-08	4.76E-08	4.79E-08	4.81E-08	4.81E-08
eu152	4.69E-08	6.43E-08	6.44E-08	6.46E-08	6.48E-08	4.68E-08
sn119	4.21E-08	4.23E-08	4.25E-08	4.28E-08	4.30E-08	4.30E-08
pd110	3.91E-08	3.93E-08	3.96E-08	3.98E-08	4.00E-08	4.00E-08
xe129	3.68E-08	3.75E-08	3.82E-08	3.88E-08	3.95E-08	3.95E-08
sn115	3.85E-08	3.87E-08	3.89E-08	3.91E-08	3.93E-08	3.93E-08
sr 88	2.81E-08	2.83E-08	2.84E-08	2.86E-08	2.87E-08	2.87E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 226
0 fraction of total absorption rate
power= .00mw, burnup= 24577.mwd, flux= 2.95E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

xe130	2.42E-08	2.44E-08	2.46E-08	2.49E-08	2.51E-08	2.51E-08
te126	1.99E-08	2.02E-08	2.06E-08	2.09E-08	2.12E-08	2.12E-08
ba136	2.03E-08	2.05E-08	2.07E-08	2.08E-08	2.10E-08	2.10E-08
se 82	1.94E-08	1.95E-08	1.96E-08	1.97E-08	1.98E-08	1.98E-08
sn126	1.59E-08	1.59E-08	1.60E-08	1.60E-08	1.60E-08	1.60E-08
se 78	1.52E-08	1.53E-08	1.54E-08	1.54E-08	1.55E-08	1.55E-08
dy163	1.51E-08	1.52E-08	1.53E-08	1.54E-08	1.55E-08	1.55E-08
kr 82	1.49E-08	1.50E-08	1.51E-08	1.52E-08	1.53E-08	1.53E-08
sn124	1.33E-08	1.34E-08	1.35E-08	1.35E-08	1.36E-08	1.36E-08
as 75	8.92E-09	8.97E-09	9.01E-09	9.06E-09	9.10E-09	9.10E-09
eu155	9.17E-09	2.23E-08	2.23E-08	2.22E-08	2.22E-08	8.80E-09
in113	7.68E-09	7.71E-09	7.75E-09	7.79E-09	7.83E-09	7.83E-09
pm147	6.83E-09	3.30E-08	3.30E-08	3.30E-08	3.30E-08	6.40E-09
sn118	5.37E-09	5.40E-09	5.43E-09	5.46E-09	5.48E-09	5.48E-09
sn122	4.64E-09	4.66E-09	4.68E-09	4.71E-09	4.73E-09	4.73E-09

cd116	4.52E-09	4.54E-09	4.56E-09	4.59E-09	4.61E-09	4.61E-09
eu154	3.49E-09	5.69E-09	5.72E-09	5.76E-09	5.79E-09	3.50E-09
sn120	3.41E-09	3.43E-09	3.44E-09	3.46E-09	3.48E-09	3.48E-09
ge 73	2.57E-09	2.58E-09	2.59E-09	2.61E-09	2.62E-09	2.62E-09
sr 90	1.74E-09	2.01E-09	2.02E-09	2.02E-09	2.02E-09	1.73E-09
dy160	1.50E-09	1.51E-09	1.53E-09	1.55E-09	1.56E-09	1.56E-09
ho165	1.51E-09	1.52E-09	1.53E-09	1.54E-09	1.55E-09	1.55E-09
gd160	1.25E-09	1.25E-09	1.26E-09	1.27E-09	1.27E-09	1.27E-09
xe128	8.74E-10	8.83E-10	8.91E-10	9.00E-10	9.09E-10	9.09E-10
ge 76	8.68E-10	8.73E-10	8.77E-10	8.81E-10	8.86E-10	8.86E-10
sr 86	4.09E-10	4.13E-10	4.17E-10	4.20E-10	4.24E-10	4.24E-10
cs137	4.01E-10	4.61E-10	4.61E-10	4.61E-10	4.61E-10	3.99E-10
sn116	3.30E-10	3.33E-10	3.36E-10	3.40E-10	3.43E-10	3.43E-10
te124	2.90E-10	2.92E-10	2.94E-10	2.97E-10	2.99E-10	2.99E-10
nb 94	1.51E-10	1.53E-10	1.54E-10	1.55E-10	1.56E-10	1.56E-10
te122	1.39E-10	1.40E-10	1.42E-10	1.43E-10	1.45E-10	1.45E-10
sr 87	1.39E-10	1.40E-10	1.41E-10	1.43E-10	1.44E-10	1.44E-10
se 76	1.14E-10	1.15E-10	1.16E-10	1.17E-10	1.18E-10	1.18E-10
er166	7.10E-11	7.15E-11	7.19E-11	7.24E-11	7.29E-11	7.29E-11
cs134	7.24E-11	5.48E-10	5.51E-10	5.54E-10	5.57E-10	6.79E-11
kr 80	6.12E-11	6.23E-11	6.33E-11	6.44E-11	6.56E-11	6.56E-11
ge 74	5.13E-11	5.16E-11	5.18E-11	5.21E-11	5.24E-11	5.24E-11
kr 85	4.60E-11	6.79E-11	6.79E-11	6.79E-11	6.80E-11	4.54E-11
ge 72	3.81E-11	3.82E-11	3.84E-11	3.86E-11	3.88E-11	3.88E-11
er167	8.68E-12	8.78E-12	8.88E-12	8.98E-12	9.09E-12	9.09E-12
te123	6.97E-12	7.07E-12	7.17E-12	7.27E-12	7.37E-12	7.37E-12
cd108	4.46E-12	4.55E-12	4.64E-12	4.73E-12	4.83E-12	4.83E-12
y 90	1.65E-12	1.92E-12	1.92E-12	1.92E-12	1.92E-12	1.65E-12
sb125	4.69E-13	2.15E-12	2.14E-12	2.14E-12	2.14E-12	4.38E-13
ce144	3.46E-13	7.19E-11	7.20E-11	7.20E-11	7.20E-11	2.77E-13
be 9	1.09E-13	1.09E-13	1.10E-13	1.10E-13	1.11E-13	1.11E-13
sn114	8.80E-14	8.88E-14	8.97E-14	9.06E-14	9.15E-14	9.15E-14
ru106	7.92E-14	4.73E-12	4.72E-12	4.71E-12	4.70E-12	6.62E-14
li 7	4.50E-14	4.52E-14	4.54E-14	4.56E-14	4.58E-14	4.58E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 227
0 fraction of total absorption rate
power= .00mw, burnup= 24577.mwd, flux= 2.95E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.82E-14	1.90E-14	1.91E-14	1.91E-14	1.91E-14	1.84E-14
cd109	8.18E-19	2.24E-17	2.28E-17	2.33E-17	2.37E-17	7.65E-19
te127m	9.82E-19	1.09E-12	1.09E-12	1.09E-12	1.09E-12	5.46E-19

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 228
power= 4.890E-04mw, burnup=2.4577E+04mwd, flux= 2.95E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
h 1	1.44E-03	1.44E-03	1.45E-03	1.46E-03	1.46E-03	1.46E-03
h 2	4.30E-06	4.32E-06	4.34E-06	4.36E-06	4.38E-06	4.38E-06
h 3	5.29E-12	7.42E-12	7.43E-12	7.44E-12	7.45E-12	5.24E-12
h 4	.00E+00	3.74E-36	3.75E-36	3.75E-36	3.76E-36	.00E+00
he 3	1.82E-08	1.83E-08	1.83E-08	1.83E-08	1.84E-08	1.84E-08
he 4	2.39E-04	2.40E-04	2.41E-04	2.42E-04	2.43E-04	2.43E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.87E-05	2.88E-05	2.89E-05	2.91E-05	2.92E-05	2.92E-05
ne 21	1.24E-08	1.26E-08	1.27E-08	1.28E-08	1.29E-08	1.29E-08
ne 22	1.89E-07	1.90E-07	1.91E-07	1.91E-07	1.92E-07	1.92E-07
ne 23	8.86E-31	8.85E-16	8.86E-16	8.86E-16	8.87E-16	8.87E-31
na 22	1.06E-12	5.25E-12	5.25E-12	5.26E-12	5.26E-12	9.93E-13

na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.22E-24	3.22E-09	3.22E-09	3.22E-09	3.23E-09	3.23E-24
na 24m	5.30E-31	5.29E-16	5.30E-16	5.30E-16	5.30E-16	5.30E-31
na 25	4.49E-39	4.53E-24	4.57E-24	4.61E-24	4.66E-24	4.66E-39
mg 24	1.85E-01	1.86E-01	1.87E-01	1.88E-01	1.88E-01	1.88E-01
mg 25	1.29E-06	1.30E-06	1.31E-06	1.32E-06	1.33E-06	1.33E-06
mg 26	4.29E-06	4.31E-06	4.33E-06	4.35E-06	4.37E-06	4.37E-06
mg 27	2.64E-28	2.64E-13	2.64E-13	2.64E-13	2.64E-13	2.64E-28
mg 28	.00E+00	6.68E-26	6.68E-26	6.69E-26	6.70E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.39E-26	2.39E-11	2.39E-11	2.39E-11	2.39E-11	2.39E-26
al 29	3.66E-37	3.69E-22	3.73E-22	3.76E-22	3.80E-22	3.80E-37
al 30	.00E+00	1.15E-31	1.17E-31	1.18E-31	1.20E-31	.00E+00
si 28	5.39E-01	5.41E-01	5.44E-01	5.46E-01	5.48E-01	5.48E-01
si 29	1.17E-05	1.18E-05	1.19E-05	1.20E-05	1.21E-05	1.21E-05
si 30	2.72E-10	2.76E-10	2.79E-10	2.83E-10	2.87E-10	2.87E-10
si 31	2.42E-38	2.45E-23	2.49E-23	2.52E-23	2.56E-23	2.56E-38
si 32	5.13E-30	5.32E-30	5.41E-30	5.49E-30	5.58E-30	5.44E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		2.95E+07	2.95E+07	2.95E+07	2.96E+07	2.96E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 229
power= 4.890E-04mw, burnup=2.4577E+04mwd, flux= 2.95E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	5.33E+01	5.39E+01	5.46E+01	5.52E+01	5.58E+01	5.58E+01
pb206	3.54E-01	3.62E-01	3.69E-01	3.76E-01	3.84E-01	3.84E-01
pb207	2.13E-02	2.17E-02	2.20E-02	2.24E-02	2.28E-02	2.28E-02
pb208	7.92E-04	7.99E-04	8.06E-04	8.14E-04	8.21E-04	8.21E-04
pb209	1.29E-09	1.30E-09	1.32E-09	1.33E-09	1.35E-09	1.35E-09
pb210	3.69E-04	3.72E-04	3.75E-04	3.78E-04	3.81E-04	3.81E-04
pb211	5.94E-11	5.96E-11	5.98E-11	6.01E-11	6.03E-11	6.05E-11
pb212	1.97E-11	2.05E-11	2.06E-11	2.07E-11	2.08E-11	2.01E-11
pb214	8.43E-10	8.50E-10	8.57E-10	8.65E-10	8.72E-10	8.72E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	6.50E-02	6.65E-02	6.80E-02	6.96E-02	7.11E-02	7.11E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.27E-07	2.29E-07	2.31E-07	2.33E-07	2.35E-07	2.35E-07
bi211	3.52E-12	3.53E-12	3.55E-12	3.56E-12	3.58E-12	3.58E-12
bi212	1.87E-12	1.94E-12	1.95E-12	1.96E-12	1.97E-12	1.90E-12
bi213	3.01E-10	3.04E-10	3.08E-10	3.11E-10	3.14E-10	3.14E-10
bi214	6.26E-10	6.31E-10	6.37E-10	6.42E-10	6.47E-10	6.47E-10
po210	6.27E-06	6.32E-06	6.38E-06	6.43E-06	6.48E-06	6.49E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.89E-17	3.90E-17	3.92E-17	3.94E-17	3.95E-17	3.96E-17
po212	9.82E-23	1.02E-22	1.03E-22	1.03E-22	1.04E-22	1.00E-22
po213	4.52E-19	4.57E-19	4.62E-19	4.68E-19	4.73E-19	4.73E-19
po214	8.61E-17	8.68E-17	8.76E-17	8.83E-17	8.90E-17	8.91E-17
po215	4.88E-17	4.89E-17	4.92E-17	4.94E-17	4.96E-17	4.97E-17
po216	7.46E-17	7.76E-17	7.80E-17	7.84E-17	7.88E-17	7.59E-17
po218	9.75E-11	9.84E-11	9.92E-11	1.00E-10	1.01E-10	1.01E-10
rn218	3.36E-44	3.63E-29	3.65E-29	3.67E-29	3.68E-29	3.50E-44
rn219	1.09E-13	1.09E-13	1.09E-13	1.10E-13	1.10E-13	1.11E-13
rn220	2.86E-14	2.98E-14	2.99E-14	3.01E-14	3.02E-14	2.91E-14
rn222	1.73E-07	1.75E-07	1.76E-07	1.78E-07	1.79E-07	1.79E-07
ra222	3.70E-41	3.94E-26	3.96E-26	3.98E-26	4.00E-26	3.76E-41
ra223	2.71E-08	2.72E-08	2.73E-08	2.74E-08	2.75E-08	2.76E-08
ra224	1.63E-10	1.69E-10	1.70E-10	1.71E-10	1.72E-10	1.66E-10
ra225	1.41E-07	1.42E-07	1.44E-07	1.45E-07	1.47E-07	1.47E-07

ra226	2.65E-02	2.67E-02	2.69E-02	2.72E-02	2.74E-02	2.74E-02
ra228	1.35E-10	1.36E-10	1.38E-10	1.39E-10	1.41E-10	1.41E-10
ac225	9.51E-08	9.61E-08	9.72E-08	9.82E-08	9.93E-08	9.93E-08
ac227	1.88E-05	1.89E-05	1.90E-05	1.91E-05	1.91E-05	1.91E-05
ac228	1.64E-14	1.66E-14	1.68E-14	1.70E-14	1.72E-14	1.72E-14
th226	1.80E-39	1.92E-24	1.93E-24	1.94E-24	1.95E-24	1.84E-39
th227	4.37E-08	4.38E-08	4.40E-08	4.42E-08	4.44E-08	4.45E-08
th228	3.10E-08	3.23E-08	3.25E-08	3.26E-08	3.28E-08	3.16E-08
th229	2.74E-02	2.77E-02	2.80E-02	2.83E-02	2.86E-02	2.86E-02
th230	1.29E+00	1.30E+00	1.31E+00	1.32E+00	1.33E+00	1.33E+00
th231	2.71E-09	3.43E-09	3.44E-09	3.44E-09	3.45E-09	2.71E-09
th232	3.29E-01	3.33E-01	3.36E-01	3.40E-01	3.44E-01	3.44E-01
th233	3.72E-28	3.76E-13	3.80E-13	3.84E-13	3.89E-13	3.89E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.83E-02	2.84E-02	2.85E-02	2.87E-02	2.88E-02	2.88E-02
pa232	6.01E-26	6.04E-11	6.07E-11	6.10E-11	6.13E-11	6.13E-26

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 230
power= 4.890E-04mw, burnup=2.4577E+04mwd, flux= 2.95E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.75E-36	1.86E-21	1.87E-21	1.88E-21	1.89E-21	1.78E-36
u231	6.15E-32	6.19E-17	6.25E-17	6.31E-17	6.37E-17	6.37E-32
u232	1.10E-06	1.18E-06	1.18E-06	1.19E-06	1.19E-06	1.12E-06
u233	6.66E-01	6.72E-01	6.77E-01	6.83E-01	6.89E-01	6.89E-01
u234	1.03E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01
u235	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02
u236	1.94E+02	1.94E+02	1.94E+02	1.94E+02	1.94E+02	1.94E+02
u237	3.95E-13	4.13E-07	4.13E-07	4.14E-07	4.14E-07	3.61E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.75E-23	3.75E-08	3.75E-08	3.76E-08	3.76E-08	3.76E-23
u240	2.43E-34	2.53E-34	2.63E-34	2.73E-34	2.83E-34	2.83E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	2.21E-14	1.03E-12	1.03E-12	1.03E-12	1.03E-12	1.88E-14
np236m	2.44E-28	2.43E-13	2.44E-13	2.44E-13	2.44E-13	2.44E-28
np236	2.58E-06	2.58E-06	2.58E-06	2.59E-06	2.59E-06	2.59E-06
np237	4.05E+01	4.05E+01	4.05E+01	4.04E+01	4.04E+01	4.04E+01
np238	5.38E-15	1.82E-07	1.82E-07	1.82E-07	1.82E-07	4.97E-15
np239	1.73E-13	5.42E-06	5.43E-06	5.43E-06	5.43E-06	1.67E-13
np240m	2.07E-36	2.16E-36	2.24E-36	2.33E-36	2.41E-36	2.41E-36
np240	2.57E-38	1.36E-16	1.36E-16	1.36E-16	1.36E-16	2.90E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	3.73E-11	1.38E-10	1.38E-10	1.38E-10	1.38E-10	3.54E-11
pu237	1.12E-28	3.27E-14	3.25E-14	3.23E-14	3.21E-14	5.07E-29
pu238	2.62E-03	2.75E-03	2.75E-03	2.75E-03	2.75E-03	2.62E-03
pu239	2.79E+01	2.77E+01	2.75E+01	2.73E+01	2.71E+01	2.71E+01
pu240	3.44E-01	3.37E-01	3.31E-01	3.25E-01	3.19E-01	3.19E-01
pu241	1.28E-05	1.68E-05	1.64E-05	1.61E-05	1.59E-05	1.17E-05
pu242	4.80E-05	4.80E-05	4.81E-05	4.81E-05	4.82E-05	4.82E-05
pu243	1.54E-29	1.24E-14	1.24E-14	1.24E-14	1.24E-14	1.55E-29
pu244	1.21E-23	1.26E-23	1.31E-23	1.36E-23	1.41E-23	1.41E-23
pu245	.00E+00	6.39E-35	6.65E-35	6.90E-35	7.16E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.76E-35	1.71E-20	1.68E-20	1.65E-20	1.63E-20	1.62E-35
am240	8.03E-33	7.83E-18	7.70E-18	7.56E-18	7.43E-18	7.42E-33

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     am241   5.18E-04  5.06E-04  4.97E-04  4.88E-04  4.80E-04  4.79E-04
     am242m  2.91E-08  2.92E-08  2.87E-08  2.82E-08  2.77E-08  2.69E-08
     am242   3.75E-13  2.32E-12  2.28E-12  2.24E-12  2.20E-12  3.47E-13
     am243   1.98E-07  1.96E-07  1.94E-07  1.92E-07  1.90E-07  1.90E-07
     am244m   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am244   1.83E-31  1.81E-16  1.79E-16  1.78E-16  1.76E-16  1.76E-31
     am245   3.73E-40  1.25E-35  1.30E-35  1.35E-35  1.40E-35  3.28E-40
     am246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm241   1.26E-43  1.66E-23  1.63E-23  1.61E-23  1.58E-23  1.68E-44
     cm242   7.58E-11  4.68E-10  4.60E-10  4.52E-10  4.44E-10  7.00E-11
     cm243   1.17E-15  1.32E-15  1.29E-15  1.27E-15  1.25E-15  1.07E-15
     cm244   2.29E-12  2.85E-12  2.82E-12  2.79E-12  2.77E-12  2.18E-12
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                    actinides        page  231
       power= 4.890E-04mw, burnup=2.4577E+04mwd, flux= 2.95E+07n/cm**2-sec
0                                        nuclide concentrations, gram atoms
                                         basis = single reactor assembly
            charge ******* d ******* d ******* d ******* d ******* d
     cm245   9.85E-15  9.57E-15  9.29E-15  9.03E-15  8.78E-15  8.77E-15
     cm246   7.67E-17  7.41E-17  7.17E-17  6.93E-17  6.71E-17  6.70E-17
     cm247   8.45E-20  8.51E-20  8.57E-20  8.62E-20  8.68E-20  8.68E-20
     cm248   4.07E-22  4.15E-22  4.23E-22  4.30E-22  4.38E-22  4.38E-22
     cm249    .00E+00  1.59E-33  1.63E-33  1.66E-33  1.69E-33   .00E+00
     cm250   1.74E-37  1.75E-37  1.76E-37  1.77E-37  1.78E-37  1.78E-37
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              2.95E+07  2.95E+07  2.95E+07  2.96E+07  2.96E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number 26 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *           prelim lwr origen-s binary working library--id = 1143              *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *       neutron flux spectrum factors and cross sections were produced from    *
          *      the "presas2" case updating all nuclides on the scale "burnup" library  *
```

```
         *                                                                      *
         *                  fission product yields are from endf/b-v            *
         *                                                                      *
         *              photon libraries use an 18-energy-group structure       *
         *             the photon data are from the master photon data base,    *
         *              produced to include bremsstrahlung from uo2 matrix      *
         *                                                                      *
         *        see information above this box (if present) for later updates *
         *                                                                      *
         ************************************************************************
         *                                                                      *
0        ************************************************************************
0                 .other identification and sizes of library.
0                  data set name:  ft33f001
0                8/29/1996    date library was produced
0                     1697    total number of nuclides in library
                       689    number of light-element nuclides
                       129    number of actinide nuclides
                       879    number of fission product nuclides
0                     7993    number of nonzero off-diagonal matrix elements
0        ************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page  232
         power=    .00mw, burnup=  25023.mwd, flux= 2.96E+07n/cm**2-sec
0                                    basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                   initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.282571E+06   1.281878E+06   1.281192E+06   1.280512E+06   1.279839E+06   1.279830E+06
     absorptions   1.045925E+06   1.045599E+06   1.045277E+06   1.044958E+06   1.044643E+06   1.044637E+06
     k infinity    1.226255E+00   1.225974E+00   1.225696E+00   1.225420E+00   1.225146E+00   1.225143E+00
0                   initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   1.026161E+06   1.025796E+06   1.025435E+06   1.025078E+06   1.024725E+06   1.024719E+06
     non-actinide
     abs. fracs.   1.889569E-02   1.893938E-02   1.898199E-02   1.902443E-02   1.906663E-02   1.906627E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2              fission products        page  233
0                              fraction of total absorption rate
         power=    .00mw, burnup=  25023.mwd, flux= 2.96E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d ******* d

     sm149     5.42E-03  5.42E-03  5.42E-03  5.42E-03  5.42E-03  5.42E-03
     nd143     2.38E-03  2.40E-03  2.41E-03  2.42E-03  2.43E-03  2.43E-03
     eu151     1.99E-03  2.00E-03  2.00E-03  2.00E-03  2.01E-03  2.01E-03
     rh103     1.16E-03  1.17E-03  1.17E-03  1.18E-03  1.18E-03  1.18E-03
     xe131     7.75E-04  7.79E-04  7.82E-04  7.86E-04  7.90E-04  7.90E-04
     cs133     6.04E-04  6.07E-04  6.10E-04  6.13E-04  6.16E-04  6.16E-04
     sm147     4.42E-04  4.44E-04  4.46E-04  4.49E-04  4.51E-04  4.51E-04
     tc 99     3.94E-04  3.95E-04  3.96E-04  3.97E-04  3.99E-04  3.99E-04
     nd145     3.41E-04  3.43E-04  3.44E-04  3.46E-04  3.48E-04  3.48E-04
     sm152     2.72E-04  2.74E-04  2.75E-04  2.77E-04  2.78E-04  2.78E-04
     mo 95     2.37E-04  2.38E-04  2.39E-04  2.40E-04  2.41E-04  2.41E-04
     gd155     2.26E-04  2.26E-04  2.26E-04  2.25E-04  2.25E-04  2.25E-04
     sm150     1.81E-04  1.82E-04  1.83E-04  1.84E-04  1.85E-04  1.85E-04
     kr 83     1.46E-04  1.46E-04  1.47E-04  1.48E-04  1.48E-04  1.48E-04
     cs135     1.37E-04  1.37E-04  1.38E-04  1.39E-04  1.39E-04  1.39E-04
     eu153     1.12E-04  1.12E-04  1.13E-04  1.14E-04  1.14E-04  1.14E-04
     ru101     1.06E-04  1.07E-04  1.07E-04  1.08E-04  1.09E-04  1.09E-04
     pr141     1.03E-04  1.03E-04  1.04E-04  1.04E-04  1.05E-04  1.05E-04
     cd113     1.03E-04  1.03E-04  1.02E-04  1.02E-04  1.02E-04  1.02E-04
     la139     8.39E-05  8.43E-05  8.47E-05  8.51E-05  8.56E-05  8.56E-05
     gd157     5.90E-05  5.89E-05  5.87E-05  5.86E-05  5.84E-05  5.84E-05
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ag109	4.41E-05	4.44E-05	4.46E-05	4.48E-05	4.51E-05	4.51E-05
pd105	4.32E-05	4.34E-05	4.37E-05	4.39E-05	4.41E-05	4.41E-05
ba137	4.07E-05	4.09E-05	4.11E-05	4.13E-05	4.15E-05	4.15E-05
zr 93	3.26E-05	3.27E-05	3.29E-05	3.30E-05	3.32E-05	3.32E-05
i129	2.76E-05	2.77E-05	2.78E-05	2.80E-05	2.81E-05	2.81E-05
nd144	2.61E-05	2.63E-05	2.64E-05	2.65E-05	2.67E-05	2.67E-05
gd152	2.36E-05	2.37E-05	2.39E-05	2.41E-05	2.43E-05	2.43E-05
mo 97	1.91E-05	1.91E-05	1.92E-05	1.93E-05	1.94E-05	1.94E-05
pd108	1.06E-05	1.06E-05	1.07E-05	1.08E-05	1.08E-05	1.08E-05
zr 91	8.74E-06	8.79E-06	8.83E-06	8.87E-06	8.91E-06	8.91E-06
y 89	8.36E-06	8.40E-06	8.45E-06	8.49E-06	8.53E-06	8.53E-06
ru 99	7.92E-06	8.05E-06	8.18E-06	8.31E-06	8.44E-06	8.44E-06
ru102	8.00E-06	8.04E-06	8.08E-06	8.11E-06	8.15E-06	8.15E-06
ce142	7.00E-06	7.03E-06	7.07E-06	7.10E-06	7.14E-06	7.14E-06
nd148	6.73E-06	6.76E-06	6.80E-06	6.83E-06	6.86E-06	6.86E-06
sm151	6.61E-06	6.94E-06	6.94E-06	6.94E-06	6.95E-06	6.61E-06
nd146	5.69E-06	5.72E-06	5.75E-06	5.77E-06	5.80E-06	5.80E-06
pd107	5.33E-06	5.36E-06	5.39E-06	5.42E-06	5.44E-06	5.44E-06
in115	4.99E-06	5.01E-06	5.03E-06	5.06E-06	5.08E-06	5.08E-06
ba138	4.84E-06	4.86E-06	4.89E-06	4.91E-06	4.93E-06	4.93E-06
ce140	4.53E-06	4.55E-06	4.58E-06	4.60E-06	4.62E-06	4.62E-06
xe132	4.16E-06	4.18E-06	4.21E-06	4.23E-06	4.25E-06	4.25E-06
mo 98	2.77E-06	2.78E-06	2.80E-06	2.81E-06	2.82E-06	2.82E-06
mo100	2.71E-06	2.72E-06	2.73E-06	2.75E-06	2.76E-06	2.76E-06
xe134	2.68E-06	2.69E-06	2.70E-06	2.72E-06	2.73E-06	2.73E-06
zr 92	2.12E-06	2.13E-06	2.14E-06	2.15E-06	2.16E-06	2.16E-06
i127	2.02E-06	2.03E-06	2.04E-06	2.05E-06	2.06E-06	2.06E-06
ru104	1.85E-06	1.86E-06	1.87E-06	1.88E-06	1.88E-06	1.88E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 234
0 fraction of total absorption rate
power= .00mw, burnup= 25023.mwd, flux= 2.96E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.65E-06	1.66E-06	1.67E-06	1.68E-06	1.69E-06	1.69E-06
nd150	1.53E-06	1.53E-06	1.54E-06	1.55E-06	1.56E-06	1.56E-06
xe136	1.45E-06	1.46E-06	1.47E-06	1.47E-06	1.48E-06	1.48E-06
gd154	1.20E-06	1.21E-06	1.23E-06	1.24E-06	1.25E-06	1.25E-06
cd111	1.20E-06	1.20E-06	1.21E-06	1.22E-06	1.22E-06	1.22E-06
br 81	1.07E-06	1.08E-06	1.08E-06	1.09E-06	1.09E-06	1.09E-06
rb 85	1.02E-06	1.03E-06	1.03E-06	1.04E-06	1.04E-06	1.04E-06
zr 94	8.94E-07	8.98E-07	9.03E-07	9.07E-07	9.11E-07	9.11E-07
ba135	8.19E-07	8.33E-07	8.47E-07	8.61E-07	8.75E-07	8.75E-07
zr 90	8.24E-07	8.28E-07	8.32E-07	8.36E-07	8.40E-07	8.40E-07
sm154	7.24E-07	7.27E-07	7.31E-07	7.35E-07	7.38E-07	7.38E-07
te130	6.71E-07	6.75E-07	6.78E-07	6.81E-07	6.84E-07	6.84E-07
rb 87	5.89E-07	5.92E-07	5.95E-07	5.98E-07	6.00E-07	6.00E-07
pd106	4.46E-07	4.48E-07	4.50E-07	4.53E-07	4.55E-07	4.55E-07
se 77	4.33E-07	4.35E-07	4.37E-07	4.39E-07	4.41E-07	4.41E-07
gd156	4.26E-07	4.29E-07	4.31E-07	4.33E-07	4.36E-07	4.36E-07
ru100	3.20E-07	3.23E-07	3.26E-07	3.29E-07	3.32E-07	3.32E-07
kr 84	2.81E-07	2.82E-07	2.84E-07	2.85E-07	2.86E-07	2.86E-07
dy161	2.64E-07	2.65E-07	2.67E-07	2.68E-07	2.69E-07	2.69E-07
nd142	2.37E-07	2.40E-07	2.42E-07	2.44E-07	2.46E-07	2.46E-07
sb121	2.30E-07	2.32E-07	2.33E-07	2.34E-07	2.35E-07	2.35E-07
ba134	2.26E-07	2.28E-07	2.30E-07	2.32E-07	2.35E-07	2.35E-07
sm148	2.05E-07	2.07E-07	2.09E-07	2.11E-07	2.13E-07	2.13E-07
se 79	2.09E-07	2.09E-07	2.10E-07	2.11E-07	2.12E-07	2.12E-07
sb123	1.86E-07	1.87E-07	1.88E-07	1.89E-07	1.90E-07	1.90E-07
pd104	1.55E-07	1.56E-07	1.58E-07	1.59E-07	1.61E-07	1.61E-07
kr 86	1.56E-07	1.57E-07	1.58E-07	1.59E-07	1.59E-07	1.59E-07

te128	1.52E-07	1.53E-07	1.53E-07	1.54E-07	1.55E-07	1.55E-07
nb 93	1.30E-07	1.32E-07	1.34E-07	1.37E-07	1.39E-07	1.39E-07
tb159	1.14E-07	1.14E-07	1.15E-07	1.15E-07	1.16E-07	1.16E-07
se 80	1.04E-07	1.04E-07	1.05E-07	1.05E-07	1.06E-07	1.06E-07
te125	1.04E-07	1.04E-07	1.05E-07	1.05E-07	1.06E-07	1.06E-07
gd158	8.97E-08	9.02E-08	9.06E-08	9.11E-08	9.16E-08	9.16E-08
cd112	8.06E-08	8.10E-08	8.14E-08	8.18E-08	8.23E-08	8.23E-08
ag107	6.52E-08	6.65E-08	6.77E-08	6.89E-08	7.01E-08	7.02E-08
br 79	6.42E-08	6.53E-08	6.64E-08	6.75E-08	6.86E-08	6.86E-08
dy162	6.19E-08	6.23E-08	6.27E-08	6.31E-08	6.34E-08	6.34E-08
cd110	5.81E-08	5.88E-08	5.94E-08	6.01E-08	6.07E-08	6.07E-08
dy164	5.89E-08	5.91E-08	5.94E-08	5.97E-08	5.99E-08	5.99E-08
sn117	5.66E-08	5.68E-08	5.71E-08	5.74E-08	5.77E-08	5.77E-08
li 6	5.30E-08	5.33E-08	5.35E-08	5.37E-08	5.39E-08	5.39E-08
mo 96	5.13E-08	5.18E-08	5.23E-08	5.28E-08	5.33E-08	5.33E-08
cd114	4.81E-08	4.84E-08	4.86E-08	4.89E-08	4.91E-08	4.91E-08
eu152	4.68E-08	6.50E-08	6.51E-08	6.53E-08	6.55E-08	4.67E-08
sn119	4.30E-08	4.32E-08	4.34E-08	4.36E-08	4.38E-08	4.38E-08
xe129	3.95E-08	4.02E-08	4.09E-08	4.16E-08	4.23E-08	4.23E-08
pd110	4.00E-08	4.02E-08	4.04E-08	4.06E-08	4.08E-08	4.08E-08
sn115	3.93E-08	3.95E-08	3.97E-08	3.99E-08	4.01E-08	4.01E-08
sr 88	2.87E-08	2.88E-08	2.90E-08	2.91E-08	2.93E-08	2.93E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 235
0 fraction of total absorption rate
power= .00mw, burnup= 25023.mwd, flux= 2.96E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

xe130	2.51E-08	2.53E-08	2.56E-08	2.58E-08	2.60E-08	2.60E-08
te126	2.12E-08	2.16E-08	2.19E-08	2.22E-08	2.26E-08	2.26E-08
ba136	2.10E-08	2.11E-08	2.13E-08	2.15E-08	2.16E-08	2.16E-08
se 82	1.98E-08	1.99E-08	2.00E-08	2.00E-08	2.01E-08	2.01E-08
sn126	1.61E-08	1.61E-08	1.61E-08	1.61E-08	1.62E-08	1.62E-08
dy163	1.55E-08	1.56E-08	1.57E-08	1.57E-08	1.58E-08	1.58E-08
se 78	1.55E-08	1.56E-08	1.57E-08	1.57E-08	1.58E-08	1.58E-08
kr 82	1.53E-08	1.54E-08	1.55E-08	1.56E-08	1.57E-08	1.57E-08
sn124	1.36E-08	1.37E-08	1.37E-08	1.38E-08	1.39E-08	1.39E-08
as 75	9.10E-09	9.14E-09	9.19E-09	9.23E-09	9.28E-09	9.28E-09
eu155	8.80E-09	2.22E-08	2.22E-08	2.22E-08	2.22E-08	8.45E-09
in113	7.83E-09	7.87E-09	7.91E-09	7.95E-09	7.99E-09	7.99E-09
pm147	6.39E-09	3.30E-08	3.31E-08	3.31E-08	3.31E-08	6.00E-09
sn118	5.48E-09	5.51E-09	5.53E-09	5.56E-09	5.59E-09	5.59E-09
sn122	4.73E-09	4.76E-09	4.78E-09	4.80E-09	4.83E-09	4.83E-09
cd116	4.61E-09	4.63E-09	4.65E-09	4.67E-09	4.70E-09	4.70E-09
sn120	3.48E-09	3.49E-09	3.51E-09	3.53E-09	3.55E-09	3.55E-09
eu154	3.50E-09	5.83E-09	5.86E-09	5.89E-09	5.93E-09	3.51E-09
ge 73	2.62E-09	2.63E-09	2.64E-09	2.66E-09	2.67E-09	2.67E-09
sr 90	1.73E-09	2.02E-09	2.02E-09	2.02E-09	2.02E-09	1.72E-09
dy160	1.56E-09	1.58E-09	1.59E-09	1.61E-09	1.63E-09	1.63E-09
ho165	1.55E-09	1.56E-09	1.57E-09	1.59E-09	1.60E-09	1.60E-09
gd160	1.27E-09	1.28E-09	1.29E-09	1.29E-09	1.30E-09	1.30E-09
xe128	9.09E-10	9.18E-10	9.27E-10	9.35E-10	9.44E-10	9.44E-10
ge 76	8.86E-10	8.90E-10	8.94E-10	8.99E-10	9.03E-10	9.03E-10
sr 86	4.24E-10	4.28E-10	4.32E-10	4.36E-10	4.40E-10	4.40E-10
cs137	3.99E-10	4.61E-10	4.61E-10	4.61E-10	4.62E-10	3.97E-10
sn116	3.43E-10	3.46E-10	3.49E-10	3.53E-10	3.56E-10	3.56E-10
te124	2.99E-10	3.01E-10	3.04E-10	3.06E-10	3.08E-10	3.08E-10
nb 94	1.56E-10	1.58E-10	1.59E-10	1.60E-10	1.62E-10	1.62E-10
te122	1.44E-10	1.46E-10	1.47E-10	1.49E-10	1.50E-10	1.50E-10
sr 87	1.44E-10	1.45E-10	1.46E-10	1.47E-10	1.48E-10	1.48E-10
se 76	1.18E-10	1.19E-10	1.20E-10	1.21E-10	1.22E-10	1.22E-10

er166	7.29E-11	7.33E-11	7.38E-11	7.42E-11	7.47E-11	7.47E-11
kr 80	6.56E-11	6.67E-11	6.79E-11	6.91E-11	7.03E-11	7.03E-11
cs134	6.79E-11	5.59E-10	5.62E-10	5.65E-10	5.68E-10	6.37E-11
ge 74	5.24E-11	5.26E-11	5.29E-11	5.31E-11	5.34E-11	5.34E-11
kr 85	4.54E-11	6.80E-11	6.81E-11	6.81E-11	6.81E-11	4.47E-11
ge 72	3.88E-11	3.90E-11	3.92E-11	3.94E-11	3.96E-11	3.96E-11
er167	9.09E-12	9.19E-12	9.30E-12	9.40E-12	9.50E-12	9.50E-12
te123	7.37E-12	7.47E-12	7.57E-12	7.67E-12	7.78E-12	7.78E-12
cd108	4.83E-12	4.92E-12	5.02E-12	5.12E-12	5.22E-12	5.22E-12
y 90	1.65E-12	1.92E-12	1.93E-12	1.93E-12	1.93E-12	1.64E-12
sb125	4.38E-13	2.14E-12	2.14E-12	2.14E-12	2.14E-12	4.11E-13
ce144	2.77E-13	7.21E-11	7.21E-11	7.21E-11	7.22E-11	2.22E-13
be 9	1.11E-13	1.11E-13	1.12E-13	1.12E-13	1.13E-13	1.13E-13
sn114	9.15E-14	9.24E-14	9.34E-14	9.43E-14	9.52E-14	9.52E-14
ru106	6.61E-14	4.69E-12	4.68E-12	4.68E-12	4.67E-12	5.54E-14
li 7	4.59E-14	4.61E-14	4.63E-14	4.65E-14	4.68E-14	4.68E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 236
0 fraction of total absorption rate
power= .00mw, burnup= 25023.mwd, flux= 2.96E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.84E-14	1.92E-14	1.92E-14	1.92E-14	1.93E-14	1.85E-14
cd109	7.64E-19	2.42E-17	2.47E-17	2.51E-17	2.56E-17	7.37E-19
te127m	5.45E-19	1.09E-12	1.09E-12	1.09E-12	1.09E-12	3.00E-19

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 237
power= 4.890E-04mw, burnup=2.5023E+04mwd, flux= 2.96E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d
h 1	1.46E-03	1.47E-03	1.48E-03	1.48E-03	1.49E-03	1.49E-03
h 2	4.38E-06	4.40E-06	4.42E-06	4.44E-06	4.46E-06	4.46E-06
h 3	5.24E-12	7.45E-12	7.47E-12	7.48E-12	7.49E-12	5.19E-12
h 4	.00E+00	3.76E-36	3.77E-36	3.78E-36	3.79E-36	.00E+00
he 3	1.84E-08	1.84E-08	1.85E-08	1.85E-08	1.85E-08	1.85E-08
he 4	2.43E-04	2.44E-04	2.45E-04	2.46E-04	2.47E-04	2.47E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.92E-05	2.93E-05	2.95E-05	2.96E-05	2.97E-05	2.97E-05
ne 21	1.29E-08	1.30E-08	1.31E-08	1.32E-08	1.34E-08	1.34E-08
ne 22	1.92E-07	1.93E-07	1.94E-07	1.95E-07	1.96E-07	1.96E-07
ne 23	8.87E-31	8.86E-16	8.86E-16	8.86E-16	8.87E-16	8.87E-31
na 22	9.93E-13	5.25E-12	5.26E-12	5.26E-12	5.26E-12	9.29E-13
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.23E-24	3.22E-09	3.23E-09	3.23E-09	3.23E-09	3.23E-24
na 24m	5.30E-31	5.30E-16	5.30E-16	5.30E-16	5.30E-16	5.31E-31
na 25	4.66E-39	4.70E-24	4.74E-24	4.78E-24	4.83E-24	4.83E-39
mg 24	1.88E-01	1.89E-01	1.90E-01	1.91E-01	1.92E-01	1.92E-01
mg 25	1.33E-06	1.35E-06	1.36E-06	1.37E-06	1.38E-06	1.38E-06
mg 26	4.37E-06	4.39E-06	4.41E-06	4.43E-06	4.45E-06	4.45E-06
mg 27	2.64E-28	2.64E-13	2.64E-13	2.64E-13	2.65E-13	2.65E-28
mg 28	.00E+00	6.69E-26	6.70E-26	6.71E-26	6.71E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.39E-26	2.39E-11	2.39E-11	2.39E-11	2.39E-11	2.39E-26
al 29	3.80E-37	3.83E-22	3.86E-22	3.90E-22	3.94E-22	3.94E-37
al 30	.00E+00	1.21E-31	1.23E-31	1.25E-31	1.27E-31	.00E+00
si 28	5.48E-01	5.51E-01	5.53E-01	5.56E-01	5.58E-01	5.58E-01
si 29	1.21E-05	1.23E-05	1.24E-05	1.25E-05	1.26E-05	1.26E-05
si 30	2.87E-10	2.91E-10	2.95E-10	2.99E-10	3.03E-10	3.03E-10
si 31	2.56E-38	2.59E-23	2.63E-23	2.67E-23	2.70E-23	2.71E-38
si 32	5.44E-30	5.65E-30	5.74E-30	5.82E-30	5.91E-30	5.76E-30

totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		2.96E+07	2.96E+07	2.96E+07	2.96E+07	2.96E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 238

power= 4.890E-04mw, burnup=2.5023E+04mwd, flux= 2.96E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	5.58E+01	5.64E+01	5.70E+01	5.76E+01	5.82E+01	5.82E+01
pb206	3.84E-01	3.91E-01	3.99E-01	4.06E-01	4.14E-01	4.14E-01
pb207	2.28E-02	2.32E-02	2.36E-02	2.40E-02	2.43E-02	2.43E-02
pb208	8.21E-04	8.28E-04	8.36E-04	8.44E-04	8.51E-04	8.51E-04
pb209	1.35E-09	1.36E-09	1.37E-09	1.39E-09	1.40E-09	1.40E-09
pb210	3.81E-04	3.85E-04	3.88E-04	3.91E-04	3.94E-04	3.94E-04
pb211	6.05E-11	6.06E-11	6.09E-11	6.11E-11	6.14E-11	6.15E-11
pb212	2.01E-11	2.09E-11	2.10E-11	2.11E-11	2.12E-11	2.04E-11
pb214	8.72E-10	8.79E-10	8.86E-10	8.93E-10	9.00E-10	9.00E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	7.11E-02	7.27E-02	7.43E-02	7.59E-02	7.75E-02	7.76E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.35E-07	2.37E-07	2.39E-07	2.40E-07	2.42E-07	2.42E-07
bi211	3.58E-12	3.59E-12	3.61E-12	3.62E-12	3.64E-12	3.65E-12
bi212	1.90E-12	1.98E-12	1.99E-12	2.00E-12	2.01E-12	1.93E-12
bi213	3.14E-10	3.18E-10	3.21E-10	3.24E-10	3.28E-10	3.28E-10
bi214	6.47E-10	6.53E-10	6.58E-10	6.63E-10	6.68E-10	6.68E-10
po210	6.49E-06	6.54E-06	6.59E-06	6.64E-06	6.69E-06	6.70E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.96E-17	3.97E-17	3.99E-17	4.00E-17	4.02E-17	4.03E-17
po212	1.00E-22	1.04E-22	1.05E-22	1.05E-22	1.06E-22	1.02E-22
po213	4.73E-19	4.78E-19	4.83E-19	4.88E-19	4.93E-19	4.93E-19
po214	8.91E-17	8.98E-17	9.05E-17	9.12E-17	9.19E-17	9.19E-17
po215	4.97E-17	4.98E-17	5.00E-17	5.02E-17	5.04E-17	5.05E-17
po216	7.59E-17	7.91E-17	7.95E-17	7.99E-17	8.03E-17	7.72E-17
po218	1.01E-10	1.02E-10	1.02E-10	1.03E-10	1.04E-10	1.04E-10
rn218	3.50E-44	3.70E-29	3.72E-29	3.74E-29	3.76E-29	3.50E-44
rn219	1.11E-13	1.11E-13	1.11E-13	1.12E-13	1.12E-13	1.12E-13
rn220	2.91E-14	3.03E-14	3.05E-14	3.06E-14	3.08E-14	2.96E-14
rn222	1.79E-07	1.81E-07	1.82E-07	1.84E-07	1.85E-07	1.85E-07
ra222	3.76E-41	4.02E-26	4.04E-26	4.06E-26	4.08E-26	3.83E-41
ra223	2.76E-08	2.76E-08	2.78E-08	2.79E-08	2.80E-08	2.80E-08
ra224	1.66E-10	1.73E-10	1.73E-10	1.74E-10	1.75E-10	1.68E-10
ra225	1.47E-07	1.49E-07	1.50E-07	1.52E-07	1.53E-07	1.53E-07
ra226	2.74E-02	2.76E-02	2.78E-02	2.80E-02	2.83E-02	2.83E-02
ra228	1.41E-10	1.42E-10	1.43E-10	1.45E-10	1.46E-10	1.46E-10
ac225	9.93E-08	1.00E-07	1.01E-07	1.02E-07	1.04E-07	1.04E-07
ac227	1.91E-05	1.92E-05	1.93E-05	1.94E-05	1.95E-05	1.95E-05
ac228	1.72E-14	1.73E-14	1.75E-14	1.77E-14	1.79E-14	1.79E-14
th226	1.84E-39	1.96E-24	1.97E-24	1.98E-24	1.99E-24	1.87E-39
th227	4.45E-08	4.46E-08	4.48E-08	4.50E-08	4.52E-08	4.53E-08
th228	3.16E-08	3.29E-08	3.31E-08	3.33E-08	3.34E-08	3.21E-08
th229	2.86E-02	2.89E-02	2.92E-02	2.95E-02	2.98E-02	2.98E-02
th230	1.33E+00	1.34E+00	1.35E+00	1.36E+00	1.37E+00	1.37E+00
th231	2.71E-09	3.45E-09	3.46E-09	3.47E-09	3.47E-09	2.71E-09
th232	3.44E-01	3.47E-01	3.51E-01	3.54E-01	3.58E-01	3.58E-01
th233	3.89E-28	3.93E-13	3.97E-13	4.01E-13	4.06E-13	4.06E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.88E-02	2.89E-02	2.90E-02	2.92E-02	2.93E-02	2.93E-02
pa232	6.13E-26	6.16E-11	6.19E-11	6.21E-11	6.24E-11	6.25E-26

1

power= 4.890E-04mw, burnup=2.5023E+04mwd, flux= 2.96E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06	1.40E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.78E-36	1.90E-21	1.91E-21	1.92E-21	1.93E-21	1.81E-36
u231	6.37E-32	6.41E-17	6.47E-17	6.53E-17	6.58E-17	6.58E-32
u232	1.12E-06	1.20E-06	1.21E-06	1.21E-06	1.22E-06	1.14E-06
u233	6.89E-01	6.95E-01	7.01E-01	7.07E-01	7.12E-01	7.12E-01
u234	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01
u235	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02	6.55E+02
u236	1.94E+02	1.94E+02	1.94E+02	1.94E+02	1.94E+02	1.94E+02
u237	3.61E-13	4.14E-07	4.14E-07	4.15E-07	4.15E-07	3.34E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.76E-23	3.76E-08	3.76E-08	3.76E-08	3.76E-08	3.76E-23
u240	2.83E-34	2.93E-34	3.04E-34	3.15E-34	3.25E-34	3.26E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.88E-14	1.02E-12	1.02E-12	1.02E-12	1.02E-12	1.60E-14
np236m	2.44E-28	2.43E-13	2.43E-13	2.43E-13	2.43E-13	2.43E-28
np236	2.59E-06	2.60E-06	2.60E-06	2.61E-06	2.61E-06	2.61E-06
np237	4.04E+01	4.04E+01	4.04E+01	4.04E+01	4.04E+01	4.04E+01
np238	4.97E-15	1.82E-07	1.82E-07	1.82E-07	1.82E-07	4.64E-15
np239	1.67E-13	5.43E-06	5.43E-06	5.43E-06	5.44E-06	1.61E-13
np240m	2.41E-36	2.50E-36	2.59E-36	2.68E-36	2.78E-36	2.78E-36
np240	2.90E-38	1.36E-16	1.36E-16	1.37E-16	1.37E-16	3.26E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	3.54E-11	1.38E-10	1.38E-10	1.38E-10	1.38E-10	3.37E-11
pu237	5.07E-29	3.19E-14	3.18E-14	3.16E-14	3.14E-14	3.58E-29
pu238	2.62E-03	2.75E-03	2.75E-03	2.75E-03	2.75E-03	2.62E-03
pu239	2.71E+01	2.70E+01	2.68E+01	2.66E+01	2.65E+01	2.65E+01
pu240	3.19E-01	3.13E-01	3.08E-01	3.03E-01	2.98E-01	2.98E-01
pu241	1.17E-05	1.56E-05	1.53E-05	1.51E-05	1.48E-05	1.08E-05
pu242	4.82E-05	4.82E-05	4.82E-05	4.83E-05	4.83E-05	4.83E-05
pu243	1.55E-29	1.24E-14	1.24E-14	1.25E-14	1.25E-14	1.56E-29
pu244	1.41E-23	1.46E-23	1.51E-23	1.57E-23	1.62E-23	1.62E-23
pu245	.00E+00	7.43E-35	7.70E-35	7.98E-35	8.26E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.62E-35	1.59E-20	1.56E-20	1.54E-20	1.52E-20	1.52E-35
am240	7.42E-33	7.26E-18	7.15E-18	7.04E-18	6.94E-18	6.93E-33
am241	4.79E-04	4.69E-04	4.62E-04	4.55E-04	4.48E-04	4.47E-04
am242m	2.69E-08	2.70E-08	2.67E-08	2.63E-08	2.59E-08	2.51E-08
am242	3.47E-13	2.15E-12	2.12E-12	2.09E-12	2.05E-12	3.23E-13
am243	1.90E-07	1.89E-07	1.87E-07	1.86E-07	1.84E-07	1.84E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.76E-31	1.75E-16	1.73E-16	1.72E-16	1.71E-16	1.71E-31
am245	3.28E-40	1.46E-35	1.51E-35	1.56E-35	1.62E-35	2.98E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.68E-44	1.54E-23	1.52E-23	1.50E-23	1.48E-23	.00E+00
cm242	7.00E-11	4.34E-10	4.28E-10	4.21E-10	4.15E-10	6.53E-11
cm243	1.07E-15	1.22E-15	1.21E-15	1.19E-15	1.17E-15	1.00E-15
cm244	2.18E-12	2.74E-12	2.72E-12	2.70E-12	2.68E-12	2.09E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 240

power= 4.890E-04mw, burnup=2.5023E+04mwd, flux= 2.96E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge ******* d ******* d ******* d ******* d ******* d

```
     cm245   8.77E-15  8.53E-15  8.30E-15  8.09E-15  7.88E-15  7.87E-15
     cm246   6.70E-17  6.49E-17  6.28E-17  6.09E-17  5.90E-17  5.89E-17
     cm247   8.68E-20  8.73E-20  8.78E-20  8.83E-20  8.87E-20  8.87E-20
     cm248   4.38E-22  4.46E-22  4.54E-22  4.62E-22  4.70E-22  4.70E-22
     cm249    .00E+00  1.72E-33  1.75E-33  1.78E-33  1.81E-33   .00E+00
     cm250   1.78E-37  1.79E-37  1.80E-37  1.81E-37  1.82E-37  1.82E-37
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux               2.96E+07  2.96E+07  2.96E+07  2.96E+07  2.96E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number 27 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr origen-s binary working library--id = 1143             *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *       neutron flux spectrum factors and cross sections were produced from    *
          *      the "presas2" case updating all nuclides on the scale "burnup" library  *
          *                                                                              *
          *                    fission product yields are from endf/b-v                  *
          *                                                                              *
          *               photon libraries use an 18-energy-group structure              *
          *              the photon data are from the master photon data base,           *
          *               produced to include bremsstrahlung from uo2 matrix             *
          *                                                                              *
          *         see information above this box (if present) for later updates        *
          *                                                                              *
          ********************************************************************************
          *                                                                              *
0         ********************************************************************************
0                    .other identification and sizes of library.
0                     data set name:  ft33f001
0                   8/29/1996    date library was produced
0                        1697    total number of nuclides in library
                          689    number of light-element nuclides
                          129    number of actinide nuclides
```

879 number of fission product nuclides
7993 number of nonzero off-diagonal matrix elements

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1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 page 241

power= .00mw, burnup= 25470.mwd, flux= 2.96E+07n/cm**2-sec

basis =

(note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)

	initial	******* d	******* d	******* d	******* d	******* d
productions	1.280524E+06	1.279857E+06	1.279196E+06	1.278541E+06	1.277893E+06	1.277883E+06
absorptions	1.044879E+06	1.044567E+06	1.044258E+06	1.043953E+06	1.043652E+06	1.043646E+06
k infinity	1.225524E+00	1.225251E+00	1.224980E+00	1.224711E+00	1.224444E+00	1.224442E+00

	initial	******* d	******* d	******* d	******* d	******* d
actinide absorptions	1.024956E+06	1.024606E+06	1.024260E+06	1.023918E+06	1.023578E+06	1.023573E+06
non-actinide abs. fracs.	1.906675E-02	1.910883E-02	1.915073E-02	1.919210E-02	1.923358E-02	1.923329E-02

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 242

fraction of total absorption rate

power= .00mw, burnup= 25470.mwd, flux= 2.96E+07n/cm**2-sec

	initial	******* d	******* d	******* d	******* d	******* d
sm149	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03	5.42E-03
nd143	2.43E-03	2.44E-03	2.45E-03	2.46E-03	2.47E-03	2.47E-03
eu151	2.01E-03	2.01E-03	2.02E-03	2.02E-03	2.02E-03	2.03E-03
rh103	1.18E-03	1.19E-03	1.19E-03	1.20E-03	1.21E-03	1.21E-03
xe131	7.89E-04	7.93E-04	7.97E-04	8.00E-04	8.04E-04	8.04E-04
cs133	6.16E-04	6.19E-04	6.22E-04	6.24E-04	6.27E-04	6.27E-04
sm147	4.50E-04	4.53E-04	4.55E-04	4.57E-04	4.59E-04	4.59E-04
tc 99	3.99E-04	4.00E-04	4.01E-04	4.02E-04	4.04E-04	4.04E-04
nd145	3.48E-04	3.49E-04	3.51E-04	3.53E-04	3.54E-04	3.54E-04
sm152	2.78E-04	2.80E-04	2.81E-04	2.83E-04	2.84E-04	2.84E-04
mo 95	2.41E-04	2.42E-04	2.43E-04	2.44E-04	2.46E-04	2.46E-04
gd155	2.25E-04	2.25E-04	2.25E-04	2.24E-04	2.24E-04	2.24E-04
sm150	1.85E-04	1.86E-04	1.86E-04	1.87E-04	1.88E-04	1.88E-04
kr 83	1.48E-04	1.49E-04	1.50E-04	1.50E-04	1.51E-04	1.51E-04
cs135	1.39E-04	1.40E-04	1.41E-04	1.41E-04	1.42E-04	1.42E-04
eu153	1.14E-04	1.15E-04	1.15E-04	1.16E-04	1.17E-04	1.17E-04
ru101	1.08E-04	1.09E-04	1.09E-04	1.10E-04	1.11E-04	1.11E-04
pr141	1.05E-04	1.05E-04	1.06E-04	1.06E-04	1.07E-04	1.07E-04
cd113	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04
la139	8.56E-05	8.60E-05	8.64E-05	8.68E-05	8.72E-05	8.72E-05
gd157	5.85E-05	5.83E-05	5.82E-05	5.80E-05	5.79E-05	5.79E-05
ag109	4.51E-05	4.53E-05	4.55E-05	4.58E-05	4.60E-05	4.60E-05
pd105	4.41E-05	4.43E-05	4.45E-05	4.47E-05	4.49E-05	4.49E-05
ba137	4.15E-05	4.17E-05	4.19E-05	4.21E-05	4.23E-05	4.23E-05
zr 93	3.32E-05	3.33E-05	3.35E-05	3.36E-05	3.38E-05	3.38E-05
i129	2.81E-05	2.83E-05	2.84E-05	2.85E-05	2.87E-05	2.87E-05
nd144	2.67E-05	2.68E-05	2.69E-05	2.71E-05	2.72E-05	2.72E-05
gd152	2.43E-05	2.45E-05	2.47E-05	2.49E-05	2.50E-05	2.50E-05
mo 97	1.94E-05	1.95E-05	1.96E-05	1.97E-05	1.98E-05	1.98E-05
pd108	1.08E-05	1.09E-05	1.09E-05	1.10E-05	1.10E-05	1.10E-05
zr 91	8.91E-06	8.96E-06	9.00E-06	9.04E-06	9.08E-06	9.08E-06
ru 99	8.44E-06	8.57E-06	8.70E-06	8.84E-06	8.97E-06	8.97E-06
y 89	8.53E-06	8.57E-06	8.61E-06	8.65E-06	8.69E-06	8.69E-06
ru102	8.16E-06	8.19E-06	8.23E-06	8.27E-06	8.31E-06	8.31E-06
ce142	7.14E-06	7.17E-06	7.21E-06	7.24E-06	7.27E-06	7.27E-06
nd148	6.86E-06	6.90E-06	6.93E-06	6.96E-06	6.99E-06	6.99E-06
sm151	6.61E-06	6.95E-06	6.96E-06	6.96E-06	6.96E-06	6.61E-06
nd146	5.80E-06	5.83E-06	5.86E-06	5.89E-06	5.92E-06	5.92E-06
pd107	5.45E-06	5.47E-06	5.50E-06	5.53E-06	5.56E-06	5.56E-06

in115	5.08E-06	5.10E-06	5.13E-06	5.15E-06	5.18E-06	5.18E-06
ba138	4.94E-06	4.96E-06	4.98E-06	5.01E-06	5.03E-06	5.03E-06
ce140	4.62E-06	4.64E-06	4.67E-06	4.69E-06	4.71E-06	4.71E-06
xe132	4.25E-06	4.27E-06	4.29E-06	4.31E-06	4.33E-06	4.33E-06
mo 98	2.82E-06	2.83E-06	2.85E-06	2.86E-06	2.87E-06	2.87E-06
mo100	2.76E-06	2.77E-06	2.79E-06	2.80E-06	2.81E-06	2.81E-06
xe134	2.73E-06	2.74E-06	2.76E-06	2.77E-06	2.78E-06	2.78E-06
zr 92	2.16E-06	2.17E-06	2.18E-06	2.19E-06	2.20E-06	2.20E-06
i127	2.06E-06	2.07E-06	2.08E-06	2.09E-06	2.10E-06	2.10E-06
ru104	1.88E-06	1.89E-06	1.90E-06	1.91E-06	1.92E-06	1.92E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 243

0 fraction of total absorption rate

power= .00mw, burnup= 25470.mwd, flux= 2.96E+07n/cm**2-sec

0

	initial	******* d	******* d	******* d	******* d	******* d
zr 96	1.68E-06	1.69E-06	1.70E-06	1.71E-06	1.72E-06	1.72E-06
nd150	1.56E-06	1.56E-06	1.57E-06	1.58E-06	1.59E-06	1.59E-06
xe136	1.48E-06	1.49E-06	1.49E-06	1.50E-06	1.51E-06	1.51E-06
gd154	1.25E-06	1.26E-06	1.28E-06	1.29E-06	1.30E-06	1.30E-06
cd111	1.22E-06	1.23E-06	1.23E-06	1.24E-06	1.25E-06	1.25E-06
br 81	1.09E-06	1.10E-06	1.10E-06	1.11E-06	1.11E-06	1.11E-06
rb 85	1.04E-06	1.05E-06	1.05E-06	1.06E-06	1.06E-06	1.06E-06
ba135	8.75E-07	8.90E-07	9.04E-07	9.18E-07	9.33E-07	9.33E-07
zr 94	9.11E-07	9.15E-07	9.20E-07	9.24E-07	9.28E-07	9.28E-07
zr 90	8.40E-07	8.44E-07	8.48E-07	8.52E-07	8.56E-07	8.56E-07
sm154	7.38E-07	7.42E-07	7.45E-07	7.49E-07	7.53E-07	7.53E-07
te130	6.85E-07	6.88E-07	6.91E-07	6.94E-07	6.98E-07	6.98E-07
rb 87	6.00E-07	6.03E-07	6.06E-07	6.09E-07	6.12E-07	6.12E-07
pd106	4.55E-07	4.57E-07	4.59E-07	4.62E-07	4.64E-07	4.64E-07
se 77	4.41E-07	4.44E-07	4.46E-07	4.48E-07	4.50E-07	4.50E-07
gd156	4.35E-07	4.38E-07	4.40E-07	4.42E-07	4.45E-07	4.45E-07
ru100	3.32E-07	3.35E-07	3.38E-07	3.41E-07	3.44E-07	3.44E-07
kr 84	2.86E-07	2.88E-07	2.89E-07	2.90E-07	2.92E-07	2.92E-07
dy161	2.70E-07	2.71E-07	2.72E-07	2.73E-07	2.75E-07	2.75E-07
nd142	2.47E-07	2.49E-07	2.51E-07	2.54E-07	2.56E-07	2.56E-07
ba134	2.35E-07	2.37E-07	2.39E-07	2.41E-07	2.43E-07	2.44E-07
sb121	2.35E-07	2.36E-07	2.37E-07	2.38E-07	2.39E-07	2.39E-07
sm148	2.13E-07	2.15E-07	2.17E-07	2.19E-07	2.21E-07	2.21E-07
se 79	2.12E-07	2.13E-07	2.14E-07	2.14E-07	2.15E-07	2.15E-07
sb123	1.90E-07	1.91E-07	1.92E-07	1.93E-07	1.93E-07	1.93E-07
pd104	1.61E-07	1.62E-07	1.64E-07	1.65E-07	1.67E-07	1.67E-07
kr 86	1.60E-07	1.60E-07	1.61E-07	1.62E-07	1.63E-07	1.63E-07
te128	1.55E-07	1.55E-07	1.56E-07	1.57E-07	1.58E-07	1.58E-07
nb 93	1.39E-07	1.41E-07	1.43E-07	1.46E-07	1.48E-07	1.48E-07
tb159	1.16E-07	1.17E-07	1.17E-07	1.18E-07	1.18E-07	1.18E-07
se 80	1.06E-07	1.06E-07	1.07E-07	1.07E-07	1.08E-07	1.08E-07
te125	1.06E-07	1.06E-07	1.07E-07	1.07E-07	1.08E-07	1.08E-07
gd158	9.16E-08	9.21E-08	9.25E-08	9.30E-08	9.35E-08	9.35E-08
cd112	8.23E-08	8.27E-08	8.31E-08	8.35E-08	8.39E-08	8.39E-08
ag107	7.02E-08	7.14E-08	7.27E-08	7.39E-08	7.52E-08	7.52E-08
br 79	6.86E-08	6.97E-08	7.08E-08	7.19E-08	7.30E-08	7.30E-08
dy162	6.34E-08	6.38E-08	6.42E-08	6.46E-08	6.49E-08	6.49E-08
cd110	6.07E-08	6.14E-08	6.20E-08	6.27E-08	6.34E-08	6.34E-08
dy164	6.00E-08	6.02E-08	6.05E-08	6.07E-08	6.10E-08	6.10E-08
sn117	5.77E-08	5.80E-08	5.83E-08	5.85E-08	5.88E-08	5.88E-08
mo 96	5.33E-08	5.38E-08	5.42E-08	5.47E-08	5.52E-08	5.52E-08
li 6	5.40E-08	5.42E-08	5.44E-08	5.47E-08	5.49E-08	5.49E-08
cd114	4.91E-08	4.93E-08	4.96E-08	4.98E-08	5.01E-08	5.01E-08
eu152	4.67E-08	6.56E-08	6.58E-08	6.60E-08	6.61E-08	4.65E-08
xe129	4.23E-08	4.30E-08	4.37E-08	4.44E-08	4.51E-08	4.51E-08

sn119	4.38E-08	4.41E-08	4.43E-08	4.45E-08	4.47E-08	4.47E-08
pd110	4.08E-08	4.10E-08	4.12E-08	4.14E-08	4.16E-08	4.16E-08
sn115	4.01E-08	4.03E-08	4.05E-08	4.07E-08	4.09E-08	4.09E-08
sr 88	2.93E-08	2.94E-08	2.95E-08	2.97E-08	2.98E-08	2.98E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 244
0 fraction of total absorption rate
power= .00mw, burnup= 25470.mwd, flux= 2.96E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

xe130	2.60E-08	2.63E-08	2.65E-08	2.67E-08	2.70E-08	2.70E-08
te126	2.26E-08	2.29E-08	2.33E-08	2.36E-08	2.39E-08	2.39E-08
ba136	2.16E-08	2.18E-08	2.20E-08	2.21E-08	2.23E-08	2.23E-08
se 82	2.02E-08	2.02E-08	2.03E-08	2.04E-08	2.05E-08	2.05E-08
sn126	1.62E-08	1.62E-08	1.62E-08	1.63E-08	1.63E-08	1.63E-08
dy163	1.58E-08	1.59E-08	1.60E-08	1.61E-08	1.62E-08	1.62E-08
se 78	1.58E-08	1.59E-08	1.60E-08	1.60E-08	1.61E-08	1.61E-08
kr 82	1.57E-08	1.58E-08	1.59E-08	1.60E-08	1.61E-08	1.61E-08
sn124	1.39E-08	1.39E-08	1.40E-08	1.41E-08	1.41E-08	1.41E-08
as 75	9.28E-09	9.32E-09	9.37E-09	9.41E-09	9.45E-09	9.45E-09
in113	7.99E-09	8.03E-09	8.07E-09	8.10E-09	8.14E-09	8.14E-09
eu155	8.45E-09	2.21E-08	2.21E-08	2.21E-08	2.21E-08	8.12E-09
sn118	5.59E-09	5.61E-09	5.64E-09	5.67E-09	5.69E-09	5.69E-09
pm147	5.99E-09	3.31E-08	3.31E-08	3.31E-08	3.31E-08	5.62E-09
sn122	4.83E-09	4.85E-09	4.87E-09	4.90E-09	4.92E-09	4.92E-09
cd116	4.70E-09	4.72E-09	4.74E-09	4.76E-09	4.79E-09	4.79E-09
sn120	3.55E-09	3.56E-09	3.58E-09	3.60E-09	3.61E-09	3.61E-09
eu154	3.51E-09	5.96E-09	5.99E-09	6.03E-09	6.06E-09	3.51E-09
ge 73	2.67E-09	2.68E-09	2.70E-09	2.71E-09	2.72E-09	2.72E-09
sr 90	1.72E-09	2.03E-09	2.03E-09	2.03E-09	2.03E-09	1.72E-09
dy160	1.63E-09	1.64E-09	1.66E-09	1.67E-09	1.69E-09	1.69E-09
ho165	1.60E-09	1.61E-09	1.62E-09	1.63E-09	1.64E-09	1.64E-09
gd160	1.30E-09	1.31E-09	1.31E-09	1.32E-09	1.33E-09	1.33E-09
xe128	9.45E-10	9.54E-10	9.63E-10	9.72E-10	9.81E-10	9.81E-10
ge 76	9.03E-10	9.07E-10	9.12E-10	9.16E-10	9.20E-10	9.20E-10
sr 86	4.40E-10	4.44E-10	4.48E-10	4.52E-10	4.56E-10	4.56E-10
cs137	3.97E-10	4.62E-10	4.62E-10	4.62E-10	4.62E-10	3.95E-10
sn116	3.56E-10	3.59E-10	3.63E-10	3.66E-10	3.69E-10	3.69E-10
te124	3.08E-10	3.11E-10	3.13E-10	3.15E-10	3.17E-10	3.17E-10
nb 94	1.62E-10	1.63E-10	1.65E-10	1.66E-10	1.68E-10	1.68E-10
te122	1.50E-10	1.52E-10	1.53E-10	1.54E-10	1.56E-10	1.56E-10
sr 87	1.48E-10	1.49E-10	1.50E-10	1.52E-10	1.53E-10	1.53E-10
se 76	1.22E-10	1.23E-10	1.24E-10	1.25E-10	1.26E-10	1.26E-10
er166	7.47E-11	7.51E-11	7.56E-11	7.60E-11	7.65E-11	7.65E-11
kr 80	7.03E-11	7.15E-11	7.27E-11	7.40E-11	7.53E-11	7.53E-11
cs134	6.38E-11	5.71E-10	5.74E-10	5.77E-10	5.80E-10	5.98E-11
ge 74	5.34E-11	5.37E-11	5.39E-11	5.42E-11	5.45E-11	5.45E-11
kr 85	4.47E-11	6.82E-11	6.82E-11	6.83E-11	6.83E-11	4.41E-11
ge 72	3.96E-11	3.98E-11	4.00E-11	4.02E-11	4.04E-11	4.04E-11
er167	9.51E-12	9.61E-12	9.72E-12	9.82E-12	9.93E-12	9.93E-12
te123	7.78E-12	7.88E-12	7.99E-12	8.10E-12	8.20E-12	8.20E-12
cd108	5.22E-12	5.33E-12	5.43E-12	5.54E-12	5.64E-12	5.64E-12
y 90	1.64E-12	1.93E-12	1.93E-12	1.93E-12	1.93E-12	1.64E-12
sb125	4.10E-13	2.14E-12	2.13E-12	2.13E-12	2.13E-12	3.85E-13
ce144	2.22E-13	7.22E-11	7.22E-11	7.23E-11	7.23E-11	1.79E-13
be 9	1.13E-13	1.13E-13	1.14E-13	1.14E-13	1.15E-13	1.15E-13
sn114	9.52E-14	9.61E-14	9.71E-14	9.80E-14	9.89E-14	9.89E-14
li 7	4.68E-14	4.70E-14	4.72E-14	4.74E-14	4.77E-14	4.77E-14
ru106	5.54E-14	4.66E-12	4.65E-12	4.64E-12	4.64E-12	4.65E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 245
0 fraction of total absorption rate

power= .00mw, burnup= 25470.mwd, flux= 2.96E+07n/cm**2-sec

	initial ******* d	******* d	******* d	******* d	******* d
sb126	1.85E-14	1.93E-14	1.93E-14	1.94E-14	1.94E-14	1.87E-14
cd109	7.36E-19	2.61E-17	2.66E-17	2.72E-17	2.76E-17	6.82E-19
te127m	3.00E-19	1.09E-12	1.09E-12	1.09E-12	1.09E-12	1.64E-19

power= 4.890E-04mw, burnup=2.5470E+04mwd, flux= 2.96E+07n/cm**2-sec

nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d	******* d
h 1	1.49E-03	1.50E-03	1.50E-03	1.51E-03	1.52E-03	1.52E-03
h 2	4.46E-06	4.48E-06	4.50E-06	4.52E-06	4.54E-06	4.54E-06
h 3	5.19E-12	7.49E-12	7.50E-12	7.51E-12	7.52E-12	5.14E-12
h 4	.00E+00	3.79E-36	3.80E-36	3.80E-36	3.81E-36	.00E+00
he 3	1.85E-08	1.86E-08	1.86E-08	1.86E-08	1.87E-08	1.87E-08
he 4	2.47E-04	2.49E-04	2.50E-04	2.51E-04	2.52E-04	2.52E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	2.97E-05	2.99E-05	3.00E-05	3.01E-05	3.03E-05	3.03E-05
ne 21	1.34E-08	1.35E-08	1.36E-08	1.37E-08	1.38E-08	1.38E-08
ne 22	1.96E-07	1.97E-07	1.98E-07	1.98E-07	1.99E-07	1.99E-07
ne 23	8.87E-31	8.86E-16	8.86E-16	8.87E-16	8.87E-16	8.87E-31
na 22	9.29E-13	5.25E-12	5.26E-12	5.26E-12	5.26E-12	8.69E-13
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.23E-24	3.23E-09	3.23E-09	3.23E-09	3.23E-09	3.23E-24
na 24m	5.31E-31	5.30E-16	5.30E-16	5.31E-16	5.31E-16	5.31E-31
na 25	4.83E-39	4.87E-24	4.91E-24	4.96E-24	5.00E-24	5.00E-39
mg 24	1.92E-01	1.93E-01	1.93E-01	1.94E-01	1.95E-01	1.95E-01
mg 25	1.38E-06	1.39E-06	1.41E-06	1.42E-06	1.43E-06	1.43E-06
mg 26	4.45E-06	4.47E-06	4.49E-06	4.51E-06	4.53E-06	4.53E-06
mg 27	2.65E-28	2.64E-13	2.64E-13	2.64E-13	2.65E-13	2.65E-28
mg 28	.00E+00	6.71E-26	6.72E-26	6.72E-26	6.73E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.39E-26	2.39E-11	2.39E-11	2.39E-11	2.39E-11	2.40E-26
al 29	3.94E-37	3.97E-22	4.01E-22	4.04E-22	4.08E-22	4.08E-37
al 30	.00E+00	1.28E-31	1.30E-31	1.32E-31	1.34E-31	.00E+00
si 28	5.58E-01	5.61E-01	5.63E-01	5.65E-01	5.68E-01	5.68E-01
si 29	1.26E-05	1.27E-05	1.28E-05	1.29E-05	1.30E-05	1.30E-05
si 30	3.03E-10	3.07E-10	3.11E-10	3.15E-10	3.20E-10	3.20E-10
si 31	2.71E-38	2.74E-23	2.78E-23	2.82E-23	2.86E-23	2.86E-38
si 32	5.76E-30	5.98E-30	6.08E-30	6.17E-30	6.26E-30	6.09E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
flux		2.96E+07	2.96E+07	2.96E+07	2.96E+07	2.96E-08

power= 4.890E-04mw, burnup=2.5470E+04mwd, flux= 2.96E+07n/cm**2-sec

nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d	******* d
he 4	5.82E+01	5.88E+01	5.94E+01	6.00E+01	6.06E+01	6.06E+01
pb206	4.14E-01	4.22E-01	4.30E-01	4.37E-01	4.45E-01	4.45E-01
pb207	2.43E-02	2.47E-02	2.51E-02	2.55E-02	2.59E-02	2.59E-02
pb208	8.51E-04	8.59E-04	8.66E-04	8.74E-04	8.82E-04	8.82E-04
pb209	1.40E-09	1.42E-09	1.43E-09	1.44E-09	1.46E-09	1.46E-09
pb210	3.94E-04	3.97E-04	4.00E-04	4.03E-04	4.06E-04	4.06E-04
pb211	6.15E-11	6.16E-11	6.19E-11	6.21E-11	6.24E-11	6.25E-11
pb212	2.04E-11	2.13E-11	2.14E-11	2.15E-11	2.16E-11	2.07E-11
pb214	9.00E-10	9.07E-10	9.14E-10	9.21E-10	9.27E-10	9.28E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

bi209	7.76E-02	7.92E-02	8.09E-02	8.26E-02	8.42E-02	8.43E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.42E-07	2.44E-07	2.46E-07	2.48E-07	2.50E-07	2.50E-07
bi211	3.65E-12	3.65E-12	3.67E-12	3.68E-12	3.70E-12	3.71E-12
bi212	1.93E-12	2.02E-12	2.03E-12	2.04E-12	2.05E-12	1.97E-12
bi213	3.28E-10	3.31E-10	3.34E-10	3.37E-10	3.41E-10	3.41E-10
bi214	6.68E-10	6.73E-10	6.79E-10	6.84E-10	6.89E-10	6.89E-10
po210	6.70E-06	6.74E-06	6.80E-06	6.85E-06	6.90E-06	6.90E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	4.03E-17	4.04E-17	4.05E-17	4.07E-17	4.09E-17	4.09E-17
po212	1.02E-22	1.06E-22	1.07E-22	1.07E-22	1.08E-22	1.03E-22
po213	4.93E-19	4.98E-19	5.02E-19	5.07E-19	5.12E-19	5.12E-19
po214	9.19E-17	9.26E-17	9.34E-17	9.41E-17	9.47E-17	9.48E-17
po215	5.05E-17	5.07E-17	5.09E-17	5.11E-17	5.13E-17	5.14E-17
po216	7.72E-17	8.06E-17	8.10E-17	8.14E-17	8.17E-17	7.84E-17
po218	1.04E-10	1.05E-10	1.06E-10	1.07E-10	1.07E-10	1.07E-10
rn218	3.50E-44	3.77E-29	3.79E-29	3.81E-29	3.83E-29	3.64E-44
rn219	1.12E-13	1.13E-13	1.13E-13	1.14E-13	1.14E-13	1.14E-13
rn220	2.96E-14	3.09E-14	3.11E-14	3.12E-14	3.13E-14	3.01E-14
rn222	1.85E-07	1.86E-07	1.88E-07	1.89E-07	1.91E-07	1.91E-07
ra222	3.83E-41	4.09E-26	4.11E-26	4.14E-26	4.16E-26	3.89E-41
ra223	2.80E-08	2.81E-08	2.82E-08	2.83E-08	2.85E-08	2.85E-08
ra224	1.68E-10	1.76E-10	1.77E-10	1.77E-10	1.78E-10	1.71E-10
ra225	1.53E-07	1.55E-07	1.56E-07	1.58E-07	1.59E-07	1.59E-07
ra226	2.83E-02	2.85E-02	2.87E-02	2.89E-02	2.91E-02	2.91E-02
ra228	1.46E-10	1.48E-10	1.49E-10	1.51E-10	1.52E-10	1.52E-10
ac225	1.04E-07	1.05E-07	1.06E-07	1.07E-07	1.08E-07	1.08E-07
ac227	1.95E-05	1.96E-05	1.96E-05	1.97E-05	1.98E-05	1.98E-05
ac228	1.79E-14	1.81E-14	1.82E-14	1.84E-14	1.86E-14	1.86E-14
th226	1.87E-39	2.00E-24	2.01E-24	2.02E-24	2.03E-24	1.90E-39
th227	4.53E-08	4.54E-08	4.56E-08	4.58E-08	4.59E-08	4.60E-08
th228	3.21E-08	3.36E-08	3.37E-08	3.39E-08	3.40E-08	3.26E-08
th229	2.98E-02	3.01E-02	3.04E-02	3.07E-02	3.10E-02	3.10E-02
th230	1.37E+00	1.38E+00	1.39E+00	1.40E+00	1.41E+00	1.41E+00
th231	2.71E-09	3.48E-09	3.48E-09	3.49E-09	3.49E-09	2.71E-09
th232	3.58E-01	3.62E-01	3.65E-01	3.69E-01	3.72E-01	3.72E-01
th233	4.06E-28	4.10E-13	4.14E-13	4.18E-13	4.23E-13	4.23E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.93E-02	2.94E-02	2.95E-02	2.96E-02	2.98E-02	2.98E-02
pa232	6.25E-26	6.27E-11	6.30E-11	6.33E-11	6.36E-11	6.36E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 248
power= 4.890E-04mw, burnup=2.5470E+04mwd, flux= 2.96E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.40E-06	1.40E-06	1.40E-06	1.39E-06	1.39E-06	1.39E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.81E-36	1.94E-21	1.95E-21	1.96E-21	1.97E-21	1.84E-36
u231	6.58E-32	6.63E-17	6.69E-17	6.74E-17	6.80E-17	6.80E-32
u232	1.14E-06	1.22E-06	1.23E-06	1.23E-06	1.24E-06	1.16E-06
u233	7.12E-01	7.18E-01	7.24E-01	7.30E-01	7.35E-01	7.35E-01
u234	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01
u235	6.55E+02	6.55E+02	6.54E+02	6.54E+02	6.54E+02	6.54E+02
u236	1.94E+02	1.94E+02	1.94E+02	1.95E+02	1.95E+02	1.95E+02
u237	3.34E-13	4.15E-07	4.15E-07	4.16E-07	4.16E-07	3.11E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.76E-23	3.76E-08	3.76E-08	3.76E-08	3.77E-08	3.77E-23

u240	3.26E-34	3.37E-34	3.48E-34	3.60E-34	3.71E-34	3.71E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.60E-14	1.02E-12	1.02E-12	1.02E-12	1.02E-12	1.36E-14
np236m	2.43E-28	2.43E-13	2.43E-13	2.43E-13	2.43E-13	2.43E-28
np236	2.61E-06	2.62E-06	2.62E-06	2.63E-06	2.63E-06	2.63E-06
np237	4.04E+01	4.04E+01	4.04E+01	4.03E+01	4.03E+01	4.03E+01
np238	4.64E-15	1.82E-07	1.82E-07	1.82E-07	1.82E-07	4.36E-15
np239	1.61E-13	5.43E-06	5.44E-06	5.44E-06	5.44E-06	1.57E-13
np240m	2.78E-36	2.87E-36	2.97E-36	3.07E-36	3.17E-36	3.17E-36
np240	3.26E-38	1.37E-16	1.37E-16	1.37E-16	1.37E-16	3.66E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	3.37E-11	1.38E-10	1.38E-10	1.38E-10	1.38E-10	3.22E-11
pu237	3.58E-29	3.12E-14	3.11E-14	3.09E-14	3.08E-14	3.17E-29
pu238	2.62E-03	2.75E-03	2.75E-03	2.75E-03	2.75E-03	2.61E-03
pu239	2.65E+01	2.63E+01	2.62E+01	2.60E+01	2.59E+01	2.59E+01
pu240	2.98E-01	2.93E-01	2.89E-01	2.85E-01	2.81E-01	2.81E-01
pu241	1.08E-05	1.46E-05	1.44E-05	1.42E-05	1.40E-05	1.01E-05
pu242	4.83E-05	4.83E-05	4.83E-05	4.84E-05	4.84E-05	4.84E-05
pu243	1.56E-29	1.25E-14	1.25E-14	1.25E-14	1.25E-14	1.57E-29
pu244	1.62E-23	1.68E-23	1.73E-23	1.79E-23	1.85E-23	1.85E-23
pu245	.00E+00	8.55E-35	8.84E-35	9.14E-35	9.44E-35	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.52E-35	1.48E-20	1.47E-20	1.45E-20	1.43E-20	1.43E-35
am240	6.93E-33	6.79E-18	6.71E-18	6.62E-18	6.53E-18	6.52E-33
am241	4.47E-04	4.39E-04	4.33E-04	4.27E-04	4.21E-04	4.21E-04
am242m	2.51E-08	2.53E-08	2.50E-08	2.47E-08	2.44E-08	2.36E-08
am242	3.23E-13	2.01E-12	1.99E-12	1.96E-12	1.94E-12	3.04E-13
am243	1.84E-07	1.83E-07	1.82E-07	1.81E-07	1.80E-07	1.80E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.71E-31	1.70E-16	1.69E-16	1.68E-16	1.67E-16	1.67E-31
am245	2.98E-40	1.68E-35	1.73E-35	1.79E-35	1.85E-35	2.54E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	1.45E-23	1.43E-23	1.41E-23	1.39E-23	.00E+00
cm242	6.53E-11	4.06E-10	4.02E-10	3.96E-10	3.91E-10	6.15E-11
cm243	1.00E-15	1.15E-15	1.13E-15	1.12E-15	1.11E-15	9.38E-16
cm244	2.09E-12	2.66E-12	2.65E-12	2.63E-12	2.62E-12	2.02E-12

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 249
power= 4.890E-04mw, burnup=2.5470E+04mwd, flux= 2.96E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d
cm245	7.87E-15	7.67E-15	7.48E-15	7.30E-15	7.13E-15	7.13E-15
cm246	5.89E-17	5.71E-17	5.54E-17	5.37E-17	5.21E-17	5.21E-17
cm247	8.87E-20	8.92E-20	8.96E-20	9.01E-20	9.05E-20	9.05E-20
cm248	4.70E-22	4.78E-22	4.86E-22	4.94E-22	5.02E-22	5.02E-22
cm249	.00E+00	1.84E-33	1.87E-33	1.91E-33	1.94E-33	.00E+00
cm250	1.82E-37	1.84E-37	1.85E-37	1.87E-37	1.88E-37	1.88E-37
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		2.96E+07	2.96E+07	2.96E+07	2.96E+07	2.96E-08

0 1q array has 20 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 3q array has 1 entries.
0 4q array has 1 entries.
0 54q array has 12 entries.
1library information...

cross-section data taken from position number 28 of library on unit 33.

```
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         pass   1
         pass   0
         *scale-system control module sas2 library*
         used a time-dependent neutron spectrum, for each of the above passes
           pass 0 applies start-up fuel densiities
           pass n applies mid time densities of nth library interval
         first library updated was...
         ********************************************************************************
         *                                                                              *
         *            prelim lwr origen-s binary working library--id = 1143             *
         *          made from modified card-image origen-s libraries of scale 4.2       *
         *       data from the light element, actinide, and fission product libraries   *
         *         decay data, including gamma and total energy, are from endf/b-vi     *
         *                                                                              *
         *       neutron flux spectrum factors and cross sections were produced from    *
         *      the "presas2" case updating all nuclides on the scale "burnup" library  *
         *                                                                              *
         *                    fission product yields are from endf/b-v                  *
         *                                                                              *
         *              photon libraries use an 18-energy-group structure               *
         *             the photon data are from the master photon data base,            *
         *              produced to include bremsstrahlung from uo2 matrix              *
         *                                                                              *
         *         see information above this box (if present) for later updates        *
         *                                                                              *
         ********************************************************************************
         *                                                                              *
0        ********************************************************************************
0                  .other identification and sizes of library.
0                   data set name:  ft33f001
0                 8/29/1996    date library was produced
0                      1697    total number of nuclides in library
                        689    number of light-element nuclides
                        129    number of actinide nuclides
                        879    number of fission product nuclides
0                      7993    number of nonzero off-diagonal matrix elements
0        ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page  250
         power=    .00mw, burnup=  25916.mwd, flux= 2.96E+07n/cm**2-sec
0                                    basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.278555E+06   1.277911E+06   1.277274E+06   1.276642E+06   1.276016E+06   1.276007E+06
     absorptions   1.043883E+06   1.043584E+06   1.043289E+06   1.042996E+06   1.042707E+06   1.042701E+06
     k infinity    1.224807E+00   1.224541E+00   1.224276E+00   1.224014E+00   1.223754E+00   1.223751E+00
0                    initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   1.023805E+06   1.023469E+06   1.023136E+06   1.022807E+06   1.022481E+06   1.022475E+06
     non-actinide
     abs. fracs.   1.923376E-02   1.927501E-02   1.931602E-02   1.935685E-02   1.939768E-02   1.939726E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2              fission products        page  251
0                              fraction of total absorption rate
```

power= .00mw, burnup= 25916.mwd, flux= 2.96E+07n/cm**2-sec

	initial	******* d	******* d	******* d	******* d	******* d
sm149	5.43E-03	5.43E-03	5.43E-03	5.43E-03	5.43E-03	5.43E-03
nd143	2.47E-03	2.49E-03	2.50E-03	2.51E-03	2.52E-03	2.52E-03
eu151	2.03E-03	2.03E-03	2.03E-03	2.04E-03	2.04E-03	2.04E-03
rh103	1.21E-03	1.21E-03	1.22E-03	1.22E-03	1.23E-03	1.23E-03
xe131	8.04E-04	8.07E-04	8.11E-04	8.15E-04	8.18E-04	8.18E-04
cs133	6.27E-04	6.30E-04	6.33E-04	6.36E-04	6.39E-04	6.39E-04
sm147	4.59E-04	4.61E-04	4.63E-04	4.65E-04	4.67E-04	4.67E-04
tc 99	4.04E-04	4.05E-04	4.06E-04	4.07E-04	4.09E-04	4.09E-04
nd145	3.54E-04	3.56E-04	3.57E-04	3.59E-04	3.61E-04	3.61E-04
sm152	2.84E-04	2.86E-04	2.87E-04	2.89E-04	2.90E-04	2.90E-04
mo 95	2.46E-04	2.47E-04	2.48E-04	2.49E-04	2.50E-04	2.50E-04
gd155	2.24E-04	2.24E-04	2.24E-04	2.23E-04	2.23E-04	2.23E-04
sm150	1.88E-04	1.89E-04	1.90E-04	1.91E-04	1.92E-04	1.92E-04
kr 83	1.51E-04	1.52E-04	1.52E-04	1.53E-04	1.54E-04	1.54E-04
cs135	1.42E-04	1.43E-04	1.43E-04	1.44E-04	1.44E-04	1.44E-04
eu153	1.17E-04	1.17E-04	1.18E-04	1.18E-04	1.19E-04	1.19E-04
ru101	1.10E-04	1.11E-04	1.11E-04	1.12E-04	1.12E-04	1.12E-04
pr141	1.07E-04	1.07E-04	1.08E-04	1.08E-04	1.09E-04	1.09E-04
cd113	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04
la139	8.72E-05	8.76E-05	8.80E-05	8.84E-05	8.88E-05	8.88E-05
gd157	5.79E-05	5.78E-05	5.77E-05	5.75E-05	5.74E-05	5.74E-05
ag109	4.60E-05	4.62E-05	4.64E-05	4.66E-05	4.69E-05	4.69E-05
pd105	4.49E-05	4.51E-05	4.54E-05	4.56E-05	4.58E-05	4.58E-05
ba137	4.23E-05	4.25E-05	4.27E-05	4.29E-05	4.31E-05	4.31E-05
zr 93	3.38E-05	3.39E-05	3.41E-05	3.42E-05	3.44E-05	3.44E-05
i129	2.87E-05	2.88E-05	2.89E-05	2.91E-05	2.92E-05	2.92E-05
nd144	2.72E-05	2.73E-05	2.75E-05	2.76E-05	2.77E-05	2.77E-05
gd152	2.51E-05	2.52E-05	2.54E-05	2.56E-05	2.58E-05	2.58E-05
mo 97	1.98E-05	1.99E-05	2.00E-05	2.01E-05	2.02E-05	2.02E-05
pd108	1.10E-05	1.11E-05	1.11E-05	1.12E-05	1.12E-05	1.12E-05
ru 99	8.97E-06	9.10E-06	9.24E-06	9.37E-06	9.50E-06	9.51E-06
zr 91	9.08E-06	9.13E-06	9.17E-06	9.21E-06	9.25E-06	9.25E-06
y 89	8.69E-06	8.73E-06	8.77E-06	8.81E-06	8.85E-06	8.85E-06
ru102	8.31E-06	8.35E-06	8.39E-06	8.43E-06	8.47E-06	8.47E-06
ce142	7.28E-06	7.31E-06	7.34E-06	7.38E-06	7.41E-06	7.41E-06
nd148	6.99E-06	7.03E-06	7.06E-06	7.09E-06	7.13E-06	7.13E-06
sm151	6.61E-06	6.97E-06	6.97E-06	6.98E-06	6.98E-06	6.61E-06
nd146	5.92E-06	5.94E-06	5.97E-06	6.00E-06	6.03E-06	6.03E-06
pd107	5.56E-06	5.58E-06	5.61E-06	5.64E-06	5.67E-06	5.67E-06
in115	5.18E-06	5.20E-06	5.22E-06	5.25E-06	5.27E-06	5.27E-06
ba138	5.03E-06	5.06E-06	5.08E-06	5.10E-06	5.13E-06	5.13E-06
ce140	4.71E-06	4.73E-06	4.76E-06	4.78E-06	4.80E-06	4.80E-06
xe132	4.33E-06	4.35E-06	4.37E-06	4.39E-06	4.41E-06	4.41E-06
mo 98	2.87E-06	2.89E-06	2.90E-06	2.91E-06	2.93E-06	2.93E-06
mo100	2.81E-06	2.82E-06	2.84E-06	2.85E-06	2.86E-06	2.86E-06
xe134	2.78E-06	2.80E-06	2.81E-06	2.82E-06	2.84E-06	2.84E-06
zr 92	2.20E-06	2.21E-06	2.22E-06	2.23E-06	2.24E-06	2.24E-06
i127	2.10E-06	2.11E-06	2.12E-06	2.13E-06	2.14E-06	2.14E-06
ru104	1.92E-06	1.93E-06	1.94E-06	1.95E-06	1.96E-06	1.96E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 252

0 fraction of total absorption rate

power= .00mw, burnup= 25916.mwd, flux= 2.96E+07n/cm**2-sec

	initial	******* d	******* d	******* d	******* d	******* d
zr 96	1.71E-06	1.72E-06	1.73E-06	1.74E-06	1.75E-06	1.75E-06
nd150	1.59E-06	1.59E-06	1.60E-06	1.61E-06	1.61E-06	1.61E-06
xe136	1.51E-06	1.52E-06	1.52E-06	1.53E-06	1.54E-06	1.54E-06

gd154	1.30E-06	1.31E-06	1.33E-06	1.34E-06	1.35E-06	1.35E-06
cd111	1.25E-06	1.25E-06	1.26E-06	1.27E-06	1.27E-06	1.27E-06
br 81	1.11E-06	1.12E-06	1.12E-06	1.13E-06	1.13E-06	1.13E-06
rb 85	1.06E-06	1.07E-06	1.07E-06	1.08E-06	1.08E-06	1.08E-06
ba135	9.33E-07	9.48E-07	9.62E-07	9.77E-07	9.92E-07	9.92E-07
zr 94	9.28E-07	9.32E-07	9.37E-07	9.41E-07	9.45E-07	9.45E-07
zr 90	8.57E-07	8.61E-07	8.64E-07	8.68E-07	8.72E-07	8.72E-07
sm154	7.53E-07	7.56E-07	7.60E-07	7.63E-07	7.67E-07	7.67E-07
te130	6.98E-07	7.01E-07	7.04E-07	7.08E-07	7.11E-07	7.11E-07
rb 87	6.12E-07	6.15E-07	6.17E-07	6.20E-07	6.23E-07	6.23E-07
pd106	4.64E-07	4.66E-07	4.68E-07	4.71E-07	4.73E-07	4.73E-07
se 77	4.50E-07	4.52E-07	4.54E-07	4.56E-07	4.58E-07	4.58E-07
gd156	4.44E-07	4.47E-07	4.49E-07	4.51E-07	4.54E-07	4.54E-07
ru100	3.44E-07	3.47E-07	3.50E-07	3.53E-07	3.56E-07	3.56E-07
kr 84	2.92E-07	2.93E-07	2.94E-07	2.96E-07	2.97E-07	2.97E-07
dy161	2.75E-07	2.76E-07	2.77E-07	2.79E-07	2.80E-07	2.80E-07
nd142	2.56E-07	2.58E-07	2.61E-07	2.63E-07	2.66E-07	2.66E-07
ba134	2.44E-07	2.46E-07	2.48E-07	2.50E-07	2.52E-07	2.53E-07
sb121	2.39E-07	2.41E-07	2.42E-07	2.43E-07	2.44E-07	2.44E-07
sm148	2.21E-07	2.23E-07	2.25E-07	2.27E-07	2.29E-07	2.29E-07
se 79	2.15E-07	2.16E-07	2.17E-07	2.18E-07	2.18E-07	2.18E-07
sb123	1.93E-07	1.94E-07	1.95E-07	1.96E-07	1.97E-07	1.97E-07
pd104	1.67E-07	1.68E-07	1.70E-07	1.71E-07	1.73E-07	1.73E-07
kr 86	1.63E-07	1.63E-07	1.64E-07	1.65E-07	1.66E-07	1.66E-07
te128	1.58E-07	1.58E-07	1.59E-07	1.60E-07	1.61E-07	1.61E-07
nb 93	1.48E-07	1.50E-07	1.53E-07	1.55E-07	1.57E-07	1.57E-07
tb159	1.18E-07	1.19E-07	1.20E-07	1.20E-07	1.21E-07	1.21E-07
se 80	1.08E-07	1.08E-07	1.09E-07	1.09E-07	1.10E-07	1.10E-07
te125	1.08E-07	1.08E-07	1.09E-07	1.09E-07	1.10E-07	1.10E-07
gd158	9.35E-08	9.39E-08	9.44E-08	9.49E-08	9.53E-08	9.53E-08
cd112	8.39E-08	8.43E-08	8.47E-08	8.51E-08	8.55E-08	8.55E-08
ag107	7.52E-08	7.65E-08	7.78E-08	7.90E-08	8.03E-08	8.03E-08
br 79	7.30E-08	7.41E-08	7.52E-08	7.63E-08	7.74E-08	7.75E-08
dy162	6.49E-08	6.53E-08	6.57E-08	6.60E-08	6.64E-08	6.64E-08
cd110	6.34E-08	6.41E-08	6.47E-08	6.54E-08	6.61E-08	6.61E-08
dy164	6.10E-08	6.13E-08	6.15E-08	6.18E-08	6.20E-08	6.20E-08
sn117	5.88E-08	5.91E-08	5.94E-08	5.97E-08	6.00E-08	6.00E-08
mo 96	5.52E-08	5.57E-08	5.62E-08	5.67E-08	5.72E-08	5.72E-08
li 6	5.49E-08	5.51E-08	5.54E-08	5.56E-08	5.58E-08	5.58E-08
cd114	5.01E-08	5.03E-08	5.06E-08	5.08E-08	5.11E-08	5.11E-08
xe129	4.51E-08	4.58E-08	4.66E-08	4.73E-08	4.80E-08	4.80E-08
eu152	4.65E-08	6.63E-08	6.65E-08	6.66E-08	6.68E-08	4.64E-08
sn119	4.47E-08	4.49E-08	4.51E-08	4.53E-08	4.56E-08	4.56E-08
pd110	4.16E-08	4.18E-08	4.20E-08	4.22E-08	4.24E-08	4.24E-08
sn115	4.09E-08	4.11E-08	4.13E-08	4.15E-08	4.17E-08	4.17E-08
sr 88	2.98E-08	3.00E-08	3.01E-08	3.02E-08	3.04E-08	3.04E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 253
0 fraction of total absorption rate
power= .00mw, burnup= 25916.mwd, flux= 2.96E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

xe130	2.70E-08	2.72E-08	2.74E-08	2.77E-08	2.79E-08	2.79E-08
te126	2.39E-08	2.43E-08	2.46E-08	2.50E-08	2.53E-08	2.53E-08
ba136	2.23E-08	2.25E-08	2.26E-08	2.28E-08	2.30E-08	2.30E-08
se 82	2.05E-08	2.06E-08	2.07E-08	2.08E-08	2.09E-08	2.09E-08
dy163	1.62E-08	1.63E-08	1.64E-08	1.65E-08	1.66E-08	1.66E-08
kr 82	1.61E-08	1.62E-08	1.63E-08	1.64E-08	1.65E-08	1.65E-08
sn126	1.63E-08	1.63E-08	1.64E-08	1.64E-08	1.64E-08	1.64E-08
se 78	1.61E-08	1.62E-08	1.63E-08	1.63E-08	1.64E-08	1.64E-08
sn124	1.41E-08	1.42E-08	1.43E-08	1.43E-08	1.44E-08	1.44E-08

as 75	9.45E-09	9.50E-09	9.54E-09	9.59E-09	9.63E-09	9.63E-09
in113	8.14E-09	8.18E-09	8.22E-09	8.26E-09	8.30E-09	8.30E-09
eu155	8.12E-09	2.21E-08	2.21E-08	2.20E-08	2.20E-08	7.80E-09
sn118	5.69E-09	5.72E-09	5.74E-09	5.77E-09	5.80E-09	5.80E-09
pm147	5.62E-09	3.31E-08	3.31E-08	3.31E-08	3.31E-08	5.26E-09
sn122	4.92E-09	4.94E-09	4.97E-09	4.99E-09	5.01E-09	5.01E-09
cd116	4.78E-09	4.81E-09	4.83E-09	4.85E-09	4.87E-09	4.87E-09
sn120	3.61E-09	3.63E-09	3.65E-09	3.67E-09	3.68E-09	3.68E-09
eu154	3.52E-09	6.10E-09	6.13E-09	6.17E-09	6.20E-09	3.52E-09
ge 73	2.72E-09	2.74E-09	2.75E-09	2.76E-09	2.77E-09	2.77E-09
dy160	1.69E-09	1.71E-09	1.72E-09	1.74E-09	1.76E-09	1.76E-09
sr 90	1.72E-09	2.03E-09	2.03E-09	2.03E-09	2.03E-09	1.71E-09
ho165	1.64E-09	1.66E-09	1.67E-09	1.68E-09	1.69E-09	1.69E-09
gd160	1.33E-09	1.33E-09	1.34E-09	1.35E-09	1.35E-09	1.35E-09
xe128	9.81E-10	9.90E-10	9.99E-10	1.01E-09	1.02E-09	1.02E-09
ge 76	9.20E-10	9.24E-10	9.29E-10	9.33E-10	9.37E-10	9.37E-10
sr 86	4.56E-10	4.60E-10	4.64E-10	4.68E-10	4.72E-10	4.72E-10
cs137	3.95E-10	4.62E-10	4.62E-10	4.62E-10	4.63E-10	3.93E-10
sn116	3.69E-10	3.73E-10	3.76E-10	3.80E-10	3.83E-10	3.83E-10
te124	3.18E-10	3.20E-10	3.22E-10	3.24E-10	3.27E-10	3.27E-10
nb 94	1.68E-10	1.70E-10	1.71E-10	1.73E-10	1.75E-10	1.75E-10
te122	1.56E-10	1.57E-10	1.59E-10	1.60E-10	1.62E-10	1.62E-10
sr 87	1.53E-10	1.54E-10	1.55E-10	1.56E-10	1.57E-10	1.57E-10
se 76	1.26E-10	1.27E-10	1.28E-10	1.29E-10	1.30E-10	1.30E-10
kr 80	7.53E-11	7.66E-11	7.79E-11	7.92E-11	8.06E-11	8.06E-11
er166	7.65E-11	7.69E-11	7.74E-11	7.78E-11	7.83E-11	7.83E-11
cs134	5.98E-11	5.83E-10	5.85E-10	5.88E-10	5.91E-10	5.60E-11
ge 74	5.45E-11	5.47E-11	5.50E-11	5.52E-11	5.55E-11	5.55E-11
kr 85	4.41E-11	6.83E-11	6.84E-11	6.84E-11	6.84E-11	4.35E-11
ge 72	4.04E-11	4.06E-11	4.08E-11	4.10E-11	4.12E-11	4.12E-11
er167	9.93E-12	1.00E-11	1.01E-11	1.03E-11	1.04E-11	1.04E-11
te123	8.20E-12	8.31E-12	8.42E-12	8.53E-12	8.65E-12	8.65E-12
cd108	5.65E-12	5.76E-12	5.87E-12	5.98E-12	6.10E-12	6.10E-12
y 90	1.64E-12	1.93E-12	1.94E-12	1.94E-12	1.94E-12	1.63E-12
sb125	3.85E-13	2.13E-12	2.13E-12	2.13E-12	2.13E-12	3.60E-13
ce144	1.79E-13	7.23E-11	7.24E-11	7.24E-11	7.24E-11	1.43E-13
be 9	1.15E-13	1.15E-13	1.16E-13	1.16E-13	1.17E-13	1.17E-13
sn114	9.90E-14	9.99E-14	1.01E-13	1.02E-13	1.03E-13	1.03E-13
li 7	4.77E-14	4.79E-14	4.81E-14	4.84E-14	4.86E-14	4.86E-14
ru106	4.64E-14	4.63E-12	4.62E-12	4.61E-12	4.61E-12	3.88E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 254
0 fraction of total absorption rate
power= .00mw, burnup= 25916.mwd, flux= 2.96E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.87E-14	1.94E-14	1.95E-14	1.95E-14	1.95E-14	1.88E-14
cd109	6.81E-19	2.82E-17	2.87E-17	2.93E-17	2.99E-17	6.55E-19
te127m	1.64E-19	1.08E-12	1.08E-12	1.08E-12	1.08E-12	8.19E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 255
power= 4.890E-04mw, burnup=2.5916E+04mwd, flux= 2.96E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
h 1	1.52E-03	1.52E-03	1.53E-03	1.54E-03	1.54E-03	1.54E-03
h 2	4.54E-06	4.56E-06	4.58E-06	4.60E-06	4.62E-06	4.62E-06
h 3	5.14E-12	7.52E-12	7.53E-12	7.54E-12	7.55E-12	5.09E-12
h 4	.00E+00	3.81E-36	3.82E-36	3.83E-36	3.83E-36	.00E+00
he 3	1.87E-08	1.87E-08	1.88E-08	1.88E-08	1.88E-08	1.88E-08
he 4	2.52E-04	2.53E-04	2.54E-04	2.55E-04	2.56E-04	2.56E-04

he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	3.03E-05	3.04E-05	3.05E-05	3.07E-05	3.08E-05	3.08E-05
ne 21	1.38E-08	1.39E-08	1.41E-08	1.42E-08	1.43E-08	1.43E-08
ne 22	1.99E-07	2.00E-07	2.01E-07	2.02E-07	2.03E-07	2.03E-07
ne 23	8.87E-31	8.86E-16	8.87E-16	8.87E-16	8.87E-16	8.87E-31
na 22	8.69E-13	5.26E-12	5.26E-12	5.26E-12	5.26E-12	8.13E-13
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.23E-24	3.23E-09	3.23E-09	3.23E-09	3.23E-09	3.23E-24
na 24m	5.31E-31	5.31E-16	5.31E-16	5.31E-16	5.31E-16	5.31E-31
na 25	5.00E-39	5.04E-24	5.09E-24	5.13E-24	5.18E-24	5.18E-39
mg 24	1.95E-01	1.96E-01	1.97E-01	1.98E-01	1.98E-01	1.98E-01
mg 25	1.43E-06	1.44E-06	1.46E-06	1.47E-06	1.48E-06	1.48E-06
mg 26	4.53E-06	4.55E-06	4.57E-06	4.59E-06	4.61E-06	4.61E-06
mg 27	2.65E-28	2.64E-13	2.64E-13	2.65E-13	2.65E-13	2.65E-28
mg 28	.00E+00	6.73E-26	6.73E-26	6.74E-26	6.74E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.40E-26	2.39E-11	2.39E-11	2.40E-11	2.40E-11	2.40E-26
al 29	4.08E-37	4.11E-22	4.15E-22	4.19E-22	4.23E-22	4.23E-37
al 30	.00E+00	1.35E-31	1.37E-31	1.39E-31	1.41E-31	.00E+00
si 28	5.68E-01	5.70E-01	5.73E-01	5.75E-01	5.78E-01	5.78E-01
si 29	1.30E-05	1.32E-05	1.33E-05	1.34E-05	1.35E-05	1.35E-05
si 30	3.20E-10	3.24E-10	3.28E-10	3.32E-10	3.37E-10	3.37E-10
si 31	2.86E-38	2.90E-23	2.94E-23	2.98E-23	3.02E-23	3.02E-38
si 32	6.09E-30	6.33E-30	6.44E-30	6.53E-30	6.62E-30	6.43E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		2.96E+07	2.96E+07	2.97E+07	2.97E+07	2.97E-08

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 256

power= 4.890E-04mw, burnup=2.5916E+04mwd, flux= 2.96E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
he 4	6.06E+01	6.12E+01	6.18E+01	6.24E+01	6.30E+01	6.30E+01
pb206	4.45E-01	4.53E-01	4.61E-01	4.70E-01	4.78E-01	4.78E-01
pb207	2.59E-02	2.63E-02	2.67E-02	2.71E-02	2.75E-02	2.75E-02
pb208	8.82E-04	8.90E-04	8.97E-04	9.05E-04	9.13E-04	9.13E-04
pb209	1.46E-09	1.47E-09	1.49E-09	1.50E-09	1.51E-09	1.51E-09
pb210	4.06E-04	4.09E-04	4.12E-04	4.15E-04	4.18E-04	4.18E-04
pb211	6.25E-11	6.26E-11	6.29E-11	6.31E-11	6.34E-11	6.35E-11
pb212	2.07E-11	2.17E-11	2.18E-11	2.19E-11	2.20E-11	2.10E-11
pb214	9.28E-10	9.34E-10	9.41E-10	9.48E-10	9.54E-10	9.54E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	8.43E-02	8.60E-02	8.77E-02	8.94E-02	9.12E-02	9.12E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.50E-07	2.52E-07	2.53E-07	2.55E-07	2.57E-07	2.57E-07
bi211	3.71E-12	3.71E-12	3.73E-12	3.74E-12	3.76E-12	3.76E-12
bi212	1.97E-12	2.06E-12	2.07E-12	2.08E-12	2.08E-12	2.00E-12
bi213	3.41E-10	3.44E-10	3.47E-10	3.51E-10	3.54E-10	3.54E-10
bi214	6.89E-10	6.94E-10	6.99E-10	7.04E-10	7.09E-10	7.09E-10
po210	6.90E-06	6.95E-06	7.00E-06	7.05E-06	7.10E-06	7.10E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	4.09E-17	4.10E-17	4.12E-17	4.14E-17	4.15E-17	4.16E-17
po212	1.03E-22	1.08E-22	1.09E-22	1.09E-22	1.10E-22	1.05E-22
po213	5.12E-19	5.17E-19	5.22E-19	5.27E-19	5.32E-19	5.32E-19
po214	9.48E-17	9.54E-17	9.61E-17	9.68E-17	9.75E-17	9.75E-17
po215	5.14E-17	5.15E-17	5.17E-17	5.19E-17	5.21E-17	5.22E-17
po216	7.84E-17	8.21E-17	8.25E-17	8.28E-17	8.32E-17	7.96E-17
po218	1.07E-10	1.08E-10	1.09E-10	1.10E-10	1.10E-10	1.10E-10
rn218	3.64E-44	3.84E-29	3.86E-29	3.88E-29	3.90E-29	3.64E-44
rn219	1.14E-13	1.15E-13	1.15E-13	1.15E-13	1.16E-13	1.16E-13

rn220	3.01E-14	3.15E-14	3.16E-14	3.18E-14	3.19E-14	3.05E-14
rn222	1.91E-07	1.92E-07	1.93E-07	1.95E-07	1.96E-07	1.96E-07
ra222	3.89E-41	4.17E-26	4.19E-26	4.21E-26	4.23E-26	3.95E-41
ra223	2.85E-08	2.86E-08	2.87E-08	2.88E-08	2.89E-08	2.90E-08
ra224	1.71E-10	1.79E-10	1.80E-10	1.81E-10	1.81E-10	1.74E-10
ra225	1.59E-07	1.61E-07	1.62E-07	1.64E-07	1.65E-07	1.65E-07
ra226	2.91E-02	2.93E-02	2.96E-02	2.98E-02	3.00E-02	3.00E-02
ra228	1.52E-10	1.54E-10	1.55E-10	1.57E-10	1.58E-10	1.58E-10
ac225	1.08E-07	1.09E-07	1.10E-07	1.11E-07	1.12E-07	1.12E-07
ac227	1.98E-05	1.99E-05	1.99E-05	2.00E-05	2.01E-05	2.01E-05
ac228	1.86E-14	1.88E-14	1.90E-14	1.91E-14	1.93E-14	1.93E-14
th226	1.90E-39	2.03E-24	2.04E-24	2.05E-24	2.06E-24	1.93E-39
th227	4.60E-08	4.61E-08	4.63E-08	4.65E-08	4.67E-08	4.67E-08
th228	3.26E-08	3.42E-08	3.43E-08	3.45E-08	3.46E-08	3.31E-08
th229	3.10E-02	3.13E-02	3.16E-02	3.19E-02	3.22E-02	3.22E-02
th230	1.41E+00	1.42E+00	1.43E+00	1.44E+00	1.45E+00	1.45E+00
th231	2.71E-09	3.50E-09	3.50E-09	3.51E-09	3.51E-09	2.71E-09
th232	3.72E-01	3.76E-01	3.80E-01	3.83E-01	3.87E-01	3.87E-01
th233	4.23E-28	4.27E-13	4.31E-13	4.35E-13	4.40E-13	4.40E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.98E-02	2.99E-02	3.00E-02	3.01E-02	3.02E-02	3.02E-02
pa232	6.36E-26	6.39E-11	6.41E-11	6.44E-11	6.47E-11	6.47E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 257
power= 4.890E-04mw, burnup=2.5916E+04mwd, flux= 2.96E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.39E-06	1.39E-06	1.39E-06	1.39E-06	1.39E-06	1.39E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.84E-36	1.97E-21	1.98E-21	1.99E-21	2.00E-21	1.87E-36
u231	6.80E-32	6.84E-17	6.90E-17	6.95E-17	7.01E-17	7.01E-32
u232	1.16E-06	1.25E-06	1.25E-06	1.26E-06	1.26E-06	1.18E-06
u233	7.35E-01	7.41E-01	7.47E-01	7.52E-01	7.58E-01	7.58E-01
u234	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01
u235	6.54E+02	6.54E+02	6.54E+02	6.54E+02	6.54E+02	6.54E+02
u236	1.95E+02	1.95E+02	1.95E+02	1.95E+02	1.95E+02	1.95E+02
u237	3.11E-13	4.16E-07	4.16E-07	4.17E-07	4.17E-07	2.92E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.77E-23	3.76E-08	3.77E-08	3.77E-08	3.77E-08	3.77E-23
u240	3.71E-34	3.83E-34	3.95E-34	4.08E-34	4.20E-34	4.20E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.36E-14	1.02E-12	1.02E-12	1.02E-12	1.02E-12	1.16E-14
np236m	2.43E-28	2.43E-13	2.43E-13	2.43E-13	2.43E-13	2.43E-28
np236	2.63E-06	2.64E-06	2.64E-06	2.64E-06	2.65E-06	2.65E-06
np237	4.03E+01	4.03E+01	4.03E+01	4.03E+01	4.03E+01	4.03E+01
np238	4.36E-15	1.82E-07	1.82E-07	1.82E-07	1.82E-07	4.14E-15
np239	1.57E-13	5.44E-06	5.44E-06	5.44E-06	5.45E-06	1.54E-13
np240m	3.17E-36	3.27E-36	3.37E-36	3.48E-36	3.58E-36	3.59E-36
np240	3.66E-38	1.37E-16	1.37E-16	1.37E-16	1.37E-16	4.08E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	3.22E-11	1.38E-10	1.38E-10	1.38E-10	1.38E-10	3.06E-11
pu237	3.17E-29	3.06E-14	3.05E-14	3.03E-14	3.02E-14	3.03E-29
pu238	2.61E-03	2.75E-03	2.75E-03	2.75E-03	2.76E-03	2.61E-03
pu239	2.59E+01	2.57E+01	2.56E+01	2.54E+01	2.53E+01	2.53E+01
pu240	2.81E-01	2.77E-01	2.73E-01	2.70E-01	2.67E-01	2.66E-01
pu241	1.01E-05	1.38E-05	1.36E-05	1.35E-05	1.33E-05	9.48E-06
pu242	4.84E-05	4.84E-05	4.84E-05	4.84E-05	4.85E-05	4.85E-05

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     pu243   1.57E-29  1.25E-14  1.25E-14  1.25E-14  1.25E-14  1.58E-29
     pu244   1.85E-23  1.91E-23  1.97E-23  2.03E-23  2.09E-23  2.09E-23
     pu245    .00E+00  9.75E-35  1.01E-34  1.04E-34  1.07E-34   .00E+00
     pu246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am239   1.43E-35  1.40E-20  1.39E-20  1.37E-20  1.36E-20  1.35E-35
     am240   6.52E-33  6.41E-18  6.34E-18  6.27E-18  6.20E-18  6.19E-33
     am241   4.21E-04  4.14E-04  4.09E-04  4.05E-04  4.00E-04  3.99E-04
     am242m  2.36E-08  2.39E-08  2.37E-08  2.34E-08  2.32E-08  2.24E-08
     am242   3.04E-13  1.90E-12  1.88E-12  1.86E-12  1.84E-12  2.89E-13
     am243   1.80E-07  1.79E-07  1.78E-07  1.77E-07  1.76E-07  1.76E-07
     am244m   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     am244   1.67E-31  1.66E-16  1.65E-16  1.64E-16  1.64E-16  1.63E-31
     am245   2.54E-40  1.91E-35  1.97E-35  2.03E-35  2.10E-35  2.24E-40
     am246    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
     cm241    .00E+00  1.37E-23  1.35E-23  1.34E-23  1.32E-23   .00E+00
     cm242   6.15E-11  3.84E-10  3.80E-10  3.76E-10  3.72E-10  5.83E-11
     cm243   9.38E-16  1.09E-15  1.07E-15  1.06E-15  1.05E-15  8.87E-16
     cm244   2.02E-12  2.60E-12  2.59E-12  2.58E-12  2.57E-12  1.96E-12
1
     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                    actinides        page  258
       power= 4.890E-04mw, burnup=2.5916E+04mwd, flux= 2.96E+07n/cm**2-sec
0                                          nuclide concentrations, gram atoms
                                           basis = single reactor assembly
            charge ******* d ******* d ******* d ******* d ******* d
     cm245   7.13E-15  6.96E-15  6.80E-15  6.66E-15  6.51E-15  6.51E-15
     cm246   5.21E-17  5.06E-17  4.91E-17  4.77E-17  4.64E-17  4.63E-17
     cm247   9.05E-20  9.09E-20  9.12E-20  9.16E-20  9.20E-20  9.20E-20
     cm248   5.02E-22  5.11E-22  5.19E-22  5.27E-22  5.35E-22  5.35E-22
     cm249    .00E+00  1.97E-33  2.00E-33  2.03E-33  2.07E-33   .00E+00
     cm250   1.88E-37  1.90E-37  1.91E-37  1.93E-37  1.95E-37  1.95E-37
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              2.96E+07  2.96E+07  2.97E+07  2.97E+07  2.97E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number 29 of library on unit 33.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr origen-s binary working library--id = 1143             *
```

```
          *        made from modified card-image origen-s libraries of scale 4.2        *
          *      data from the light element, actinide, and fission product libraries    *
          *        decay data, including gamma and total energy, are from endf/b-vi      *
          *                                                                              *
          *      neutron flux spectrum factors and cross sections were produced from     *
          *     the "presas2" case updating all nuclides on the scale "burnup" library   *
          *                                                                              *
          *                    fission product yields are from endf/b-v                  *
          *                                                                              *
          *              photon libraries use an 18-energy-group structure               *
          *             the photon data are from the master photon data base,            *
          *              produced to include bremsstrahlung from uo2 matrix              *
          *                                                                              *
          *        see information above this box (if present) for later updates         *
          *                                                                              *
          ********************************************************************************
          *                                                                              *
0         ********************************************************************************
0                    .other identification and sizes of library.
0                     data set name:  ft33f001
0                   8/29/1996    date library was produced
0                        1697    total number of nuclides in library
                          689    number of light-element nuclides
                          129    number of actinide nuclides
                          879    number of fission product nuclides
0                        7993    number of nonzero off-diagonal matrix elements
0         ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page  259
         power=    .00mw, burnup=  26363.mwd, flux= 2.97E+07n/cm**2-sec
0                                      basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                     initial      ******* d      ******* d      ******* d      ******* d      ******* d
     productions   1.276652E+06   1.276031E+06   1.275415E+06   1.274805E+06   1.274199E+06   1.274190E+06
     absorptions   1.042930E+06   1.042643E+06   1.042360E+06   1.042079E+06   1.041801E+06   1.041795E+06
     k infinity    1.224102E+00   1.223842E+00   1.223584E+00   1.223328E+00   1.223074E+00   1.223072E+00
0                     initial      ******* d      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   1.022700E+06   1.022376E+06   1.022056E+06   1.021739E+06   1.021425E+06   1.021419E+06
     non-actinide
     abs. fracs.   1.939762E-02   1.943815E-02   1.947886E-02   1.951891E-02   1.955897E-02   1.955867E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                fission products   page  260
0                              fraction of total absorption rate
         power=    .00mw, burnup=  26363.mwd, flux= 2.97E+07n/cm**2-sec
0                initial ******* d ******* d ******* d ******* d ******* d

     sm149     5.43E-03  5.43E-03  5.43E-03  5.43E-03  5.43E-03  5.43E-03
     nd143     2.52E-03  2.53E-03  2.54E-03  2.55E-03  2.56E-03  2.56E-03
     eu151     2.04E-03  2.05E-03  2.05E-03  2.05E-03  2.06E-03  2.06E-03
     rh103     1.23E-03  1.23E-03  1.24E-03  1.24E-03  1.25E-03  1.25E-03
     xe131     8.18E-04  8.22E-04  8.25E-04  8.29E-04  8.33E-04  8.33E-04
     cs133     6.38E-04  6.41E-04  6.44E-04  6.47E-04  6.50E-04  6.50E-04
     sm147     4.67E-04  4.69E-04  4.71E-04  4.73E-04  4.75E-04  4.75E-04
     tc 99     4.09E-04  4.10E-04  4.11E-04  4.12E-04  4.14E-04  4.14E-04
     nd145     3.61E-04  3.62E-04  3.64E-04  3.66E-04  3.67E-04  3.67E-04
     sm152     2.90E-04  2.92E-04  2.93E-04  2.95E-04  2.96E-04  2.96E-04
     mo 95     2.50E-04  2.51E-04  2.52E-04  2.53E-04  2.55E-04  2.55E-04
     gd155     2.23E-04  2.23E-04  2.22E-04  2.22E-04  2.22E-04  2.22E-04
     sm150     1.92E-04  1.93E-04  1.94E-04  1.95E-04  1.96E-04  1.96E-04
     kr 83     1.54E-04  1.55E-04  1.55E-04  1.56E-04  1.57E-04  1.57E-04
     cs135     1.44E-04  1.45E-04  1.46E-04  1.46E-04  1.47E-04  1.47E-04
```

eu153	1.19E-04	1.20E-04	1.20E-04	1.21E-04	1.21E-04	1.21E-04
ru101	1.12E-04	1.13E-04	1.13E-04	1.14E-04	1.14E-04	1.14E-04
pr141	1.09E-04	1.09E-04	1.10E-04	1.10E-04	1.11E-04	1.11E-04
cd113	1.02E-04	1.02E-04	1.01E-04	1.01E-04	1.01E-04	1.01E-04
la139	8.89E-05	8.93E-05	8.97E-05	9.01E-05	9.05E-05	9.05E-05
gd157	5.74E-05	5.73E-05	5.72E-05	5.71E-05	5.69E-05	5.69E-05
ag109	4.69E-05	4.71E-05	4.73E-05	4.75E-05	4.77E-05	4.77E-05
pd105	4.58E-05	4.60E-05	4.62E-05	4.64E-05	4.66E-05	4.66E-05
ba137	4.31E-05	4.33E-05	4.35E-05	4.37E-05	4.39E-05	4.39E-05
zr 93	3.44E-05	3.45E-05	3.47E-05	3.48E-05	3.50E-05	3.50E-05
i129	2.92E-05	2.94E-05	2.95E-05	2.96E-05	2.98E-05	2.98E-05
nd144	2.77E-05	2.79E-05	2.80E-05	2.81E-05	2.83E-05	2.83E-05
gd152	2.58E-05	2.60E-05	2.62E-05	2.64E-05	2.66E-05	2.66E-05
mo 97	2.02E-05	2.03E-05	2.04E-05	2.04E-05	2.05E-05	2.05E-05
pd108	1.12E-05	1.13E-05	1.14E-05	1.14E-05	1.15E-05	1.15E-05
ru 99	9.50E-06	9.64E-06	9.77E-06	9.91E-06	1.00E-05	1.00E-05
zr 91	9.25E-06	9.30E-06	9.34E-06	9.38E-06	9.42E-06	9.42E-06
y 89	8.86E-06	8.90E-06	8.94E-06	8.98E-06	9.02E-06	9.02E-06
ru102	8.47E-06	8.51E-06	8.55E-06	8.59E-06	8.63E-06	8.63E-06
ce142	7.42E-06	7.45E-06	7.48E-06	7.52E-06	7.55E-06	7.55E-06
nd148	7.13E-06	7.16E-06	7.19E-06	7.22E-06	7.26E-06	7.26E-06
sm151	6.62E-06	6.98E-06	6.99E-06	6.99E-06	6.99E-06	6.61E-06
nd146	6.03E-06	6.06E-06	6.09E-06	6.11E-06	6.14E-06	6.14E-06
pd107	5.67E-06	5.69E-06	5.72E-06	5.75E-06	5.77E-06	5.77E-06
in115	5.27E-06	5.29E-06	5.32E-06	5.34E-06	5.36E-06	5.36E-06
ba138	5.13E-06	5.15E-06	5.17E-06	5.20E-06	5.22E-06	5.22E-06
ce140	4.80E-06	4.82E-06	4.85E-06	4.87E-06	4.89E-06	4.89E-06
xe132	4.41E-06	4.43E-06	4.45E-06	4.47E-06	4.49E-06	4.49E-06
mo 98	2.93E-06	2.94E-06	2.95E-06	2.97E-06	2.98E-06	2.98E-06
mo100	2.86E-06	2.88E-06	2.89E-06	2.90E-06	2.92E-06	2.92E-06
xe134	2.84E-06	2.85E-06	2.86E-06	2.87E-06	2.89E-06	2.89E-06
zr 92	2.24E-06	2.25E-06	2.26E-06	2.27E-06	2.28E-06	2.28E-06
i127	2.14E-06	2.15E-06	2.16E-06	2.17E-06	2.18E-06	2.18E-06
ru104	1.96E-06	1.97E-06	1.97E-06	1.98E-06	1.99E-06	1.99E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 261
0 fraction of total absorption rate
power= .00mw, burnup= 26363.mwd, flux= 2.97E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

zr 96	1.74E-06	1.75E-06	1.76E-06	1.77E-06	1.78E-06	1.78E-06
nd150	1.61E-06	1.62E-06	1.63E-06	1.64E-06	1.64E-06	1.64E-06
xe136	1.54E-06	1.54E-06	1.55E-06	1.56E-06	1.57E-06	1.57E-06
gd154	1.35E-06	1.37E-06	1.38E-06	1.39E-06	1.40E-06	1.40E-06
cd111	1.27E-06	1.28E-06	1.28E-06	1.29E-06	1.30E-06	1.30E-06
br 81	1.13E-06	1.14E-06	1.14E-06	1.15E-06	1.15E-06	1.15E-06
rb 85	1.08E-06	1.09E-06	1.09E-06	1.10E-06	1.10E-06	1.10E-06
ba135	9.92E-07	1.01E-06	1.02E-06	1.04E-06	1.05E-06	1.05E-06
zr 94	9.45E-07	9.49E-07	9.54E-07	9.58E-07	9.62E-07	9.62E-07
zr 90	8.73E-07	8.77E-07	8.81E-07	8.85E-07	8.89E-07	8.89E-07
sm154	7.67E-07	7.71E-07	7.74E-07	7.78E-07	7.81E-07	7.81E-07
te130	7.11E-07	7.14E-07	7.18E-07	7.21E-07	7.24E-07	7.24E-07
rb 87	6.23E-07	6.26E-07	6.29E-07	6.32E-07	6.34E-07	6.34E-07
pd106	4.73E-07	4.75E-07	4.77E-07	4.79E-07	4.82E-07	4.82E-07
se 77	4.59E-07	4.61E-07	4.63E-07	4.65E-07	4.67E-07	4.67E-07
gd156	4.53E-07	4.56E-07	4.58E-07	4.60E-07	4.63E-07	4.63E-07
ru100	3.56E-07	3.59E-07	3.62E-07	3.65E-07	3.68E-07	3.68E-07
kr 84	2.97E-07	2.98E-07	3.00E-07	3.01E-07	3.03E-07	3.03E-07
dy161	2.80E-07	2.81E-07	2.83E-07	2.84E-07	2.85E-07	2.85E-07
nd142	2.66E-07	2.68E-07	2.70E-07	2.73E-07	2.75E-07	2.75E-07
ba134	2.53E-07	2.55E-07	2.57E-07	2.59E-07	2.62E-07	2.62E-07

sb121	2.44E-07	2.45E-07	2.46E-07	2.47E-07	2.48E-07	2.48E-07
sm148	2.29E-07	2.32E-07	2.34E-07	2.36E-07	2.38E-07	2.38E-07
se 79	2.19E-07	2.19E-07	2.20E-07	2.21E-07	2.22E-07	2.22E-07
sb123	1.97E-07	1.98E-07	1.99E-07	2.00E-07	2.01E-07	2.01E-07
pd104	1.73E-07	1.74E-07	1.76E-07	1.78E-07	1.79E-07	1.79E-07
kr 86	1.66E-07	1.66E-07	1.67E-07	1.68E-07	1.69E-07	1.69E-07
nb 93	1.57E-07	1.60E-07	1.62E-07	1.64E-07	1.67E-07	1.67E-07
te128	1.61E-07	1.61E-07	1.62E-07	1.63E-07	1.64E-07	1.64E-07
tb159	1.21E-07	1.21E-07	1.22E-07	1.22E-07	1.23E-07	1.23E-07
se 80	1.10E-07	1.10E-07	1.11E-07	1.11E-07	1.12E-07	1.12E-07
te125	1.10E-07	1.10E-07	1.11E-07	1.11E-07	1.12E-07	1.12E-07
gd158	9.53E-08	9.58E-08	9.63E-08	9.67E-08	9.72E-08	9.72E-08
cd112	8.56E-08	8.60E-08	8.64E-08	8.68E-08	8.72E-08	8.72E-08
ag107	8.04E-08	8.16E-08	8.29E-08	8.42E-08	8.56E-08	8.56E-08
br 79	7.75E-08	7.86E-08	7.97E-08	8.08E-08	8.20E-08	8.20E-08
cd110	6.61E-08	6.68E-08	6.75E-08	6.82E-08	6.89E-08	6.89E-08
dy162	6.64E-08	6.68E-08	6.71E-08	6.75E-08	6.79E-08	6.79E-08
dy164	6.20E-08	6.23E-08	6.25E-08	6.28E-08	6.30E-08	6.30E-08
sn117	6.00E-08	6.02E-08	6.05E-08	6.08E-08	6.11E-08	6.11E-08
mo 96	5.72E-08	5.77E-08	5.83E-08	5.88E-08	5.93E-08	5.93E-08
li 6	5.58E-08	5.61E-08	5.63E-08	5.65E-08	5.67E-08	5.67E-08
cd114	5.10E-08	5.13E-08	5.15E-08	5.18E-08	5.20E-08	5.20E-08
xe129	4.80E-08	4.87E-08	4.95E-08	5.02E-08	5.09E-08	5.09E-08
sn119	4.56E-08	4.58E-08	4.60E-08	4.62E-08	4.64E-08	4.64E-08
eu152	4.64E-08	6.69E-08	6.71E-08	6.72E-08	6.74E-08	4.62E-08
pd110	4.24E-08	4.26E-08	4.28E-08	4.30E-08	4.32E-08	4.32E-08
sn115	4.17E-08	4.19E-08	4.21E-08	4.23E-08	4.25E-08	4.25E-08
sr 88	3.04E-08	3.05E-08	3.07E-08	3.08E-08	3.09E-08	3.09E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 262
0 fraction of total absorption rate
power= .00mw, burnup= 26363.mwd, flux= 2.97E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

xe130	2.79E-08	2.82E-08	2.84E-08	2.86E-08	2.89E-08	2.89E-08
te126	2.53E-08	2.57E-08	2.60E-08	2.63E-08	2.67E-08	2.67E-08
ba136	2.30E-08	2.31E-08	2.33E-08	2.35E-08	2.36E-08	2.36E-08
se 82	2.09E-08	2.10E-08	2.11E-08	2.12E-08	2.13E-08	2.13E-08
kr 82	1.65E-08	1.66E-08	1.67E-08	1.68E-08	1.69E-08	1.69E-08
dy163	1.66E-08	1.66E-08	1.67E-08	1.68E-08	1.69E-08	1.69E-08
se 78	1.64E-08	1.65E-08	1.66E-08	1.66E-08	1.67E-08	1.67E-08
sn126	1.64E-08	1.65E-08	1.65E-08	1.65E-08	1.66E-08	1.66E-08
sn124	1.44E-08	1.45E-08	1.45E-08	1.46E-08	1.47E-08	1.47E-08
as 75	9.63E-09	9.68E-09	9.72E-09	9.76E-09	9.81E-09	9.81E-09
in113	8.30E-09	8.34E-09	8.37E-09	8.41E-09	8.45E-09	8.45E-09
eu155	7.80E-09	2.20E-08	2.20E-08	2.20E-08	2.20E-08	7.50E-09
sn118	5.79E-09	5.82E-09	5.85E-09	5.87E-09	5.90E-09	5.90E-09
sn122	5.02E-09	5.04E-09	5.06E-09	5.08E-09	5.11E-09	5.11E-09
cd116	4.87E-09	4.90E-09	4.92E-09	4.94E-09	4.96E-09	4.96E-09
pm147	5.26E-09	3.31E-08	3.32E-08	3.32E-08	3.32E-08	4.93E-09
sn120	3.68E-09	3.70E-09	3.72E-09	3.73E-09	3.75E-09	3.75E-09
eu154	3.52E-09	6.23E-09	6.27E-09	6.30E-09	6.34E-09	3.53E-09
ge 73	2.77E-09	2.79E-09	2.80E-09	2.81E-09	2.83E-09	2.83E-09
dy160	1.76E-09	1.77E-09	1.79E-09	1.81E-09	1.82E-09	1.82E-09
ho165	1.69E-09	1.70E-09	1.71E-09	1.73E-09	1.74E-09	1.74E-09
sr 90	1.71E-09	2.04E-09	2.04E-09	2.04E-09	2.04E-09	1.70E-09
gd160	1.35E-09	1.36E-09	1.37E-09	1.37E-09	1.38E-09	1.38E-09
xe128	1.02E-09	1.03E-09	1.04E-09	1.05E-09	1.06E-09	1.06E-09
ge 76	9.37E-10	9.42E-10	9.46E-10	9.50E-10	9.55E-10	9.55E-10
sr 86	4.72E-10	4.76E-10	4.80E-10	4.85E-10	4.89E-10	4.89E-10
sn116	3.83E-10	3.86E-10	3.90E-10	3.93E-10	3.97E-10	3.97E-10

cs137	3.93E-10	4.63E-10	4.63E-10	4.63E-10	4.63E-10	3.91E-10
te124	3.27E-10	3.29E-10	3.32E-10	3.34E-10	3.36E-10	3.36E-10
nb 94	1.75E-10	1.77E-10	1.78E-10	1.80E-10	1.82E-10	1.82E-10
te122	1.62E-10	1.63E-10	1.65E-10	1.66E-10	1.68E-10	1.68E-10
sr 87	1.57E-10	1.58E-10	1.59E-10	1.61E-10	1.62E-10	1.62E-10
se 76	1.31E-10	1.32E-10	1.33E-10	1.34E-10	1.35E-10	1.35E-10
kr 80	8.06E-11	8.20E-11	8.34E-11	8.48E-11	8.62E-11	8.62E-11
er166	7.83E-11	7.87E-11	7.91E-11	7.96E-11	8.00E-11	8.00E-11
ge 74	5.55E-11	5.58E-11	5.60E-11	5.63E-11	5.65E-11	5.65E-11
cs134	5.60E-11	5.94E-10	5.97E-10	6.00E-10	6.03E-10	5.25E-11
kr 85	4.35E-11	6.85E-11	6.85E-11	6.86E-11	6.86E-11	4.29E-11
ge 72	4.12E-11	4.14E-11	4.16E-11	4.18E-11	4.20E-11	4.20E-11
er167	1.04E-11	1.05E-11	1.06E-11	1.07E-11	1.08E-11	1.08E-11
te123	8.65E-12	8.76E-12	8.87E-12	8.99E-12	9.10E-12	9.10E-12
cd108	6.10E-12	6.22E-12	6.34E-12	6.46E-12	6.58E-12	6.58E-12
y 90	1.63E-12	1.94E-12	1.94E-12	1.94E-12	1.94E-12	1.62E-12
sb125	3.60E-13	2.13E-12	2.13E-12	2.13E-12	2.13E-12	3.37E-13
be 9	1.17E-13	1.17E-13	1.18E-13	1.18E-13	1.19E-13	1.19E-13
ce144	1.43E-13	7.25E-11	7.25E-11	7.25E-11	7.25E-11	1.15E-13
sn114	1.03E-13	1.04E-13	1.05E-13	1.06E-13	1.07E-13	1.07E-13
li 7	4.86E-14	4.88E-14	4.90E-14	4.93E-14	4.95E-14	4.95E-14
ru106	3.88E-14	4.60E-12	4.59E-12	4.59E-12	4.58E-12	3.26E-14

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 263
0 fraction of total absorption rate
power= .00mw, burnup= 26363.mwd, flux= 2.97E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d ******* d

sb126	1.88E-14	1.96E-14	1.96E-14	1.96E-14	1.97E-14	1.89E-14
cd109	6.54E-19	3.04E-17	3.10E-17	3.16E-17	3.22E-17	6.00E-19
te127m	8.17E-20	1.08E-12	1.08E-12	1.08E-12	1.08E-12	5.46E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 264
power= 4.890E-04mw, burnup=2.6363E+04mwd, flux= 2.97E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d	******* d
h 1	1.54E-03	1.55E-03	1.56E-03	1.56E-03	1.57E-03	1.57E-03
h 2	4.62E-06	4.64E-06	4.66E-06	4.68E-06	4.70E-06	4.70E-06
h 3	5.09E-12	7.56E-12	7.57E-12	7.58E-12	7.59E-12	5.04E-12
h 4	.00E+00	3.84E-36	3.84E-36	3.85E-36	3.86E-36	.00E+00
he 3	1.88E-08	1.89E-08	1.89E-08	1.89E-08	1.90E-08	1.90E-08
he 4	2.56E-04	2.57E-04	2.59E-04	2.60E-04	2.61E-04	2.61E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	3.08E-05	3.09E-05	3.11E-05	3.12E-05	3.13E-05	3.13E-05
ne 21	1.43E-08	1.44E-08	1.46E-08	1.47E-08	1.48E-08	1.48E-08
ne 22	2.03E-07	2.04E-07	2.05E-07	2.06E-07	2.06E-07	2.06E-07
ne 23	8.87E-31	8.86E-16	8.87E-16	8.87E-16	8.88E-16	8.88E-31
na 22	8.13E-13	5.26E-12	5.26E-12	5.26E-12	5.26E-12	7.61E-13
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.23E-24	3.23E-09	3.23E-09	3.23E-09	3.24E-09	3.24E-24
na 24m	5.31E-31	5.31E-16	5.31E-16	5.31E-16	5.32E-16	5.32E-31
na 25	5.18E-39	5.22E-24	5.26E-24	5.31E-24	5.36E-24	5.36E-39
mg 24	1.98E-01	1.99E-01	2.00E-01	2.01E-01	2.02E-01	2.02E-01
mg 25	1.48E-06	1.49E-06	1.51E-06	1.52E-06	1.53E-06	1.53E-06
mg 26	4.61E-06	4.63E-06	4.65E-06	4.67E-06	4.69E-06	4.69E-06
mg 27	2.65E-28	2.64E-13	2.65E-13	2.65E-13	2.65E-13	2.65E-28
mg 28	.00E+00	6.74E-26	6.75E-26	6.75E-26	6.76E-26	.00E+00
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.40E-26	2.40E-11	2.40E-11	2.40E-11	2.40E-11	2.40E-26
al 29	4.23E-37	4.26E-22	4.30E-22	4.34E-22	4.38E-22	4.38E-37

	al 30	.00E+00	1.43E-31	1.45E-31	1.46E-31	1.48E-31	.00E+00
	si 28	5.78E-01	5.80E-01	5.83E-01	5.85E-01	5.87E-01	5.87E-01
	si 29	1.35E-05	1.36E-05	1.37E-05	1.38E-05	1.40E-05	1.40E-05
	si 30	3.37E-10	3.41E-10	3.46E-10	3.50E-10	3.55E-10	3.55E-10
	si 31	3.02E-38	3.06E-23	3.10E-23	3.14E-23	3.18E-23	3.18E-38
	si 32	6.43E-30	6.70E-30	6.81E-30	6.90E-30	7.00E-30	6.79E-30
	totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0	flux		2.97E+07	2.97E+07	2.97E+07	2.97E+07	2.97E-08
1							

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 265

power= 4.890E-04mw, burnup=2.6363E+04mwd, flux= 2.97E+07n/cm**2-sec

0 nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
he 4	6.30E+01	6.36E+01	6.42E+01	6.47E+01	6.53E+01	6.53E+01
pb206	4.78E-01	4.86E-01	4.94E-01	5.02E-01	5.11E-01	5.11E-01
pb207	2.75E-02	2.79E-02	2.83E-02	2.87E-02	2.91E-02	2.91E-02
pb208	9.13E-04	9.21E-04	9.29E-04	9.37E-04	9.45E-04	9.45E-04
pb209	1.51E-09	1.53E-09	1.54E-09	1.56E-09	1.57E-09	1.57E-09
pb210	4.18E-04	4.20E-04	4.23E-04	4.26E-04	4.29E-04	4.29E-04
pb211	6.35E-11	6.36E-11	6.39E-11	6.41E-11	6.43E-11	6.44E-11
pb212	2.10E-11	2.21E-11	2.22E-11	2.22E-11	2.23E-11	2.13E-11
pb214	9.54E-10	9.61E-10	9.68E-10	9.74E-10	9.81E-10	9.81E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	9.12E-02	9.30E-02	9.48E-02	9.66E-02	9.84E-02	9.85E-02
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.57E-07	2.59E-07	2.61E-07	2.62E-07	2.64E-07	2.64E-07
bi211	3.76E-12	3.77E-12	3.79E-12	3.80E-12	3.81E-12	3.82E-12
bi212	2.00E-12	2.09E-12	2.10E-12	2.11E-12	2.12E-12	2.02E-12
bi213	3.54E-10	3.57E-10	3.60E-10	3.63E-10	3.67E-10	3.67E-10
bi214	7.09E-10	7.14E-10	7.18E-10	7.23E-10	7.28E-10	7.28E-10
po210	7.10E-06	7.15E-06	7.19E-06	7.24E-06	7.29E-06	7.29E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	4.16E-17	4.17E-17	4.18E-17	4.20E-17	4.21E-17	4.22E-17
po212	1.05E-22	1.10E-22	1.10E-22	1.11E-22	1.11E-22	1.06E-22
po213	5.32E-19	5.37E-19	5.41E-19	5.46E-19	5.51E-19	5.51E-19
po214	9.75E-17	9.82E-17	9.88E-17	9.95E-17	1.00E-16	1.00E-16
po215	5.22E-17	5.23E-17	5.25E-17	5.27E-17	5.29E-17	5.30E-17
po216	7.96E-17	8.35E-17	8.39E-17	8.42E-17	8.46E-17	8.08E-17
po218	1.10E-10	1.11E-10	1.12E-10	1.13E-10	1.13E-10	1.13E-10
rn218	3.64E-44	3.91E-29	3.93E-29	3.95E-29	3.96E-29	3.64E-44
rn219	1.16E-13	1.16E-13	1.17E-13	1.17E-13	1.18E-13	1.18E-13
rn220	3.05E-14	3.20E-14	3.22E-14	3.23E-14	3.24E-14	3.10E-14
rn222	1.96E-07	1.97E-07	1.99E-07	2.00E-07	2.02E-07	2.02E-07
ra222	3.95E-41	4.24E-26	4.26E-26	4.28E-26	4.30E-26	4.01E-41
ra223	2.90E-08	2.90E-08	2.91E-08	2.92E-08	2.93E-08	2.94E-08
ra224	1.74E-10	1.82E-10	1.83E-10	1.84E-10	1.84E-10	1.76E-10
ra225	1.65E-07	1.67E-07	1.68E-07	1.70E-07	1.71E-07	1.71E-07
ra226	3.00E-02	3.02E-02	3.04E-02	3.06E-02	3.08E-02	3.08E-02
ra228	1.58E-10	1.60E-10	1.61E-10	1.63E-10	1.64E-10	1.64E-10
ac225	1.12E-07	1.13E-07	1.14E-07	1.15E-07	1.16E-07	1.16E-07
ac227	2.01E-05	2.02E-05	2.03E-05	2.03E-05	2.04E-05	2.04E-05
ac228	1.93E-14	1.95E-14	1.97E-14	1.99E-14	2.00E-14	2.00E-14
th226	1.93E-39	2.07E-24	2.08E-24	2.09E-24	2.10E-24	1.96E-39
th227	4.67E-08	4.68E-08	4.70E-08	4.72E-08	4.74E-08	4.74E-08
th228	3.31E-08	3.48E-08	3.49E-08	3.51E-08	3.52E-08	3.36E-08
th229	3.22E-02	3.25E-02	3.28E-02	3.30E-02	3.33E-02	3.33E-02
th230	1.45E+00	1.46E+00	1.47E+00	1.48E+00	1.49E+00	1.49E+00
th231	2.71E-09	3.52E-09	3.52E-09	3.53E-09	3.53E-09	2.70E-09
th232	3.87E-01	3.90E-01	3.94E-01	3.98E-01	4.01E-01	4.01E-01

th233	4.40E-28	4.44E-13	4.48E-13	4.52E-13	4.57E-13	4.57E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	3.02E-02	3.03E-02	3.05E-02	3.06E-02	3.07E-02	3.07E-02
pa232	6.47E-26	6.50E-11	6.52E-11	6.55E-11	6.58E-11	6.58E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 266
power= 4.890E-04mw, burnup=2.6363E+04mwd, flux= 2.97E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge	******* d	******* d	******* d	******* d	******* d
pa233	1.39E-06	1.39E-06	1.39E-06	1.39E-06	1.39E-06	1.39E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.87E-36	2.01E-21	2.02E-21	2.03E-21	2.04E-21	1.90E-36
u231	7.01E-32	7.05E-17	7.11E-17	7.16E-17	7.22E-17	7.22E-32
u232	1.18E-06	1.27E-06	1.27E-06	1.28E-06	1.28E-06	1.19E-06
u233	7.58E-01	7.63E-01	7.69E-01	7.74E-01	7.80E-01	7.80E-01
u234	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01
u235	6.54E+02	6.54E+02	6.54E+02	6.54E+02	6.54E+02	6.54E+02
u236	1.95E+02	1.95E+02	1.95E+02	1.95E+02	1.95E+02	1.95E+02
u237	2.92E-13	4.17E-07	4.17E-07	4.18E-07	4.18E-07	2.76E-13
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.77E-23	3.77E-08	3.77E-08	3.77E-08	3.77E-08	3.77E-23
u240	4.20E-34	4.33E-34	4.46E-34	4.59E-34	4.72E-34	4.72E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.16E-14	1.02E-12	1.02E-12	1.02E-12	1.02E-12	9.88E-15
np236m	2.43E-28	2.43E-13	2.43E-13	2.43E-13	2.43E-13	2.43E-28
np236	2.65E-06	2.65E-06	2.66E-06	2.66E-06	2.67E-06	2.67E-06
np237	4.03E+01	4.03E+01	4.03E+01	4.03E+01	4.02E+01	4.02E+01
np238	4.14E-15	1.82E-07	1.82E-07	1.82E-07	1.82E-07	3.95E-15
np239	1.54E-13	5.45E-06	5.45E-06	5.45E-06	5.45E-06	1.52E-13
np240m	3.59E-36	3.69E-36	3.80E-36	3.92E-36	4.03E-36	4.03E-36
np240	4.08E-38	1.37E-16	1.37E-16	1.38E-16	1.38E-16	4.53E-38
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	3.06E-11	1.38E-10	1.38E-10	1.38E-10	1.38E-10	2.92E-11
pu237	3.03E-29	3.00E-14	2.99E-14	2.98E-14	2.97E-14	2.95E-29
pu238	2.61E-03	2.75E-03	2.76E-03	2.76E-03	2.76E-03	2.60E-03
pu239	2.53E+01	2.52E+01	2.50E+01	2.49E+01	2.48E+01	2.48E+01
pu240	2.66E-01	2.63E-01	2.60E-01	2.57E-01	2.55E-01	2.55E-01
pu241	9.48E-06	1.31E-05	1.30E-05	1.29E-05	1.27E-05	8.96E-06
pu242	4.85E-05	4.85E-05	4.85E-05	4.85E-05	4.85E-05	4.85E-05
pu243	1.58E-29	1.25E-14	1.25E-14	1.25E-14	1.26E-14	1.59E-29
pu244	2.09E-23	2.16E-23	2.22E-23	2.28E-23	2.35E-23	2.35E-23
pu245	.00E+00	1.10E-34	1.14E-34	1.17E-34	1.21E-34	.00E+00
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.35E-35	1.33E-20	1.32E-20	1.31E-20	1.30E-20	1.29E-35
am240	6.19E-33	6.09E-18	6.04E-18	5.98E-18	5.92E-18	5.91E-33
am241	3.99E-04	3.93E-04	3.90E-04	3.86E-04	3.82E-04	3.81E-04
am242m	2.24E-08	2.27E-08	2.26E-08	2.24E-08	2.21E-08	2.14E-08
am242	2.89E-13	1.81E-12	1.79E-12	1.78E-12	1.76E-12	2.76E-13
am243	1.76E-07	1.75E-07	1.75E-07	1.74E-07	1.73E-07	1.73E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.63E-31	1.63E-16	1.62E-16	1.62E-16	1.61E-16	1.61E-31
am245	2.24E-40	2.16E-35	2.23E-35	2.29E-35	2.36E-35	1.94E-40
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	1.30E-23	1.29E-23	1.28E-23	1.27E-23	.00E+00
cm242	5.83E-11	3.65E-10	3.62E-10	3.59E-10	3.55E-10	5.57E-11
cm243	8.87E-16	1.03E-15	1.03E-15	1.02E-15	1.01E-15	8.44E-16
cm244	1.96E-12	2.56E-12	2.55E-12	2.54E-12	2.53E-12	1.92E-12

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     sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                    actinides        page  267
       power= 4.890E-04mw, burnup=2.6363E+04mwd, flux= 2.97E+07n/cm**2-sec
0                                        nuclide concentrations, gram atoms
                                         basis = single reactor assembly
             charge ******* d ******* d ******* d ******* d ******* d
     cm245   6.51E-15  6.37E-15  6.24E-15  6.12E-15  6.00E-15  6.00E-15
     cm246   4.63E-17  4.51E-17  4.39E-17  4.27E-17  4.16E-17  4.15E-17
     cm247   9.20E-20  9.23E-20  9.27E-20  9.30E-20  9.33E-20  9.33E-20
     cm248   5.35E-22  5.44E-22  5.52E-22  5.60E-22  5.69E-22  5.69E-22
     cm249    .00E+00  2.10E-33  2.13E-33  2.16E-33  2.20E-33   .00E+00
     cm250   1.95E-37  1.97E-37  1.99E-37  2.01E-37  2.03E-37  2.03E-37
     cm251    .00E+00   .00E+00   .00E+00   .00E+00   .00E+00   .00E+00
   totals    3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04  3.73E+04
0    flux              2.97E+07  2.97E+07  2.97E+07  2.97E+07  2.97E-08
0        1q array has      20 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        3q array has       1 entries.
0        4q array has       1 entries.
0       54q array has      12 entries.
1library information...

          cross-section data taken from position number  1 of library on unit 15.

          pass
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr origen-s binary working library--id = 1143             *
          *         made from modified card-image origen-s libraries of scale 4.2        *
          *       data from the light element, actinide, and fission product libraries   *
          *         decay data, including gamma and total energy, are from endf/b-vi     *
          *                                                                              *
          *       neutron flux spectrum factors and cross sections were produced from    *
          *      the "presas2" case updating all nuclides on the scale "burnup" library  *
          *                                                                              *
          *                   fission product yields are from endf/b-v                   *
          *                                                                              *
          *              photon libraries use an 18-energy-group structure               *
          *             the photon data are from the master photon data base,            *
          *              produced to include bremsstrahlung from uo2 matrix              *
          *                                                                              *
          *        see information above this box (if present) for later updates         *
          *                                                                              *
          ********************************************************************************
          *                                                                              *
```

```
0        ********************************************************************************
0                 .other identification and sizes of library.
0                  data set name:  ft15f001
0               8/29/1996    date library was produced
0                   1697    total number of nuclides in library
                     689    number of light-element nuclides
                     129    number of actinide nuclides
                     879    number of fission product nuclides
0                   7993    number of nonzero off-diagonal matrix elements
0        ********************************************************************************
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2                                    page  268
         power=    .00mw, burnup=  26809.mwd, flux= 2.97E+07n/cm**2-sec
0                                    basis =
0    (note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
0                    initial      ******* d      ******* d      ******* d      ******* d
     productions   1.274810E+06   1.274209E+06   1.273613E+06   1.273022E+06   1.272436E+06
     absorptions   1.042014E+06   1.041739E+06   1.041467E+06   1.041197E+06   1.040930E+06
     k infinity    1.223409E+00   1.223155E+00   1.222903E+00   1.222653E+00   1.222404E+00
0                    initial      ******* d      ******* d      ******* d      ******* d
     actinide
     absorptions   1.021634E+06   1.021322E+06   1.021013E+06   1.020707E+06   1.020404E+06
     non-actinide
     abs. fracs.   1.955879E-02   1.959932E-02   1.963931E-02   1.967925E-02   1.971906E-02
1    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2              fission products        page  269
0                              fraction of total absorption rate
         power=    .00mw, burnup=  26809.mwd, flux= 2.97E+07n/cm**2-sec
0              initial ******* d ******* d ******* d ******* d

     sm149      5.43E-03  5.43E-03  5.43E-03  5.42E-03  5.42E-03
     nd143      2.56E-03  2.58E-03  2.59E-03  2.60E-03  2.61E-03
     eu151      2.06E-03  2.06E-03  2.06E-03  2.07E-03  2.07E-03
     rh103      1.25E-03  1.25E-03  1.26E-03  1.26E-03  1.27E-03
     xe131      8.32E-04  8.36E-04  8.40E-04  8.43E-04  8.47E-04
     cs133      6.50E-04  6.53E-04  6.56E-04  6.59E-04  6.61E-04
     sm147      4.75E-04  4.77E-04  4.79E-04  4.81E-04  4.83E-04
     tc 99      4.13E-04  4.15E-04  4.16E-04  4.17E-04  4.18E-04
     nd145      3.67E-04  3.69E-04  3.70E-04  3.72E-04  3.74E-04
     sm152      2.96E-04  2.97E-04  2.99E-04  3.00E-04  3.02E-04
     mo 95      2.55E-04  2.56E-04  2.57E-04  2.58E-04  2.59E-04
     gd155      2.22E-04  2.22E-04  2.21E-04  2.21E-04  2.21E-04
     sm150      1.96E-04  1.96E-04  1.97E-04  1.98E-04  1.99E-04
     kr 83      1.57E-04  1.57E-04  1.58E-04  1.59E-04  1.59E-04
     cs135      1.47E-04  1.48E-04  1.48E-04  1.49E-04  1.50E-04
     eu153      1.21E-04  1.22E-04  1.23E-04  1.23E-04  1.24E-04
     ru101      1.14E-04  1.15E-04  1.15E-04  1.16E-04  1.16E-04
     pr141      1.11E-04  1.11E-04  1.12E-04  1.12E-04  1.13E-04
     cd113      1.01E-04  1.01E-04  1.01E-04  1.01E-04  1.01E-04
     la139      9.05E-05  9.09E-05  9.13E-05  9.17E-05  9.21E-05
     gd157      5.70E-05  5.68E-05  5.67E-05  5.66E-05  5.65E-05
     ag109      4.77E-05  4.80E-05  4.82E-05  4.84E-05  4.86E-05
     pd105      4.66E-05  4.68E-05  4.71E-05  4.73E-05  4.75E-05
     ba137      4.39E-05  4.41E-05  4.43E-05  4.45E-05  4.47E-05
     zr 93      3.49E-05  3.51E-05  3.52E-05  3.54E-05  3.55E-05
      i129      2.98E-05  2.99E-05  3.00E-05  3.02E-05  3.03E-05
     nd144      2.83E-05  2.84E-05  2.85E-05  2.87E-05  2.88E-05
     gd152      2.66E-05  2.68E-05  2.69E-05  2.71E-05  2.73E-05
     mo 97      2.05E-05  2.06E-05  2.07E-05  2.08E-05  2.09E-05
     pd108      1.15E-05  1.15E-05  1.16E-05  1.16E-05  1.17E-05
     ru 99      1.00E-05  1.02E-05  1.03E-05  1.05E-05  1.06E-05
     zr 91      9.43E-06  9.47E-06  9.51E-06  9.55E-06  9.59E-06
```

y 89	9.02E-06	9.06E-06	9.10E-06	9.14E-06	9.18E-06
ru102	8.63E-06	8.67E-06	8.71E-06	8.75E-06	8.79E-06
ce142	7.55E-06	7.59E-06	7.62E-06	7.66E-06	7.69E-06
nd148	7.26E-06	7.29E-06	7.32E-06	7.36E-06	7.39E-06
sm151	6.62E-06	7.00E-06	7.00E-06	7.01E-06	7.01E-06
nd146	6.14E-06	6.17E-06	6.20E-06	6.23E-06	6.26E-06
pd107	5.78E-06	5.80E-06	5.83E-06	5.86E-06	5.88E-06
in115	5.36E-06	5.39E-06	5.41E-06	5.43E-06	5.46E-06
ba138	5.22E-06	5.25E-06	5.27E-06	5.29E-06	5.32E-06
ce140	4.89E-06	4.91E-06	4.94E-06	4.96E-06	4.98E-06
xe132	4.49E-06	4.51E-06	4.53E-06	4.55E-06	4.57E-06
mo 98	2.98E-06	2.99E-06	3.00E-06	3.02E-06	3.03E-06
mo100	2.92E-06	2.93E-06	2.94E-06	2.96E-06	2.97E-06
xe134	2.89E-06	2.90E-06	2.91E-06	2.93E-06	2.94E-06
zr 92	2.28E-06	2.29E-06	2.30E-06	2.32E-06	2.33E-06
i127	2.18E-06	2.19E-06	2.20E-06	2.21E-06	2.22E-06
ru104	1.99E-06	2.00E-06	2.01E-06	2.02E-06	2.03E-06

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 270
0 fraction of total absorption rate
power= .00mw, burnup= 26809.mwd, flux= 2.97E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d

zr 96	1.78E-06	1.78E-06	1.79E-06	1.80E-06	1.81E-06
nd150	1.64E-06	1.65E-06	1.66E-06	1.67E-06	1.67E-06
xe136	1.57E-06	1.57E-06	1.58E-06	1.59E-06	1.59E-06
gd154	1.40E-06	1.42E-06	1.43E-06	1.44E-06	1.46E-06
cd111	1.30E-06	1.30E-06	1.31E-06	1.31E-06	1.32E-06
br 81	1.15E-06	1.16E-06	1.16E-06	1.17E-06	1.17E-06
rb 85	1.10E-06	1.11E-06	1.11E-06	1.12E-06	1.12E-06
ba135	1.05E-06	1.07E-06	1.08E-06	1.10E-06	1.11E-06
zr 94	9.62E-07	9.66E-07	9.71E-07	9.75E-07	9.79E-07
zr 90	8.89E-07	8.93E-07	8.97E-07	9.01E-07	9.05E-07
sm154	7.82E-07	7.85E-07	7.89E-07	7.92E-07	7.96E-07
te130	7.25E-07	7.28E-07	7.31E-07	7.34E-07	7.38E-07
rb 87	6.34E-07	6.37E-07	6.40E-07	6.43E-07	6.46E-07
pd106	4.82E-07	4.84E-07	4.86E-07	4.88E-07	4.90E-07
se 77	4.67E-07	4.69E-07	4.71E-07	4.73E-07	4.75E-07
gd156	4.62E-07	4.65E-07	4.67E-07	4.69E-07	4.72E-07
ru100	3.68E-07	3.71E-07	3.74E-07	3.77E-07	3.80E-07
kr 84	3.03E-07	3.04E-07	3.05E-07	3.07E-07	3.08E-07
dy161	2.85E-07	2.87E-07	2.88E-07	2.89E-07	2.90E-07
xe135	2.86E-22	2.86E-07	2.86E-07	2.86E-07	2.86E-07
nd142	2.75E-07	2.78E-07	2.80E-07	2.83E-07	2.85E-07
ba134	2.62E-07	2.64E-07	2.66E-07	2.69E-07	2.71E-07
sb121	2.48E-07	2.49E-07	2.51E-07	2.52E-07	2.53E-07
sm148	2.38E-07	2.40E-07	2.42E-07	2.44E-07	2.46E-07
se 79	2.22E-07	2.23E-07	2.23E-07	2.24E-07	2.25E-07
sb123	2.01E-07	2.02E-07	2.02E-07	2.03E-07	2.04E-07
pd104	1.79E-07	1.81E-07	1.82E-07	1.84E-07	1.85E-07
nb 93	1.67E-07	1.69E-07	1.72E-07	1.74E-07	1.76E-07
kr 86	1.69E-07	1.70E-07	1.70E-07	1.71E-07	1.72E-07
te128	1.64E-07	1.64E-07	1.65E-07	1.66E-07	1.67E-07
tb159	1.23E-07	1.24E-07	1.24E-07	1.25E-07	1.25E-07
se 80	1.12E-07	1.12E-07	1.13E-07	1.13E-07	1.14E-07
te125	1.12E-07	1.12E-07	1.13E-07	1.13E-07	1.14E-07
gd158	9.72E-08	9.76E-08	9.81E-08	9.86E-08	9.90E-08
ag107	8.56E-08	8.69E-08	8.82E-08	8.96E-08	9.09E-08
cd112	8.72E-08	8.76E-08	8.80E-08	8.84E-08	8.88E-08
br 79	8.20E-08	8.31E-08	8.43E-08	8.54E-08	8.66E-08
cd110	6.89E-08	6.96E-08	7.03E-08	7.10E-08	7.17E-08

dy162	6.79E-08	6.82E-08	6.86E-08	6.89E-08	6.93E-08
eu152	4.62E-08	6.76E-08	6.77E-08	6.78E-08	6.80E-08
dy164	6.30E-08	6.33E-08	6.35E-08	6.37E-08	6.40E-08
sn117	6.11E-08	6.14E-08	6.16E-08	6.19E-08	6.22E-08
mo 96	5.93E-08	5.98E-08	6.03E-08	6.08E-08	6.14E-08
li 6	5.67E-08	5.70E-08	5.72E-08	5.74E-08	5.76E-08
xe129	5.10E-08	5.17E-08	5.24E-08	5.32E-08	5.39E-08
cd114	5.20E-08	5.23E-08	5.25E-08	5.28E-08	5.30E-08
sn119	4.64E-08	4.66E-08	4.69E-08	4.71E-08	4.73E-08
pd110	4.32E-08	4.34E-08	4.36E-08	4.38E-08	4.40E-08
sn115	4.25E-08	4.27E-08	4.29E-08	4.30E-08	4.32E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 271
0 fraction of total absorption rate
power= .00mw, burnup= 26809.mwd, flux= 2.97E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d

pm147	4.93E-09	3.32E-08	3.32E-08	3.32E-08	3.32E-08
sr 88	3.09E-08	3.11E-08	3.12E-08	3.14E-08	3.15E-08
xe130	2.89E-08	2.91E-08	2.94E-08	2.96E-08	2.99E-08
te126	2.67E-08	2.70E-08	2.74E-08	2.77E-08	2.81E-08
ba136	2.36E-08	2.38E-08	2.40E-08	2.41E-08	2.43E-08
eu155	7.50E-09	2.20E-08	2.19E-08	2.19E-08	2.19E-08
se 82	2.13E-08	2.14E-08	2.15E-08	2.16E-08	2.17E-08
kr 82	1.69E-08	1.70E-08	1.71E-08	1.72E-08	1.73E-08
dy163	1.69E-08	1.70E-08	1.71E-08	1.72E-08	1.73E-08
se 78	1.67E-08	1.68E-08	1.69E-08	1.69E-08	1.70E-08
sn126	1.66E-08	1.66E-08	1.66E-08	1.66E-08	1.67E-08
sn124	1.46E-08	1.47E-08	1.48E-08	1.48E-08	1.49E-08
as 75	9.81E-09	9.85E-09	9.90E-09	9.94E-09	9.98E-09
in113	8.45E-09	8.49E-09	8.53E-09	8.57E-09	8.61E-09
eu154	3.53E-09	6.37E-09	6.40E-09	6.44E-09	6.47E-09
sn118	5.90E-09	5.93E-09	5.95E-09	5.98E-09	6.01E-09
sn122	5.11E-09	5.13E-09	5.16E-09	5.18E-09	5.20E-09
cd116	4.96E-09	4.98E-09	5.01E-09	5.03E-09	5.05E-09
sn120	3.75E-09	3.77E-09	3.79E-09	3.80E-09	3.82E-09
ge 73	2.83E-09	2.84E-09	2.85E-09	2.87E-09	2.88E-09
sr 90	1.70E-09	2.04E-09	2.04E-09	2.04E-09	2.04E-09
dy160	1.82E-09	1.84E-09	1.86E-09	1.88E-09	1.89E-09
ho165	1.74E-09	1.75E-09	1.76E-09	1.77E-09	1.79E-09
gd160	1.38E-09	1.39E-09	1.39E-09	1.40E-09	1.41E-09
rh105	1.28E-24	1.28E-09	1.28E-09	1.28E-09	1.28E-09
xe128	1.06E-09	1.07E-09	1.08E-09	1.08E-09	1.09E-09
ge 76	9.55E-10	9.59E-10	9.63E-10	9.67E-10	9.72E-10
cs134	5.25E-11	6.06E-10	6.09E-10	6.11E-10	6.14E-10
sr 86	4.89E-10	4.93E-10	4.97E-10	5.01E-10	5.06E-10
cs137	3.91E-10	4.63E-10	4.63E-10	4.63E-10	4.63E-10
sn116	3.97E-10	4.00E-10	4.04E-10	4.07E-10	4.11E-10
te124	3.36E-10	3.39E-10	3.41E-10	3.44E-10	3.46E-10
pr143	3.24E-25	3.24E-10	3.24E-10	3.24E-10	3.24E-10
xe133	2.50E-25	2.50E-10	2.50E-10	2.50E-10	2.50E-10
ce141	1.97E-25	1.97E-10	1.97E-10	1.97E-10	1.97E-10
nb 94	1.82E-10	1.84E-10	1.86E-10	1.88E-10	1.90E-10
te122	1.68E-10	1.69E-10	1.71E-10	1.72E-10	1.74E-10
sr 87	1.62E-10	1.63E-10	1.64E-10	1.65E-10	1.66E-10
se 76	1.35E-10	1.36E-10	1.37E-10	1.38E-10	1.39E-10
pm149	1.22E-25	1.22E-10	1.22E-10	1.22E-10	1.22E-10
nd147	1.13E-25	1.13E-10	1.13E-10	1.13E-10	1.13E-10
kr 80	8.62E-11	8.77E-11	8.92E-11	9.07E-11	9.22E-11
er166	8.00E-11	8.05E-11	8.09E-11	8.13E-11	8.18E-11
ce144	1.15E-13	7.26E-11	7.26E-11	7.26E-11	7.26E-11

kr 85	4.29E-11	6.86E-11	6.87E-11	6.87E-11	6.87E-11
ge 74	5.66E-11	5.68E-11	5.71E-11	5.73E-11	5.76E-11
ru103	4.72E-26	4.72E-11	4.72E-11	4.72E-11	4.72E-11
ge 72	4.20E-11	4.22E-11	4.24E-11	4.26E-11	4.28E-11
zr 95	6.72E-24	1.98E-11	1.98E-11	1.98E-11	1.98E-11

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 272

0 fraction of total absorption rate

power= .00mw, burnup= 26809.mwd, flux= 2.97E+07n/cm**2-sec

0 initial ******* d ******* d ******* d ******* d

nb 95	1.38E-23	1.85E-11	1.85E-11	1.85E-11	1.85E-11
y 91	4.10E-25	1.72E-11	1.72E-11	1.72E-11	1.72E-11
pm151	1.43E-26	1.43E-11	1.43E-11	1.43E-11	1.43E-11
er167	1.08E-11	1.09E-11	1.10E-11	1.11E-11	1.13E-11
te123	9.10E-12	9.22E-12	9.34E-12	9.46E-12	9.58E-12
cd108	6.59E-12	6.71E-12	6.84E-12	6.97E-12	7.10E-12
sm153	6.70E-27	6.70E-12	6.71E-12	6.72E-12	6.73E-12
eu156	6.00E-27	5.99E-12	5.99E-12	5.98E-12	5.97E-12
ba140	5.79E-27	5.79E-12	5.79E-12	5.79E-12	5.79E-12
ru106	3.26E-14	4.57E-12	4.57E-12	4.56E-12	4.56E-12
sr 89	4.25E-27	3.66E-12	3.66E-12	3.66E-12	3.67E-12
kr 87	2.75E-27	2.75E-12	2.75E-12	2.75E-12	2.75E-12
ce143	2.12E-27	2.12E-12	2.12E-12	2.12E-12	2.13E-12
sb125	3.37E-13	2.12E-12	2.12E-12	2.12E-12	2.12E-12
y 90	1.62E-12	1.94E-12	1.94E-12	1.95E-12	1.95E-12
la140	1.86E-27	1.86E-12	1.86E-12	1.86E-12	1.86E-12
mo 99	1.61E-27	1.61E-12	1.61E-12	1.61E-12	1.61E-12
te127m	5.33E-20	1.08E-12	1.08E-12	1.08E-12	1.08E-12
i131	8.47E-28	8.47E-13	8.47E-13	8.47E-13	8.47E-13
te129m	2.35E-28	2.35E-13	2.35E-13	2.35E-13	2.35E-13
pm148m	8.86E-29	2.11E-13	2.11E-13	2.11E-13	2.11E-13
be 9	1.19E-13	1.19E-13	1.20E-13	1.21E-13	1.21E-13
sn114	1.07E-13	1.08E-13	1.09E-13	1.10E-13	1.11E-13
ag111	6.85E-29	6.83E-14	6.82E-14	6.81E-14	6.80E-14
eu157	5.73E-29	5.72E-14	5.72E-14	5.71E-14	5.70E-14
cs136	5.04E-29	5.05E-14	5.07E-14	5.08E-14	5.10E-14
li 7	4.95E-14	4.97E-14	5.00E-14	5.02E-14	5.04E-14
tb160	3.33E-25	3.67E-14	3.69E-14	3.71E-14	3.72E-14
cd115m	3.33E-29	3.32E-14	3.32E-14	3.32E-14	3.32E-14
sb126	1.89E-14	1.97E-14	1.97E-14	1.98E-14	1.98E-14
pr142	1.56E-29	1.57E-14	1.58E-14	1.58E-14	1.59E-14
pm148	1.81E-30	6.40E-15	6.40E-15	6.40E-15	6.40E-15
ru105	4.47E-30	4.47E-15	4.47E-15	4.46E-15	4.46E-15
sn125	3.93E-30	3.93E-15	3.93E-15	3.93E-15	3.93E-15
i130	2.66E-30	2.67E-15	2.68E-15	2.69E-15	2.70E-15
rb 88	1.54E-30	1.54E-15	1.55E-15	1.55E-15	1.55E-15
sn123	8.46E-22	1.28E-15	1.28E-15	1.28E-15	1.28E-15
sb124	7.03E-29	1.26E-15	1.27E-15	1.27E-15	1.28E-15
i135	1.26E-30	1.26E-15	1.26E-15	1.26E-15	1.26E-15
te132	1.19E-30	1.19E-15	1.19E-15	1.20E-15	1.20E-15
rb 86	8.94E-31	8.98E-16	9.02E-16	9.06E-16	9.10E-16
te134	7.12E-31	7.12E-16	7.12E-16	7.12E-16	7.13E-16
dy165	3.69E-31	3.69E-16	3.70E-16	3.70E-16	3.70E-16
in117m	3.18E-31	3.18E-16	3.18E-16	3.17E-16	3.17E-16
cs134m	1.14E-31	1.15E-16	1.15E-16	1.16E-16	1.16E-16
in117	9.49E-32	9.48E-17	9.48E-17	9.47E-17	9.47E-17
cd109	6.06E-19	3.28E-17	3.34E-17	3.40E-17	3.47E-17
cd118	1.69E-32	1.69E-17	1.69E-17	1.69E-17	1.68E-17
ge 75	1.08E-32	1.08E-17	1.08E-17	1.08E-17	1.08E-17

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 273

0 fraction of total absorption rate
power= .00mw, burnup= 26809.mwd, flux= 2.97E+07n/cm**2-sec
0 initial ******* d ******* d ******* d ******* d

ag110	2.70E-24	7.90E-18	7.94E-18	7.98E-18	8.02E-18
in119m	4.14E-33	4.14E-18	4.14E-18	4.14E-18	4.14E-18
in119	3.27E-34	3.36E-19	3.36E-19	3.36E-19	3.36E-19
in120	.00E+00	5.34E-23	5.34E-23	5.34E-23	5.34E-23
in120m	.00E+00	8.05E-24	8.04E-24	8.03E-24	8.02E-24

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 274
power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d
h 1	1.57E-03	1.58E-03	1.58E-03	1.59E-03	1.60E-03
h 2	4.70E-06	4.72E-06	4.74E-06	4.76E-06	4.78E-06
h 3	5.04E-12	7.59E-12	7.60E-12	7.61E-12	7.62E-12
h 4	.00E+00	3.86E-36	3.87E-36	3.87E-36	3.88E-36
he 3	1.90E-08	1.90E-08	1.90E-08	1.91E-08	1.91E-08
he 4	2.61E-04	2.62E-04	2.63E-04	2.64E-04	2.65E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	3.13E-05	3.15E-05	3.16E-05	3.17E-05	3.19E-05
ne 21	1.48E-08	1.49E-08	1.50E-08	1.52E-08	1.53E-08
ne 22	2.06E-07	2.07E-07	2.08E-07	2.09E-07	2.10E-07
ne 23	8.88E-31	8.87E-16	8.87E-16	8.87E-16	8.88E-16
na 22	7.61E-13	5.26E-12	5.26E-12	5.26E-12	5.26E-12
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	3.24E-24	3.23E-09	3.24E-09	3.24E-09	3.24E-09
na 24m	5.32E-31	5.31E-16	5.32E-16	5.32E-16	5.32E-16
na 25	5.36E-39	5.40E-24	5.45E-24	5.49E-24	5.54E-24
mg 24	2.02E-01	2.03E-01	2.04E-01	2.04E-01	2.05E-01
mg 25	1.53E-06	1.54E-06	1.56E-06	1.57E-06	1.58E-06
mg 26	4.69E-06	4.71E-06	4.73E-06	4.75E-06	4.77E-06
mg 27	2.65E-28	2.65E-13	2.65E-13	2.65E-13	2.65E-13
mg 28	.00E+00	6.76E-26	6.76E-26	6.77E-26	6.77E-26
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.40E-26	2.40E-11	2.40E-11	2.40E-11	2.40E-11
al 29	4.38E-37	4.41E-22	4.45E-22	4.49E-22	4.53E-22
al 30	.00E+00	1.50E-31	1.52E-31	1.54E-31	1.56E-31
si 28	5.87E-01	5.90E-01	5.92E-01	5.95E-01	5.97E-01
si 29	1.40E-05	1.41E-05	1.42E-05	1.43E-05	1.44E-05
si 30	3.55E-10	3.59E-10	3.64E-10	3.68E-10	3.73E-10
si 31	3.18E-38	3.23E-23	3.27E-23	3.31E-23	3.35E-23
si 32	6.79E-30	7.08E-30	7.19E-30	7.29E-30	7.39E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
0 flux		2.97E+07	2.97E+07	2.97E+07	2.97E+07

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 275
power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d
he 4	6.53E+01	6.59E+01	6.65E+01	6.70E+01	6.76E+01
pb206	5.11E-01	5.19E-01	5.28E-01	5.36E-01	5.45E-01
pb207	2.91E-02	2.95E-02	2.99E-02	3.03E-02	3.08E-02
pb208	9.45E-04	9.53E-04	9.61E-04	9.69E-04	9.77E-04
pb209	1.57E-09	1.58E-09	1.60E-09	1.61E-09	1.62E-09
pb210	4.29E-04	4.32E-04	4.35E-04	4.37E-04	4.40E-04
pb211	6.44E-11	6.46E-11	6.48E-11	6.50E-11	6.53E-11

pb212	2.13E-11	2.24E-11	2.25E-11	2.26E-11	2.27E-11
pb214	9.81E-10	9.87E-10	9.93E-10	1.00E-09	1.01E-09
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	9.85E-02	1.00E-01	1.02E-01	1.04E-01	1.06E-01
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.64E-07	2.66E-07	2.68E-07	2.69E-07	2.71E-07
bi211	3.82E-12	3.83E-12	3.84E-12	3.85E-12	3.87E-12
bi212	2.02E-12	2.13E-12	2.14E-12	2.14E-12	2.15E-12
bi213	3.67E-10	3.70E-10	3.73E-10	3.76E-10	3.79E-10
bi214	7.28E-10	7.33E-10	7.38E-10	7.42E-10	7.47E-10
po210	7.29E-06	7.34E-06	7.39E-06	7.43E-06	7.48E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	4.22E-17	4.23E-17	4.24E-17	4.26E-17	4.27E-17
po212	1.06E-22	1.12E-22	1.12E-22	1.13E-22	1.13E-22
po213	5.51E-19	5.56E-19	5.61E-19	5.65E-19	5.70E-19
po214	1.00E-16	1.01E-16	1.01E-16	1.02E-16	1.03E-16
po215	5.30E-17	5.31E-17	5.32E-17	5.34E-17	5.36E-17
po216	8.08E-17	8.49E-17	8.53E-17	8.56E-17	8.59E-17
po218	1.13E-10	1.14E-10	1.15E-10	1.16E-10	1.16E-10
rn218	3.64E-44	3.98E-29	3.99E-29	4.01E-29	4.03E-29
rn219	1.18E-13	1.18E-13	1.18E-13	1.19E-13	1.19E-13
rn220	3.10E-14	3.26E-14	3.27E-14	3.28E-14	3.30E-14
rn222	2.02E-07	2.03E-07	2.04E-07	2.05E-07	2.07E-07
ra222	4.01E-41	4.32E-26	4.34E-26	4.36E-26	4.38E-26
ra223	2.94E-08	2.94E-08	2.96E-08	2.97E-08	2.98E-08
ra224	1.76E-10	1.85E-10	1.86E-10	1.87E-10	1.87E-10
ra225	1.71E-07	1.73E-07	1.74E-07	1.76E-07	1.77E-07
ra226	3.08E-02	3.10E-02	3.12E-02	3.14E-02	3.16E-02
ra228	1.64E-10	1.66E-10	1.67E-10	1.69E-10	1.70E-10
ac225	1.16E-07	1.17E-07	1.18E-07	1.19E-07	1.20E-07
ac227	2.04E-05	2.05E-05	2.06E-05	2.06E-05	2.07E-05
ac228	2.00E-14	2.02E-14	2.04E-14	2.06E-14	2.08E-14
th226	1.96E-39	2.11E-24	2.12E-24	2.13E-24	2.13E-24
th227	4.74E-08	4.75E-08	4.77E-08	4.79E-08	4.80E-08
th228	3.36E-08	3.54E-08	3.55E-08	3.56E-08	3.58E-08
th229	3.33E-02	3.36E-02	3.39E-02	3.42E-02	3.45E-02
th230	1.49E+00	1.50E+00	1.50E+00	1.51E+00	1.52E+00
th231	2.70E-09	3.54E-09	3.54E-09	3.55E-09	3.55E-09
th232	4.01E-01	4.05E-01	4.08E-01	4.12E-01	4.16E-01
th233	4.57E-28	4.61E-13	4.65E-13	4.70E-13	4.74E-13
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	3.07E-02	3.08E-02	3.09E-02	3.10E-02	3.11E-02
pa232	6.58E-26	6.61E-11	6.63E-11	6.66E-11	6.68E-11

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 276
power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

charge	******* d	******* d	******* d	******* d
pa233	1.39E-06	1.39E-06	1.39E-06	1.39E-06	1.39E-06
pa234m	1.81E-11	1.81E-11	1.81E-11	1.81E-11	1.81E-11
pa234	8.07E-12	8.07E-12	8.07E-12	8.07E-12	8.07E-12
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	1.90E-36	2.04E-21	2.05E-21	2.06E-21	2.07E-21
u231	7.22E-32	7.26E-17	7.32E-17	7.37E-17	7.42E-17
u232	1.19E-06	1.29E-06	1.29E-06	1.30E-06	1.30E-06
u233	7.80E-01	7.85E-01	7.91E-01	7.96E-01	8.02E-01
u234	1.02E+01	1.02E+01	1.02E+01	1.02E+01	1.02E+01
u235	6.54E+02	6.54E+02	6.54E+02	6.53E+02	6.53E+02
u236	1.95E+02	1.95E+02	1.96E+02	1.96E+02	1.96E+02

u237	2.76E-13	4.18E-07	4.18E-07	4.19E-07	4.19E-07
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.77E-23	3.77E-08	3.77E-08	3.77E-08	3.78E-08
u240	4.72E-34	4.86E-34	4.99E-34	5.13E-34	5.27E-34
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	9.88E-15	1.02E-12	1.02E-12	1.02E-12	1.02E-12
np236m	2.43E-28	2.42E-13	2.42E-13	2.42E-13	2.43E-13
np236	2.67E-06	2.67E-06	2.67E-06	2.68E-06	2.68E-06
np237	4.02E+01	4.02E+01	4.02E+01	4.02E+01	4.02E+01
np238	3.95E-15	1.82E-07	1.82E-07	1.82E-07	1.82E-07
np239	1.52E-13	5.45E-06	5.45E-06	5.46E-06	5.46E-06
np240m	4.03E-36	4.14E-36	4.26E-36	4.38E-36	4.50E-36
np240	4.53E-38	1.38E-16	1.38E-16	1.38E-16	1.38E-16
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	2.92E-11	1.37E-10	1.38E-10	1.38E-10	1.38E-10
pu237	2.95E-29	2.95E-14	2.94E-14	2.93E-14	2.92E-14
pu238	2.60E-03	2.75E-03	2.76E-03	2.76E-03	2.76E-03
pu239	2.48E+01	2.47E+01	2.45E+01	2.44E+01	2.43E+01
pu240	2.55E-01	2.52E-01	2.49E-01	2.47E-01	2.45E-01
pu241	8.96E-06	1.26E-05	1.25E-05	1.23E-05	1.22E-05
pu242	4.85E-05	4.85E-05	4.85E-05	4.86E-05	4.86E-05
pu243	1.59E-29	1.26E-14	1.26E-14	1.26E-14	1.26E-14
pu244	2.35E-23	2.42E-23	2.49E-23	2.56E-23	2.63E-23
pu245	.00E+00	1.24E-34	1.28E-34	1.31E-34	1.35E-34
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.29E-35	1.27E-20	1.27E-20	1.25E-20	1.24E-20
am240	5.91E-33	5.83E-18	5.79E-18	5.74E-18	5.69E-18
am241	3.81E-04	3.76E-04	3.73E-04	3.70E-04	3.67E-04
am242m	2.14E-08	2.17E-08	2.16E-08	2.15E-08	2.13E-08
am242	2.76E-13	1.73E-12	1.72E-12	1.71E-12	1.69E-12
am243	1.73E-07	1.73E-07	1.72E-07	1.72E-07	1.71E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.61E-31	1.60E-16	1.60E-16	1.60E-16	1.59E-16
am245	1.94E-40	2.43E-35	2.50E-35	2.57E-35	2.64E-35
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	.00E+00	1.25E-23	1.24E-23	1.23E-23	1.22E-23
cm242	5.57E-11	3.50E-10	3.47E-10	3.45E-10	3.42E-10
cm243	8.44E-16	9.91E-16	9.85E-16	9.77E-16	9.69E-16
cm244	1.92E-12	2.52E-12	2.51E-12	2.51E-12	2.50E-12

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 277
power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec

0 nuclide concentrations, gram atoms
basis = single reactor assembly

	charge ******* d	******* d	******* d	******* d	******* d
cm245	6.00E-15	5.89E-15	5.78E-15	5.68E-15	5.58E-15
cm246	4.15E-17	4.05E-17	3.95E-17	3.85E-17	3.76E-17
cm247	9.33E-20	9.36E-20	9.39E-20	9.42E-20	9.45E-20
cm248	5.69E-22	5.77E-22	5.86E-22	5.94E-22	6.02E-22
cm249	.00E+00	2.23E-33	2.26E-33	2.30E-33	2.33E-33
cm250	2.03E-37	2.05E-37	2.07E-37	2.09E-37	2.11E-37
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04
0 flux		2.97E+07	2.97E+07	2.97E+07	2.97E+07

0 .results on logical unit no. 71, position 1, for time step 4, subcase31. (run position 1, case position 1)
title: sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 278
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec

0 nuclide concentrations, grams

basis =single reactor assembly

	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
h 1	1.60E-03	1.60E-03	1.60E-03	1.60E-03	1.60E-03	1.60E-03	1.60E-03
h 2	9.57E-06	9.57E-06	9.57E-06	9.57E-06	9.57E-06	9.57E-06	9.57E-06
he 4	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03	1.06E-03
ne 20	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04	6.37E-04
ne 22	4.62E-06	4.62E-06	4.62E-06	4.62E-06	4.62E-06	4.62E-06	4.62E-06
na 23	1.73E+05	1.73E+05	1.73E+05	1.73E+05	1.73E+05	1.73E+05	1.73E+05
mg 24	4.92E+00	4.92E+00	4.92E+00	4.92E+00	4.92E+00	4.92E+00	4.92E+00
mg 25	3.96E-05	3.96E-05	3.96E-05	3.96E-05	3.96E-05	3.96E-05	3.96E-05
mg 26	1.24E-04	1.24E-04	1.24E-04	1.24E-04	1.24E-04	1.24E-04	1.24E-04
al 27	1.35E+06	1.35E+06	1.35E+06	1.35E+06	1.35E+06	1.35E+06	1.35E+06
si 28	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01	1.67E+01
si 29	4.19E-04	4.19E-04	4.19E-04	4.19E-04	4.19E-04	4.19E-04	4.19E-04
total	1.52E+06	1.52E+06	1.52E+06	1.52E+06	1.52E+06	1.52E+06	1.52E+06

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 279
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
element radioactivity, curies
basis =single reactor assembly

	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
totals	3.01E+00	3.86E-15	2.33E-15	1.41E-15	8.51E-16	5.14E-16	3.10E-16

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 280
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
element thermal power, watts
basis =single reactor assembly

	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
totals	5.62E-02	1.13E-18	6.84E-19	4.13E-19	2.49E-19	1.51E-19	9.10E-20

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 281
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
nuclide gamma power, watts
basis =single reactor assembly

	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
total	3.90E-02	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 282
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
nuclide concentrations, gram atoms
basis = single reactor assembly

	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
he 4	6.76E+01	7.11E+01	7.43E+01	7.72E+01	7.98E+01	8.23E+01	8.45E+01
pb206	5.45E-01	6.03E-01	6.64E-01	7.27E-01	7.92E-01	8.59E-01	9.28E-01
pb207	3.08E-02	3.35E-02	3.62E-02	3.90E-02	4.17E-02	4.44E-02	4.72E-02
pb208	9.77E-04	9.79E-04	9.79E-04	9.79E-04	9.79E-04	9.79E-04	9.79E-04
pb210	4.40E-04	4.58E-04	4.75E-04	4.92E-04	5.07E-04	5.21E-04	5.35E-04
bi209	1.06E-01	1.19E-01	1.33E-01	1.47E-01	1.62E-01	1.78E-01	1.94E-01
po210	7.48E-06	7.79E-06	8.08E-06	8.35E-06	8.61E-06	8.86E-06	9.09E-06
ra226	3.16E-02	3.29E-02	3.41E-02	3.53E-02	3.64E-02	3.74E-02	3.84E-02
ac227	2.07E-05	2.07E-05	2.06E-05	2.06E-05	2.06E-05	2.06E-05	2.06E-05
th229	3.45E-02	3.64E-02	3.83E-02	4.02E-02	4.21E-02	4.40E-02	4.58E-02
th230	1.52E+00	1.58E+00	1.64E+00	1.69E+00	1.74E+00	1.79E+00	1.83E+00
th232	4.16E-01	4.40E-01	4.64E-01	4.88E-01	5.12E-01	5.36E-01	5.61E-01
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	3.11E-02	3.11E-02	3.10E-02	3.10E-02	3.10E-02	3.10E-02	3.10E-02
pa233	1.39E-06	1.39E-06	1.38E-06	1.38E-06	1.38E-06	1.38E-06	1.38E-06
u233	8.02E-01	8.41E-01	8.80E-01	9.17E-01	9.54E-01	9.91E-01	1.03E+00
u234	1.02E+01	1.01E+01	9.99E+00	9.90E+00	9.81E+00	9.72E+00	9.63E+00
u235	6.53E+02	6.56E+02	6.58E+02	6.61E+02	6.63E+02	6.64E+02	6.66E+02

u236	1.96E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02	1.96E+02
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
np236	2.68E-06	2.62E-06	2.55E-06	2.49E-06	2.43E-06	2.37E-06	2.31E-06
np237	4.02E+01	4.01E+01	4.01E+01	4.00E+01	4.00E+01	3.99E+01	3.99E+01
pu239	2.43E+01	2.16E+01	1.91E+01	1.70E+01	1.50E+01	1.33E+01	1.18E+01
pu240	2.45E-01	1.58E-01	1.02E-01	6.54E-02	4.21E-02	2.71E-02	1.75E-02
pu242	4.86E-05	4.82E-05	4.78E-05	4.75E-05	4.71E-05	4.67E-05	4.64E-05
total	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 283
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0 element concentrations, gram atoms
basis = single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
he	6.76E+01	7.11E+01	7.43E+01	7.72E+01	7.98E+01	8.23E+01	8.45E+01
pb	5.77E-01	6.38E-01	7.02E-01	7.68E-01	8.35E-01	9.05E-01	9.76E-01
bi	1.06E-01	1.19E-01	1.33E-01	1.47E-01	1.62E-01	1.78E-01	1.94E-01
po	7.48E-06	7.79E-06	8.08E-06	8.35E-06	8.61E-06	8.86E-06	9.09E-06
ra	3.16E-02	3.29E-02	3.41E-02	3.53E-02	3.64E-02	3.74E-02	3.84E-02
ac	2.08E-05	2.08E-05	2.08E-05	2.08E-05	2.07E-05	2.08E-05	2.08E-05
th	1.97E+00	2.06E+00	2.14E+00	2.22E+00	2.30E+00	2.37E+00	2.44E+00
pa	3.11E-02	3.11E-02	3.10E-02	3.10E-02	3.10E-02	3.10E-02	3.10E-02
u	3.71E+04	3.71E+04	3.71E+04	3.71E+04	3.71E+04	3.71E+04	3.71E+04
np	4.02E+01	4.01E+01	4.01E+01	4.00E+01	4.00E+01	3.99E+01	3.99E+01
pu	2.45E+01	2.17E+01	1.92E+01	1.70E+01	1.51E+01	1.34E+01	1.19E+01
totals	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04	3.73E+04

1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 284
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0 nuclide concentrations, grams
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
he 4	2.70E+02	2.84E+02	2.97E+02	3.09E+02	3.19E+02	3.29E+02	3.38E+02
pb206	1.12E+02	1.24E+02	1.37E+02	1.50E+02	1.63E+02	1.77E+02	1.91E+02
pb207	6.37E+00	6.93E+00	7.50E+00	8.07E+00	8.63E+00	9.20E+00	9.76E+00
pb208	2.03E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01	2.04E-01
pb210	9.24E-02	9.62E-02	9.98E-02	1.03E-01	1.06E-01	1.09E-01	1.12E-01
bi209	2.21E+01	2.48E+01	2.77E+01	3.07E+01	3.39E+01	3.72E+01	4.06E+01
bi210	5.69E-05	5.92E-05	6.14E-05	6.35E-05	6.55E-05	6.74E-05	6.91E-05
po210	1.57E-03	1.64E-03	1.70E-03	1.75E-03	1.81E-03	1.86E-03	1.91E-03
rn222	4.59E-05	4.78E-05	4.96E-05	5.13E-05	5.29E-05	5.44E-05	5.58E-05
ra223	6.64E-06	6.62E-06	6.62E-06	6.61E-06	6.61E-06	6.60E-06	6.60E-06
ra225	3.99E-05	4.21E-05	4.43E-05	4.65E-05	4.87E-05	5.09E-05	5.30E-05
ra226	7.14E+00	7.43E+00	7.71E+00	7.97E+00	8.22E+00	8.46E+00	8.68E+00
ac225	2.70E-05	2.85E-05	3.00E-05	3.14E-05	3.29E-05	3.44E-05	3.58E-05
ac227	4.70E-03	4.69E-03	4.68E-03	4.68E-03	4.68E-03	4.68E-03	4.68E-03
th227	1.09E-05	1.09E-05	1.09E-05	1.09E-05	1.09E-05	1.09E-05	1.09E-05
th229	7.90E+00	8.34E+00	8.77E+00	9.21E+00	9.64E+00	1.01E+01	1.05E+01
th230	3.50E+02	3.64E+02	3.77E+02	3.89E+02	4.01E+02	4.12E+02	4.22E+02
th231	8.21E-07	6.27E-07	6.29E-07	6.31E-07	6.33E-07	6.35E-07	6.36E-07
th232	9.64E+01	1.02E+02	1.08E+02	1.13E+02	1.19E+02	1.24E+02	1.30E+02
th234	1.25E-04	1.25E-04	1.25E-04	1.25E-04	1.25E-04	1.25E-04	1.25E-04
pa231	7.19E+00	7.18E+00	7.17E+00	7.16E+00	7.16E+00	7.16E+00	7.16E+00
pa233	3.24E-04	3.23E-04	3.23E-04	3.22E-04	3.22E-04	3.21E-04	3.21E-04
u233	1.87E+02	1.96E+02	2.05E+02	2.14E+02	2.22E+02	2.31E+02	2.39E+02
u234	2.38E+03	2.36E+03	2.34E+03	2.32E+03	2.30E+03	2.27E+03	2.25E+03
u235	1.54E+05	1.54E+05	1.55E+05	1.55E+05	1.56E+05	1.56E+05	1.56E+05
u236	4.62E+04	4.62E+04	4.62E+04	4.62E+04	4.62E+04	4.62E+04	4.62E+04
u238	8.63E+06	8.63E+06	8.63E+06	8.63E+06	8.63E+06	8.63E+06	8.63E+06
np236	6.33E-04	6.17E-04	6.02E-04	5.87E-04	5.73E-04	5.58E-04	5.45E-04

np237	9.53E+03	9.51E+03	9.50E+03	9.49E+03	9.48E+03	9.46E+03	9.45E+03
pu239	5.81E+03	5.15E+03	4.57E+03	4.05E+03	3.60E+03	3.19E+03	2.83E+03
pu240	5.87E+01	3.78E+01	2.44E+01	1.57E+01	1.01E+01	6.51E+00	4.19E+00
pu242	1.18E-02	1.17E-02	1.16E-02	1.15E-02	1.14E-02	1.13E-02	1.12E-02
am243	4.16E-05	2.81E-05	1.90E-05	1.28E-05	8.68E-06	5.86E-06	3.96E-06
total	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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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 285
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
element concentrations, grams
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
he	2.70E+02	2.84E+02	2.97E+02	3.09E+02	3.19E+02	3.29E+02	3.38E+02
pb	1.19E+02	1.32E+02	1.45E+02	1.58E+02	1.72E+02	1.86E+02	2.01E+02
bi	2.21E+01	2.48E+01	2.77E+01	3.07E+01	3.39E+01	3.72E+01	4.06E+01
po	1.57E-03	1.64E-03	1.70E-03	1.75E-03	1.81E-03	1.86E-03	1.91E-03
rn	4.59E-05	4.78E-05	4.96E-05	5.13E-05	5.29E-05	5.44E-05	5.58E-05
ra	7.14E+00	7.43E+00	7.71E+00	7.97E+00	8.22E+00	8.46E+00	8.68E+00
ac	4.73E-03	4.72E-03	4.71E-03	4.71E-03	4.71E-03	4.71E-03	4.71E-03
th	4.55E+02	4.74E+02	4.93E+02	5.12E+02	5.29E+02	5.46E+02	5.62E+02
pa	7.19E+00	7.18E+00	7.17E+00	7.16E+00	7.16E+00	7.16E+00	7.16E+00
u	8.84E+06	8.84E+06	8.84E+06	8.84E+06	8.84E+06	8.84E+06	8.84E+06
np	9.53E+03	9.51E+03	9.50E+03	9.49E+03	9.48E+03	9.46E+03	9.45E+03
pu	5.87E+03	5.19E+03	4.59E+03	4.07E+03	3.61E+03	3.20E+03	2.83E+03
am	8.84E-02	1.43E-04	1.91E-05	1.28E-05	8.68E-06	5.86E-06	3.96E-06
totals	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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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 286
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
nuclide radioactivity, curies
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
tl206	9.32E-06	9.70E-06	1.01E-05	1.04E-05	1.07E-05	1.10E-05	1.13E-05
tl207	3.39E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.37E-01	3.37E-01
tl208	2.40E-03	4.28E-06	4.50E-06	4.71E-06	4.93E-06	5.14E-06	5.36E-06
tl209	3.29E-02	3.47E-02	3.65E-02	3.83E-02	4.01E-02	4.19E-02	4.37E-02
pb209	1.56E+00	1.65E+00	1.74E+00	1.83E+00	1.91E+00	2.00E+00	2.08E+00
pb210	7.06E+00	7.35E+00	7.62E+00	7.88E+00	8.13E+00	8.36E+00	8.58E+00
pb211	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01
pb212	6.69E-03	1.19E-05	1.25E-05	1.31E-05	1.37E-05	1.43E-05	1.49E-05
pb214	7.06E+00	7.35E+00	7.63E+00	7.89E+00	8.13E+00	8.36E+00	8.58E+00
bi210	7.06E+00	7.35E+00	7.62E+00	7.88E+00	8.13E+00	8.36E+00	8.58E+00
bi211	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01
bi212	6.69E-03	1.19E-05	1.25E-05	1.31E-05	1.37E-05	1.43E-05	1.49E-05
bi213	1.56E+00	1.65E+00	1.74E+00	1.83E+00	1.91E+00	2.00E+00	2.08E+00
bi214	7.06E+00	7.35E+00	7.63E+00	7.89E+00	8.13E+00	8.36E+00	8.58E+00
po210	7.06E+00	7.35E+00	7.62E+00	7.88E+00	8.13E+00	8.36E+00	8.58E+00
po211	9.35E-04	9.33E-04	9.32E-04	9.31E-04	9.31E-04	9.31E-04	9.31E-04
po212	4.29E-03	7.64E-06	8.02E-06	8.40E-06	8.78E-06	9.17E-06	9.55E-06
po213	1.53E+00	1.62E+00	1.70E+00	1.79E+00	1.87E+00	1.95E+00	2.04E+00
po214	7.06E+00	7.35E+00	7.62E+00	7.88E+00	8.13E+00	8.36E+00	8.58E+00
po215	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01
po216	6.69E-03	1.19E-05	1.25E-05	1.31E-05	1.37E-05	1.43E-05	1.49E-05
po218	7.06E+00	7.35E+00	7.63E+00	7.89E+00	8.13E+00	8.36E+00	8.58E+00
at217	1.57E+00	1.65E+00	1.74E+00	1.83E+00	1.91E+00	2.00E+00	2.08E+00
rn219	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01
rn220	6.69E-03	1.19E-05	1.25E-05	1.31E-05	1.37E-05	1.43E-05	1.49E-05
rn222	7.06E+00	7.35E+00	7.63E+00	7.89E+00	8.13E+00	8.36E+00	8.58E+00
fr221	1.57E+00	1.65E+00	1.74E+00	1.83E+00	1.91E+00	2.00E+00	2.08E+00
fr223	4.69E-03	4.68E-03	4.68E-03	4.67E-03	4.67E-03	4.67E-03	4.67E-03

ra223	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01
ra224	6.69E-03	1.19E-05	1.25E-05	1.31E-05	1.37E-05	1.43E-05	1.49E-05
ra225	1.57E+00	1.65E+00	1.74E+00	1.83E+00	1.91E+00	2.00E+00	2.08E+00
ra226	7.06E+00	7.35E+00	7.63E+00	7.89E+00	8.13E+00	8.36E+00	8.58E+00
ra228	1.06E-05	1.12E-05	1.18E-05	1.24E-05	1.30E-05	1.37E-05	1.43E-05
ac225	1.57E+00	1.65E+00	1.74E+00	1.83E+00	1.91E+00	2.00E+00	2.08E+00
ac227	3.40E-01	3.39E-01	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01
ac228	1.06E-05	1.12E-05	1.18E-05	1.24E-05	1.30E-05	1.37E-05	1.43E-05
th227	3.35E-01	3.35E-01	3.34E-01	3.34E-01	3.34E-01	3.34E-01	3.34E-01
th228	6.69E-03	1.19E-05	1.25E-05	1.31E-05	1.37E-05	1.43E-05	1.49E-05
th229	1.57E+00	1.65E+00	1.74E+00	1.83E+00	1.91E+00	2.00E+00	2.08E+00
th230	7.23E+00	7.51E+00	7.78E+00	8.03E+00	8.26E+00	8.49E+00	8.70E+00
th231	4.37E-01	3.33E-01	3.35E-01	3.36E-01	3.37E-01	3.38E-01	3.38E-01
th232	1.06E-05	1.12E-05	1.18E-05	1.24E-05	1.30E-05	1.37E-05	1.43E-05
th234	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	3.39E-01	3.39E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01
pa233	6.72E+00	6.71E+00	6.70E+00	6.69E+00	6.68E+00	6.67E+00	6.66E+00
pa234m	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
u232	6.68E-03	7.24E-07	7.06E-07	6.89E-07	6.72E-07	6.55E-07	6.39E-07
u233	1.80E+00	1.89E+00	1.98E+00	2.06E+00	2.14E+00	2.23E+00	2.31E+00
u234	1.48E+01	1.47E+01	1.45E+01	1.44E+01	1.43E+01	1.41E+01	1.40E+01
u235	3.32E-01	3.33E-01	3.35E-01	3.36E-01	3.37E-01	3.38E-01	3.38E-01
u236	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00	2.99E+00

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 287
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0 nuclide radioactivity, curies
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
u238	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00	2.90E+00
np236	8.34E-06	8.14E-06	7.94E-06	7.74E-06	7.55E-06	7.36E-06	7.18E-06
np237	6.72E+00	6.71E+00	6.70E+00	6.69E+00	6.68E+00	6.67E+00	6.66E+00
np239	3.03E+02	5.61E-06	3.79E-06	2.56E-06	1.73E-06	1.17E-06	7.91E-07
pu236	1.70E-05	7.24E-07	7.06E-07	6.89E-07	6.72E-07	6.55E-07	6.39E-07
pu239	3.60E+02	3.20E+02	2.84E+02	2.52E+02	2.23E+02	1.98E+02	1.76E+02
pu240	1.33E+01	8.59E+00	5.53E+00	3.56E+00	2.29E+00	1.48E+00	9.51E-01
pu242	4.65E-05	4.61E-05	4.58E-05	4.54E-05	4.51E-05	4.47E-05	4.44E-05
am243	8.31E-06	5.61E-06	3.79E-06	2.56E-06	1.73E-06	1.17E-06	7.91E-07
total	1.14E+03	4.61E+02	4.25E+02	3.94E+02	3.67E+02	3.44E+02	3.24E+02

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 288
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0 element thermal power, watts
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
tl	1.60E-03	1.58E-03	1.60E-03	1.63E-03	1.66E-03	1.69E-03	1.72E-03
pb	2.73E-02	2.84E-02	2.95E-02	3.05E-02	3.14E-02	3.23E-02	3.32E-02
bi	1.27E-01	1.32E-01	1.36E-01	1.41E-01	1.45E-01	1.48E-01	1.52E-01
po	9.03E-01	9.40E-01	9.76E-01	1.01E+00	1.04E+00	1.07E+00	1.10E+00
at	6.68E-02	7.05E-02	7.42E-02	7.79E-02	8.16E-02	8.52E-02	8.87E-02
rn	2.48E-01	2.58E-01	2.67E-01	2.75E-01	2.84E-01	2.91E-01	2.98E-01
fr	6.04E-02	6.38E-02	6.71E-02	7.05E-02	7.38E-02	7.71E-02	8.03E-02
ra	2.17E-01	2.26E-01	2.34E-01	2.41E-01	2.48E-01	2.55E-01	2.61E-01
ac	5.48E-02	5.78E-02	6.09E-02	6.39E-02	6.69E-02	6.99E-02	7.28E-02
th	2.66E-01	2.77E-01	2.87E-01	2.97E-01	3.06E-01	3.15E-01	3.23E-01
pa	4.17E-02	4.17E-02	4.16E-02	4.16E-02	4.16E-02	4.15E-02	4.15E-02
u	1.48E+00	6.41E-01	6.40E-01	6.39E-01	6.37E-01	6.36E-01	6.34E-01
np	1.01E+00	1.91E-01	1.91E-01	1.91E-01	1.91E-01	1.90E-01	1.90E-01
pu	1.20E+01	1.02E+01	8.99E+00	7.93E+00	7.01E+00	6.20E+00	5.49E+00

am	1.01E-02	1.34E-05	1.39E-07	8.25E-08	5.58E-08	3.77E-08	2.55E-08
totals	1.65E+01	1.31E+01	1.20E+01	1.10E+01	1.02E+01	9.42E+00	8.77E+00

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 289
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
nuclide gamma power, watts
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
tl207	4.42E-06	4.41E-06	4.41E-06	4.40E-06	4.40E-06	4.40E-06	4.40E-06
tl208	4.79E-05	8.53E-08	8.96E-08	9.39E-08	9.82E-08	1.02E-07	1.07E-07
tl209	4.13E-04	4.36E-04	4.59E-04	4.82E-04	5.05E-04	5.27E-04	5.49E-04
pb210	2.11E-04	2.20E-04	2.28E-04	2.36E-04	2.43E-04	2.50E-04	2.56E-04
pb211	1.36E-04	1.36E-04	1.36E-04	1.36E-04	1.36E-04	1.36E-04	1.36E-04
pb212	5.75E-06	1.02E-08	1.08E-08	1.13E-08	1.18E-08	1.23E-08	1.28E-08
pb214	1.05E-02	1.09E-02	1.13E-02	1.17E-02	1.21E-02	1.24E-02	1.27E-02
bi210	1.30E-08	1.35E-08	1.40E-08	1.45E-08	1.49E-08	1.54E-08	1.58E-08
bi211	9.43E-05	9.42E-05	9.40E-05	9.40E-05	9.39E-05	9.39E-05	9.39E-05
bi212	4.17E-06	7.43E-09	7.81E-09	8.18E-09	8.55E-09	8.92E-09	9.30E-09
bi213	1.17E-03	1.24E-03	1.30E-03	1.37E-03	1.43E-03	1.49E-03	1.56E-03
bi214	6.31E-02	6.57E-02	6.81E-02	7.05E-02	7.27E-02	7.47E-02	7.67E-02
po210	3.56E-07	3.70E-07	3.84E-07	3.97E-07	4.10E-07	4.21E-07	4.32E-07
po211	4.27E-08	4.26E-08	4.26E-08	4.25E-08	4.25E-08	4.25E-08	4.25E-08
po214	3.47E-06	3.62E-06	3.75E-06	3.88E-06	4.00E-06	4.11E-06	4.22E-06
po215	3.54E-07	3.53E-07	3.53E-07	3.52E-07	3.52E-07	3.52E-07	3.52E-07
rn219	1.13E-04	1.13E-04	1.13E-04	1.12E-04	1.12E-04	1.12E-04	1.12E-04
rn222	1.63E-05	1.70E-05	1.76E-05	1.82E-05	1.88E-05	1.93E-05	1.98E-05
fr221	2.75E-04	2.90E-04	3.05E-04	3.20E-04	3.35E-04	3.50E-04	3.65E-04
fr223	1.60E-06	1.59E-06	1.59E-06	1.59E-06	1.59E-06	1.59E-06	1.59E-06
ra223	2.71E-04	2.70E-04	2.70E-04	2.70E-04	2.70E-04	2.70E-04	2.70E-04
ra225	1.34E-04	1.41E-04	1.48E-04	1.56E-04	1.63E-04	1.70E-04	1.77E-04
ra226	3.02E-04	3.15E-04	3.26E-04	3.38E-04	3.48E-04	3.58E-04	3.67E-04
ac225	1.56E-04	1.65E-04	1.73E-04	1.82E-04	1.90E-04	1.99E-04	2.07E-04
ac227	3.89E-07	3.88E-07	3.88E-07	3.87E-07	3.87E-07	3.87E-07	3.87E-07
ac228	5.52E-08	5.84E-08	6.16E-08	6.48E-08	6.80E-08	7.12E-08	7.44E-08
th227	2.21E-04	2.20E-04	2.20E-04	2.20E-04	2.20E-04	2.20E-04	2.20E-04
th229	8.78E-04	9.26E-04	9.75E-04	1.02E-03	1.07E-03	1.12E-03	1.17E-03
th230	7.20E-05	7.48E-05	7.75E-05	8.00E-05	8.23E-05	8.46E-05	8.66E-05
th231	8.02E-05	6.13E-05	6.15E-05	6.17E-05	6.19E-05	6.20E-05	6.22E-05
th234	1.67E-04	1.67E-04	1.67E-04	1.67E-04	1.67E-04	1.67E-04	1.67E-04
pa231	8.06E-05	8.04E-05	8.03E-05	8.03E-05	8.02E-05	8.02E-05	8.02E-05
pa233	8.91E-03	8.89E-03	8.88E-03	8.86E-03	8.85E-03	8.84E-03	8.83E-03
pa234m	1.91E-04	1.91E-04	1.91E-04	1.91E-04	1.91E-04	1.91E-04	1.91E-04
pa234	4.38E-05	4.38E-05	4.38E-05	4.38E-05	4.38E-05	4.38E-05	4.38E-05
u233	1.32E-05	1.39E-05	1.45E-05	1.51E-05	1.58E-05	1.64E-05	1.69E-05
u234	1.41E-04	1.40E-04	1.39E-04	1.38E-04	1.36E-04	1.35E-04	1.34E-04
u235	3.27E-04	3.28E-04	3.30E-04	3.31E-04	3.32E-04	3.33E-04	3.33E-04
u236	3.01E-05	3.01E-05	3.01E-05	3.01E-05	3.01E-05	3.01E-05	3.01E-05
u238	2.32E-05	2.32E-05	2.32E-05	2.32E-05	2.32E-05	2.32E-05	2.32E-05
np236	7.27E-09	7.09E-09	6.92E-09	6.75E-09	6.58E-09	6.42E-09	6.26E-09
np237	1.40E-03	1.40E-03	1.39E-03	1.39E-03	1.39E-03	1.39E-03	1.39E-03
pu239	1.73E-03	1.54E-03	1.36E-03	1.21E-03	1.07E-03	9.51E-04	8.44E-04
pu240	1.30E-04	8.40E-05	5.41E-05	3.48E-05	2.24E-05	1.44E-05	9.30E-06
total	5.63E-01	9.42E-02	9.71E-02	9.98E-02	1.02E-01	1.05E-01	1.07E-01

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 290
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
nuclide concentrations, grams
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
li 6	3.17E-04	3.17E-04	3.17E-04	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	8.41E-06	8.41E-06	8.41E-06
be 9	1.62E-05	1.62E-05	1.62E-05	1.62E-05	1.62E-05	1.62E-05	1.62E-05
be 10	1.06E-04	1.06E-04	1.06E-04	1.05E-04	1.05E-04	1.05E-04	1.05E-04
zn 70	2.40E-06	2.40E-06	2.40E-06	2.40E-06	2.40E-06	2.40E-06	2.40E-06
ga 71	2.90E-05	2.90E-05	2.90E-05	2.90E-05	2.90E-05	2.90E-05	2.90E-05
ge 72	2.66E-03	2.66E-03	2.66E-03	2.66E-03	2.66E-03	2.66E-03	2.66E-03
ge 73	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02	1.07E-02
ge 74	9.24E-03	9.24E-03	9.24E-03	9.24E-03	9.24E-03	9.24E-03	9.24E-03
as 75	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01
ge 76	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01	3.39E-01
se 76	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04	1.09E-04
se 77	7.55E-01	7.55E-01	7.55E-01	7.55E-01	7.55E-01	7.55E-01	7.55E-01
se 78	2.05E+00	2.05E+00	2.05E+00	2.05E+00	2.05E+00	2.05E+00	2.05E+00
se 79	3.80E+00	3.77E+00	3.74E+00	3.71E+00	3.67E+00	3.64E+00	3.61E+00
br 79	3.81E-01	4.14E-01	4.47E-01	4.80E-01	5.12E-01	5.44E-01	5.76E-01
se 80	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01
kr 80	3.99E-04	3.99E-04	3.99E-04	3.99E-04	3.99E-04	3.99E-04	3.99E-04
br 81	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01
kr 81	8.03E-07	7.92E-07	7.82E-07	7.71E-07	7.61E-07	7.50E-07	7.40E-07
se 82	3.13E+01	3.13E+01	3.13E+01	3.13E+01	3.13E+01	3.13E+01	3.13E+01
kr 82	3.52E-02	3.52E-02	3.52E-02	3.52E-02	3.52E-02	3.52E-02	3.52E-02
kr 83	5.03E+01	5.03E+01	5.03E+01	5.03E+01	5.03E+01	5.03E+01	5.03E+01
kr 84	1.06E+02	1.06E+02	1.06E+02	1.06E+02	1.06E+02	1.06E+02	1.06E+02
rb 85	1.20E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02
kr 86	1.94E+02	1.94E+02	1.94E+02	1.94E+02	1.94E+02	1.94E+02	1.94E+02
sr 86	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02	1.28E-02
rb 87	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02	2.54E+02
sr 87	6.56E-04	6.71E-04	6.87E-04	7.02E-04	7.17E-04	7.32E-04	7.48E-04
sr 88	3.67E+02	3.67E+02	3.67E+02	3.67E+02	3.67E+02	3.67E+02	3.67E+02
y 89	4.96E+02	4.96E+02	4.96E+02	4.96E+02	4.96E+02	4.96E+02	4.96E+02
zr 90	6.06E+02	6.06E+02	6.06E+02	6.06E+02	6.06E+02	6.06E+02	6.06E+02
zr 91	6.22E+02	6.22E+02	6.22E+02	6.22E+02	6.22E+02	6.22E+02	6.22E+02
zr 92	6.37E+02	6.37E+02	6.37E+02	6.37E+02	6.37E+02	6.37E+02	6.37E+02
zr 93	4.49E+02	4.48E+02	4.47E+02	4.46E+02	4.45E+02	4.44E+02	4.44E+02
nb 93	9.44E+00	1.03E+01	1.11E+01	1.20E+01	1.28E+01	1.37E+01	1.45E+01
nb 93m	4.73E-03	4.72E-03	4.71E-03	4.70E-03	4.70E-03	4.69E-03	4.68E-03
zr 94	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02	7.10E+02
nb 94	5.49E-04	4.76E-04	4.13E-04	3.58E-04	3.10E-04	2.69E-04	2.34E-04
mo 95	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02	7.23E+02
zr 96	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02	7.13E+02
mo 96	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00
mo 97	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02	6.53E+02
mo 98	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	2.00E-04	2.00E-04
tc 99	6.21E+02	6.12E+02	6.04E+02	5.96E+02	5.88E+02	5.80E+02	5.72E+02
ru 99	9.96E+01	1.08E+02	1.16E+02	1.25E+02	1.33E+02	1.41E+02	1.48E+02
mo100	7.55E+02	7.55E+02	7.55E+02	7.55E+02	7.55E+02	7.55E+02	7.55E+02
ru100	5.50E+00	5.50E+00	5.50E+00	5.50E+00	5.50E+00	5.50E+00	5.50E+00
ru101	6.24E+02	6.24E+02	6.24E+02	6.24E+02	6.24E+02	6.24E+02	6.24E+02
ru102	5.39E+02	5.39E+02	5.39E+02	5.39E+02	5.39E+02	5.39E+02	5.39E+02
rh103	3.99E+02	3.99E+02	3.99E+02	3.99E+02	3.99E+02	3.99E+02	3.99E+02

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 291
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0
nuclide concentrations, grams
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
ru104	2.69E+02	2.69E+02	2.69E+02	2.69E+02	2.69E+02	2.69E+02	2.69E+02
pd104	1.58E+01	1.58E+01	1.58E+01	1.58E+01	1.58E+01	1.58E+01	1.58E+01
pd105	1.64E+02	1.64E+02	1.64E+02	1.64E+02	1.64E+02	1.64E+02	1.64E+02

pd106	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01	8.76E+01
pd107	4.54E+01	4.54E+01	4.54E+01	4.53E+01	4.53E+01	4.53E+01	4.53E+01
ag107	2.09E-01	2.29E-01	2.49E-01	2.69E-01	2.89E-01	3.10E-01	3.30E-01
pd108	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01	2.60E+01
cd108	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04	5.25E-04
ag109	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01	1.84E+01
pd110	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00	8.63E+00
cd110	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01	5.61E-01
cd111	5.01E+00	5.01E+00	5.01E+00	5.01E+00	5.01E+00	5.01E+00	5.01E+00
cd112	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00	3.25E+00
cd113	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01
in113	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02	4.50E-02
cd114	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00
sn114	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04	1.10E-04
in115	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00	1.67E+00
sn115	8.75E-02	8.75E-02	8.75E-02	8.75E-02	8.75E-02	8.75E-02	8.75E-02
cd116	2.72E+00	2.72E+00	2.72E+00	2.72E+00	2.72E+00	2.72E+00	2.72E+00
sn116	7.57E-02	7.57E-02	7.57E-02	7.57E-02	7.57E-02	7.57E-02	7.57E-02
sn117	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00	1.99E+00
sn118	1.88E+00	1.88E+00	1.88E+00	1.88E+00	1.88E+00	1.88E+00	1.88E+00
sn119	2.06E+00	2.06E+00	2.06E+00	2.06E+00	2.06E+00	2.06E+00	2.06E+00
sn120	2.05E+00	2.05E+00	2.05E+00	2.05E+00	2.05E+00	2.05E+00	2.05E+00
sb121	2.22E+00	2.22E+00	2.22E+00	2.22E+00	2.22E+00	2.22E+00	2.22E+00
sn122	2.63E+00	2.63E+00	2.63E+00	2.63E+00	2.63E+00	2.63E+00	2.63E+00
te122	3.56E-03	3.56E-03	3.56E-03	3.56E-03	3.56E-03	3.56E-03	3.56E-03
sb123	2.68E+00	2.68E+00	2.68E+00	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	1.69E-06	1.69E-06	1.69E-06
sn124	4.46E+00	4.46E+00	4.46E+00	4.46E+00	4.46E+00	4.46E+00	4.46E+00
te124	5.36E-03	5.36E-03	5.36E-03	5.36E-03	5.36E-03	5.36E-03	5.36E-03
te125	5.20E+00	5.20E+00	5.20E+00	5.20E+00	5.20E+00	5.20E+00	5.20E+00
sn126	6.08E+00	5.91E+00	5.74E+00	5.57E+00	5.42E+00	5.26E+00	5.11E+00
te126	2.20E+00	2.38E+00	2.55E+00	2.71E+00	2.87E+00	3.02E+00	3.17E+00
i127	2.21E+01	2.21E+01	2.21E+01	2.21E+01	2.21E+01	2.21E+01	2.21E+01
te128	5.81E+01	5.81E+01	5.81E+01	5.81E+01	5.81E+01	5.81E+01	5.81E+01
xe128	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02	3.17E-02
i129	1.23E+02	1.23E+02	1.23E+02	1.23E+02	1.23E+02	1.23E+02	1.23E+02
xe129	2.49E-01	2.71E-01	2.94E-01	3.17E-01	3.39E-01	3.62E-01	3.85E-01
te130	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02	2.79E+02
xe130	5.45E-01	5.45E-01	5.45E-01	5.45E-01	5.45E-01	5.45E-01	5.45E-01
xe131	4.50E+02	4.50E+02	4.90E+02	4.50E+02	4.50E+02	4.50E+02	4.50E+02
xe132	7.09E+02	7.09E+02	7.09E+02	7.09E+02	7.09E+02	7.09E+02	7.09E+02
ba132	4.87E-06	4.87E-06	4.87E-06	4.87E-06	4.87E-06	4.87E-06	4.87E-06
cs133	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03	1.06E+03
xe134	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03
ba134	1.07E+01	1.07E+01	1.07E+01	1.07E+01	1.07E+01	1.07E+01	1.07E+01
cs135	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03
ba135	1.46E+01	1.60E+01	1.73E+01	1.86E+01	1.99E+01	2.12E+01	2.26E+01
xe136	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03
ba136	4.03E+00	4.03E+00	4.03E+00	4.03E+00	4.03E+00	4.03E+00	4.03E+00

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 292
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0 nuclide concentrations, grams
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
ba137	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03	1.04E+03
ba138	1.10E+03	1.10E+03	1.10E+03	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	5.84E-03	5.84E-03	5.84E-03
la139	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03
ce140	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03	1.05E+03

pr141	9.73E+02	9.73E+02	9.73E+02	9.73E+02	9.73E+02	9.73E+02	9.73E+02
ce142	9.88E+02	9.88E+02	9.88E+02	9.88E+02	9.88E+02	9.88E+02	9.88E+02
nd142	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00	1.90E+00
nd143	9.53E+02	9.53E+02	9.53E+02	9.53E+02	9.53E+02	9.53E+02	9.53E+02
nd144	9.70E+02	9.70E+02	9.70E+02	9.70E+02	9.70E+02	9.70E+02	9.70E+02
nd145	6.66E+02	6.66E+02	6.66E+02	6.66E+02	6.66E+02	6.66E+02	6.66E+02
nd146	5.25E+02	5.25E+02	5.25E+02	5.25E+02	5.25E+02	5.25E+02	5.25E+02
sm146	8.37E-04	8.37E-04	8.37E-04	8.37E-04	8.37E-04	8.37E-04	8.37E-04
sm147	3.89E+02	3.89E+02	3.89E+02	3.89E+02	3.89E+02	3.89E+02	3.89E+02
nd148	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02	2.98E+02
sm148	8.64E+00	8.64E+00	8.64E+00	8.64E+00	8.64E+00	8.64E+00	8.64E+00
sm149	8.79E+00	8.79E+00	8.79E+00	8.79E+00	8.79E+00	8.79E+00	8.79E+00
nd150	1.23E+02	1.23E+02	1.23E+02	1.23E+02	1.23E+02	1.23E+02	1.23E+02
sm150	1.85E+02	1.85E+02	1.85E+02	1.85E+02	1.85E+02	1.85E+02	1.85E+02
eu151	3.76E+01	3.76E+01	3.76E+01	3.76E+01	3.76E+01	3.76E+01	3.76E+01
sm152	7.57E+01	7.57E+01	7.57E+01	7.57E+01	7.57E+01	7.57E+01	7.57E+01
gd152	2.01E+01	2.01E+01	2.01E+01	2.01E+01	2.01E+01	2.01E+01	2.01E+01
eu153	3.65E+01	3.65E+01	3.65E+01	3.65E+01	3.65E+01	3.65E+01	3.65E+01
sm154	1.64E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01	1.64E+01
gd154	2.15E+00	2.15E+00	2.15E+00	2.15E+00	2.15E+00	2.15E+00	2.15E+00
gd155	6.66E-01	6.66E-01	6.66E-01	6.66E-01	6.66E-01	6.66E-01	6.66E-01
gd156	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01
gd157	5.42E-02	5.42E-02	5.42E-02	5.42E-02	5.42E-02	5.42E-02	5.42E-02
gd158	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00	3.07E+00
tb159	4.41E-01	4.41E-01	4.41E-01	4.41E-01	4.41E-01	4.41E-01	4.41E-01
gd160	1.79E-01	1.79E-01	1.79E-01	1.79E-01	1.79E-01	1.79E-01	1.79E-01
dy160	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03	2.30E-03
dy161	7.00E-02	7.00E-02	7.00E-02	7.00E-02	7.00E-02	7.00E-02	7.00E-02
dy162	3.62E-02	3.62E-02	3.62E-02	3.62E-02	3.62E-02	3.62E-02	3.62E-02
dy163	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02
dy164	3.85E-03	3.85E-03	3.85E-03	3.85E-03	3.85E-03	3.85E-03	3.85E-03
ho165	2.94E-03	2.94E-03	2.94E-03	2.94E-03	2.94E-03	2.94E-03	2.94E-03
er166	3.07E-04	3.07E-04	3.07E-04	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	1.25E-06	1.25E-06	1.25E-06
er170	5.06E-07	5.06E-07	5.06E-07	5.06E-07	5.06E-07	5.06E-07	5.06E-07
yb171	7.02E-07	7.02E-07	7.02E-07	7.02E-07	7.02E-07	7.02E-07	7.02E-07
total	2.78E+04	2.78E+04	2.78E+04	2.78E+04	2.78E+04	2.78E+04	2.78E+04

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 293
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec
0 nuclide radioactivity, curies
basis =single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
be 10	2.37E-06	2.36E-06	2.36E-06	2.36E-06	2.35E-06	2.35E-06	2.34E-06
se 79	5.22E-02	5.18E-02	5.13E-02	5.09E-02	5.04E-02	5.00E-02	4.95E-02
rb 87	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05	2.18E-05
zr 93	1.13E+00	1.13E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00
nb 93m	1.13E+00	1.13E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00
nb 94	1.03E-04	8.92E-05	7.73E-05	6.71E-05	5.82E-05	5.05E-05	4.38E-05
tc 99	1.06E+01	1.05E+01	1.03E+01	1.02E+01	1.01E+01	9.92E+00	9.78E+00
pd107	2.33E-02	2.33E-02	2.33E-02	2.33E-02	2.33E-02	2.33E-02	2.33E-02
sn126	1.73E-01	1.68E-01	1.63E-01	1.58E-01	1.54E-01	1.49E-01	1.45E-01
sb126	2.51E-02	2.35E-02	2.28E-02	2.22E-02	2.15E-02	2.09E-02	2.03E-02
sb126m	1.74E-01	1.68E-01	1.63E-01	1.58E-01	1.54E-01	1.49E-01	1.45E-01
i129	2.18E-02	2.18E-02	2.18E-02	2.18E-02	2.18E-02	2.18E-02	2.18E-02
cs135	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.21E+00	1.20E+00
ce142	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05	2.37E-05
sm147	8.92E-06	8.92E-06	8.92E-06	8.92E-06	8.92E-06	8.92E-06	8.92E-06
total	2.54E+03	1.44E+01	1.42E+01	1.41E+01	1.39E+01	1.38E+01	1.36E+01

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 294
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec

0 element thermal power, watts
basis =single reactor assembly

	initial	d	d	d	d	d	d
se	3.90E-01	1.62E-05	1.61E-05	1.59E-05	1.58E-05	1.57E-05	1.55E-05
rb	2.97E+00	1.06E-08	1.06E-08	1.06E-08	1.06E-08	1.06E-08	1.06E-08
zr	1.45E+00	1.27E-04	1.27E-04	1.26E-04	1.26E-04	1.26E-04	1.26E-04
nb	2.64E+00	1.94E-04	1.94E-04	1.93E-04	1.93E-04	1.92E-04	1.92E-04
tc	8.85E-01	5.25E-03	5.18E-03	5.11E-03	5.04E-03	4.97E-03	4.91E-03
pd	5.94E-03	1.29E-06	1.29E-06	1.29E-06	1.28E-06	1.28E-06	1.28E-06
sn	2.29E-01	2.61E-04	2.54E-04	2.47E-04	2.40E-04	2.33E-04	2.26E-04
sb	9.16E-01	2.61E-03	2.53E-03	2.46E-03	2.39E-03	2.32E-03	2.26E-03
i	2.52E+00	1.02E-05	1.02E-05	1.02E-05	1.02E-05	1.02E-05	1.02E-05
cs	2.21E+00	4.04E-04	4.04E-04	4.03E-04	4.03E-04	4.02E-04	4.02E-04
sm	3.66E-03	1.23E-07	1.23E-07	1.23E-07	1.23E-07	1.23E-07	1.23E-07
totals	3.15E+01	8.87E-03	8.72E-03	8.57E-03	8.42E-03	8.28E-03	8.13E-03

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 295
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec

0 nuclide gamma power, watts
basis =single reactor assembly

	initial	d	d	d	d	d	d
nb 93m	1.26E-05	1.25E-05	1.25E-05	1.25E-05	1.25E-05	1.25E-05	1.24E-05
nb 94	9.58E-07	8.31E-07	7.21E-07	6.25E-07	5.42E-07	4.70E-07	4.08E-07
tc 99	3.90E-08	3.85E-08	3.80E-08	3.75E-08	3.70E-08	3.64E-08	3.60E-08
sn126	1.34E-04	1.30E-04	1.26E-04	1.22E-04	1.19E-04	1.16E-04	1.12E-04
sb126	4.09E-04	3.83E-04	3.72E-04	3.62E-04	3.51E-04	3.41E-04	3.32E-04
sb126m	1.60E-03	1.54E-03	1.50E-03	1.46E-03	1.42E-03	1.38E-03	1.34E-03
i129	3.18E-06	3.18E-06	3.18E-06	3.17E-06	3.17E-06	3.17E-06	3.17E-06
total	1.56E+01	2.07E-03	2.01E-03	1.96E-03	1.90E-03	1.85E-03	1.80E-03

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 296
decay, following reactor irradiation identified by: power= 9.787E-04mw, burnup=2.6809E+04mwd, flux= 6.14E+07n/cm**2-sec

0 element gamma power, watts
basis =single reactor assembly

	initial	d	d	d	d	d	d
nb	1.12E+00	1.34E-05	1.32E-05	1.31E-05	1.30E-05	1.29E-05	1.28E-05
tc	4.43E-01	3.99E-08	3.94E-08	3.89E-08	3.84E-08	3.79E-08	3.74E-08
sn	1.50E-01	1.30E-04	1.26E-04	1.22E-04	1.19E-04	1.16E-04	1.12E-04
sb	6.30E-01	1.93E-03	1.87E-03	1.82E-03	1.77E-03	1.72E-03	1.67E-03
i	1.65E+00	3.18E-06	3.18E-06	3.17E-06	3.17E-06	3.17E-06	3.17E-06
totals	1.56E+01	2.07E-03	2.01E-03	1.96E-03	1.90E-03	1.85E-03	1.80E-03

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photon spectrum as a function of time for light elements, cladding and structural materials

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
power= .00 mw, burnup= 26809.mwd, flux= 6.14E+07 n**2-sec
0 spectrum of photon release rates, photons/sec
basis = single reactor assembly
0

emean		time after discharge					
(mev)	initial	d	d	d	d	d	d
1.00E-02	6.07E+10	3.25E-06	1.96E-06	1.18E-06	7.15E-07	4.32E-07	2.61E-07
3.00E-02	1.99E+10	6.32E-07	3.82E-07	2.30E-07	1.39E-07	8.41E-08	5.08E-08
5.50E-02	1.39E+10	2.12E-07	1.28E-07	7.73E-08	4.67E-08	2.82E-08	1.70E-08
8.50E-02	8.13E+09	3.81E-08	2.30E-08	1.39E-08	8.39E-09	5.07E-09	3.06E-09
1.20E-01	5.78E+09	4.45E-09	2.69E-09	1.62E-09	9.81E-10	5.92E-10	3.58E-10
1.70E-01	6.05E+09	7.20E-11	4.35E-11	2.63E-11	1.59E-11	9.59E-12	5.79E-12
3.00E-01	6.93E+09	2.44E-24	2.44E-24	2.44E-24	2.43E-24	2.43E-24	2.42E-24

	6.50E-01	3.42E+09	2.06E-26	2.06E-26	2.05E-26	2.05E-26	2.04E-26	2.04E-26
	1.13E+00	5.89E+08	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	1.58E+00	1.07E+11	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	2.00E+00	2.11E+07	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	2.40E+00	4.28E+06	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	2.80E+00	2.52E+10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	3.25E+00	1.70E+03	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	3.75E+00	1.64E+07	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	4.25E+00	2.15E+05	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	4.75E+00	4.28E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
	5.50E+00	7.01E-11	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
0	total	2.57E+11	4.13E-06	2.50E-06	1.51E-06	9.11E-07	5.50E-07	3.32E-07
0	mev/sec	2.48E+11	6.68E-08	4.04E-08	2.44E-08	1.47E-08	8.90E-09	5.38E-09

0 spectrum of energy release rates, mev/watt-sec
basis = single reactor assembly

0

emean	time after discharge						
(mev)	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
1.00E-02	6.20E+05	3.32E-11	2.00E-11	1.21E-11	7.31E-12	4.42E-12	2.67E-12
3.00E-02	6.11E+05	1.94E-11	1.17E-11	7.06E-12	4.27E-12	2.58E-12	1.56E-12
5.50E-02	7.82E+05	1.19E-11	7.19E-12	4.34E-12	2.62E-12	1.59E-12	9.57E-13
8.50E-02	7.06E+05	3.31E-12	2.00E-12	1.21E-12	7.29E-13	4.40E-13	2.66E-13
1.20E-01	7.08E+05	5.46E-13	3.30E-13	1.99E-13	1.20E-13	7.26E-14	4.39E-14
1.70E-01	1.05E+06	1.25E-14	7.56E-15	4.57E-15	2.76E-15	1.67E-15	1.01E-15
3.00E-01	2.12E+06	7.49E-28	7.48E-28	7.47E-28	7.45E-28	7.44E-28	7.42E-28
6.50E-01	2.27E+06	1.37E-29	1.37E-29	1.36E-29	1.36E-29	1.36E-29	1.36E-29
1.13E+00	6.77E+05	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
1.58E+00	1.72E+08	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
2.00E+00	4.32E+04	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
2.40E+00	1.05E+04	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
2.80E+00	7.20E+07	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
3.25E+00	5.65E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
3.75E+00	6.28E+04	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
4.25E+00	9.32E+02	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
4.75E+00	2.08E-12	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
5.50E+00	3.94E-13	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
0 total	2.53E+08	6.83E-11	4.13E-11	2.49E-11	1.51E-11	9.09E-12	5.49E-12
0 gamma watts	3.97E-02	1.07E-20	6.47E-21	3.91E-21	2.36E-21	1.43E-21	8.62E-22

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photon spectrum as a function of time for fission products

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
power= .00 mw, burnup= 26809.mwd, flux= 6.14E+07 n**2-sec

0 spectrum of photon release rates, photons/sec
basis = single reactor assembly

0

emean	time after discharge						
(mev)	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
1.00E-02	3.16E+13	2.94E+10	2.90E+10	2.87E+10	2.84E+10	2.81E+10	2.78E+10
3.00E-02	1.38E+13	7.89E+09	7.75E+09	7.62E+09	7.49E+09	7.36E+09	7.24E+09
5.50E-02	7.37E+12	3.33E+09	3.27E+09	3.21E+09	3.15E+09	3.10E+09	3.04E+09
8.50E-02	5.08E+12	3.93E+09	3.83E+09	3.73E+09	3.63E+09	3.54E+09	3.45E+09
1.20E-01	4.17E+12	4.54E+08	4.46E+08	4.37E+08	4.29E+08	4.21E+08	4.13E+08
1.70E-01	6.65E+12	2.56E+08	2.51E+08	2.45E+08	2.39E+08	2.34E+08	2.29E+08
3.00E-01	1.35E+13	4.43E+09	4.31E+09	4.18E+09	4.06E+09	3.95E+09	3.84E+09
6.50E-01	2.81E+13	1.61E+10	1.56E+10	1.52E+10	1.47E+10	1.43E+10	1.39E+10
1.13E+00	9.45E+12	3.06E+08	2.97E+08	2.89E+08	2.81E+08	2.73E+08	2.65E+08
1.58E+00	4.88E+12	2.25E+07	2.18E+07	2.12E+07	2.06E+07	2.00E+07	1.94E+07
2.00E+00	1.48E+12	6.06E+00	5.88E+00	5.72E+00	5.55E+00	5.40E+00	5.24E+00
2.40E+00	1.27E+12	5.41E-04	5.41E-04	5.41E-04	5.41E-04	5.41E-04	5.41E-04

	2.80E+00	5.08E+11	2.84E-04	2.84E-04	2.84E-04	2.84E-04	2.84E-04	2.84E-04
	3.25E+00	2.94E+11	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04	1.45E-04
	3.75E+00	1.49E+11	7.28E-05	7.28E-05	7.28E-05	7.28E-05	7.28E-05	7.28E-05
	4.25E+00	1.63E+11	3.65E-05	3.65E-05	3.65E-05	3.65E-05	3.65E-05	3.65E-05
	4.75E+00	4.77E+10	1.83E-05	1.83E-05	1.83E-05	1.83E-05	1.83E-05	1.83E-05
	5.50E+00	3.56E+10	1.36E-05	1.36E-05	1.36E-05	1.36E-05	1.36E-05	1.36E-05
0	total	1.28E+14	6.60E+10	6.48E+10	6.36E+10	6.24E+10	6.13E+10	6.02E+10
0	mev/sec	5.38E+13	1.33E+10	1.29E+10	1.26E+10	1.22E+10	1.19E+10	1.16E+10

0 spectrum of energy release rates, mev/watt-sec
basis = single reactor assembly

0

emean	time after discharge						
(mev)	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
1.00E-02	3.23E+08	3.00E+05	2.97E+05	2.93E+05	2.90E+05	2.87E+05	2.84E+05
3.00E-02	4.24E+08	2.42E+05	2.38E+05	2.34E+05	2.30E+05	2.26E+05	2.22E+05
5.50E-02	4.14E+08	1.87E+05	1.84E+05	1.80E+05	1.77E+05	1.74E+05	1.71E+05
8.50E-02	4.41E+08	3.41E+05	3.32E+05	3.24E+05	3.16E+05	3.08E+05	3.00E+05
1.20E-01	5.11E+08	5.57E+04	5.47E+04	5.36E+04	5.26E+04	5.16E+04	5.07E+04
1.70E-01	1.16E+09	4.46E+04	4.35E+04	4.25E+04	4.16E+04	4.06E+04	3.97E+04
3.00E-01	4.12E+09	1.36E+06	1.32E+06	1.28E+06	1.25E+06	1.21E+06	1.18E+06
6.50E-01	1.86E+10	1.07E+07	1.04E+07	1.01E+07	9.78E+06	9.50E+06	9.23E+06
1.13E+00	1.09E+10	3.52E+05	3.42E+05	3.32E+05	3.23E+05	3.13E+05	3.04E+05
1.58E+00	7.86E+09	3.61E+04	3.51E+04	3.41E+04	3.31E+04	3.22E+04	3.13E+04
2.00E+00	3.02E+09	1.24E-02	1.20E-02	1.17E-02	1.14E-02	1.10E-02	1.07E-02
2.40E+00	3.11E+09	1.33E-06	1.33E-06	1.33E-06	1.33E-06	1.33E-06	1.33E-06
2.80E+00	1.45E+09	8.13E-07	8.13E-07	8.13E-07	8.13E-07	8.13E-07	8.13E-07
3.25E+00	9.76E+08	4.82E-07	4.82E-07	4.82E-07	4.82E-07	4.82E-07	4.82E-07
3.75E+00	5.70E+08	2.79E-07	2.79E-07	2.79E-07	2.79E-07	2.79E-07	2.79E-07
4.25E+00	7.08E+08	1.59E-07	1.59E-07	1.59E-07	1.59E-07	1.59E-07	1.59E-07
4.75E+00	2.32E+08	8.89E-08	8.89E-08	8.89E-08	8.89E-08	8.89E-08	8.89E-08
5.50E+00	2.00E+08	7.63E-08	7.63E-08	7.63E-08	7.63E-08	7.63E-08	7.63E-08
0 total	5.50E+10	1.36E+07	1.32E+07	1.28E+07	1.25E+07	1.21E+07	1.18E+07
0 gamma watts	8.63E+00	2.13E-03	2.07E-03	2.01E-03	1.96E-03	1.91E-03	1.85E-03

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0 principal photon sources in group 1, photons/sec
mean energy = .0100 mev. nuclides exceeding 1.0E-03 of total group release rate (2.81E+10) at ******* d

nuclide	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
se 79	5.14E+07	5.09E+07	5.05E+07	5.00E+07	4.96E+07	4.92E+07	4.87E+07
zr 93	2.70E+08	2.70E+08	2.69E+08	2.69E+08	2.68E+08	2.68E+08	2.67E+08
nb 93m	7.87E+09	7.86E+09	7.84E+09	7.83E+09	7.81E+09	7.80E+09	7.78E+09
tc 99	1.76E+10	1.73E+10	1.71E+10	1.69E+10	1.66E+10	1.64E+10	1.62E+10
sn126	6.09E+08	5.91E+08	5.74E+08	5.58E+08	5.42E+08	5.27E+08	5.12E+08
sb126	1.44E+08	1.35E+08	1.31E+08	1.27E+08	1.24E+08	1.20E+08	1.17E+08
sb126m	1.89E+09	1.82E+09	1.77E+09	1.72E+09	1.67E+09	1.62E+09	1.58E+09
i129	4.21E+07	4.21E+07	4.21E+07	4.21E+07	4.21E+07	4.21E+07	4.21E+07
cs135	1.26E+09	1.26E+09	1.26E+09	1.25E+09	1.25E+09	1.25E+09	1.25E+09

0 principal photon sources in group 2, photons/sec
mean energy = .0300 mev. nuclides exceeding 1.0E-03 of total group release rate (7.36E+09) at ******* d

nuclide	initial******* d	******* d	******* d	******* d	******* d	******* d	******* d
se 79	1.06E+07	1.05E+07	1.04E+07	1.03E+07	1.02E+07	1.01E+07	1.00E+07
zr 93	2.02E+07	2.01E+07	2.01E+07	2.01E+07	2.00E+07	2.00E+07	2.00E+07
tc 99	4.25E+09	4.19E+09	4.14E+09	4.08E+09	4.02E+09	3.97E+09	3.91E+09
sn126	2.14E+09	2.08E+09	2.02E+09	1.97E+09	1.91E+09	1.86E+09	1.80E+09
sb126	5.53E+07	5.18E+07	5.03E+07	4.89E+07	4.75E+07	4.62E+07	4.49E+07
sb126m	6.75E+08	6.51E+08	6.33E+08	6.15E+08	5.97E+08	5.80E+08	5.64E+08
i129	6.17E+08	6.17E+08	6.17E+08	6.16E+08	6.16E+08	6.16E+08	6.16E+08
cs135	2.67E+08	2.66E+08	2.66E+08	2.66E+08	2.65E+08	2.65E+08	2.65E+08

0 principal photon sources in group 3, photons/sec

mean energy = .0550 mev. nuclides exceeding 1.0E-03 of total group release rate (3.10E+09) at ******* d

nuclide	initial	******* d	******* d	******* d	******* d	******* d	******* d
	time after discharge						
se 79	3.83E+06	3.80E+06	3.77E+06	3.73E+06	3.70E+06	3.67E+06	3.64E+06
tc 99	2.05E+09	2.02E+09	2.00E+09	1.97E+09	1.94E+09	1.92E+09	1.89E+09
sn126	7.85E+08	7.63E+08	7.41E+08	7.20E+08	7.00E+08	6.80E+08	6.61E+08
sb126	2.72E+07	2.55E+07	2.48E+07	2.41E+07	2.34E+07	2.27E+07	2.21E+07
sb126m	4.02E+08	3.87E+08	3.76E+08	3.66E+08	3.55E+08	3.45E+08	3.35E+08
i129	2.26E+07	2.26E+07	2.26E+07	2.26E+07	2.26E+07	2.26E+07	2.25E+07
cs135	1.06E+08	1.06E+08	1.06E+08	1.06E+08	1.05E+08	1.05E+08	1.05E+08

0 principal photon sources in group 4, photons/sec

mean energy = .0850 mev. nuclides exceeding 1.0E-03 of total group release rate (3.54E+09) at ******* d

nuclide	initial	******* d	******* d	******* d	******* d	******* d	******* d
	time after discharge						
tc 99	7.29E+08	7.19E+08	7.09E+08	7.00E+08	6.90E+08	6.81E+08	6.72E+08
sn126	3.03E+09	2.95E+09	2.86E+09	2.78E+09	2.70E+09	2.63E+09	2.55E+09
sb126	1.43E+07	1.34E+07	1.30E+07	1.26E+07	1.23E+07	1.19E+07	1.16E+07
sb126m	2.27E+08	2.19E+08	2.12E+08	2.06E+08	2.00E+08	1.95E+08	1.89E+08
cs135	2.74E+07	2.73E+07	2.73E+07	2.73E+07	2.72E+07	2.72E+07	2.72E+07

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0 principal photon sources in group 5, photons/sec

mean energy = .1200 mev. nuclides exceeding 1.0E-03 of total group release rate (4.21E+08) at ******* d

nuclide	initial	******* d	******* d	******* d	******* d	******* d	******* d
	time after discharge						
tc 99	2.85E+08	2.81E+08	2.77E+08	2.74E+08	2.70E+08	2.66E+08	2.63E+08
sn126	8.05E+06	7.82E+06	7.59E+06	7.38E+06	7.17E+06	6.96E+06	6.77E+06
sb126	9.16E+06	8.58E+06	8.33E+06	8.10E+06	7.87E+06	7.64E+06	7.43E+06
sb126m	1.55E+08	1.50E+08	1.46E+08	1.42E+08	1.37E+08	1.34E+08	1.30E+08
cs135	6.59E+06	6.59E+06	6.58E+06	6.57E+06	6.56E+06	6.55E+06	6.54E+06

0 principal photon sources in group 6, photons/sec

mean energy = .1700 mev. nuclides exceeding 1.0E-03 of total group release rate (2.34E+08) at ******* d

nuclide	initial	******* d	******* d	******* d	******* d	******* d	******* d
	time after discharge						
tc 99	9.51E+07	9.38E+07	9.26E+07	9.13E+07	9.01E+07	8.88E+07	8.76E+07
sn126	3.58E+06	3.48E+06	3.38E+06	3.29E+06	3.19E+06	3.10E+06	3.01E+06
sb126	1.07E+07	1.00E+07	9.72E+06	9.45E+06	9.18E+06	8.92E+06	8.66E+06
sb126m	1.54E+08	1.48E+08	1.44E+08	1.40E+08	1.36E+08	1.32E+08	1.28E+08
cs135	7.25E+05	7.24E+05	7.23E+05	7.22E+05	7.21E+05	7.20E+05	7.19E+05

0 principal photon sources in group 7, photons/sec

mean energy = .3000 mev. nuclides exceeding 1.0E-03 of total group release rate (3.95E+09) at ******* d

nuclide	initial	******* d	******* d	******* d	******* d	******* d	******* d
	time after discharge						
tc 99	7.02E+06	6.92E+06	6.83E+06	6.74E+06	6.64E+06	6.55E+06	6.47E+06
sb126	6.44E+08	6.03E+08	5.86E+08	5.69E+08	5.53E+08	5.37E+08	5.22E+08
sb126m	3.96E+09	3.82E+09	3.71E+09	3.61E+09	3.50E+09	3.40E+09	3.31E+09

0 principal photon sources in group 8, photons/sec

mean energy = .6500 mev. nuclides exceeding 1.0E-03 of total group release rate (1.43E+10) at ******* d

nuclide	initial	******* d	******* d	******* d	******* d	******* d	******* d
	time after discharge						
sb126	3.55E+09	3.32E+09	3.23E+09	3.14E+09	3.05E+09	2.96E+09	2.88E+09
sb126m	1.32E+10	1.27E+10	1.24E+10	1.20E+10	1.17E+10	1.13E+10	1.10E+10

0 principal photon sources in group 9, photons/sec

mean energy = 1.1250 mev. nuclides exceeding 1.0E-03 of total group release rate (2.73E+08) at ******* d

nuclide	initial	******* d	******* d	******* d	******* d	******* d	******* d
	time after discharge						
sb126	1.11E+08	1.04E+08	1.01E+08	9.83E+07	9.55E+07	9.28E+07	9.01E+07
sb126m	2.09E+08	2.02E+08	1.96E+08	1.91E+08	1.85E+08	1.80E+08	1.75E+08

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0 principal photon sources in group 10, photons/sec

mean energy = 1.5750 mev. nuclides exceeding 1.0E-03 of total group release rate (2.00E+07) at ******* d

```
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      sb126   2.60E+06  2.43E+06  2.37E+06  2.30E+06  2.23E+06  2.17E+06  2.11E+06
      sb126m  2.08E+07  2.00E+07  1.94E+07  1.89E+07  1.84E+07  1.78E+07  1.73E+07
0                  principal photon sources in group 11, photons/sec
        mean energy = 2.0000 mev.  nuclides exceeding  1.0E-03 of total group release rate (5.40E+00) at ******* d
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      sb126   3.77E-02  3.53E-02  3.43E-02  3.33E-02  3.24E-02  3.15E-02  3.06E-02
      sb126m  6.24E+00  6.02E+00  5.85E+00  5.68E+00  5.52E+00  5.36E+00  5.21E+00
0                  principal photon sources in group 12, photons/sec
        mean energy = 2.4000 mev.  nuclides exceeding  1.0E-03 of total group release rate (5.41E-04) at ******* d
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      ce142   3.93E-04  3.93E-04  3.93E-04  3.93E-04  3.93E-04  3.93E-04  3.93E-04
      sm147   1.48E-04  1.48E-04  1.48E-04  1.48E-04  1.48E-04  1.48E-04  1.48E-04
0                  principal photon sources in group 13, photons/sec
        mean energy = 2.8000 mev.  nuclides exceeding  1.0E-03 of total group release rate (2.84E-04) at ******* d
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      ce142   2.06E-04  2.06E-04  2.06E-04  2.06E-04  2.06E-04  2.06E-04  2.06E-04
      sm147   7.76E-05  7.76E-05  7.76E-05  7.76E-05  7.76E-05  7.76E-05  7.76E-05
0                  principal photon sources in group 14, photons/sec
        mean energy = 3.2500 mev.  nuclides exceeding  1.0E-03 of total group release rate (1.45E-04) at ******* d
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      ce142   1.05E-04  1.05E-04  1.05E-04  1.05E-04  1.05E-04  1.05E-04  1.05E-04
      sm147   3.96E-05  3.96E-05  3.96E-05  3.96E-05  3.96E-05  3.96E-05  3.96E-05
0                  principal photon sources in group 15, photons/sec
        mean energy = 3.7500 mev.  nuclides exceeding  1.0E-03 of total group release rate (7.28E-05) at ******* d
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      ce142   5.29E-05  5.29E-05  5.29E-05  5.29E-05  5.29E-05  5.29E-05  5.29E-05
      sm147   1.99E-05  1.99E-05  1.99E-05  1.99E-05  1.99E-05  1.99E-05  1.99E-05
1                                                                                          page 302
0                  principal photon sources in group 16, photons/sec
        mean energy = 4.2500 mev.  nuclides exceeding  1.0E-03 of total group release rate (3.65E-05) at ******* d
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      ce142   2.65E-05  2.65E-05  2.65E-05  2.65E-05  2.65E-05  2.65E-05  2.65E-05
      sm147   9.97E-06  9.97E-06  9.97E-06  9.97E-06  9.97E-06  9.97E-06  9.97E-06
0                  principal photon sources in group 17, photons/sec
        mean energy = 4.7500 mev.  nuclides exceeding  1.0E-03 of total group release rate (1.83E-05) at ******* d
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      ce142   1.33E-05  1.33E-05  1.33E-05  1.33E-05  1.33E-05  1.33E-05  1.33E-05
      sm147   5.00E-06  5.00E-06  5.00E-06  5.00E-06  5.00E-06  5.00E-06  5.00E-06
0                  principal photon sources in group 18, photons/sec
        mean energy = 5.5000 mev.  nuclides exceeding  1.0E-03 of total group release rate (1.36E-05) at ******* d
    nuclide                                    time after discharge
             initial******* d ******* d ******* d ******* d ******* d ******* d ******* d
      ce142   9.86E-06  9.86E-06  9.86E-06  9.86E-06  9.86E-06  9.86E-06  9.86E-06
      sm147   3.71E-06  3.71E-06  3.71E-06  3.71E-06  3.71E-06  3.71E-06  3.71E-06
1                                                                                          page 303
          photon spectrum as a function of time for heavy metals and their daughters

0                    sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
                          power=    .00 mw, burnup=  26809.mwd, flux= 6.14E+07 n**2-sec
0                              actinide photon release rates, photons/sec
                          basis = single reactor assembly
```

0

emean (mev)	initial	******* d	******* d	******* d	******* d	******* d	******* d
		time after discharge					
1.00E-02	1.77E+13	1.74E+12	1.67E+12	1.61E+12	1.56E+12	1.51E+12	1.48E+12
3.00E-02	1.13E+12	1.36E+11	1.39E+11	1.43E+11	1.46E+11	1.49E+11	1.52E+11
5.50E-02	1.40E+12	9.02E+10	9.24E+10	9.46E+10	9.68E+10	9.88E+10	1.01E+11
8.50E-02	6.52E+12	2.77E+11	2.82E+11	2.87E+11	2.92E+11	2.96E+11	3.01E+11
1.20E-01	6.51E+12	5.47E+10	5.56E+10	5.65E+10	5.74E+10	5.83E+10	5.92E+10
1.70E-01	2.54E+11	5.20E+10	5.34E+10	5.47E+10	5.59E+10	5.71E+10	5.83E+10
3.00E-01	3.75E+12	3.52E+11	3.60E+11	3.68E+11	3.75E+11	3.82E+11	3.88E+11
6.50E-01	3.51E+11	1.85E+11	1.92E+11	1.99E+11	2.05E+11	2.11E+11	2.16E+11
1.13E+00	2.99E+11	8.36E+10	8.67E+10	8.96E+10	9.24E+10	9.50E+10	9.74E+10
1.58E+00	9.21E+10	9.58E+10	9.94E+10	1.03E+11	1.06E+11	1.09E+11	1.12E+11
2.00E+00	1.91E+10	1.99E+10	2.06E+10	2.13E+10	2.20E+10	2.26E+10	2.32E+10
2.40E+00	1.13E+10	1.18E+10	1.22E+10	1.26E+10	1.30E+10	1.34E+10	1.37E+10
2.80E+00	4.32E+08	3.64E+08	3.78E+08	3.90E+08	4.03E+08	4.14E+08	4.25E+08
3.25E+00	9.02E+07	9.38E+07	9.74E+07	1.01E+08	1.04E+08	1.07E+08	1.10E+08
3.75E+00	9.55E+03	8.41E+03	7.73E+03	7.28E+03	6.97E+03	6.75E+03	6.60E+03
4.25E+00	5.45E+03	4.81E+03	4.42E+03	4.16E+03	3.98E+03	3.86E+03	3.78E+03
4.75E+00	3.12E+03	2.75E+03	2.53E+03	2.38E+03	2.28E+03	2.21E+03	2.17E+03
5.50E+00	2.78E+03	2.45E+03	2.25E+03	2.12E+03	2.04E+03	1.98E+03	1.94E+03
0 total	3.81E+13	3.10E+12	3.06E+12	3.04E+12	3.02E+12	3.01E+12	3.00E+12
0 mev/sec	3.57E+12	6.06E+11	6.25E+11	6.43E+11	6.60E+11	6.76E+11	6.91E+11

0 actinide energy release rates, mev/watt-sec
basis = single reactor assembly

0

emean (mev)	initial	******* d	******* d	******* d	******* d	******* d	******* d
		time after discharge					
1.00E-02	1.81E+08	1.78E+07	1.70E+07	1.64E+07	1.59E+07	1.55E+07	1.51E+07
3.00E-02	3.48E+07	4.16E+06	4.27E+06	4.38E+06	4.48E+06	4.57E+06	4.67E+06
5.50E-02	7.87E+07	5.07E+06	5.20E+06	5.32E+06	5.44E+06	5.55E+06	5.66E+06
8.50E-02	5.66E+08	2.41E+07	2.45E+07	2.49E+07	2.53E+07	2.57E+07	2.61E+07
1.20E-01	7.99E+08	6.70E+06	6.82E+06	6.93E+06	7.04E+06	7.15E+06	7.26E+06
1.70E-01	4.41E+07	9.03E+06	9.27E+06	9.50E+06	9.72E+06	9.93E+06	1.01E+07
3.00E-01	1.15E+09	1.08E+08	1.10E+08	1.13E+08	1.15E+08	1.17E+08	1.19E+08
6.50E-01	2.33E+08	1.23E+08	1.28E+08	1.32E+08	1.36E+08	1.40E+08	1.44E+08
1.13E+00	3.44E+08	9.61E+07	9.96E+07	1.03E+08	1.06E+08	1.09E+08	1.12E+08
1.58E+00	1.48E+08	1.54E+08	1.60E+08	1.66E+08	1.71E+08	1.76E+08	1.80E+08
2.00E+00	3.91E+07	4.07E+07	4.22E+07	4.36E+07	4.50E+07	4.62E+07	4.74E+07
2.40E+00	2.77E+07	2.88E+07	2.99E+07	3.09E+07	3.19E+07	3.28E+07	3.37E+07
2.80E+00	1.24E+06	1.04E+06	1.08E+06	1.12E+06	1.15E+06	1.18E+06	1.22E+06
3.25E+00	2.99E+05	3.12E+05	3.23E+05	3.34E+05	3.45E+05	3.55E+05	3.64E+05
3.75E+00	3.66E+01	3.22E+01	2.96E+01	2.79E+01	2.67E+01	2.59E+01	2.53E+01
4.25E+00	2.37E+01	2.09E+01	1.92E+01	1.81E+01	1.73E+01	1.68E+01	1.64E+01
4.75E+00	1.52E+01	1.34E+01	1.23E+01	1.16E+01	1.11E+01	1.08E+01	1.05E+01
5.50E+00	1.56E+01	1.38E+01	1.27E+01	1.19E+01	1.14E+01	1.11E+01	1.09E+01
0 total	3.65E+09	6.19E+08	6.38E+08	6.57E+08	6.74E+08	6.91E+08	7.06E+08
0 gamma watts	5.72E-01	9.71E-02	1.00E-01	1.03E-01	1.06E-01	1.08E-01	1.11E-01

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neutron source intensity as a function of time

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
alpha-n neutron source, neutrons/sec/basis
basis = single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
pb210	1.71E-05	1.78E-05	1.85E-05	1.91E-05	1.97E-05	2.02E-05	2.08E-05
bi210	4.36E-03	4.54E-03	4.71E-03	4.87E-03	5.02E-03	5.16E-03	5.30E-03
bi211	5.39E+02	5.38E+02	5.38E+02	5.37E+02	5.37E+02	5.37E+02	5.37E+02

bi212	2.93E+00	5.22E-03	5.49E-03	5.75E-03	6.01E-03	6.27E-03	6.53E-03
bi213	3.62E+01	3.82E+01	4.02E+01	4.22E+01	4.42E+01	4.62E+01	4.81E+01
bi214	1.98E+00	2.06E+00	2.14E+00	2.21E+00	2.28E+00	2.34E+00	2.40E+00
po210	5.37E+03	5.59E+03	5.80E+03	6.00E+03	6.18E+03	6.36E+03	6.53E+03
po211	2.14E+00	2.13E+00	2.13E+00	2.13E+00	2.13E+00	2.12E+00	2.12E+00
po212	1.50E+01	2.68E-02	2.81E-02	2.94E-02	3.08E-02	3.21E-02	3.35E-02
po213	4.78E+03	5.04E+03	5.31E+03	5.57E+03	5.84E+03	6.10E+03	6.35E+03
po214	1.76E+04	1.83E+04	1.90E+04	1.97E+04	2.03E+04	2.09E+04	2.14E+04
po215	7.62E+02	7.61E+02	7.60E+02	7.59E+02	7.59E+02	7.58E+02	7.58E+02
po216	1.17E+01	2.09E-02	2.19E-02	2.30E-02	2.40E-02	2.51E-02	2.61E-02
po218	8.39E+03	8.73E+03	9.06E+03	9.37E+03	9.66E+03	9.93E+03	1.02E+04
at217	3.10E+03	3.27E+03	3.44E+03	3.61E+03	3.78E+03	3.95E+03	4.12E+03
rn218	2.63E-11	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
rn219	6.06E+02	6.05E+02	6.04E+02	6.04E+02	6.03E+02	6.03E+02	6.03E+02
rn220	9.28E+00	1.65E-02	1.74E-02	1.82E-02	1.90E-02	1.99E-02	2.07E-02
rn222	6.12E+03	6.38E+03	6.61E+03	6.84E+03	7.05E+03	7.25E+03	7.44E+03
fr221	2.26E+03	2.39E+03	2.51E+03	2.64E+03	2.76E+03	2.88E+03	3.00E+03
fr223	2.30E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04	2.29E-04
ra222	2.04E-11	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ra223	3.51E+02	3.50E+02	3.50E+02	3.49E+02	3.49E+02	3.49E+02	3.49E+02
ra224	6.56E+00	1.17E-02	1.23E-02	1.29E-02	1.34E-02	1.40E-02	1.46E-02
ra226	3.58E+03	3.73E+03	3.87E+03	4.00E+03	4.12E+03	4.24E+03	4.35E+03
ac225	1.62E+03	1.71E+03	1.81E+03	1.90E+03	1.98E+03	2.07E+03	2.16E+03
ac227	2.59E+00	2.58E+00	2.58E+00	2.58E+00	2.57E+00	2.57E+00	2.57E+00
ac228	1.85E-10	1.96E-10	2.06E-10	2.17E-10	2.28E-10	2.38E-10	2.49E-10
th226	1.84E-11	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
th227	3.87E+02	3.86E+02	3.86E+02	3.86E+02	3.85E+02	3.85E+02	3.85E+02
th228	5.53E+00	9.86E-03	1.04E-02	1.08E-02	1.13E-02	1.18E-02	1.23E-02
th229	9.49E+02	1.00E+03	1.05E+03	1.11E+03	1.16E+03	1.21E+03	1.26E+03
th230	3.38E+03	3.51E+03	3.64E+03	3.75E+03	3.87E+03	3.97E+03	4.07E+03
th232	2.35E-03	2.49E-03	2.63E-03	2.77E-03	2.90E-03	3.04E-03	3.18E-03
pa231	2.06E+02	2.06E+02	2.06E+02	2.05E+02	2.05E+02	2.05E+02	2.05E+02
u230	1.45E-11	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u231	1.07E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u232	5.15E+00	5.59E-04	5.45E-04	5.31E-04	5.18E-04	5.05E-04	4.93E-04
u233	9.52E+02	9.99E+02	1.04E+03	1.09E+03	1.13E+03	1.18E+03	1.22E+03
u234	7.45E+03	7.38E+03	7.31E+03	7.25E+03	7.18E+03	7.11E+03	7.05E+03
u235	1.23E+02	1.23E+02	1.23E+02	1.24E+02	1.24E+02	1.25E+02	1.25E+02
u236	1.17E+03	1.17E+03	1.17E+03	1.17E+03	1.17E+03	1.17E+03	1.17E+03
u238	8.30E+02	8.30E+02	8.30E+02	8.30E+02	8.30E+02	8.30E+02	8.30E+02
np235	2.86E-09	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np237	3.20E+03	3.19E+03	3.19E+03	3.18E+03	3.18E+03	3.18E+03	3.17E+03
pu236	1.75E-02	7.47E-04	7.29E-04	7.11E-04	6.93E-04	6.76E-04	6.59E-04
pu237	2.85E-09	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu238	9.75E+03	1.80E-10	1.67E-19	2.18E-28	.00E+00	.00E+00	.00E+00

1

neutron source intensity as a function of time

0

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
alpha-n neutron source, neutrons/sec/basis
basis = single reactor assembly

initial ******* d ******* d ******* d ******* d ******* d ******* d

pu239	2.45E+05	2.18E+05	1.93E+05	1.71E+05	1.52E+05	1.35E+05	1.20E+05
pu240	9.15E+03	5.89E+03	3.79E+03	2.44E+03	1.57E+03	1.01E+03	6.52E+02
pu241	4.05E-03	2.22E-15	1.58E-15	1.13E-15	8.02E-16	5.71E-16	4.07E-16
pu242	2.60E-02	2.58E-02	2.56E-02	2.54E-02	2.52E-02	2.51E-02	2.49E-02
pu244	5.01E-23	5.90E-23	6.78E-23	7.66E-23	8.53E-23	9.39E-23	1.02E-22
am239	3.39E-13	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

am240	5.32E-13	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am241	2.61E+02	3.40E-01	4.29E-04	5.40E-07	7.34E-10	3.97E-11	2.76E-11
am242m	1.74E-04	2.22E-13	2.83E-22	3.68E-31	.00E+00	.00E+00	.00E+00
am243	6.23E-03	4.21E-03	2.84E-03	1.92E-03	1.30E-03	8.78E-04	5.93E-04
cm241	5.44E-16	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm242	3.33E-01	6.89E-11	8.78E-20	1.11E-28	.00E+00	.00E+00	.00E+00
cm243	1.32E-08	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm244	5.23E-05	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm245	1.96E-10	1.39E-10	9.91E-11	7.06E-11	5.02E-11	3.58E-11	2.55E-11
cm246	2.28E-12	1.24E-12	6.74E-13	3.66E-13	1.99E-13	1.08E-13	5.86E-14
cm247	1.24E-18	1.24E-18	1.24E-18	1.24E-18	1.24E-18	1.24E-18	1.24E-18
cm248	3.72E-19	3.69E-19	3.66E-19	3.63E-19	3.60E-19	3.57E-19	3.54E-19
bk249	7.86E-26	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf249	7.42E-21	1.96E-24	5.28E-28	.00E+00	.00E+00	.00E+00	.00E+00
cf250	3.48E-24	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf251	2.44E-28	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
0 total	3.38E+05	3.00E+05	2.76E+05	2.55E+05	2.37E+05	2.21E+05	2.08E+05

1

neutron source intensity as a function of time

0

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
spontaneous fission neutron source, neutrons/sec/basis
basis = single reactor assembly

	initial	******* d	******* d	******* d	******* d	******* d	******* d
th230	8.67E-02	9.01E-02	9.33E-02	9.64E-02	9.92E-02	1.02E-01	1.04E-01
pa231	2.58E-02	2.58E-02	2.58E-02	2.57E-02	2.57E-02	2.57E-02	2.57E-02
u232	3.17E-04	3.43E-08	3.35E-08	3.26E-08	3.18E-08	3.10E-08	3.03E-08
u234	1.60E+01	1.59E+01	1.57E+01	1.56E+01	1.54E+01	1.53E+01	1.52E+01
u235	1.50E+00	1.51E+00	1.51E+00	1.52E+00	1.52E+00	1.52E+00	1.53E+00
u236	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02	1.76E+02
u237	1.65E-10	8.13E-29	5.79E-29	4.12E-29	2.93E-29	2.09E-29	1.49E-29
u238	1.17E+05	1.17E+05	1.17E+05	1.17E+05	1.17E+05	1.17E+05	1.17E+05
u239	1.15E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np236	1.00E-07	9.79E-08	9.55E-08	9.31E-08	9.08E-08	8.86E-08	8.64E-08
np238	2.37E-09	6.51E-26	8.29E-35	.00E+00	.00E+00	.00E+00	.00E+00
np239	2.35E-06	4.36E-14	2.95E-14	1.99E-14	1.35E-14	9.10E-15	6.15E-15
pu236	1.18E-03	5.06E-05	4.93E-05	4.81E-05	4.69E-05	4.57E-05	4.46E-05
pu238	1.80E+03	3.32E-11	3.08E-20	3.92E-29	4.94E-38	.00E+00	.00E+00
pu239	1.31E+02	1.17E+02	1.03E+02	9.17E+01	8.14E+01	7.22E+01	6.40E+01
pu240	6.08E+04	3.92E+04	2.52E+04	1.62E+04	1.05E+04	6.74E+03	4.34E+03
pu241	1.46E-04	8.00E-17	5.70E-17	4.06E-17	2.89E-17	2.06E-17	1.46E-17
pu242	2.03E+01	2.01E+01	2.00E+01	1.98E+01	1.97E+01	1.95E+01	1.94E+01
pu243	2.02E-13	5.36E-29	5.36E-29	5.36E-29	5.36E-29	5.36E-29	5.36E-29
pu244	1.20E-17	1.41E-17	1.62E-17	1.83E-17	2.04E-17	2.25E-17	2.45E-17
am241	1.00E-01	1.31E-04	1.65E-07	2.08E-10	2.83E-13	1.53E-14	1.06E-14
am242m	8.28E-04	1.05E-12	1.34E-21	1.71E-30	2.18E-39	.00E+00	.00E+00
am242	5.54E-06	1.14E-15	1.46E-24	1.91E-33	.00E+00	.00E+00	.00E+00
am243	2.87E-05	1.94E-05	1.31E-05	8.85E-06	5.98E-06	4.04E-06	2.73E-06
am244	7.08E-14	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm242	1.66E+00	3.44E-10	4.38E-19	5.58E-28	.00E+00	.00E+00	.00E+00
cm243	2.87E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm244	6.82E-03	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm245	5.30E-11	3.78E-11	2.69E-11	1.91E-11	1.36E-11	9.70E-12	6.90E-12
cm246	8.24E-08	4.47E-08	2.43E-08	1.32E-08	7.17E-09	3.89E-09	2.11E-09
cm248	6.09E-12	6.04E-12	5.99E-12	5.94E-12	5.89E-12	5.84E-12	5.79E-12
cm250	3.25E-25	2.75E-25	2.33E-25	1.97E-25	1.67E-25	1.42E-25	1.20E-25
bk249	4.34E-22	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cf249	4.51E-21	1.19E-24	3.15E-28	8.30E-32	2.19E-35	5.75E-39	.00E+00

	cf250	2.92E-19	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
0	total	1.80E+05	1.57E+05	1.43E+05	1.34E+05	1.28E+05	1.24E+05	1.22E+05
0	total	5.18E+05	4.56E+05	4.18E+05	3.88E+05	3.65E+05	3.45E+05	3.29E+05

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alpha-n neutron source spectrum as a function of time
(using reaction spectra for uranium dioxide)

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
alpha-n neutron spectra, neutrons/sec/basis
basis = single reactor assembly

	boundaries, mev	initial	******* d	******* d	******* d	******* d	******* d	******* d
1	6.43E+00 - 2.00E+01	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
2	3.00E+00 - 6.43E+00	6.551E+04	7.948E+04	6.965E+04	6.438E+04	5.983E+04	5.589E+04	5.246E+04
3	1.85E+00 - 3.00E+00	1.856E+05	1.578E+05	1.442E+05	1.333E+05	1.239E+05	1.157E+05	1.086E+05
4	1.40E+00 - 1.85E+00	4.984E+04	3.679E+04	3.606E+04	3.333E+04	3.098E+04	2.893E+04	2.716E+04
5	9.00E-01 - 1.40E+00	2.804E+04	1.950E+04	1.923E+04	1.778E+04	1.652E+04	1.543E+04	1.449E+04
6	4.00E-01 - 9.00E-01	8.144E+03	5.431E+03	5.460E+03	5.047E+03	4.691E+03	4.382E+03	4.113E+03
7	1.00E-01 - 4.00E-01	1.273E+03	8.592E+02	9.616E+02	8.888E+02	8.260E+02	7.716E+02	7.243E+02
8	1.70E-02 - 1.00E-01	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
9	3.00E-03 - 1.70E-02	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
10	5.50E-04 - 3.00E-03	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
11	1.00E-04 - 5.50E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
12	3.00E-05 - 1.00E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
13	1.00E-05 - 3.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
14	3.05E-06 - 1.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
15	1.77E-06 - 3.05E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
16	1.30E-06 - 1.77E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
17	1.13E-06 - 1.30E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
18	1.00E-06 - 1.13E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
19	8.00E-07 - 1.00E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
20	4.00E-07 - 8.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
21	3.25E-07 - 4.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
22	2.25E-07 - 3.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
23	1.00E-07 - 2.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
24	5.00E-08 - 1.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
25	3.00E-08 - 5.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
26	1.00E-08 - 3.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
27	1.00E-11 - 1.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
0		3.384E+05	2.999E+05	2.756E+05	2.547E+05	2.367E+05	2.211E+05	2.076E+05

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spontaneous fission neutron source spectrum as a function of time

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
spontaneous fission neutron spectra, neutrons/sec/basis
basis = single reactor assembly

	boundaries, mev	initial	******* d	******* d	******* d	******* d	******* d	******* d
1	6.43E+00 - 2.00E+01	3.438E+03	2.967E+03	2.684E+03	2.514E+03	2.405E+03	2.335E+03	2.290E+03
2	3.00E+00 - 6.43E+00	3.768E+04	3.279E+04	2.988E+04	2.800E+04	2.678E+04	2.600E+04	2.550E+04
3	1.85E+00 - 3.00E+00	4.106E+04	3.558E+04	3.231E+04	3.027E+04	2.896E+04	2.811E+04	2.757E+04
4	1.40E+00 - 1.85E+00	2.327E+04	2.036E+04	1.865E+04	1.748E+04	1.672E+04	1.623E+04	1.592E+04
5	9.00E-01 - 1.40E+00	3.194E+04	2.792E+04	2.555E+04	2.393E+04	2.290E+04	2.223E+04	2.180E+04
6	4.00E-01 - 9.00E-01	3.559E+04	3.086E+04	2.803E+04	2.626E+04	2.512E+04	2.439E+04	2.391E+04
7	1.00E-01 - 4.00E-01	7.026E+03	6.065E+03	5.488E+03	5.142E+03	4.919E+03	4.775E+03	4.683E+03
8	1.70E-02 - 1.00E-01	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
9	3.00E-03 - 1.70E-02	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00

10	5.50E-04 - 3.00E-03	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
11	1.00E-04 - 5.50E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
12	3.00E-05 - 1.00E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
13	1.00E-05 - 3.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
14	3.05E-06 - 1.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
15	1.77E-06 - 3.05E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
16	1.30E-06 - 1.77E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
17	1.13E-06 - 1.30E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
18	1.00E-06 - 1.13E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
19	8.00E-07 - 1.00E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
20	4.00E-07 - 8.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
21	3.25E-07 - 4.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
22	2.25E-07 - 3.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
23	1.00E-07 - 2.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
24	5.00E-08 - 1.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
25	3.00E-08 - 5.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
26	1.00E-08 - 3.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
27	1.00E-11 - 1.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
0		1.800E+05	1.565E+05	1.426E+05	1.336E+05	1.278E+05	1.241E+05	1.217E+05

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total (alpha-n plus spon. fission) neutron source spectrum as a function of time
(using reaction spectra for uranium dioxide)

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
neutron spectra, neutrons/sec/basis
basis = single reactor assembly

boundaries, mev	initial *******	d *******	d *******	d *******	d *******	d *******	d
1 6.43E+00 - 2.00E+01	3.438E+03	2.967E+03	2.684E+03	2.514E+03	2.405E+03	2.335E+03	2.290E+03
2 3.00E+00 - 6.43E+00	1.032E+05	1.123E+05	9.953E+04	9.238E+04	8.661E+04	8.189E+04	7.796E+04
3 1.85E+00 - 3.00E+00	2.266E+05	1.934E+05	1.765E+05	1.636E+05	1.529E+05	1.438E+05	1.362E+05
4 1.40E+00 - 1.85E+00	7.311E+04	5.716E+04	5.471E+04	5.081E+04	4.769E+04	4.516E+04	4.308E+04
5 9.00E-01 - 1.40E+00	5.998E+04	4.742E+04	4.478E+04	4.171E+04	3.942E+04	3.766E+04	3.628E+04
6 4.00E-01 - 9.00E-01	4.373E+04	3.629E+04	3.349E+04	3.131E+04	2.981E+04	2.877E+04	2.803E+04
7 1.00E-01 - 4.00E-01	8.299E+03	6.925E+03	6.449E+03	6.031E+03	5.745E+03	5.547E+03	5.407E+03
8 1.70E-02 - 1.00E-01	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
9 3.00E-03 - 1.70E-02	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
10 5.50E-04 - 3.00E-03	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
11 1.00E-04 - 5.50E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
12 3.00E-05 - 1.00E-04	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
13 1.00E-05 - 3.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
14 3.05E-06 - 1.00E-05	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
15 1.77E-06 - 3.05E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
16 1.30E-06 - 1.77E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
17 1.13E-06 - 1.30E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
18 1.00E-06 - 1.13E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
19 8.00E-07 - 1.00E-06	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
20 4.00E-07 - 8.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
21 3.25E-07 - 4.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
22 2.25E-07 - 3.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
23 1.00E-07 - 2.25E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
24 5.00E-08 - 1.00E-07	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
25 3.00E-08 - 5.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
26 1.00E-08 - 3.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
27 1.00E-11 - 1.00E-08	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	.000E+00
0	5.184E+05	4.564E+05	4.182E+05	3.883E+05	3.646E+05	3.452E+05	3.292E+05

1

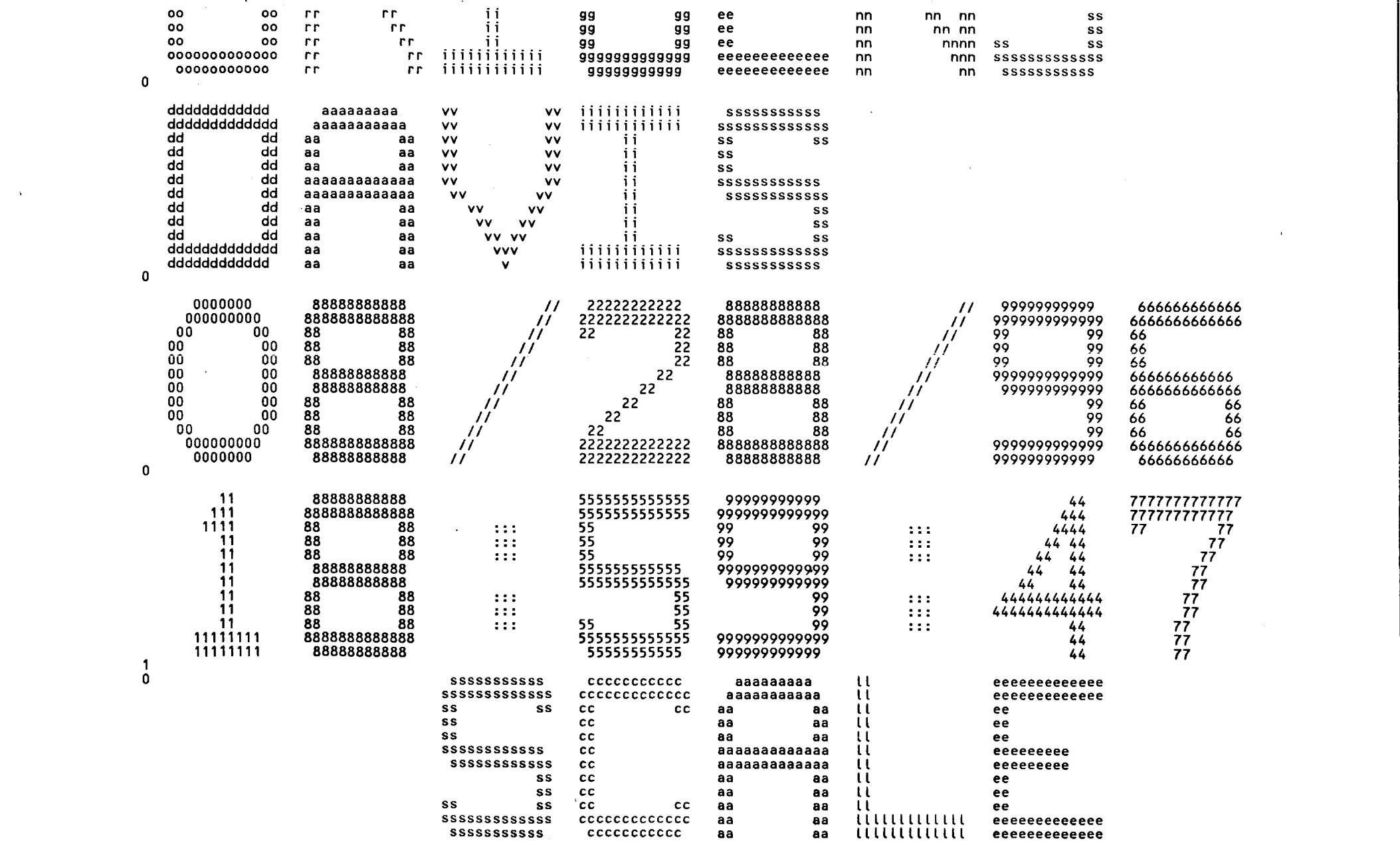
1 * gamma sources determined *

0case applies the following photon data base

```
                    master photon library
                    in binary mode
0    the sources include photons of nuclides for...

       light elements
       actinides
       fission products
1                       gamma source spectrum for gamma lines (sas2)
0                                    9131250.00  day time of the requested nuclides
0                            energy interval in mev       photons / second     mev / second
0
                        1.0000E-02 to       5.0000E-02        6.9808E+11        2.0942E+10
                        5.0000E-02 to       1.0000E-01        3.8584E+11        2.8938E+10
                        1.0000E-01 to       2.0000E-01        1.1289E+11        1.6934E+10
                        2.0000E-01 to       3.0000E-01        1.4488E+11        3.6220E+10
                        3.0000E-01 to       4.0000E-01        2.2971E+11        8.0400E+10
                        4.0000E-01 to       6.0000E-01        4.4709E+10        2.2354E+10
                        6.0000E-01 to       8.0000E-01        1.7332E+11        1.2132E+11
                        8.0000E-01 to       1.0000E+00        2.0805E+10        1.8725E+10
                        1.0000E+00 to       1.3300E+00        8.4120E+10        9.7999E+10
                        1.3300E+00 to       1.6600E+00        4.4072E+10        6.5888E+10
                        1.6600E+00 to       2.0000E+00        7.0645E+10        1.2928E+11
                        2.0000E+00 to       2.5000E+00        2.6955E+10        6.0650E+10
                        2.5000E+00 to       3.0000E+00        4.4295E+08        1.2181E+09
                        3.0000E+00 to       4.0000E+00        1.0172E+08        3.5601E+08
                        4.0000E+00 to       5.0000E+00        5.8590E+03        2.6366E+04
                        5.0000E+00 to       6.5000E+00        2.3016E+03        1.3234E+04
                        6.5000E+00 to       8.0000E+00        4.4274E+02        3.2099E+03
                        8.0000E+00 to       1.0000E+01        9.2729E+01        8.3456E+02
0                       totals                                2.0366E+12        7.0123E+11
0
0                       total energy from nuclides with spectrum data     =   7.0123E+11
0                       total energy from nuclides with no spectrum data  =   5.7340E+01
1
0  .results on logical unit no. 71, position  2, for time step  6, subcase32. (run position 1, case position 2)
   title: sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
0     .terminated logical unit no. 71 with zero flag record.
1  * normal termination of execution *
```

```
1          primary module access and input record ( scale driver - 95/03/29 - 09:06:37 )
-    module origens  will be called
       0$$  a8 26 a11 71 e
       1$$ 1  1t
        DBF Fuel 8% UO2 in Tuff (47% water) 1K yr burn
       3$$ 21 0 1 e
       '   3$$ 21 0 1  a33  -88
       2t
       35$$ 0  t
       '  54$$ a8 1 e
       '   56$$ 0 7 a5 1 a13 -1 a15 3 0 4 e   5t
       56$$ 0 7 a13 -1 a15 3 0 4 e   5t
       Part B 8% UO2 in Tuff (47%  H2O) DBF Fuel  1K yr burn
       per critical mass 10.1 MT UO2
       60**  0 1 90 365.25 730.5 1826.25  3652.5
       '  61** f1-20
       '  65$$ a4 1 2z 1 2z 1 5z 1 2z 1
       '   a25 1 2z 1 2z 1 5z 1 2z 1
       '   a46 1 2z 1 2z 1 5z 1 2z 1 e
       65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
       6t
       '   56$$ 0 -6 a10 1  e  t
       56$$ 0 10 a10 7 a14 5 a17 4 e  57** 10  e  5t
       60**  15 20 30 50 100 150 200 250 300 400
       '  61** f1-20
       '  65$$ a4 1 2z 1 2z 1 5z 1 2z 1
       '   a25 1 2z 1 2z 1 5z 1 2z 1
       '   a46 1 2z 1 2z 1 5z 1 2z 1 e
       65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
       6t
       56$$ 0 10 a10 10 a14 5 a17 4 e  57** 400  e  5t
       60**  500 1+3 2+3 4+3 6+3 8+3 1+4 1.2+4 1.4+4 1.6+4
       '    61** f1-20
       65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
       6t
       56$$ 0 10 a10 10 a14 5 a17 4 e  57** 1.6+4  e  5t
       60**  1.8+4 2.0+4 2.2+4 2.4+4 2.6+4 2.8+4 3+4 3.2+4 3.6+4 3.8+4
       '  61** f1-20
       65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
       6t
       56$$ 0 10 a10 10 a14 5 a17 4 e  57** 3.8+4  e  5t
       60**  4+4 4.5+4 5+4 5.5+4 6+4 6.5+4 7+4 1+5 2+5 2.5+5
       '    61** f1-20
       65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
       6t
       56$$ 0 3 a10 10 a14 5 a17 4 e  57** 2.5+5  e  5t
       60**  3+5 5+5 999999
       '  61** f1-20
       65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
       6t
       '   56$$ 0 -10 a10 1 e  t
       56$$ f0  t
0    module origens  is finished. completion code     0. cpu time used     7.00 (seconds).
1     oooooooooo     rrrrrrrrrrr    iiiiiiiiiii     ggggggggggg    eeeeeeeeeeeee   nn          nn   sssssssssss
    oooooooooooo    rrrrrrrrrrrrr   iiiiiiiiiiii   gggggggggggg   eeeeeeeeeeeee   nnn         nn  sssssssssssss
    oo          oo  rr          rr        ii       gg          gg  ee              nnnn        nn  ss          ss
    oo          oo  rr          rr        ii       gg              ee              nn nn       nn  ss
    oo          oo  rr          rr        ii       gg              ee              nn  nn      nn  ss
    oo          oo  rrrrrrrrrrrrr         ii       gg    ggggggg   eeeeeeeee       nn   nn     nn  sssssssssss
    oo          oo  rrrrrrrrrrrr          ii       gg    ggggggg   eeeeeeeee       nn    nn    nn   sssssssssss
```


oo oo rr rr ii gg gg ee nn nn nn ss
oo oo rr rr ii gg gg ee nn nn nn ss
oo oo rr rr ii gg gg ee nn nnnn ss ss
oooooooooooo rr rr iiiiiiiiiiii ggggggggggggg eeeeeeeeeeeee nn nnn sssssssssssss
oooooooooo rr rr iiiiiiiiiiii ggggggggggg eeeeeeeeeeeee nn nn ssssssssss
0
dddddddddddd aaaaaaaaa vv vv iiiiiiiiiiii sssssssssss
dddddddddddd aaaaaaaaaaa vv vv iiiiiiiiiiii sssssssssssss
dd dd aa aa vv vv ii ss ss
dd dd aa aa vv vv ii ss
dd dd aa aa vv vv ii ss
dd dd aaaaaaaaaaaaa vv vv ii sssssssssss
dd dd aaaaaaaaaaaaa vv vv ii sssssssssss
dd dd aa aa vv vv ii ss
dd dd aa aa vv vv ii ss
dd dd aa aa vv vv ii ss ss
dddddddddddd aa aa vvv iiiiiiiiiiii sssssssssss
dddddddddddd aa aa v iiiiiiiiiiii sssssssssss
0
0000000 88888888888 // 22222222222 88888888888 // 99999999999 666666666666
000000000 8888888888888 // 2222222222222 8888888888888 // 9999999999999 6666666666666
00 00 88 88 // 22 22 88 88 // 99 99 66
00 00 88 88 // 22 88 88 // 99 99 66
00 00 88 88 // 22 88 88 // 99 99 66
00 00 88888888888 // 22 88888888888 // 9999999999999 666666666666
00 00 88888888888 // 22 88888888888 // 999999999999 6666666666666
00 00 88 88 // 22 88 88 // 99 66 66
00 00 88 88 // 22 88 88 // 99 66 66
00 00 88 88 // 22 88 88 // 99 66 66
000000000 8888888888888 // 2222222222222 8888888888888 // 9999999999999 6666666666666
0000000 88888888888 // 2222222222222 88888888888 // 999999999999 66666666666
0
11 88888888888 5555555555555 99999999999 44 77777777777777
111 8888888888888 5555555555555 9999999999999 444 777777777777
1111 88 88 ::: 55 99 99 ::: 4444 77 77
11 88 88 ::: 55 99 99 ::: 44 44 77
11 88 88 ::: 55 99 99 ::: 44 44 77
11 88888888888 555555555555 99999999999 44 44 77
11 88888888888 5555555555555 999999999999 44 44 77
11 88 88 ::: 55 99 ::: 444444444444 77
11 88 88 ::: 55 99 ::: 444444444444 77
11 88 88 ::: 55 55 99 ::: 44 77
11111111 8888888888888 5555555555555 99999999999 44 77
11111111 88888888888 55555555555 999999999999 44 77
1
0
sssssssssss ccccccccccc aaaaaaaaa ll eeeeeeeeeeeee
ssssssssssss ccccccccccccc aaaaaaaaaaa ll eeeeeeeeeeeee
ss ss cc cc aa aa ll ee
ss cc aa aa ll ee
ss cc aa aa ll ee
sssssssssss cc aaaaaaaaaaaaa ll eeeeeeeee
ssssssssssss cc aaaaaaaaaaaaa ll eeeeeeeee
ss cc aa aa ll ee
ss cc aa aa ll ee
ss ss cc cc aa aa ll ee
ssssssssssss ccccccccccccc aa aa lllllllllllll eeeeeeeeeeeee
sssssssssss ccccccccccc aa aa lllllllllllll eeeeeeeeeeeee

```
*******************************************************************************
*******************************************************************************
*******************************************************************************
*****                                                                     *****
*****                  program verification information                *****
*****                                                                     *****
*****                 code system:    scale  version:    4.3           *****
*****                                                                     *****
*******************************************************************************
*******************************************************************************
*****                                                                     *****
*****                                                                     *****
*****              program:  origen                                       *****
*****                                                                     *****
*****        creation date:  03/13/96                                     *****
*****                                                                     *****
*****              library:  /usr1/ornl/Scale/bin                         *****
*****                                                                     *****
*****                                                                     *****
*****            test code:  origens                                      *****
*****                                                                     *****
*****              version:  3.0                                          *****
*****                                                                     *****
*****              jobname:  davis                                        *****
*****                                                                     *****
*****    date of execution:  08/28/96                                     *****
*****                                                                     *****
*****    time of execution:  18:59:48                                     *****
*****                                                                     *****
*****                                                                     *****
*******************************************************************************
*******************************************************************************
*******************************************************************************
```

```
1
1            * input echo * (with break between col. 1-72 and 73-80)
0       note:  only comments are permitted after column 72.
0--------------------only this is used as input data.------------------        comment or title end
0.............................columns 1-72.............................              ..73-80.

 0$$  a8 26 a11 71 e
 1$$ 1  1t
  DBF Fuel 8% UO2 in Tuff (47% water) 1K yr burn
 3$$ 21 0 1 e
 '   3$$ 21 0 1  a33  -88
 2t
 35$$ 0  t
 '  54$$ a8 1 e
 '   56$$ 0 7 a5 1 a13 -1 a15 3 0 4 e   5t
 56$$ 0 7 a13 -1 a15 3 0 4 e   5t
 Part B 8% UO2 in Tuff (47%  H2O) DBF Fuel  1K yr burn
 per critical mass 10.1 MT UO2
 60**  0 1 90 365.25 730.5 1826.25  3652.5
 '  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
65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
6t
'   56$$ 0 -6 a10 1  e  t
56$$ 0 10 a10 7 a14 5 a17 4 e  57** 10  e  5t
60**  15 20 30 50 100 150 200 250 300 400
'  61** f1-20
'  65$$ 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
65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
6t
56$$ 0 10 a10 10 a14 5 a17 4 e  57** 400  e  5t
60**  500 1+3 2+3 4+3 6+3 8+3 1+4 1.2+4 1.4+4 1.6+4
'    61** f1-20
65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
6t
56$$ 0 10 a10 10 a14 5 a17 4 e  57** 1.6+4  e  5t
60**  1.8+4 2.0+4 2.2+4 2.4+4 2.6+4 2.8+4 3+4 3.2+4 3.6+4 3.8+4
'  61** f1-20
65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
6t
56$$ 0 10 a10 10 a14 5 a17 4 e  57** 3.8+4  e  5t
60**  4+4 4.5+4 5+4 5.5+4 6+4 6.5+4 7+4 1+5 2+5 2.5+5
'    61** f1-20
65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
6t
56$$ 0 3 a10 10 a14 5 a17 4 e  57** 2.5+5  e  5t
60**  3+5 5+5 999999
'  61** f1-20
65$$ a25 1 0 0 1 0 0 0 a46 1 0 0 1 0 0 0 e
6t
'   56$$ 0 -10 a10 1 e  t
56$$ f0  t
0when job "fails", make sure no fido input.....................................is out here!

0    0$ array     12 entries read
0    1$ array      1 entries read
0    1t
0         dbl. prec. machine word applied has, at least, a 16 significant figure accuracy.
0             short-lived split test fraction, qxn =    9.1188E-04
0             half-norm of matrix used, axn =    7.0000E+00
0             4-place-accuracy-retention ratio, ratio4 =    6.4516E-13
   3$$ 21 0 1  a33  -88
0    3$ array     33 entries read
0    2t
1library information...

          cross-section data taken from position number  1 of library on unit 21.

          pass   1
          pass   0
          *scale-system control module sas2 library*
          used a time-dependent neutron spectrum, for each of the above passes
            pass 0 applies start-up fuel densiities
            pass n applies mid time densities of nth library interval
          first library updated was...
          ********************************************************************************
          *                                                                              *
          *            prelim lwr origen-s binary working library--id = 1143             *
```

```
          *        made from modified card-image origen-s libraries of scale 4.2         *
          *     data from the light element, actinide, and fission product libraries     *
          *       decay data, including gamma and total energy, are from endf/b-vi       *
          *                                                                              *
          *     neutron flux spectrum factors and cross sections were produced from      *
          *    the "presas2" case updating all nuclides on the scale "burnup" library    *
          *                                                                              *
          *                   fission product yields are from endf/b-v                   *
          *                                                                              *
          *                 photon libraries use an 18-energy-group structure            *
          *                the photon data are from the master photon data base,         *
          *                 produced to include bremsstrahlung from uo2 matrix           *
          *                                                                              *
          *       see information above this box (if present) for later updates          *
          *                                                                              *
          ********************************************************************************
          *                                                                              *
0         ********************************************************************************
0                  .other identification and sizes of library.
0                   data set name:  /usr1/ornl/Scale/data/prlimlwr
0               3/13/1996     date library was produced
0                    1697     total number of nuclides in library
                      689     number of light-element nuclides
                      129     number of actinide nuclides
                      879     number of fission product nuclides
0                    7935     number of nonzero off-diagonal matrix elements
0         ********************************************************************************
0obtaining data from position no.     1 on unit no.    71
1
     Part B 8% UO2 in Tuff (47%  H2O) DBF Fuel  1K yr burn                                      actinides          page    1
0                                           nuclide concentrations, grams
                                            basis =per critical mass 10.1 MT UO2
```

	charge	discharge	.0 d	1.0 d	90.0 d	365.3 d	730.5 d	1826.3 d	3652.5 d
he 4	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.14E+00	1.15E+00	1.15E+00
tl206	1.30E-16	1.30E-16	1.30E-16	1.31E-16	1.31E-16	1.31E-16	1.31E-16	1.32E-16	1.33E-16
tl207	3.99E-11	3.99E-11	3.99E-11	3.99E-11	3.99E-11	4.00E-11	4.01E-11	4.02E-11	4.04E-11
tl208	1.54E-12	1.54E-12	1.54E-12	1.58E-12	1.55E-12	1.54E-12	1.52E-12	1.48E-12	1.41E-12
tl209	6.69E-14	6.69E-14	6.69E-14	6.69E-14	6.69E-14	6.70E-14	6.72E-14	6.75E-14	6.82E-14
pb206	2.89E-03	2.89E-03	2.89E-03	2.89E-03	2.89E-03	2.89E-03	2.90E-03	2.93E-03	2.97E-03
pb207	1.48E-03	1.48E-03	1.48E-03	1.48E-03	1.48E-03	1.49E-03	1.49E-03	1.50E-03	1.51E-03
pb208	2.56E-04	2.56E-04	2.56E-04	2.56E-04	2.56E-04	2.57E-04	2.57E-04	2.59E-04	2.61E-04
pb209	2.83E-10	2.83E-10	2.83E-10	2.69E-10	2.83E-10	2.83E-10	2.84E-10	2.85E-10	2.88E-10
pb210	2.81E-04	2.81E-04	2.81E-04	2.81E-04	2.81E-04	2.82E-04	2.82E-04	2.84E-04	2.87E-04
pb211	3.09E-10	3.09E-10	3.09E-10	3.09E-10	3.09E-10	3.10E-10	3.10E-10	3.11E-10	3.12E-10
pb212	9.15E-10	9.15E-10	9.15E-10	9.14E-10	9.17E-10	9.11E-10	9.03E-10	8.78E-10	8.37E-10
pb214	6.96E-10	6.96E-10	6.96E-10	6.96E-10	6.96E-10	6.97E-10	6.99E-10	7.03E-10	7.09E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	1.77E-04	1.77E-04	1.77E-04	1.77E-04	1.78E-04	1.78E-04	1.78E-04	1.80E-04	1.83E-04
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.73E-07	1.73E-07	1.73E-07	1.73E-07	1.73E-07	1.74E-07	1.74E-07	1.75E-07	1.77E-07
bi211	1.83E-11	1.83E-11	1.83E-11	1.83E-11	1.83E-11	1.84E-11	1.84E-11	1.84E-11	1.85E-11
bi212	8.68E-11	8.68E-11	8.68E-11	8.86E-11	8.70E-11	8.64E-11	8.57E-11	8.33E-11	7.94E-11
bi213	6.73E-11	6.73E-11	6.73E-11	6.73E-11	6.73E-11	6.74E-11	6.75E-11	6.79E-11	6.86E-11
bi214	5.17E-10	5.17E-10	5.17E-10	5.17E-10	5.17E-10	5.18E-10	5.19E-10	5.22E-10	5.27E-10
po210	4.78E-06	4.78E-06	4.78E-06	4.78E-06	4.76E-06	4.73E-06	4.74E-06	4.79E-06	4.88E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	2.02E-16	2.02E-16	2.02E-16	2.02E-16	2.02E-16	2.03E-16	2.03E-16	2.04E-16	2.05E-16
po212	4.56E-21	4.56E-21	4.56E-21	4.66E-21	4.57E-21	4.54E-21	4.50E-21	4.38E-21	4.17E-21
po213	1.01E-19	1.01E-19	1.01E-19	1.01E-19	1.01E-19	1.01E-19	1.02E-19	1.02E-19	1.03E-19
po214	7.11E-17	7.11E-17	7.11E-17	7.11E-17	7.11E-17	7.12E-17	7.14E-17	7.18E-17	7.24E-17

po215	2.59E-16	2.59E-16	2.59E-16	2.59E-16	2.58E-16	2.59E-16	2.59E-16	2.60E-16	2.62E-16
po216	3.53E-15	3.53E-15	3.53E-15	3.53E-15	3.54E-15	3.51E-15	3.48E-15	3.39E-15	3.23E-15
po218	8.20E-11	8.20E-11	8.20E-11	8.21E-11	8.21E-11	8.22E-11	8.24E-11	8.28E-11	8.36E-11
at217	8.09E-16	8.09E-16	8.09E-16	8.10E-16	8.10E-16	8.11E-16	8.12E-16	8.17E-16	8.25E-16
rn218	1.34E-26	1.34E-26	1.34E-26	1.29E-26	6.66E-28	6.92E-32	3.58E-37	.00E+00	.00E+00
rn219	5.86E-13	5.86E-13	5.86E-13	5.86E-13	5.86E-13	5.87E-13	5.88E-13	5.90E-13	5.93E-13
rn220	1.38E-12	1.38E-12	1.38E-12	1.38E-12	1.38E-12	1.37E-12	1.36E-12	1.32E-12	1.26E-12
rn222	1.48E-07	1.48E-07	1.48E-07	1.48E-07	1.48E-07	1.49E-07	1.49E-07	1.50E-07	1.51E-07
fr221	7.50E-12	7.50E-12	7.50E-12	7.50E-12	7.50E-12	7.52E-12	7.53E-12	7.58E-12	7.65E-12
fr223	2.72E-12	2.72E-12	2.72E-12	2.72E-12	2.72E-12	2.72E-12	2.72E-12	2.73E-12	2.75E-12
ra222	1.48E-23	1.48E-23	1.48E-23	1.43E-23	7.37E-25	7.65E-29	3.95E-34	.00E+00	.00E+00
ra223	1.49E-07	1.49E-07	1.49E-07	1.49E-07	1.49E-07	1.49E-07	1.49E-07	1.50E-07	1.51E-07
ra224	7.98E-09	7.98E-09	7.98E-09	7.98E-09	8.00E-09	7.95E-09	7.88E-09	7.66E-09	7.30E-09
ra225	3.32E-08	3.32E-08	3.32E-08	3.32E-08	3.32E-08	3.33E-08	3.34E-08	3.36E-08	3.39E-08
ra226	2.31E-02	2.31E-02	2.31E-02	2.31E-02	2.31E-02	2.31E-02	2.32E-02	2.33E-02	2.35E-02
ra228	4.79E-10	4.79E-10	4.79E-10	4.79E-10	4.79E-10	4.80E-10	4.80E-10	4.81E-10	4.84E-10
ac225	2.24E-08	2.24E-08	2.24E-08	2.24E-08	2.25E-08	2.25E-08	2.25E-08	2.27E-08	2.29E-08
ac227	1.05E-04	1.05E-04	1.05E-04	1.05E-04	1.05E-04	1.05E-04	1.05E-04	1.06E-04	1.06E-04
ac228	5.85E-14	5.85E-14	5.85E-14	5.85E-14	5.85E-14	5.85E-14	5.86E-14	5.88E-14	5.91E-14
th226	7.34E-22	7.34E-22	7.34E-22	7.11E-22	3.66E-23	3.80E-27	1.96E-32	.00E+00	.00E+00
th227	2.45E-07	2.45E-07	2.45E-07	2.45E-07	2.44E-07	2.45E-07	2.45E-07	2.46E-07	2.47E-07
th228	1.55E-06	1.55E-06	1.55E-06	1.55E-06	1.55E-06	1.54E-06	1.53E-06	1.49E-06	1.42E-06
th229	6.58E-03	6.58E-03	6.58E-03	6.58E-03	6.58E-03	6.59E-03	6.60E-03	6.64E-03	6.71E-03
th230	5.88E+00	5.88E+00	5.88E+00	5.88E+00	5.88E+00	5.88E+00	5.89E+00	5.91E+00	5.94E+00
th231	7.18E-07	7.18E-07	7.18E-07	7.05E-07	6.91E-07	6.91E-07	6.91E-07	6.91E-07	6.91E-07

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 1K yr burn actinides page 2

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

	charge	discharge	.0 d	1.0 d	90.0 d	365.3 d	730.5 d	1826.3 d	3652.5 d
th232	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.20E+00	1.21E+00	1.21E+00
th233	1.10E-11	1.10E-11	1.10E-11	4.01E-31	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
th234	1.26E-04	1.26E-04	1.26E-04	1.26E-04	1.26E-04	1.26E-04	1.26E-04	1.26E-04	1.26E-04
pa231	1.66E-01	1.66E-01	1.66E-01	1.66E-01	1.67E-01	1.67E-01	1.67E-01	1.67E-01	1.68E-01
pa232	2.86E-09	2.86E-09	2.86E-09	1.69E-09	6.00E-30	.00E+00	.00E+00	.00E+00	.00E+00
pa233	3.39E-04	3.39E-04	3.39E-04	3.39E-04	3.39E-04	3.39E-04	3.39E-04	3.39E-04	3.39E-04
pa234m	4.24E-09	4.24E-09	4.24E-09	4.24E-09	4.24E-09	4.24E-09	4.24E-09	4.24E-09	4.24E-09
pa234	1.89E-09	1.89E-09	1.89E-09	1.89E-09	1.89E-09	1.89E-09	1.89E-09	1.89E-09	1.89E-09
pa235	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u230	7.24E-19	7.24E-19	7.24E-19	7.00E-19	3.61E-20	3.74E-24	1.94E-29	.00E+00	.00E+00
u231	2.38E-15	2.38E-15	2.38E-15	2.01E-15	8.46E-22	1.62E-41	.00E+00	.00E+00	.00E+00
u232	5.63E-05	5.63E-05	5.63E-05	5.63E-05	5.62E-05	5.58E-05	5.53E-05	5.38E-05	5.12E-05
u233	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.16E+00	3.17E+00	3.19E+00
u234	2.15E+03	2.15E+03	2.15E+03	2.15E+03	2.15E+03	2.15E+03	2.15E+03	2.15E+03	2.15E+03
u235	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05
u236	4.14E+04	4.14E+04	4.14E+04	4.14E+04	4.14E+04	4.14E+04	4.14E+04	4.14E+04	4.14E+04
u237	7.38E-04	7.38E-04	7.38E-04	6.66E-04	7.16E-08	6.28E-11	5.98E-11	5.18E-11	4.07E-11
u238	8.65E+06	8.65E+06	8.65E+06	8.65E+06	8.65E+06	8.65E+06	8.65E+06	8.65E+06	8.65E+06
u239	7.58E-05	7.58E-05	7.58E-05	2.56E-23	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u240	.00E+00	.00E+00	.00E+00	5.38E-42	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	2.03E-09	2.03E-09	2.03E-09	2.03E-09	1.73E-09	1.07E-09	5.66E-10	8.32E-11	3.41E-12
np236m	4.85E-10	4.85E-10	4.85E-10	2.31E-10	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np236	4.62E-05	4.62E-05	4.62E-05	4.62E-05	4.62E-05	4.62E-05	4.62E-05	4.62E-05	4.62E-05
np237	9.97E+03	9.97E+03	9.97E+03	9.97E+03	9.97E+03	9.97E+03	9.97E+03	9.97E+03	9.97E+03
np238	3.68E-04	3.68E-04	3.68E-04	2.65E-04	1.38E-12	1.38E-12	1.37E-12	1.35E-12	1.32E-12
np239	1.10E-02	1.10E-02	1.10E-02	8.22E-03	8.61E-14	5.15E-14	5.15E-14	5.14E-14	5.14E-14
np240m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np240	2.23E-12	2.23E-12	2.23E-12	2.21E-19	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00

pu236	2.63E-07	2.63E-07	2.63E-07	2.63E-07	2.48E-07	2.07E-07	1.63E-07	7.98E-08	2.42E-08
pu237	6.35E-11	6.35E-11	6.35E-11	6.26E-11	1.60E-11	2.34E-13	8.61E-16	4.30E-23	2.91E-35
pu238	5.57E+00	5.57E+00	5.57E+00	5.57E+00	5.56E+00	5.52E+00	5.48E+00	5.35E+00	5.14E+00
pu239	1.15E+03	1.15E+03	1.15E+03	1.15E+03	1.15E+03	1.15E+03	1.15E+03	1.15E+03	1.15E+03
pu240	5.49E+00	5.49E+00	5.49E+00	5.49E+00	5.49E+00	5.49E+00	5.49E+00	5.49E+00	5.48E+00
pu241	2.17E-03	2.17E-03	2.17E-03	2.17E-03	2.15E-03	2.07E-03	1.97E-03	1.71E-03	1.34E-03
pu242	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.20E-05	2.21E-05
pu243	4.65E-14	4.65E-14	4.65E-14	1.62E-15	5.09E-34	5.09E-34	5.09E-34	5.09E-34	5.09E-34
pu244	3.94E-31	3.94E-31	3.94E-31	3.94E-31	3.95E-31	3.98E-31	4.02E-31	4.14E-31	4.33E-31
pu245	.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
am239	6.66E-18	6.66E-18	6.66E-18	1.64E-18	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am240	3.06E-15	3.06E-15	3.06E-15	2.21E-15	5.11E-28	.00E+00	.00E+00	.00E+00	.00E+00
am241	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.45E-02	2.46E-02	2.47E-02	2.49E-02
am242m	7.60E-06	7.60E-06	7.60E-06	7.60E-06	7.59E-06	7.56E-06	7.52E-06	7.41E-06	7.23E-06
am242	9.49E-10	9.49E-10	9.49E-10	3.99E-10	9.79E-11	9.75E-11	9.70E-11	9.56E-11	9.33E-11
am243	5.98E-08	5.98E-08	5.98E-08	5.98E-08	5.98E-08	5.98E-08	5.98E-08	5.98E-08	5.97E-08
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	4.56E-16	4.56E-16	4.56E-16	8.78E-17	.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
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	5.50E-20	5.50E-20	5.50E-20	5.39E-20	8.21E-21	2.45E-23	1.09E-26	9.55E-37	.00E+00

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 1K yr burn actinides page 3

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

	charge	discharge	.0 d	1.0 d	90.0 d	365.3 d	730.5 d	1826.3 d	3652.5 d
cm242	1.92E-07	1.92E-07	1.92E-07	1.91E-07	1.37E-07	5.62E-08	2.73E-08	1.94E-08	1.88E-08
cm243	7.14E-14	7.14E-14	7.14E-14	7.14E-14	7.10E-14	6.97E-14	6.80E-14	6.32E-14	5.60E-14
cm244	6.42E-12	6.42E-12	6.42E-12	6.42E-12	6.36E-12	6.18E-12	5.95E-12	5.30E-12	4.38E-12
cm245	1.21E-15	1.21E-15	1.21E-15	1.21E-15	1.21E-15	1.21E-15	1.21E-15	1.21E-15	1.21E-15
cm246	1.04E-18	1.04E-18	1.04E-18	1.04E-18	1.04E-18	1.04E-18	1.04E-18	1.04E-18	1.04E-18
cm247	1.46E-23	1.46E-23	1.46E-23	1.46E-23	1.46E-23	1.46E-23	1.46E-23	1.46E-23	1.46E-23
cm248	2.11E-27	2.11E-27	2.11E-27	2.11E-27	2.11E-27	2.11E-27	2.11E-27	2.11E-27	2.11E-27
cm249	6.59E-38	6.59E-38	6.59E-38	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm250	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm251	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bk249	4.73E-34	4.73E-34	4.73E-34	4.72E-34	3.89E-34	2.15E-34	9.73E-35	9.06E-36	1.74E-37
bk250	.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
cf249	3.21E-32	3.21E-32	3.21E-32	3.21E-32	3.22E-32	3.23E-32	3.24E-32	3.23E-32	3.20E-32
cf250	3.59E-36	3.59E-36	3.59E-36	3.59E-36	3.55E-36	3.41E-36	3.23E-36	2.76E-36	2.12E-36
cf251	1.14E-38	1.14E-38	1.14E-38	1.14E-38	1.14E-38	1.14E-38	1.14E-38	1.13E-38	1.13E-38
cf252	1.77E-42	1.77E-42	1.77E-42	1.77E-42	1.77E-42	1.41E-42	1.06E-42	3.53E-43	.00E+00
cf253	.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
cf255	.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
es254m	.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
es255	.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
total	8.88E+06	8.88E+06	8.88E+06	8.88E+06	8.88E+06	8.88E+06	8.88E+06	8.88E+06	8.88E+06

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Part B 8% UO2 in Tuff (47% H2O) DBF Fuel 1K yr burn actinides page 4

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

	charge	discharge	.0 d	1.0 d	90.0 d	365.3 d	730.5 d	1826.3 d	3652.5 d
he 4	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
tl206	2.84E-08	2.84E-08	2.84E-08	2.84E-08	2.84E-08	2.84E-08	2.85E-08	2.87E-08	2.89E-08