

po210	2.71E-07	2.98E-07	3.26E-07	3.54E-07	3.83E-07	3.83E-07
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	3.99E-18	4.24E-18	4.49E-18	4.74E-18	4.99E-18	4.99E-18
po212	8.33E-23	8.85E-23	9.37E-23	9.88E-23	1.04E-22	1.04E-22
po213	6.87E-21	7.69E-21	8.55E-21	9.45E-21	1.04E-20	1.04E-20
po214	3.72E-18	4.10E-18	4.47E-18	4.86E-18	5.25E-18	5.25E-18
po215	5.00E-18	5.32E-18	5.63E-18	5.95E-18	6.27E-18	6.27E-18
po216	6.33E-17	6.72E-17	7.11E-17	7.51E-17	7.90E-17	7.90E-17
po218	4.22E-12	4.64E-12	5.07E-12	5.51E-12	5.95E-12	5.95E-12
rn218	2.44E-28	2.60E-28	2.75E-28	2.90E-28	3.05E-28	3.05E-28
rn219	1.11E-14	1.18E-14	1.25E-14	1.32E-14	1.39E-14	1.39E-14
rn220	2.43E-14	2.58E-14	2.73E-14	2.88E-14	3.03E-14	3.03E-14
rn222	7.49E-09	8.24E-09	9.00E-09	9.78E-09	1.06E-08	1.06E-08
ra222	2.65E-25	2.82E-25	2.98E-25	3.14E-25	3.31E-25	3.31E-25
ra223	2.78E-09	2.95E-09	3.13E-09	3.30E-09	3.48E-09	3.48E-09
ra224	1.38E-10	1.47E-10	1.55E-10	1.64E-10	1.72E-10	1.72E-10
ra225	2.14E-09	2.39E-09	2.66E-09	2.94E-09	3.23E-09	3.23E-09
ra226	1.14E-03	1.26E-03	1.38E-03	1.49E-03	1.62E-03	1.62E-03
ra228	8.55E-12	9.09E-12	9.64E-12	1.02E-11	1.07E-11	1.07E-11
ac225	1.44E-09	1.62E-09	1.80E-09	1.99E-09	2.18E-09	2.18E-09
ac227	1.93E-06	2.05E-06	2.17E-06	2.30E-06	2.42E-06	2.42E-06
ac228	1.04E-15	1.11E-15	1.18E-15	1.24E-15	1.31E-15	1.31E-15
th226	1.29E-23	1.38E-23	1.45E-23	1.53E-23	1.61E-23	1.61E-23
th227	4.48E-09	4.76E-09	5.05E-09	5.33E-09	5.61E-09	5.61E-09
th228	2.63E-08	2.80E-08	2.96E-08	3.13E-08	3.29E-08	3.29E-08
th229	4.15E-04	4.65E-04	5.17E-04	5.72E-04	6.28E-04	6.28E-04
th230	1.03E-01	1.10E-01	1.16E-01	1.23E-01	1.29E-01	1.29E-01
th231	3.37E-09	3.39E-09	3.42E-09	3.44E-09	3.46E-09	3.46E-09
th232	2.09E-02	2.22E-02	2.36E-02	2.49E-02	2.62E-02	2.62E-02
th233	1.90E-13	2.02E-13	2.13E-13	2.25E-13	2.37E-13	2.37E-13
th234	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	2.90E-03	3.09E-03	3.27E-03	3.45E-03	3.64E-03	3.64E-03
pa232	4.91E-11	5.22E-11	5.53E-11	5.83E-11	6.14E-11	6.14E-11

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.000E-03mw, burnup=7.3050E+03mwd, flux= 2.67E+08n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides

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	charge	***** d	***** d	***** d	***** d	***** d
pa233	1.45E-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	1.25E-20	1.33E-20	1.41E-20	1.49E-20	1.56E-20	1.56E-20
u231	4.05E-17	4.31E-17	4.55E-17	4.79E-17	5.03E-17	5.03E-17
u232	9.59E-07	1.02E-06	1.08E-06	1.14E-06	1.20E-06	1.20E-06
u233	5.30E-02	5.62E-02	5.94E-02	6.26E-02	6.58E-02	6.58E-02
u234	9.59E+00	9.63E+00	9.66E+00	9.70E+00	9.73E+00	9.73E+00
u235	7.02E+02	7.00E+02	6.99E+02	6.97E+02	6.96E+02	6.96E+02
u236	1.79E+02	1.79E+02	1.79E+02	1.80E+02	1.80E+02	1.80E+02
u237	3.18E-06	3.19E-06	3.19E-06	3.19E-06	3.19E-06	3.19E-06
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07
u240	1.74E-38	2.96E-38	4.85E-38	7.75E-38	1.21E-37	1.21E-37
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	8.71E-12	8.75E-12	8.74E-12	8.73E-12	8.72E-12	8.72E-12
np236m	2.07E-12	2.08E-12	2.08E-12	2.07E-12	2.07E-12	2.07E-12
np236	7.90E-07	8.38E-07	8.86E-07	9.33E-07	9.81E-07	9.81E-07
np237	4.18E+01	4.18E+01	4.18E+01	4.18E+01	4.18E+01	4.18E+01
np238	1.53E-06	1.53E-06	1.53E-06	1.53E-06	1.52E-06	1.52E-06

np239	4.58E-05	4.59E-05	4.59E-05	4.58E-05	4.58E-05	4.58E-05
np240m	1.49E-40	2.52E-40	4.14E-40	6.61E-40	1.03E-39	1.03E-39
np240	9.21E-15	9.22E-15	9.20E-15	9.19E-15	9.18E-15	9.18E-15
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.12E-09	1.13E-09	1.13E-09	1.13E-09	1.13E-09	1.13E-09
pu237	3.83E-13	3.93E-13	4.01E-13	4.09E-13	4.16E-13	4.16E-13
pu238	2.31E-02	2.31E-02	2.31E-02	2.31E-02	2.31E-02	2.31E-02
pu239	1.79E+01	1.88E+01	1.98E+01	2.07E+01	2.17E+01	2.17E+01
pu240	3.07E-01	3.41E-01	3.76E-01	4.13E-01	4.50E-01	4.50E-01
pu241	1.26E-04	1.40E-04	1.55E-04	1.70E-04	1.85E-04	1.85E-04
pu242	1.09E-05	1.31E-05	1.56E-05	1.85E-05	2.16E-05	2.16E-05
pu243	2.29E-14	2.77E-14	3.31E-14	3.90E-14	4.55E-14	4.55E-14
pu244	8.68E-28	1.47E-27	2.42E-27	3.86E-27	6.01E-27	6.01E-27
pu245	3.49E-38	5.92E-38	9.73E-38	1.55E-37	2.41E-37	2.41E-37
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	7.83E-19	8.90E-19	9.96E-19	1.11E-18	1.22E-18	1.22E-18
am240	3.58E-16	4.07E-16	4.56E-16	5.06E-16	5.59E-16	5.59E-16
am241	2.82E-03	3.18E-03	3.57E-03	3.97E-03	4.38E-03	4.38E-03
am242m	1.28E-06	1.46E-06	1.64E-06	1.84E-06	2.04E-06	2.04E-06
am242	1.13E-10	1.28E-10	1.43E-10	1.59E-10	1.76E-10	1.76E-10
am243	6.34E-08	7.87E-08	9.63E-08	1.16E-07	1.39E-07	1.39E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	4.82E-16	5.98E-16	7.32E-16	8.84E-16	1.06E-15	1.06E-15
am245	7.70E-39	1.30E-38	2.12E-38	3.36E-38	5.20E-38	5.20E-38
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	6.68E-21	7.58E-21	8.49E-21	9.44E-21	1.04E-20	1.04E-20
cm242	2.28E-08	2.58E-08	2.90E-08	3.22E-08	3.56E-08	3.56E-08
cm243	1.65E-17	1.88E-17	2.12E-17	2.38E-17	2.65E-17	2.65E-17
cm244	7.57E-12	9.40E-12	1.15E-11	1.39E-11	1.66E-11	1.66E-11

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 4.000E-03mw, burnup=7.3050E+03mwd, flux= 2.67E+08n/cm\*\*2-sec  
nuclide concentrations, gram atoms  
basis = single reactor assembly

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	charge	***** d	***** d	***** d	***** d	***** d
cm245	6.31E-15	8.32E-15	1.08E-14	1.38E-14	1.73E-14	1.73E-14
cm246	2.38E-17	3.33E-17	4.56E-17	6.13E-17	8.10E-17	8.10E-17
cm247	1.56E-21	2.33E-21	3.39E-21	4.82E-21	6.73E-21	6.73E-21
cm248	1.01E-24	1.61E-24	2.49E-24	3.76E-24	5.54E-24	5.54E-24
cm249	3.18E-35	5.06E-35	7.82E-35	1.18E-34	1.74E-34	1.74E-34
cm250	5.86E-40	9.92E-40	1.63E-39	2.59E-39	4.03E-39	4.03E-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
flux		2.67E+08	2.67E+08	2.67E+08	2.66E+08	2.66E-07

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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 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
*
*****
```

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```
*****
*      .other identification and sizes of library.
*      data set name: ft33f001
*      8/28/1996 date library was produced
*      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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0  
1

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= .00mw, burnup= 8766.mwd, flux= 2.66E+08n/cm\*\*2-sec

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

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	initial	***** d	***** d	***** d	***** d	***** d	***** d
productions	1.163128E+06	1.164209E+06	1.165256E+06	1.166270E+06	1.167251E+06	1.167251E+06	1.167251E+06
absorptions	9.567318E+05	9.576066E+05	9.584629E+05	9.593006E+05	9.601203E+05	9.601203E+05	9.601203E+05
k infinity	1.215731E+00	1.215749E+00	1.215755E+00	1.215750E+00	1.215734E+00	1.215734E+00	1.215734E+00

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	initial	***** d	***** d	***** d	***** d	***** d	***** d
actinide absorptions	9.450275E+05	9.457461E+05	9.464477E+05	9.471324E+05	9.478004E+05	9.478004E+05	9.478004E+05
non-actinide abs. fracs.	1.223361E-02	1.238549E-02	1.253587E-02	1.268452E-02	1.283157E-02	1.283157E-02	1.283157E-02

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 fraction of total absorption rate  
 power= .00mw, burnup= 8766.mwd, flux= 2.66E+08n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

sm149	5.34E-03	5.34E-03	5.35E-03	5.35E-03	5.35E-03	5.35E-03	5.35E-03
eu151	8.66E-04	9.01E-04	9.34E-04	9.67E-04	1.00E-03	1.00E-03	1.00E-03
nd143	7.02E-04	7.35E-04	7.69E-04	8.02E-04	8.36E-04	8.36E-04	8.36E-04
rh103	3.45E-04	3.62E-04	3.79E-04	3.97E-04	4.14E-04	4.14E-04	4.14E-04

xe131	2.29E-04	2.40E-04	2.51E-04	2.63E-04	2.74E-04	2.74E-04
cs133	1.77E-04	1.86E-04	1.94E-04	2.03E-04	2.12E-04	2.12E-04
gd155	1.88E-04	1.91E-04	1.94E-04	1.97E-04	1.99E-04	1.99E-04
sm147	1.31E-04	1.37E-04	1.43E-04	1.50E-04	1.56E-04	1.56E-04
tc 99	1.29E-04	1.36E-04	1.42E-04	1.48E-04	1.54E-04	1.54E-04
nd145	1.00E-04	1.05E-04	1.10E-04	1.14E-04	1.19E-04	1.19E-04
cd113	9.28E-05	9.37E-05	9.46E-05	9.54E-05	9.62E-05	9.62E-05
mo 95	6.95E-05	7.29E-05	7.62E-05	7.96E-05	8.29E-05	8.29E-05
sm152	6.58E-05	6.96E-05	7.33E-05	7.71E-05	8.09E-05	8.09E-05
sm150	4.68E-05	4.95E-05	5.21E-05	5.48E-05	5.75E-05	5.75E-05
gd157	5.37E-05	5.45E-05	5.54E-05	5.62E-05	5.70E-05	5.70E-05
kr 83	4.26E-05	4.46E-05	4.67E-05	4.87E-05	5.07E-05	5.07E-05
cs135	4.01E-05	4.20E-05	4.40E-05	4.60E-05	4.79E-05	4.79E-05
sm151	4.12E-05	4.13E-05	4.14E-05	4.15E-05	4.16E-05	4.16E-05
ru101	3.13E-05	3.28E-05	3.44E-05	3.59E-05	3.74E-05	3.74E-05
pr141	2.96E-05	3.10E-05	3.25E-05	3.39E-05	3.53E-05	3.53E-05
eu153	2.86E-05	3.01E-05	3.16E-05	3.31E-05	3.46E-05	3.46E-05
la139	2.41E-05	2.53E-05	2.65E-05	2.77E-05	2.88E-05	2.88E-05
pd105	1.16E-05	1.23E-05	1.29E-05	1.35E-05	1.42E-05	1.42E-05
ba137	1.15E-05	1.21E-05	1.26E-05	1.32E-05	1.38E-05	1.38E-05
ag109	9.24E-06	9.94E-06	1.07E-05	1.14E-05	1.22E-05	1.22E-05
zr 93	9.78E-06	1.03E-05	1.07E-05	1.12E-05	1.17E-05	1.17E-05
i129	7.73E-06	8.12E-06	8.51E-06	8.90E-06	9.29E-06	9.29E-06
nd144	7.29E-06	7.65E-06	8.01E-06	8.36E-06	8.72E-06	8.72E-06
mo 97	5.49E-06	5.76E-06	6.03E-06	6.30E-06	6.56E-06	6.56E-06
gd152	2.57E-06	2.81E-06	3.07E-06	3.33E-06	3.61E-06	3.61E-06
pd108	2.37E-06	2.53E-06	2.70E-06	2.87E-06	3.05E-06	3.05E-06
zr 91	2.55E-06	2.67E-06	2.79E-06	2.91E-06	3.03E-06	3.03E-06
y 89	2.43E-06	2.55E-06	2.67E-06	2.78E-06	2.90E-06	2.90E-06
ru102	2.27E-06	2.38E-06	2.49E-06	2.60E-06	2.72E-06	2.72E-06
ce142	2.00E-06	2.10E-06	2.20E-06	2.30E-06	2.39E-06	2.39E-06
nd148	1.94E-06	2.04E-06	2.13E-06	2.23E-06	2.32E-06	2.32E-06
xe135	2.26E-06	2.26E-06	2.26E-06	2.26E-06	2.26E-06	2.26E-06
nd146	1.62E-06	1.70E-06	1.78E-06	1.86E-06	1.94E-06	1.94E-06
in115	1.42E-06	1.49E-06	1.56E-06	1.64E-06	1.71E-06	1.71E-06
ba138	1.38E-06	1.45E-06	1.52E-06	1.59E-06	1.65E-06	1.65E-06
pd107	1.22E-06	1.30E-06	1.38E-06	1.47E-06	1.55E-06	1.55E-06
ce140	1.29E-06	1.36E-06	1.42E-06	1.48E-06	1.55E-06	1.55E-06
xe132	1.19E-06	1.25E-06	1.31E-06	1.37E-06	1.42E-06	1.42E-06
mo 98	8.14E-07	8.54E-07	8.94E-07	9.33E-07	9.73E-07	9.73E-07
mo100	7.86E-07	8.24E-07	8.63E-07	9.01E-07	9.40E-07	9.40E-07
xe134	7.67E-07	8.04E-07	8.42E-07	8.79E-07	9.17E-07	9.17E-07
zr 92	6.14E-07	6.44E-07	6.73E-07	7.03E-07	7.32E-07	7.32E-07
i127	5.55E-07	5.84E-07	6.13E-07	6.43E-07	6.73E-07	6.73E-07
ru104	5.13E-07	5.40E-07	5.67E-07	5.93E-07	6.20E-07	6.20E-07

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gmd/mtu 40% h2o/ 8% uo2  
 fraction of total absorption rate  
 power= .00mw, burnup= 8766.mwd, flux= 2.66E+08n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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zr 96	4.94E-07	5.18E-07	5.42E-07	5.66E-07	5.90E-07	5.90E-07
nd150	4.37E-07	4.59E-07	4.81E-07	5.03E-07	5.24E-07	5.24E-07
xe136	4.16E-07	4.36E-07	4.57E-07	4.77E-07	4.97E-07	4.97E-07
br 81	3.12E-07	3.27E-07	3.42E-07	3.57E-07	3.73E-07	3.73E-07
rb 85	3.00E-07	3.15E-07	3.29E-07	3.43E-07	3.58E-07	3.58E-07
cd111	2.84E-07	3.01E-07	3.19E-07	3.38E-07	3.56E-07	3.56E-07
zr 94	2.64E-07	2.76E-07	2.89E-07	3.02E-07	3.15E-07	3.15E-07
zr 90	2.38E-07	2.50E-07	2.61E-07	2.73E-07	2.84E-07	2.84E-07
pm147	2.64E-07	2.63E-07	2.63E-07	2.63E-07	2.62E-07	2.62E-07
eu152	2.24E-07	2.32E-07	2.41E-07	2.49E-07	2.57E-07	2.57E-07



br 79	1.31E-09	1.44E-09	1.58E-09	1.72E-09	1.87E-09	1.87E-09
sn118	1.55E-09	1.63E-09	1.71E-09	1.79E-09	1.87E-09	1.87E-09
sn122	1.30E-09	1.37E-09	1.43E-09	1.50E-09	1.57E-09	1.57E-09
cd116	1.30E-09	1.37E-09	1.43E-09	1.50E-09	1.57E-09	1.57E-09
cs134	1.30E-09	1.36E-09	1.43E-09	1.49E-09	1.55E-09	1.55E-09
ce141	1.54E-09	1.53E-09	1.53E-09	1.53E-09	1.53E-09	1.53E-09
ag107	9.64E-10	1.08E-09	1.19E-09	1.32E-09	1.45E-09	1.45E-09
sn120	9.66E-10	1.02E-09	1.07E-09	1.12E-09	1.17E-09	1.17E-09
xe129	7.56E-10	8.34E-10	9.15E-10	1.00E-09	1.09E-09	1.09E-09
pm149	9.52E-10	9.51E-10	9.50E-10	9.50E-10	9.49E-10	9.49E-10
nd147	9.05E-10	9.04E-10	9.03E-10	9.01E-10	9.00E-10	9.00E-10
ge 73	7.34E-10	7.71E-10	8.08E-10	8.45E-10	8.82E-10	8.82E-10
te126	6.01E-10	6.56E-10	7.15E-10	7.75E-10	8.39E-10	8.39E-10
ce144	5.73E-10	5.72E-10	5.71E-10	5.70E-10	5.69E-10	5.69E-10
kr 85	5.38E-10	5.37E-10	5.35E-10	5.34E-10	5.33E-10	5.33E-10
ru103	3.72E-10	3.73E-10	3.74E-10	3.74E-10	3.75E-10	3.75E-10
gd160	2.83E-10	3.02E-10	3.22E-10	3.42E-10	3.63E-10	3.63E-10
ge 76	2.57E-10	2.69E-10	2.82E-10	2.94E-10	3.07E-10	3.07E-10
ho165	2.21E-10	2.41E-10	2.61E-10	2.83E-10	3.05E-10	3.05E-10
dy160	1.19E-10	1.32E-10	1.46E-10	1.61E-10	1.76E-10	1.76E-10
zr 95	1.59E-10	1.59E-10	1.59E-10	1.58E-10	1.58E-10	1.58E-10
nb 95	1.46E-10	1.46E-10	1.46E-10	1.46E-10	1.46E-10	1.46E-10
y 91	1.34E-10	1.34E-10	1.33E-10	1.33E-10	1.33E-10	1.33E-10
pm151	1.12E-10	1.12E-10	1.12E-10	1.12E-10	1.12E-10	1.12E-10
xe128	7.62E-11	8.40E-11	9.22E-11	1.01E-10	1.10E-10	1.10E-10
te124	4.89E-11	5.22E-11	5.57E-11	5.92E-11	6.28E-11	6.28E-11
sr 86	4.32E-11	4.71E-11	5.12E-11	5.54E-11	5.98E-11	5.98E-11
eu156	4.70E-11	4.75E-11	4.81E-11	4.86E-11	4.91E-11	4.91E-11
ba140	4.56E-11	4.55E-11	4.55E-11	4.54E-11	4.54E-11	4.54E-11
sm153	4.25E-11	4.27E-11	4.30E-11	4.32E-11	4.35E-11	4.35E-11
sn116	2.94E-11	3.24E-11	3.56E-11	3.89E-11	4.24E-11	4.24E-11
ru106	3.70E-11	3.75E-11	3.80E-11	3.84E-11	3.89E-11	3.89E-11
sr 87	3.16E-11	3.32E-11	3.49E-11	3.65E-11	3.82E-11	3.82E-11

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

fission products

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0 fraction of total absorption rate  
 power=.00mw, burnup= 8766.mwd, flux= 2.66E+08n/cm\*\*2-sec  
 0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

sr 89	2.86E-11	2.85E-11	2.84E-11	2.83E-11	2.83E-11	2.83E-11
nb 94	1.95E-11	2.07E-11	2.19E-11	2.31E-11	2.44E-11	2.44E-11
kr 87	2.14E-11	2.13E-11	2.13E-11	2.12E-11	2.12E-11	2.12E-11
se 76	1.41E-11	1.53E-11	1.65E-11	1.77E-11	1.89E-11	1.89E-11
ge 74	1.47E-11	1.54E-11	1.61E-11	1.69E-11	1.76E-11	1.76E-11
te122	1.22E-11	1.35E-11	1.48E-11	1.62E-11	1.76E-11	1.76E-11
sb125	1.69E-11	1.70E-11	1.70E-11	1.71E-11	1.72E-11	1.72E-11
ce143	1.67E-11	1.67E-11	1.66E-11	1.66E-11	1.66E-11	1.66E-11
er166	1.20E-11	1.31E-11	1.42E-11	1.54E-11	1.66E-11	1.66E-11
y 90	1.52E-11	1.51E-11	1.51E-11	1.50E-11	1.50E-11	1.50E-11
la140	1.48E-11	1.48E-11	1.48E-11	1.48E-11	1.47E-11	1.47E-11
mo 99	1.28E-11	1.28E-11	1.27E-11	1.27E-11	1.27E-11	1.27E-11
ge 72	1.04E-11	1.10E-11	1.15E-11	1.21E-11	1.27E-11	1.27E-11
pm148m	9.59E-12	9.60E-12	9.61E-12	9.61E-12	9.62E-12	9.62E-12
te127m	8.46E-12	8.50E-12	8.55E-12	8.59E-12	8.63E-12	8.63E-12
1131	6.70E-12	6.70E-12	6.70E-12	6.70E-12	6.70E-12	6.70E-12
te129m	1.85E-12	1.85E-12	1.85E-12	1.86E-12	1.86E-12	1.86E-12
kr 80	1.14E-12	1.26E-12	1.38E-12	1.52E-12	1.66E-12	1.66E-12
er167	4.97E-13	5.63E-13	6.34E-13	7.11E-13	7.93E-13	7.93E-13
ag111	5.48E-13	5.58E-13	5.67E-13	5.76E-13	5.85E-13	5.85E-13
eu157	4.50E-13	4.57E-13	4.63E-13	4.69E-13	4.75E-13	4.75E-13
te123	2.60E-13	2.95E-13	3.32E-13	3.72E-13	4.16E-13	4.16E-13

pm148	3.65E-13	3.65E-13	3.64E-13	3.64E-13	3.64E-13	3.64E-13
cd115m	2.61E-13	2.62E-13	2.63E-13	2.64E-13	2.65E-13	2.65E-13
cs136	1.83E-13	1.89E-13	1.95E-13	2.01E-13	2.06E-13	2.06E-13
tb160	6.83E-14	7.25E-14	7.68E-14	8.11E-14	8.54E-14	8.54E-14
cd108	3.09E-14	3.59E-14	4.13E-14	4.74E-14	5.40E-14	5.40E-14
pr142	3.30E-14	3.46E-14	3.62E-14	3.78E-14	3.94E-14	3.94E-14
be 9	3.28E-14	3.44E-14	3.60E-14	3.76E-14	3.92E-14	3.92E-14
ru105	3.60E-14	3.63E-14	3.65E-14	3.68E-14	3.70E-14	3.70E-14
sn125	3.14E-14	3.15E-14	3.16E-14	3.17E-14	3.18E-14	3.18E-14
li 7	1.31E-14	1.37E-14	1.43E-14	1.50E-14	1.56E-14	1.56E-14
sb126	1.17E-14	1.21E-14	1.25E-14	1.30E-14	1.34E-14	1.34E-14
rb 88	1.20E-14	1.20E-14	1.19E-14	1.19E-14	1.19E-14	1.19E-14
sn114	7.32E-15	8.08E-15	8.88E-15	9.72E-15	1.06E-14	1.06E-14
sn123	1.04E-14	1.04E-14	1.04E-14	1.04E-14	1.04E-14	1.04E-14
i135	9.82E-15	9.81E-15	9.80E-15	9.79E-15	9.78E-15	9.78E-15
te132	9.38E-15	9.37E-15	9.37E-15	9.37E-15	9.36E-15	9.36E-15
i130	6.79E-15	7.09E-15	7.38E-15	7.67E-15	7.96E-15	7.96E-15
te134	5.54E-15	5.53E-15	5.52E-15	5.51E-15	5.50E-15	5.50E-15
sb124	4.62E-15	4.74E-15	4.86E-15	4.98E-15	5.10E-15	5.10E-15
in117m	2.47E-15	2.49E-15	2.51E-15	2.52E-15	2.54E-15	2.54E-15
rb 86	2.16E-15	2.26E-15	2.35E-15	2.44E-15	2.53E-15	2.53E-15
dy165	1.57E-15	1.64E-15	1.71E-15	1.78E-15	1.84E-15	1.84E-15
in117	7.38E-16	7.44E-16	7.49E-16	7.54E-16	7.59E-16	7.59E-16
cs134m	2.43E-16	2.55E-16	2.67E-16	2.79E-16	2.90E-16	2.90E-16
cd118	1.31E-16	1.32E-16	1.32E-16	1.33E-16	1.33E-16	1.33E-16
ge 75	8.39E-17	8.38E-17	8.37E-17	8.36E-17	8.36E-17	8.36E-17
in119m	3.23E-17	3.24E-17	3.25E-17	3.26E-17	3.26E-17	3.26E-17

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= .00mw, burnup= 8766.mwd, flux= 2.66E+08n/cm\*\*2-sec  
initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d  
fraction of total absorption rate

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ag110	1.19E-17	1.28E-17	1.37E-17	1.47E-17	1.56E-17	1.56E-17
cd109	8.55E-18	9.02E-18	9.52E-18	1.00E-17	1.05E-17	1.05E-17
in119	2.62E-18	2.63E-18	2.64E-18	2.65E-18	2.67E-18	2.67E-18

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 4.000E-03mw, burnup=8.7659E+03mwd, flux= 2.66E+08n/cm\*\*2-sec  
nuclide concentrations, gram atoms  
basis = single reactor assembly

light elements page 59

h 1	4.34E-04	4.56E-04	4.78E-04	4.99E-04	5.21E-04	5.21E-04
h 2	1.29E-06	1.36E-06	1.42E-06	1.49E-06	1.55E-06	1.55E-06
h 3	4.56E-11	4.63E-11	4.68E-11	4.72E-11	4.76E-11	4.76E-11
h 4	1.82E-34	1.84E-34	1.86E-34	1.88E-34	1.89E-34	1.89E-34
he 3	8.45E-09	8.80E-09	9.14E-09	9.48E-09	9.81E-09	9.81E-09
he 4	7.19E-05	7.55E-05	7.91E-05	8.28E-05	8.64E-05	8.64E-05
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	8.64E-06	9.07E-06	9.51E-06	9.94E-06	1.04E-05	1.04E-05
ne 21	1.33E-09	1.46E-09	1.59E-09	1.73E-09	1.88E-09	1.88E-09
ne 22	5.72E-08	6.00E-08	6.29E-08	6.58E-08	6.87E-08	6.87E-08
ne 23	7.16E-15	7.20E-15	7.20E-15	7.19E-15	7.19E-15	7.19E-15
na 22	4.23E-11	4.25E-11	4.25E-11	4.25E-11	4.25E-11	4.25E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	2.76E-08	2.76E-08	2.76E-08	2.76E-08	2.75E-08	2.75E-08
na 24m	4.53E-15	4.53E-15	4.53E-15	4.53E-15	4.53E-15	4.53E-15
na 25	4.04E-24	4.43E-24	4.82E-24	5.23E-24	5.65E-24	5.65E-24
mg 24	6.26E-02	6.54E-02	6.83E-02	7.12E-02	7.40E-02	7.40E-02
mg 25	1.40E-07	1.53E-07	1.67E-07	1.81E-07	1.96E-07	1.96E-07
mg 26	1.29E-06	1.36E-06	1.42E-06	1.49E-06	1.55E-06	1.55E-06

mg 27	2.14E-12	2.15E-12	2.15E-12	2.14E-12	2.14E-12	2.14E-12
mg 28	4.27E-24	4.29E-24	4.29E-24	4.28E-24	4.28E-24	4.28E-24
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.04E-10	2.04E-10	2.04E-10	2.04E-10	2.04E-10	2.04E-10
al 29	3.15E-22	3.46E-22	3.78E-22	4.10E-22	4.45E-22	4.45E-22
al 30	2.97E-32	3.43E-32	3.92E-32	4.45E-32	5.02E-32	5.02E-32
si 28	1.82E-01	1.90E-01	1.99E-01	2.07E-01	2.15E-01	2.15E-01
si 29	1.22E-06	1.34E-06	1.46E-06	1.59E-06	1.72E-06	1.72E-06
si 30	8.62E-12	9.92E-12	1.13E-11	1.29E-11	1.46E-11	1.46E-11
si 31	6.08E-24	6.99E-24	7.98E-24	9.07E-24	1.02E-23	1.02E-23
si 32	9.16E-30	1.06E-29	1.22E-29	1.39E-29	1.58E-29	1.58E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
flux		2.66E+08	2.66E+08	2.66E+08	2.66E+08	2.66E+07

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 4.000E-03mw, burnup=8.7659E+03mwd, flux= 2.66E+08n/cm\*\*2-sec

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nuclide concentrations, gram atoms  
basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d
he 4	2.91E+00	3.15E+00	3.39E+00	3.64E+00	3.89E+00	3.89E+00
pb206	1.34E-03	1.52E-03	1.71E-03	1.92E-03	2.14E-03	2.14E-03
pb207	1.90E-04	2.10E-04	2.31E-04	2.52E-04	2.75E-04	2.75E-04
pb208	3.01E-05	3.32E-05	3.64E-05	3.98E-05	4.33E-05	4.33E-05
pb209	2.96E-11	3.23E-11	3.52E-11	3.82E-11	4.12E-11	4.12E-11
pb210	2.25E-05	2.42E-05	2.60E-05	2.77E-05	2.95E-05	2.95E-05
pb211	7.62E-12	8.01E-12	8.40E-12	8.78E-12	9.17E-12	9.17E-12
pb212	2.09E-11	2.19E-11	2.30E-11	2.40E-11	2.50E-11	2.50E-11
pb214	5.14E-11	5.53E-11	5.93E-11	6.33E-11	6.74E-11	6.74E-11
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	9.60E-05	1.10E-04	1.26E-04	1.43E-04	1.62E-04	1.62E-04
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.39E-08	1.49E-08	1.60E-08	1.71E-08	1.81E-08	1.81E-08
bi211	4.52E-13	4.75E-13	4.98E-13	5.21E-13	5.44E-13	5.44E-13
bi212	1.98E-12	2.08E-12	2.18E-12	2.28E-12	2.37E-12	2.37E-12
bi213	6.91E-12	7.55E-12	8.22E-12	8.91E-12	9.63E-12	9.63E-12
bi214	3.82E-11	4.11E-11	4.40E-11	4.70E-11	5.00E-11	5.00E-11
po210	3.83E-07	4.12E-07	4.41E-07	4.71E-07	5.01E-07	5.01E-07
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	4.99E-18	5.25E-18	5.50E-18	5.75E-18	6.01E-18	6.01E-18
po212	1.04E-22	1.09E-22	1.14E-22	1.20E-22	1.25E-22	1.25E-22
po213	1.04E-20	1.14E-20	1.24E-20	1.34E-20	1.45E-20	1.45E-20
po214	5.25E-18	5.65E-18	6.06E-18	6.47E-18	6.88E-18	6.88E-18
po215	6.27E-18	6.58E-18	6.90E-18	7.22E-18	7.54E-18	7.54E-18
po216	7.90E-17	8.30E-17	8.69E-17	9.08E-17	9.48E-17	9.48E-17
po218	5.95E-12	6.40E-12	6.86E-12	7.32E-12	7.79E-12	7.79E-12
rn218	3.05E-28	3.21E-28	3.36E-28	3.51E-28	3.66E-28	3.66E-28
rn219	1.39E-14	1.46E-14	1.54E-14	1.61E-14	1.68E-14	1.68E-14
rn220	3.03E-14	3.18E-14	3.33E-14	3.48E-14	3.63E-14	3.63E-14
rn222	1.06E-08	1.14E-08	1.22E-08	1.30E-08	1.38E-08	1.38E-08
ra222	3.31E-25	3.48E-25	3.65E-25	3.81E-25	3.97E-25	3.97E-25
ra223	3.48E-09	3.65E-09	3.83E-09	4.01E-09	4.18E-09	4.18E-09
ra224	1.72E-10	1.81E-10	1.89E-10	1.98E-10	2.07E-10	2.07E-10
ra225	3.23E-09	3.53E-09	3.85E-09	4.17E-09	4.50E-09	4.50E-09
ra226	1.62E-03	1.74E-03	1.86E-03	1.99E-03	2.12E-03	2.12E-03
ra228	1.07E-11	1.13E-11	1.18E-11	1.24E-11	1.29E-11	1.29E-11
ac225	2.18E-09	2.39E-09	2.60E-09	2.82E-09	3.04E-09	3.04E-09
ac227	2.42E-06	2.54E-06	2.66E-06	2.79E-06	2.91E-06	2.91E-06
ac228	1.31E-15	1.38E-15	1.44E-15	1.51E-15	1.58E-15	1.58E-15
th226	1.61E-23	1.70E-23	1.78E-23	1.86E-23	1.94E-23	1.94E-23
th227	5.61E-09	5.90E-09	6.18E-09	6.47E-09	6.75E-09	6.75E-09



th228	3.29E-08	3.45E-08	3.62E-08	3.78E-08	3.95E-08	3.95E-08
th229	6.28E-04	6.87E-04	7.48E-04	8.11E-04	8.76E-04	8.76E-04
th230	1.29E-01	1.36E-01	1.42E-01	1.49E-01	1.55E-01	1.55E-01
th231	3.46E-09	3.49E-09	3.51E-09	3.53E-09	3.55E-09	3.55E-09
th232	2.62E-02	2.75E-02	2.89E-02	3.02E-02	3.15E-02	3.15E-02
th233	2.37E-13	2.49E-13	2.61E-13	2.73E-13	2.85E-13	2.85E-13
th234	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07	5.37E-07
pa231	3.64E-03	3.82E-03	4.00E-03	4.19E-03	4.37E-03	4.37E-03
pa232	6.14E-11	6.45E-11	6.75E-11	7.06E-11	7.37E-11	7.37E-11

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 4.000E-03mw, burnup=8.7659E+03mwd, flux= 2.66E+08n/cm\*\*2-sec

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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	1.56E-20	1.65E-20	1.72E-20	1.80E-20	1.88E-20	1.88E-20
u231	5.03E-17	5.29E-17	5.53E-17	5.77E-17	6.00E-17	6.00E-17
u232	1.20E-06	1.26E-06	1.32E-06	1.38E-06	1.44E-06	1.44E-06
u233	6.58E-02	6.89E-02	7.21E-02	7.52E-02	7.83E-02	7.83E-02
u234	9.73E+00	9.76E+00	9.80E+00	9.83E+00	9.87E+00	9.87E+00
u235	6.96E+02	6.94E+02	6.92E+02	6.91E+02	6.89E+02	6.89E+02
u236	1.80E+02	1.80E+02	1.80E+02	1.81E+02	1.81E+02	1.81E+02
u237	3.19E-06	3.20E-06	3.21E-06	3.21E-06	3.21E-06	3.21E-06
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07
u240	1.21E-37	1.84E-37	2.74E-37	4.00E-37	5.75E-37	5.75E-37
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	8.72E-12	8.76E-12	8.75E-12	8.74E-12	8.73E-12	8.73E-12
np236m	2.07E-12	2.08E-12	2.08E-12	2.08E-12	2.07E-12	2.07E-12
np236	9.81E-07	1.03E-06	1.08E-06	1.12E-06	1.17E-06	1.17E-06
np237	4.18E+01	4.17E+01	4.17E+01	4.17E+01	4.17E+01	4.17E+01
np238	1.52E-06	1.52E-06	1.52E-06	1.52E-06	1.52E-06	1.52E-06
np239	4.58E-05	4.59E-05	4.58E-05	4.58E-05	4.58E-05	4.58E-05
np240m	1.03E-39	1.57E-39	2.34E-39	3.42E-39	4.91E-39	4.91E-39
np240	9.18E-15	9.19E-15	9.18E-15	9.17E-15	9.16E-15	9.16E-15
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.13E-09	1.13E-09	1.13E-09	1.13E-09	1.13E-09	1.13E-09
pu237	4.16E-13	4.26E-13	4.34E-13	4.41E-13	4.48E-13	4.48E-13
pu238	2.31E-02	2.30E-02	2.30E-02	2.30E-02	2.30E-02	2.30E-02
pu239	2.17E+01	2.26E+01	2.35E+01	2.44E+01	2.53E+01	2.53E+01
pu240	4.50E-01	4.88E-01	5.28E-01	5.68E-01	6.09E-01	6.09E-01
pu241	1.85E-04	2.01E-04	2.17E-04	2.33E-04	2.50E-04	2.50E-04
pu242	2.16E-05	2.50E-05	2.87E-05	3.28E-05	3.72E-05	3.72E-05
pu243	4.55E-14	5.29E-14	6.07E-14	6.93E-14	7.86E-14	7.86E-14
pu244	6.01E-27	9.14E-27	1.36E-26	1.99E-26	2.87E-26	2.87E-26
pu245	2.41E-37	3.67E-37	5.47E-37	7.99E-37	1.15E-36	1.15E-36
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.22E-18	1.35E-18	1.47E-18	1.60E-18	1.73E-18	1.73E-18
am240	5.59E-16	6.16E-16	6.73E-16	7.30E-16	7.89E-16	7.89E-16
am241	4.38E-03	4.81E-03	5.25E-03	5.71E-03	6.17E-03	6.17E-03
am242m	2.04E-06	2.24E-06	2.46E-06	2.68E-06	2.91E-06	2.91E-06
am242	1.76E-10	1.93E-10	2.11E-10	2.29E-10	2.48E-10	2.48E-10
am243	1.39E-07	1.65E-07	1.94E-07	2.26E-07	2.61E-07	2.61E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.06E-15	1.25E-15	1.47E-15	1.71E-15	1.98E-15	1.98E-15
am245	5.20E-38	7.87E-38	1.17E-37	1.70E-37	2.43E-37	2.43E-37

am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.04E-20	1.15E-20	1.25E-20	1.36E-20	1.47E-20	1.47E-20
cm242	3.56E-08	3.90E-08	4.26E-08	4.63E-08	5.01E-08	5.01E-08
cm243	2.65E-17	2.92E-17	3.21E-17	3.50E-17	3.80E-17	3.80E-17
cm244	1.66E-11	1.97E-11	2.31E-11	2.69E-11	3.11E-11	3.11E-11

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.000E-03mw, burnup=8.7659E+03mwd, flux= 2.66E+08n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	charge	***** d	***** d	***** d	***** d	***** d
cm245	1.73E-14	2.15E-14	2.64E-14	3.22E-14	3.88E-14	3.88E-14
cm246	8.10E-17	1.05E-16	1.35E-16	1.72E-16	2.15E-16	2.15E-16
cm247	6.73E-21	9.24E-21	1.25E-20	1.66E-20	2.18E-20	2.18E-20
cm248	5.54E-24	8.00E-24	1.14E-23	1.58E-23	2.18E-23	2.18E-23
cm249	1.74E-34	2.51E-34	3.56E-34	4.97E-34	6.82E-34	6.82E-34
cm250	4.03E-39	6.12E-39	9.10E-39	1.33E-38	1.91E-38	1.91E-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
flux		2.66E+08	2.66E+08	2.66E+08	2.66E+08	2.66E+07

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1q array has 20 entries.  
 3q array has 1 entries.  
 3q array has 1 entries.  
 3q array has 1 entries.  
 4q array has 1 entries.  
 5q array has 12 entries.

library 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 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--ld = 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 \*  
\*  
\*\*\*\*\*  
\*  
\*\*\*\*\*

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.other identification and sizes of library.  
data set name: ft33f001  
8/28/1996 date library was produced  
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

0  
0  
1

\*\*\*\*\*  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= .00mw, burnup= 10227.mwd, flux= 2.65E+08n/cm\*\*2-sec

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(note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)  
initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d  
productions 1.167762E+06 1.168719E+06 1.169645E+06 1.170540E+06 1.171404E+06 1.171404E+06  
absorptions 9.612581E+05 9.620653E+05 9.628549E+05 9.636281E+05 9.643840E+05 9.643840E+05  
k infinity 1.214826E+00 1.214802E+00 1.214768E+00 1.214722E+00 1.214666E+00 1.214666E+00  
initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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actinide absorptions 9.489255E+05 9.495816E+05 9.502214E+05 9.508454E+05 9.514534E+05 9.514534E+05  
non-actinide  
abs. fracs. 1.282966E-02 1.297593E-02 1.312083E-02 1.326519E-02 1.340818E-02 1.340818E-02

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fraction of total absorption rate fission products  
power= .00mw, burnup= 10227.mwd, flux= 2.65E+08n/cm\*\*2-sec  
initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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sm149	5.34E-03	5.34E-03	5.35E-03	5.35E-03	5.35E-03	5.35E-03
eu151	9.99E-04	1.03E-03	1.06E-03	1.09E-03	1.12E-03	1.12E-03
nd143	8.35E-04	8.68E-04	9.01E-04	9.34E-04	9.67E-04	9.67E-04
rh103	4.14E-04	4.31E-04	4.49E-04	4.66E-04	4.83E-04	4.83E-04
xe131	2.74E-04	2.85E-04	2.96E-04	3.08E-04	3.19E-04	3.19E-04
cs133	2.12E-04	2.20E-04	2.29E-04	2.38E-04	2.46E-04	2.46E-04
gd155	1.99E-04	2.02E-04	2.04E-04	2.06E-04	2.08E-04	2.08E-04
sm147	1.56E-04	1.62E-04	1.69E-04	1.75E-04	1.81E-04	1.81E-04
tc 99	1.55E-04	1.61E-04	1.67E-04	1.73E-04	1.79E-04	1.79E-04
nd145	1.19E-04	1.24E-04	1.29E-04	1.34E-04	1.38E-04	1.38E-04
cd113	9.61E-05	9.68E-05	9.75E-05	9.82E-05	9.88E-05	9.88E-05
sm152	8.10E-05	8.49E-05	8.88E-05	9.27E-05	9.66E-05	9.66E-05
mo 95	8.30E-05	8.63E-05	8.97E-05	9.30E-05	9.63E-05	9.63E-05
sm150	5.75E-05	6.02E-05	6.28E-05	6.55E-05	6.82E-05	6.82E-05
gd157	5.69E-05	5.77E-05	5.85E-05	5.93E-05	6.01E-05	6.01E-05
kr 83	5.07E-05	5.27E-05	5.47E-05	5.67E-05	5.87E-05	5.87E-05
cs135	4.80E-05	4.99E-05	5.19E-05	5.38E-05	5.58E-05	5.58E-05
ru101	3.75E-05	3.90E-05	4.06E-05	4.21E-05	4.36E-05	4.36E-05
sm151	4.15E-05	4.16E-05	4.17E-05	4.18E-05	4.19E-05	4.19E-05
pr141	3.53E-05	3.68E-05	3.82E-05	3.96E-05	4.10E-05	4.10E-05
eu153	3.46E-05	3.61E-05	3.76E-05	3.92E-05	4.07E-05	4.07E-05
la139	2.88E-05	3.00E-05	3.12E-05	3.23E-05	3.35E-05	3.35E-05
pd105	1.42E-05	1.48E-05	1.55E-05	1.62E-05	1.68E-05	1.68E-05
ba137	1.37E-05	1.43E-05	1.49E-05	1.54E-05	1.60E-05	1.60E-05
ag109	1.22E-05	1.29E-05	1.37E-05	1.45E-05	1.54E-05	1.54E-05
zr 93	1.17E-05	1.21E-05	1.26E-05	1.31E-05	1.35E-05	1.35E-05
i129	9.28E-06	9.67E-06	1.01E-05	1.05E-05	1.08E-05	1.08E-05
nd144	8.71E-06	9.07E-06	9.43E-06	9.78E-06	1.01E-05	1.01E-05

mo 97	6.56E-06	6.83E-06	7.09E-06	7.36E-06	7.62E-06	7.62E-06
gd152	3.60E-06	3.88E-06	4.17E-06	4.47E-06	4.78E-06	4.78E-06
pd108	3.05E-06	3.23E-06	3.42E-06	3.60E-06	3.79E-06	3.79E-06
zr 91	3.03E-06	3.15E-06	3.27E-06	3.39E-06	3.51E-06	3.51E-06
y 89	2.90E-06	3.01E-06	3.13E-06	3.24E-06	3.35E-06	3.35E-06
ru102	2.72E-06	2.83E-06	2.94E-06	3.05E-06	3.16E-06	3.16E-06
ce142	2.39E-06	2.49E-06	2.58E-06	2.68E-06	2.78E-06	2.78E-06
nd148	2.32E-06	2.41E-06	2.51E-06	2.60E-06	2.70E-06	2.70E-06
nd146	1.94E-06	2.02E-06	2.09E-06	2.17E-06	2.25E-06	2.25E-06
xe135	2.25E-06	2.25E-06	2.25E-06	2.25E-06	2.25E-06	2.25E-06
in115	1.71E-06	1.78E-06	1.86E-06	1.93E-06	2.01E-06	2.01E-06
ba138	1.65E-06	1.72E-06	1.78E-06	1.85E-06	1.92E-06	1.92E-06
pd107	1.55E-06	1.64E-06	1.73E-06	1.82E-06	1.91E-06	1.91E-06
ce140	1.55E-06	1.61E-06	1.67E-06	1.73E-06	1.80E-06	1.80E-06
xe132	1.42E-06	1.48E-06	1.54E-06	1.60E-06	1.66E-06	1.66E-06
mo 98	9.74E-07	1.01E-06	1.05E-06	1.09E-06	1.13E-06	1.13E-06
mo100	9.40E-07	9.78E-07	1.02E-06	1.06E-06	1.09E-06	1.09E-06
xe134	9.16E-07	9.53E-07	9.90E-07	1.03E-06	1.06E-06	1.06E-06
zr 92	7.31E-07	7.61E-07	7.90E-07	8.19E-07	8.48E-07	8.48E-07
i127	6.73E-07	7.03E-07	7.33E-07	7.63E-07	7.93E-07	7.93E-07
ru104	6.20E-07	6.47E-07	6.74E-07	7.01E-07	7.29E-07	7.29E-07

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 fraction of total absorption rate  
 power= .00mw, burnup= 10227.mwd, flux= 2.65E+08n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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zr 96	5.91E-07	6.15E-07	6.39E-07	6.63E-07	6.87E-07	6.87E-07
nd150	5.24E-07	5.46E-07	5.68E-07	5.89E-07	6.11E-07	6.11E-07
xe136	4.97E-07	5.17E-07	5.37E-07	5.58E-07	5.78E-07	5.78E-07
br 81	3.73E-07	3.88E-07	4.03E-07	4.18E-07	4.33E-07	4.33E-07
cd111	3.56E-07	3.75E-07	3.94E-07	4.13E-07	4.33E-07	4.33E-07
rb 85	3.58E-07	3.72E-07	3.86E-07	4.01E-07	4.15E-07	4.15E-07
zr 94	3.15E-07	3.27E-07	3.40E-07	3.53E-07	3.65E-07	3.65E-07
zr 90	2.84E-07	2.95E-07	3.07E-07	3.18E-07	3.29E-07	3.29E-07
ru 99	2.40E-07	2.60E-07	2.81E-07	3.03E-07	3.25E-07	3.25E-07
eu152	2.57E-07	2.65E-07	2.73E-07	2.81E-07	2.88E-07	2.88E-07
sm154	2.39E-07	2.50E-07	2.60E-07	2.71E-07	2.81E-07	2.81E-07
te130	2.28E-07	2.37E-07	2.46E-07	2.56E-07	2.65E-07	2.65E-07
pm147	2.63E-07	2.62E-07	2.62E-07	2.62E-07	2.61E-07	2.61E-07
rb 87	2.07E-07	2.15E-07	2.23E-07	2.31E-07	2.39E-07	2.39E-07
eu155	1.94E-07	1.95E-07	1.96E-07	1.97E-07	1.99E-07	1.99E-07
gd154	1.35E-07	1.47E-07	1.59E-07	1.71E-07	1.84E-07	1.84E-07
se 77	1.48E-07	1.54E-07	1.60E-07	1.66E-07	1.72E-07	1.72E-07
pd106	1.40E-07	1.47E-07	1.54E-07	1.61E-07	1.69E-07	1.69E-07
gd156	1.19E-07	1.26E-07	1.33E-07	1.39E-07	1.46E-07	1.46E-07
kr 84	9.87E-08	1.03E-07	1.07E-07	1.11E-07	1.14E-07	1.14E-07
dy161	7.38E-08	7.84E-08	8.30E-08	8.78E-08	9.27E-08	9.27E-08
sb121	7.82E-08	8.16E-08	8.50E-08	8.84E-08	9.18E-08	9.18E-08
se 79	7.60E-08	7.91E-08	8.22E-08	8.53E-08	8.83E-08	8.83E-08
sb123	6.33E-08	6.60E-08	6.87E-08	7.14E-08	7.42E-08	7.42E-08
kr 86	5.40E-08	5.62E-08	5.83E-08	6.05E-08	6.26E-08	6.26E-08
te128	5.16E-08	5.38E-08	5.59E-08	5.81E-08	6.03E-08	6.03E-08
ru100	4.12E-08	4.46E-08	4.82E-08	5.19E-08	5.57E-08	5.57E-08
se 80	3.55E-08	3.69E-08	3.83E-08	3.98E-08	4.12E-08	4.12E-08
tb159	3.37E-08	3.55E-08	3.74E-08	3.93E-08	4.12E-08	4.12E-08
te125	3.44E-08	3.59E-08	3.75E-08	3.90E-08	4.05E-08	4.05E-08
nd142	2.87E-08	3.11E-08	3.36E-08	3.62E-08	3.89E-08	3.89E-08
ba134	2.80E-08	3.03E-08	3.28E-08	3.53E-08	3.79E-08	3.79E-08
sm148	2.56E-08	2.78E-08	3.00E-08	3.23E-08	3.47E-08	3.47E-08
gd158	2.65E-08	2.79E-08	2.93E-08	3.08E-08	3.23E-08	3.23E-08

ba135	2.31E-08	2.51E-08	2.71E-08	2.92E-08	3.14E-08	3.14E-08
cd112	2.53E-08	2.65E-08	2.78E-08	2.90E-08	3.03E-08	3.03E-08
pd104	1.97E-08	2.14E-08	2.31E-08	2.49E-08	2.68E-08	2.68E-08
li 6	1.94E-08	2.02E-08	2.09E-08	2.17E-08	2.24E-08	2.24E-08
sn117	1.84E-08	1.92E-08	2.01E-08	2.09E-08	2.18E-08	2.18E-08
dy164	1.65E-08	1.76E-08	1.87E-08	1.99E-08	2.11E-08	2.11E-08
eu154	1.73E-08	1.81E-08	1.89E-08	1.96E-08	2.04E-08	2.04E-08
dy162	1.50E-08	1.61E-08	1.72E-08	1.83E-08	1.94E-08	1.94E-08
cd114	1.48E-08	1.56E-08	1.63E-08	1.71E-08	1.78E-08	1.78E-08
sn119	1.42E-08	1.48E-08	1.54E-08	1.61E-08	1.67E-08	1.67E-08
sr 90	1.58E-08	1.57E-08	1.57E-08	1.57E-08	1.56E-08	1.56E-08
sn115	1.30E-08	1.36E-08	1.41E-08	1.47E-08	1.53E-08	1.53E-08
pd110	1.19E-08	1.25E-08	1.32E-08	1.39E-08	1.46E-08	1.46E-08
sr 88	9.94E-09	1.03E-08	1.07E-08	1.11E-08	1.15E-08	1.15E-08
rh105	1.04E-08	1.04E-08	1.05E-08	1.06E-08	1.06E-08	1.06E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 0 fraction of total absorption rate  
 power= .00mw, burnup= 10227.mwd, flux= 2.65E+08n/cm\*\*2-sec  
 0 Initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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mo 96	6.71E-09	7.25E-09	7.81E-09	8.40E-09	9.00E-09	9.00E-09
se 82	6.80E-09	7.08E-09	7.35E-09	7.62E-09	7.89E-09	7.89E-09
cd110	5.29E-09	5.85E-09	6.44E-09	7.06E-09	7.73E-09	7.73E-09
sn126	6.37E-09	6.66E-09	6.95E-09	7.24E-09	7.54E-09	7.54E-09
se 78	5.32E-09	5.53E-09	5.75E-09	5.97E-09	6.19E-09	6.19E-09
sn124	4.61E-09	4.81E-09	5.02E-09	5.22E-09	5.42E-09	5.42E-09
ba136	4.10E-09	4.37E-09	4.64E-09	4.92E-09	5.21E-09	5.21E-09
nb 93	3.68E-09	3.99E-09	4.31E-09	4.64E-09	4.99E-09	4.99E-09
dy163	3.80E-09	4.06E-09	4.34E-09	4.62E-09	4.91E-09	4.91E-09
xe130	3.60E-09	3.87E-09	4.16E-09	4.45E-09	4.76E-09	4.76E-09
kr 82	3.34E-09	3.57E-09	3.81E-09	4.05E-09	4.30E-09	4.30E-09
cs137	3.67E-09	3.67E-09	3.67E-09	3.66E-09	3.66E-09	3.66E-09
as 75	3.14E-09	3.27E-09	3.39E-09	3.52E-09	3.65E-09	3.65E-09
in113	2.59E-09	2.70E-09	2.82E-09	2.93E-09	3.05E-09	3.05E-09
br 79	1.87E-09	2.03E-09	2.19E-09	2.36E-09	2.54E-09	2.54E-09
pr143	2.53E-09	2.53E-09	2.52E-09	2.52E-09	2.52E-09	2.52E-09
sn118	1.88E-09	1.96E-09	2.04E-09	2.12E-09	2.20E-09	2.20E-09
ag107	1.45E-09	1.59E-09	1.74E-09	1.90E-09	2.06E-09	2.06E-09
xe133	1.94E-09	1.94E-09	1.94E-09	1.94E-09	1.94E-09	1.94E-09
sn122	1.57E-09	1.64E-09	1.71E-09	1.77E-09	1.84E-09	1.84E-09
cd116	1.57E-09	1.64E-09	1.71E-09	1.77E-09	1.84E-09	1.84E-09
cs134	1.55E-09	1.61E-09	1.68E-09	1.74E-09	1.80E-09	1.80E-09
ce141	1.53E-09	1.52E-09	1.52E-09	1.52E-09	1.52E-09	1.52E-09
xe129	1.09E-09	1.18E-09	1.28E-09	1.38E-09	1.48E-09	1.48E-09
sn120	1.17E-09	1.22E-09	1.27E-09	1.32E-09	1.37E-09	1.37E-09
te126	8.38E-10	9.04E-10	9.73E-10	1.04E-09	1.12E-09	1.12E-09
ge 73	8.81E-10	9.18E-10	9.55E-10	9.92E-10	1.03E-09	1.03E-09
pm149	9.48E-10	9.48E-10	9.47E-10	9.47E-10	9.46E-10	9.46E-10
nd147	9.01E-10	9.00E-10	8.99E-10	8.98E-10	8.97E-10	8.97E-10
ce144	5.68E-10	5.67E-10	5.66E-10	5.66E-10	5.65E-10	5.65E-10
kr 85	5.32E-10	5.31E-10	5.30E-10	5.29E-10	5.28E-10	5.28E-10
gd160	3.63E-10	3.84E-10	4.06E-10	4.28E-10	4.50E-10	4.50E-10
ho165	3.05E-10	3.28E-10	3.52E-10	3.77E-10	4.02E-10	4.02E-10
ru103	3.75E-10	3.76E-10	3.76E-10	3.77E-10	3.78E-10	3.78E-10
ge 76	3.06E-10	3.19E-10	3.31E-10	3.44E-10	3.56E-10	3.56E-10
dy160	1.76E-10	1.93E-10	2.10E-10	2.28E-10	2.47E-10	2.47E-10
zr 95	1.58E-10	1.58E-10	1.58E-10	1.58E-10	1.57E-10	1.57E-10
xe128	1.10E-10	1.19E-10	1.29E-10	1.39E-10	1.50E-10	1.50E-10
nb 95	1.46E-10	1.45E-10	1.45E-10	1.45E-10	1.45E-10	1.45E-10
y 91	1.33E-10	1.32E-10	1.32E-10	1.32E-10	1.31E-10	1.31E-10

	pm151	1.12E-10	1.12E-10	1.12E-10	1.12E-10	1.12E-10	1.12E-10
	sr 86	5.97E-11	6.43E-11	6.90E-11	7.38E-11	7.88E-11	7.88E-11
	te124	6.28E-11	6.65E-11	7.02E-11	7.41E-11	7.81E-11	7.81E-11
	sn116	4.25E-11	4.61E-11	4.99E-11	5.38E-11	5.79E-11	5.79E-11
	eu156	4.90E-11	4.96E-11	5.01E-11	5.05E-11	5.10E-11	5.10E-11
	ba140	4.53E-11	4.53E-11	4.52E-11	4.52E-11	4.51E-11	4.51E-11
	sr 87	3.82E-11	3.98E-11	4.15E-11	4.32E-11	4.49E-11	4.49E-11
	sm153	4.34E-11	4.37E-11	4.39E-11	4.41E-11	4.44E-11	4.44E-11
	ru106	3.89E-11	3.94E-11	3.98E-11	4.03E-11	4.07E-11	4.07E-11
1	sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2						
0	fraction of total absorption rate						
	power=	.00mw, burnup=	10227.mwd, flux=	2.65E+08n/cm**2-sec			
0	initial	***** d	***** d	***** d	***** d	***** d	***** d
	nb 94	2.44E-11	2.57E-11	2.70E-11	2.83E-11	2.96E-11	2.96E-11
	sr 89	2.82E-11	2.82E-11	2.81E-11	2.80E-11	2.79E-11	2.79E-11
	se 76	1.89E-11	2.02E-11	2.15E-11	2.29E-11	2.43E-11	2.43E-11
	te122	1.76E-11	1.91E-11	2.07E-11	2.23E-11	2.40E-11	2.40E-11
	er166	1.66E-11	1.78E-11	1.91E-11	2.05E-11	2.18E-11	2.18E-11
	kr 87	2.11E-11	2.11E-11	2.10E-11	2.10E-11	2.09E-11	2.09E-11
	ge 74	1.76E-11	1.83E-11	1.91E-11	1.98E-11	2.05E-11	2.05E-11
	sb125	1.72E-11	1.73E-11	1.74E-11	1.74E-11	1.75E-11	1.75E-11
	ce143	1.66E-11	1.66E-11	1.65E-11	1.65E-11	1.65E-11	1.65E-11
	ge 72	1.26E-11	1.32E-11	1.38E-11	1.43E-11	1.49E-11	1.49E-11
	y 90	1.50E-11	1.49E-11	1.49E-11	1.49E-11	1.48E-11	1.48E-11
	la140	1.47E-11	1.47E-11	1.47E-11	1.47E-11	1.47E-11	1.47E-11
	mo 99	1.27E-11	1.27E-11	1.27E-11	1.27E-11	1.27E-11	1.27E-11
	pm148m	9.61E-12	9.62E-12	9.63E-12	9.63E-12	9.64E-12	9.64E-12
	te127m	8.63E-12	8.67E-12	8.71E-12	8.75E-12	8.79E-12	8.79E-12
	i131	6.70E-12	6.70E-12	6.69E-12	6.69E-12	6.69E-12	6.69E-12
	kr 80	1.66E-12	1.82E-12	1.98E-12	2.15E-12	2.33E-12	2.33E-12
	te129m	1.86E-12	1.86E-12	1.86E-12	1.87E-12	1.87E-12	1.87E-12
	er167	7.92E-13	8.80E-13	9.74E-13	1.07E-12	1.18E-12	1.18E-12
	te123	4.16E-13	4.63E-13	5.13E-13	5.67E-13	6.25E-13	6.25E-13
	ag111	5.86E-13	5.95E-13	6.03E-13	6.12E-13	6.21E-13	6.21E-13
	eu157	4.75E-13	4.81E-13	4.87E-13	4.93E-13	4.98E-13	4.98E-13
	pm148	3.64E-13	3.64E-13	3.64E-13	3.64E-13	3.64E-13	3.64E-13
	cd115m	2.65E-13	2.66E-13	2.67E-13	2.68E-13	2.69E-13	2.69E-13
	cs136	2.07E-13	2.12E-13	2.18E-13	2.24E-13	2.29E-13	2.29E-13
	tb160	8.54E-14	8.99E-14	9.43E-14	9.89E-14	1.03E-13	1.03E-13
	cd108	5.40E-14	6.12E-14	6.91E-14	7.78E-14	8.71E-14	8.71E-14
	be 9	3.93E-14	4.09E-14	4.25E-14	4.41E-14	4.57E-14	4.57E-14
	pr142	3.94E-14	4.10E-14	4.25E-14	4.41E-14	4.57E-14	4.57E-14
	ru105	3.70E-14	3.73E-14	3.75E-14	3.78E-14	3.80E-14	3.80E-14
	sn125	3.18E-14	3.19E-14	3.19E-14	3.20E-14	3.21E-14	3.21E-14
	li 7	1.56E-14	1.62E-14	1.69E-14	1.75E-14	1.81E-14	1.81E-14
	sb126	1.34E-14	1.38E-14	1.43E-14	1.47E-14	1.51E-14	1.51E-14
	sn114	1.06E-14	1.15E-14	1.25E-14	1.35E-14	1.45E-14	1.45E-14
	rb 88	1.19E-14	1.18E-14	1.18E-14	1.18E-14	1.18E-14	1.18E-14
	sn123	1.05E-14	1.05E-14	1.05E-14	1.05E-14	1.05E-14	1.05E-14
	i135	9.78E-15	9.77E-15	9.76E-15	9.75E-15	9.74E-15	9.74E-15
	te132	9.36E-15	9.35E-15	9.35E-15	9.34E-15	9.34E-15	9.34E-15
	i130	7.96E-15	8.25E-15	8.54E-15	8.82E-15	9.11E-15	9.11E-15
	sb124	5.10E-15	5.23E-15	5.35E-15	5.47E-15	5.59E-15	5.59E-15
	te134	5.50E-15	5.49E-15	5.48E-15	5.47E-15	5.46E-15	5.46E-15
	rb 86	2.52E-15	2.62E-15	2.70E-15	2.79E-15	2.88E-15	2.88E-15
	in117m	2.54E-15	2.55E-15	2.57E-15	2.58E-15	2.60E-15	2.60E-15
	dy165	1.84E-15	1.91E-15	1.98E-15	2.05E-15	2.12E-15	2.12E-15
	in117	7.58E-16	7.63E-16	7.68E-16	7.73E-16	7.78E-16	7.78E-16
	cs134m	2.90E-16	3.02E-16	3.14E-16	3.25E-16	3.37E-16	3.37E-16

cd118 1.33E-16 1.34E-16 1.34E-16 1.34E-16 1.35E-16 1.35E-16  
 ge 75 8.35E-17 8.34E-17 8.33E-17 8.33E-17 8.32E-17 8.32E-17  
 in119m 3.26E-17 3.27E-17 3.28E-17 3.29E-17 3.30E-17 3.30E-17  
 1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 68  
 0 fraction of total absorption rate  
 power= .00mw, burnup= 10227.mwd, flux= 2.65E+08n/cm\*\*2-sec  
 0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

ag110 1.56E-17 1.66E-17 1.77E-17 1.87E-17 1.97E-17 1.97E-17  
 cd109 1.05E-17 1.11E-17 1.16E-17 1.22E-17 1.28E-17 1.28E-17  
 1 in119 2.66E-18 2.67E-18 2.68E-18 2.69E-18 2.71E-18 2.71E-18  
 0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 69  
 power= 4.000E-03mw, burnup=1.0227E+04mwd, flux= 2.65E+08n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d	***** d
h 1	5.21E-04	5.43E-04	5.65E-04	5.86E-04	6.08E-04	6.08E-04	6.08E-04
h 2	1.55E-06	1.62E-06	1.68E-06	1.75E-06	1.81E-06	1.81E-06	1.81E-06
h 3	4.76E-11	4.83E-11	4.87E-11	4.91E-11	4.96E-11	4.96E-11	4.96E-11
h 4	1.89E-34	1.92E-34	1.93E-34	1.95E-34	1.97E-34	1.97E-34	1.97E-34
he 3	9.81E-09	1.01E-08	1.05E-08	1.08E-08	1.11E-08	1.11E-08	1.11E-08
he 4	8.64E-05	9.00E-05	9.36E-05	9.72E-05	1.01E-04	1.01E-04	1.01E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.04E-05	1.08E-05	1.12E-05	1.17E-05	1.21E-05	1.21E-05	1.21E-05
ne 21	1.88E-09	2.03E-09	2.19E-09	2.35E-09	2.52E-09	2.52E-09	2.52E-09
ne 22	6.87E-08	7.16E-08	7.44E-08	7.73E-08	8.02E-08	8.02E-08	8.02E-08
ne 23	7.19E-15	7.23E-15	7.22E-15	7.22E-15	7.22E-15	7.22E-15	7.22E-15
na 22	4.25E-11	4.27E-11	4.27E-11	4.27E-11	4.27E-11	4.27E-11	4.27E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	2.75E-08	2.76E-08	2.76E-08	2.76E-08	2.76E-08	2.76E-08	2.76E-08
na 24m	4.53E-15	4.53E-15	4.53E-15	4.53E-15	4.53E-15	4.53E-15	4.53E-15
na 25	5.65E-24	6.11E-24	6.57E-24	7.04E-24	7.53E-24	7.53E-24	7.53E-24
mg 24	7.40E-02	7.69E-02	7.97E-02	8.26E-02	8.54E-02	8.54E-02	8.54E-02
mg 25	1.96E-07	2.11E-07	2.27E-07	2.44E-07	2.61E-07	2.61E-07	2.61E-07
mg 26	1.55E-06	1.62E-06	1.68E-06	1.75E-06	1.81E-06	1.81E-06	1.81E-06
mg 27	2.14E-12	2.15E-12	2.15E-12	2.15E-12	2.15E-12	2.15E-12	2.15E-12
mg 28	4.28E-24	4.29E-24	4.29E-24	4.29E-24	4.28E-24	4.28E-24	4.28E-24
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.04E-10	2.05E-10	2.04E-10	2.04E-10	2.04E-10	2.04E-10	2.04E-10
al 29	4.45E-22	4.82E-22	5.19E-22	5.57E-22	5.96E-22	5.96E-22	5.96E-22
al 30	5.02E-32	5.67E-32	6.34E-32	7.07E-32	7.84E-32	7.84E-32	7.84E-32
si 28	2.15E-01	2.24E-01	2.32E-01	2.40E-01	2.49E-01	2.49E-01	2.49E-01
si 29	1.72E-06	1.86E-06	2.00E-06	2.15E-06	2.31E-06	2.31E-06	2.31E-06
si 30	1.46E-11	1.64E-11	1.83E-11	2.04E-11	2.27E-11	2.27E-11	2.27E-11
si 31	1.02E-23	1.15E-23	1.29E-23	1.44E-23	1.59E-23	1.59E-23	1.59E-23
si 32	1.58E-29	1.78E-29	2.00E-29	2.23E-29	2.48E-29	2.48E-29	2.48E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
flux		2.65E+08	2.65E+08	2.65E+08	2.65E+08	2.65E+08	2.65E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 70  
 0 power= 4.000E-03mw, burnup=1.0227E+04mwd, flux= 2.65E+08n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d	***** d
he 4	3.89E+00	4.16E+00	4.43E+00	4.71E+00	5.00E+00	5.00E+00	5.00E+00
pb206	2.14E-03	2.38E-03	2.63E-03	2.89E-03	3.17E-03	3.17E-03	3.17E-03
pb207	2.75E-04	2.99E-04	3.23E-04	3.49E-04	3.75E-04	3.75E-04	3.75E-04
pb208	4.33E-05	4.70E-05	5.08E-05	5.48E-05	5.89E-05	5.89E-05	5.89E-05
pb209	4.12E-11	4.44E-11	4.76E-11	5.09E-11	5.43E-11	5.43E-11	5.43E-11

pb210	2.95E-05	3.13E-05	3.31E-05	3.49E-05	3.67E-05	3.67E-05
pb211	9.17E-12	9.56E-12	9.95E-12	1.03E-11	1.07E-11	1.07E-11
pb212	2.50E-11	2.61E-11	2.71E-11	2.82E-11	2.92E-11	2.92E-11
pb214	6.74E-11	7.14E-11	7.56E-11	7.97E-11	8.39E-11	8.39E-11
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	1.62E-04	1.82E-04	2.03E-04	2.26E-04	2.51E-04	2.51E-04
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	1.81E-08	1.92E-08	2.04E-08	2.15E-08	2.26E-08	2.26E-08
bi211	5.44E-13	5.67E-13	5.90E-13	6.13E-13	6.36E-13	6.36E-13
bi212	2.37E-12	2.47E-12	2.57E-12	2.67E-12	2.77E-12	2.77E-12
bi213	9.63E-11	1.04E-11	1.11E-11	1.19E-11	1.27E-11	1.27E-11
bi214	5.00E-11	5.30E-11	5.61E-11	5.92E-11	6.23E-11	6.23E-11
po210	5.01E-07	5.31E-07	5.62E-07	5.93E-07	6.24E-07	6.24E-07
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	6.01E-18	6.26E-18	6.52E-18	6.77E-18	7.03E-18	7.03E-18
po212	1.25E-22	1.30E-22	1.35E-22	1.40E-22	1.46E-22	1.46E-22
po213	1.45E-20	1.56E-20	1.67E-20	1.79E-20	1.91E-20	1.91E-20
po214	6.88E-18	7.30E-18	7.72E-18	8.14E-18	8.57E-18	8.57E-18
po215	7.54E-18	7.86E-18	8.17E-18	8.49E-18	8.81E-18	8.81E-18
po216	9.48E-17	9.87E-17	1.03E-16	1.07E-16	1.11E-16	1.11E-16
po218	7.79E-12	8.27E-12	8.74E-12	9.22E-12	9.71E-12	9.71E-12
rn218	3.66E-28	3.82E-28	3.97E-28	4.12E-28	4.28E-28	4.28E-28
rn219	1.68E-14	1.75E-14	1.82E-14	1.89E-14	1.96E-14	1.96E-14
rn220	3.63E-14	3.79E-14	3.94E-14	4.09E-14	4.24E-14	4.24E-14
rn222	1.38E-08	1.47E-08	1.55E-08	1.64E-08	1.72E-08	1.72E-08
ra222	3.97E-25	4.15E-25	4.31E-25	4.48E-25	4.64E-25	4.64E-25
ra223	4.18E-09	4.36E-09	4.54E-09	4.71E-09	4.89E-09	4.89E-09
ra224	2.07E-10	2.15E-10	2.24E-10	2.33E-10	2.41E-10	2.41E-10
ra225	4.50E-09	4.85E-09	5.20E-09	5.56E-09	5.94E-09	5.94E-09
ra226	2.12E-03	2.24E-03	2.37E-03	2.50E-03	2.64E-03	2.64E-03
ra228	1.29E-11	1.35E-11	1.40E-11	1.46E-11	1.51E-11	1.51E-11
ac225	3.04E-09	3.27E-09	3.51E-09	3.76E-09	4.01E-09	4.01E-09
ac227	2.91E-06	3.03E-06	3.16E-06	3.28E-06	3.40E-06	3.40E-06
ac228	1.58E-15	1.64E-15	1.71E-15	1.78E-15	1.84E-15	1.84E-15
th226	1.94E-23	2.02E-23	2.10E-23	2.18E-23	2.26E-23	2.26E-23
th227	6.75E-09	7.04E-09	7.32E-09	7.61E-09	7.90E-09	7.90E-09
th228	3.95E-08	4.11E-08	4.28E-08	4.44E-08	4.61E-08	4.61E-08
th229	8.76E-04	9.43E-04	1.01E-03	1.08E-03	1.15E-03	1.15E-03
th230	1.55E-01	1.62E-01	1.68E-01	1.75E-01	1.82E-01	1.82E-01
th231	3.55E-09	3.58E-09	3.60E-09	3.62E-09	3.65E-09	3.65E-09
th232	3.15E-02	3.29E-02	3.42E-02	3.56E-02	3.69E-02	3.69E-02
th233	2.85E-13	2.97E-13	3.09E-13	3.21E-13	3.33E-13	3.33E-13
th234	5.37E-07	5.37E-07	5.37E-07	5.36E-07	5.36E-07	5.36E-07
pa231	4.37E-03	4.56E-03	4.74E-03	4.93E-03	5.11E-03	5.11E-03
pa232	7.37E-11	7.68E-11	7.99E-11	8.29E-11	8.60E-11	8.60E-11

1  
0  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gdw/mtu 40% h2o/ 8% uo2  
power= 4.000E-03mw, burnup=1.0227E+04mwd, flux= 2.65E+08n/cm\*\*2-sec

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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	1.88E-20	1.96E-20	2.04E-20	2.12E-20	2.20E-20	2.20E-20
u231	6.00E-17	6.26E-17	6.49E-17	6.73E-17	6.96E-17	6.96E-17
u232	1.44E-06	1.50E-06	1.56E-06	1.62E-06	1.68E-06	1.68E-06
u233	7.83E-02	8.14E-02	8.45E-02	8.76E-02	9.07E-02	9.07E-02
u234	9.87E+00	9.90E+00	9.93E+00	9.97E+00	1.00E+01	1.00E+01



u235	6.89E+02	6.88E+02	6.86E+02	6.85E+02	6.83E+02	6.83E+02
u236	1.81E+02	1.81E+02	1.82E+02	1.82E+02	1.82E+02	1.82E+02
u237	3.21E-06	3.22E-06	3.22E-06	3.23E-06	3.23E-06	3.23E-06
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07
u240	5.75E-37	8.14E-37	1.14E-36	1.56E-36	2.13E-36	2.13E-36
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	8.73E-12	8.77E-12	8.76E-12	8.76E-12	8.75E-12	8.75E-12
np236m	2.07E-12	2.08E-12	2.08E-12	2.08E-12	2.08E-12	2.08E-12
np236	1.17E-06	1.22E-06	1.27E-06	1.31E-06	1.36E-06	1.36E-06
np237	4.17E+01	4.17E+01	4.17E+01	4.16E+01	4.16E+01	4.16E+01
np238	1.52E-06	1.52E-06	1.52E-06	1.52E-06	1.51E-06	1.51E-06
np239	4.58E-05	4.58E-05	4.58E-05	4.58E-05	4.58E-05	4.58E-05
np240m	4.91E-39	6.95E-39	9.70E-39	1.33E-38	1.81E-38	1.81E-38
np240	9.16E-15	9.17E-15	9.16E-15	9.16E-15	9.15E-15	9.15E-15
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.13E-09	1.13E-09	1.13E-09	1.13E-09	1.13E-09	1.13E-09
pu237	4.48E-13	4.58E-13	4.65E-13	4.72E-13	4.79E-13	4.79E-13
pu238	2.30E-02	2.30E-02	2.30E-02	2.29E-02	2.29E-02	2.29E-02
pu239	2.53E+01	2.61E+01	2.70E+01	2.78E+01	2.87E+01	2.87E+01
pu240	6.09E-01	6.51E-01	6.93E-01	7.36E-01	7.80E-01	7.80E-01
pu241	2.50E-04	2.67E-04	2.84E-04	3.02E-04	3.20E-04	3.20E-04
pu242	3.72E-05	4.19E-05	4.70E-05	5.25E-05	5.83E-05	5.83E-05
pu243	7.86E-14	8.87E-14	9.95E-14	1.11E-13	1.23E-13	1.23E-13
pu244	2.87E-26	4.06E-26	5.66E-26	7.79E-26	1.06E-25	1.06E-25
pu245	1.15E-36	1.62E-36	2.26E-36	3.12E-36	4.23E-36	4.23E-36
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	1.73E-18	1.87E-18	2.00E-18	2.14E-18	2.28E-18	2.28E-18
am240	7.89E-16	8.54E-16	9.16E-16	9.80E-16	1.04E-15	1.04E-15
am241	6.17E-03	6.65E-03	7.13E-03	7.63E-03	8.13E-03	8.13E-03
am242m	2.91E-06	3.14E-06	3.38E-06	3.62E-06	3.87E-06	3.87E-06
am242	2.48E-10	2.67E-10	2.87E-10	3.07E-10	3.27E-10	3.27E-10
am243	2.61E-07	3.00E-07	3.43E-07	3.90E-07	4.40E-07	4.40E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	1.98E-15	2.28E-15	2.60E-15	2.96E-15	3.34E-15	3.34E-15
am245	2.43E-37	3.43E-37	4.77E-37	6.54E-37	8.86E-37	8.86E-37
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.47E-20	1.59E-20	1.71E-20	1.83E-20	1.95E-20	1.95E-20
cm242	5.01E-08	5.40E-08	5.79E-08	6.19E-08	6.60E-08	6.60E-08
cm243	3.80E-17	4.12E-17	4.43E-17	4.75E-17	5.08E-17	5.08E-17
cm244	3.11E-11	3.58E-11	4.09E-11	4.64E-11	5.25E-11	5.25E-11

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 0 power= 4.000E-03mw, burnup=1.0227E+04mwd, flux= 2.65E+08n/cm\*\*2-sec

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nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d
cm245	3.88E-14	4.64E-14	5.50E-14	6.47E-14	7.57E-14	7.57E-14
cm246	2.15E-16	2.67E-16	3.29E-16	4.01E-16	4.85E-16	4.85E-16
cm247	2.18E-20	2.83E-20	3.63E-20	4.61E-20	5.80E-20	5.80E-20
cm248	2.18E-23	2.95E-23	3.95E-23	5.22E-23	6.82E-23	6.82E-23
cm249	6.82E-34	9.26E-34	1.24E-33	1.64E-33	2.14E-33	2.14E-33
cm250	1.91E-38	2.69E-38	3.75E-38	5.15E-38	7.00E-38	7.00E-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
flux		2.65E+08	2.65E+08	2.65E+08	2.65E+08	2.65E-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.  
 1 library 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 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 8/28/1996 date library was produced  
 0 1697 total number of nuclides in library  
 0 689 number of light-element nuclides  
 0 129 number of actinide nuclides  
 0 879 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%, 20gd/mtu 40% h2o/ 8% uo2  
 power= .00mw, burnup= 11688.mwd, flux= 2.65E+08n/cm\*\*2-sec

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

	initial	***** d	***** d	***** d	***** d	***** d
0 productions	1.171770E+06	1.172613E+06	1.173425E+06	1.174209E+06	1.174963E+06	1.174963E+06
0 absorptions	9.653493E+05	9.660934E+05	9.668211E+05	9.675327E+05	9.682284E+05	9.682284E+05
0 k infinity	1.213830E+00	1.213767E+00	1.213694E+00	1.213611E+00	1.213519E+00	1.213519E+00
0 actinide	initial	***** d	***** d	***** d	***** d	***** d

absorptions 9.524083E+05 9.530048E+05 9.535861E+05 9.541523E+05 9.547033E+05 9.547033E+05  
 non-actinide  
 abs. fracs. 1.340544E-02 1.354790E-02 1.368910E-02 1.382947E-02 1.396894E-02 1.396894E-02  
 1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 74  
 0 fraction of total absorption rate  
 power= .00mw, burnup= 11688.mwd, flux= 2.65E+08n/cm\*\*2-sec  
 0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

sm149	5.34E-03	5.34E-03	5.34E-03	5.34E-03	5.34E-03	5.34E-03
eu151	1.12E-03	1.15E-03	1.18E-03	1.20E-03	1.23E-03	1.23E-03
nd143	9.66E-04	9.99E-04	1.03E-03	1.06E-03	1.10E-03	1.10E-03
rh103	4.83E-04	5.01E-04	5.18E-04	5.35E-04	5.53E-04	5.53E-04
xe131	3.19E-04	3.30E-04	3.41E-04	3.52E-04	3.63E-04	3.63E-04
cs133	2.46E-04	2.55E-04	2.63E-04	2.72E-04	2.81E-04	2.81E-04
gd155	2.08E-04	2.10E-04	2.12E-04	2.14E-04	2.15E-04	2.15E-04
sm147	1.81E-04	1.87E-04	1.94E-04	2.00E-04	2.06E-04	2.06E-04
tc 99	1.79E-04	1.86E-04	1.92E-04	1.98E-04	2.04E-04	2.04E-04
nd145	1.39E-04	1.43E-04	1.48E-04	1.53E-04	1.58E-04	1.58E-04
sm152	9.67E-05	1.01E-04	1.05E-04	1.09E-04	1.13E-04	1.13E-04
mo 95	9.64E-05	9.97E-05	1.03E-04	1.06E-04	1.10E-04	1.10E-04
cd113	9.87E-05	9.93E-05	9.99E-05	1.00E-04	1.01E-04	1.01E-04
sm150	6.82E-05	7.08E-05	7.35E-05	7.61E-05	7.88E-05	7.88E-05
kr 83	5.86E-05	6.06E-05	6.26E-05	6.45E-05	6.65E-05	6.65E-05
cs135	5.58E-05	5.78E-05	5.97E-05	6.17E-05	6.36E-05	6.36E-05
gd157	6.00E-05	6.08E-05	6.15E-05	6.22E-05	6.29E-05	6.29E-05
ru101	4.37E-05	4.52E-05	4.67E-05	4.83E-05	4.98E-05	4.98E-05
eu153	4.07E-05	4.22E-05	4.38E-05	4.53E-05	4.69E-05	4.69E-05
pr141	4.10E-05	4.24E-05	4.39E-05	4.53E-05	4.67E-05	4.67E-05
sm151	4.18E-05	4.19E-05	4.20E-05	4.21E-05	4.22E-05	4.22E-05
la139	3.35E-05	3.46E-05	3.58E-05	3.70E-05	3.81E-05	3.81E-05
pd105	1.68E-05	1.75E-05	1.82E-05	1.88E-05	1.95E-05	1.95E-05
ag109	1.54E-05	1.62E-05	1.71E-05	1.80E-05	1.89E-05	1.89E-05
ba137	1.60E-05	1.66E-05	1.71E-05	1.77E-05	1.82E-05	1.82E-05
zr 93	1.36E-05	1.40E-05	1.45E-05	1.49E-05	1.54E-05	1.54E-05
i129	1.08E-05	1.12E-05	1.16E-05	1.20E-05	1.24E-05	1.24E-05
nd144	1.01E-05	1.05E-05	1.08E-05	1.12E-05	1.16E-05	1.16E-05
mo 97	7.62E-06	7.89E-06	8.15E-06	8.42E-06	8.68E-06	8.68E-06
gd152	4.77E-06	5.09E-06	5.41E-06	5.74E-06	6.07E-06	6.07E-06
pd108	3.80E-06	3.99E-06	4.19E-06	4.39E-06	4.59E-06	4.59E-06
zr 91	3.51E-06	3.63E-06	3.75E-06	3.87E-06	3.99E-06	3.99E-06
y 89	3.35E-06	3.47E-06	3.58E-06	3.69E-06	3.81E-06	3.81E-06
ru102	3.16E-06	3.27E-06	3.39E-06	3.50E-06	3.61E-06	3.61E-06
ce142	2.77E-06	2.87E-06	2.97E-06	3.06E-06	3.16E-06	3.16E-06
nd148	2.70E-06	2.79E-06	2.88E-06	2.98E-06	3.07E-06	3.07E-06
nd146	2.25E-06	2.33E-06	2.41E-06	2.48E-06	2.56E-06	2.56E-06
in115	2.00E-06	2.08E-06	2.15E-06	2.23E-06	2.30E-06	2.30E-06
pd107	1.91E-06	2.00E-06	2.09E-06	2.19E-06	2.29E-06	2.29E-06
xe135	2.25E-06	2.24E-06	2.24E-06	2.24E-06	2.24E-06	2.24E-06
ba138	1.92E-06	1.98E-06	2.05E-06	2.12E-06	2.18E-06	2.18E-06
ce140	1.79E-06	1.86E-06	1.92E-06	1.98E-06	2.04E-06	2.04E-06
xe132	1.66E-06	1.72E-06	1.78E-06	1.84E-06	1.90E-06	1.90E-06
mo 98	1.13E-06	1.17E-06	1.21E-06	1.25E-06	1.29E-06	1.29E-06
mo100	1.09E-06	1.13E-06	1.17E-06	1.21E-06	1.25E-06	1.25E-06
xe134	1.06E-06	1.10E-06	1.14E-06	1.18E-06	1.21E-06	1.21E-06
zr 92	8.48E-07	8.77E-07	9.05E-07	9.34E-07	9.63E-07	9.63E-07
i127	7.94E-07	8.24E-07	8.55E-07	8.85E-07	9.16E-07	9.16E-07
ru104	7.29E-07	7.56E-07	7.83E-07	8.11E-07	8.38E-07	8.38E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 75  
 0 fraction of total absorption rate  
 power= .00mw, burnup= 11688.mwd, flux= 2.65E+08n/cm\*\*2-sec

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

zr 96	6.88E-07	7.12E-07	7.36E-07	7.59E-07	7.83E-07	7.83E-07
nd150	6.11E-07	6.33E-07	6.54E-07	6.76E-07	6.98E-07	6.98E-07
xe136	5.78E-07	5.98E-07	6.18E-07	6.38E-07	6.58E-07	6.58E-07
cd111	4.32E-07	4.52E-07	4.73E-07	4.93E-07	5.14E-07	5.14E-07
br 81	4.33E-07	4.48E-07	4.63E-07	4.78E-07	4.93E-07	4.93E-07
rb 85	4.15E-07	4.29E-07	4.43E-07	4.57E-07	4.71E-07	4.71E-07
ru 99	3.26E-07	3.49E-07	3.73E-07	3.98E-07	4.23E-07	4.23E-07
zr 94	3.66E-07	3.78E-07	3.91E-07	4.03E-07	4.16E-07	4.16E-07
zr 90	3.29E-07	3.41E-07	3.52E-07	3.63E-07	3.74E-07	3.74E-07
sm154	2.81E-07	2.92E-07	3.03E-07	3.13E-07	3.24E-07	3.24E-07
eu152	2.88E-07	2.95E-07	3.02E-07	3.09E-07	3.16E-07	3.16E-07
te130	2.65E-07	2.74E-07	2.84E-07	2.93E-07	3.02E-07	3.02E-07
rb 87	2.39E-07	2.48E-07	2.56E-07	2.64E-07	2.72E-07	2.72E-07
pm147	2.62E-07	2.61E-07	2.61E-07	2.61E-07	2.61E-07	2.61E-07
gd154	1.84E-07	1.98E-07	2.12E-07	2.26E-07	2.41E-07	2.41E-07
eu155	1.99E-07	2.00E-07	2.01E-07	2.02E-07	2.03E-07	2.03E-07
pd106	1.69E-07	1.76E-07	1.83E-07	1.91E-07	1.98E-07	1.98E-07
se 77	1.72E-07	1.78E-07	1.84E-07	1.90E-07	1.96E-07	1.96E-07
gd156	1.46E-07	1.53E-07	1.60E-07	1.67E-07	1.74E-07	1.74E-07
kr 84	1.15E-07	1.19E-07	1.22E-07	1.26E-07	1.30E-07	1.30E-07
dy161	9.26E-08	9.76E-08	1.03E-07	1.08E-07	1.13E-07	1.13E-07
sb121	9.18E-08	9.52E-08	9.86E-08	1.02E-07	1.05E-07	1.05E-07
se 79	8.83E-08	9.13E-08	9.44E-08	9.74E-08	1.00E-07	1.00E-07
sb123	7.42E-08	7.69E-08	7.97E-08	8.24E-08	8.52E-08	8.52E-08
ru100	5.56E-08	5.96E-08	6.37E-08	6.79E-08	7.23E-08	7.23E-08
kr 86	6.26E-08	6.47E-08	6.68E-08	6.89E-08	7.10E-08	7.10E-08
te128	6.03E-08	6.25E-08	6.47E-08	6.69E-08	6.91E-08	6.91E-08
nd142	3.89E-08	4.16E-08	4.45E-08	4.75E-08	5.05E-08	5.05E-08
ba134	3.79E-08	4.06E-08	4.34E-08	4.63E-08	4.93E-08	4.93E-08
tb159	4.12E-08	4.32E-08	4.52E-08	4.72E-08	4.92E-08	4.92E-08
se 80	4.12E-08	4.26E-08	4.40E-08	4.55E-08	4.69E-08	4.69E-08
te125	4.05E-08	4.21E-08	4.36E-08	4.52E-08	4.68E-08	4.68E-08
sm148	3.47E-08	3.71E-08	3.97E-08	4.23E-08	4.51E-08	4.51E-08
ba135	3.14E-08	3.36E-08	3.59E-08	3.84E-08	4.08E-08	4.08E-08
gd158	3.23E-08	3.38E-08	3.53E-08	3.68E-08	3.83E-08	3.83E-08
cd112	3.03E-08	3.15E-08	3.28E-08	3.41E-08	3.54E-08	3.54E-08
pd104	2.68E-08	2.88E-08	3.08E-08	3.28E-08	3.50E-08	3.50E-08
dy164	2.11E-08	2.23E-08	2.36E-08	2.48E-08	2.61E-08	2.61E-08
li 6	2.24E-08	2.32E-08	2.39E-08	2.46E-08	2.54E-08	2.54E-08
sn117	2.17E-08	2.26E-08	2.35E-08	2.43E-08	2.52E-08	2.52E-08
dy162	1.94E-08	2.05E-08	2.17E-08	2.29E-08	2.42E-08	2.42E-08
eu154	2.04E-08	2.11E-08	2.19E-08	2.27E-08	2.34E-08	2.34E-08
cd114	1.78E-08	1.86E-08	1.94E-08	2.01E-08	2.09E-08	2.09E-08
sn119	1.67E-08	1.73E-08	1.79E-08	1.85E-08	1.92E-08	1.92E-08
sn115	1.52E-08	1.58E-08	1.64E-08	1.70E-08	1.75E-08	1.75E-08
pd110	1.46E-08	1.53E-08	1.60E-08	1.67E-08	1.74E-08	1.74E-08
sr 90	1.56E-08	1.56E-08	1.55E-08	1.55E-08	1.55E-08	1.55E-08
sr 88	1.15E-08	1.19E-08	1.23E-08	1.27E-08	1.31E-08	1.31E-08
mo 96	9.00E-09	9.63E-09	1.03E-08	1.09E-08	1.16E-08	1.16E-08

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

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power=.00mw, burnup= 11688.mwd, flux= 2.65E+08n/cm\*\*2-sec  
 0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

rh105	1.06E-08	1.07E-08	1.07E-08	1.08E-08	1.09E-08	1.09E-08
cd110	7.72E-09	8.42E-09	9.15E-09	9.93E-09	1.07E-08	1.07E-08
se 82	7.89E-09	8.16E-09	8.43E-09	8.70E-09	8.97E-09	8.97E-09
sn126	7.53E-09	7.83E-09	8.13E-09	8.43E-09	8.73E-09	8.73E-09

se 78	6.19E-09	6.41E-09	6.63E-09	6.85E-09	7.06E-09	7.06E-09
nb 93	4.98E-09	5.34E-09	5.71E-09	6.09E-09	6.48E-09	6.48E-09
ba136	5.21E-09	5.51E-09	5.81E-09	6.12E-09	6.44E-09	6.44E-09
sn124	5.43E-09	5.63E-09	5.84E-09	6.04E-09	6.25E-09	6.25E-09
dy163	4.91E-09	5.20E-09	5.50E-09	5.81E-09	6.13E-09	6.13E-09
xe130	4.76E-09	5.07E-09	5.40E-09	5.73E-09	6.08E-09	6.08E-09
kr 82	4.30E-09	4.56E-09	4.82E-09	5.09E-09	5.36E-09	5.36E-09
as 75	3.65E-09	3.78E-09	3.90E-09	4.03E-09	4.16E-09	4.16E-09
cs137	3.66E-09	3.66E-09	3.66E-09	3.66E-09	3.65E-09	3.65E-09
in113	3.05E-09	3.17E-09	3.29E-09	3.40E-09	3.52E-09	3.52E-09
br 79	2.54E-09	2.72E-09	2.91E-09	3.10E-09	3.30E-09	3.30E-09
ag107	2.06E-09	2.23E-09	2.41E-09	2.60E-09	2.80E-09	2.80E-09
sn118	2.21E-09	2.29E-09	2.37E-09	2.45E-09	2.54E-09	2.54E-09
pr143	2.52E-09	2.51E-09	2.51E-09	2.50E-09	2.50E-09	2.50E-09
sn122	1.84E-09	1.91E-09	1.98E-09	2.05E-09	2.12E-09	2.12E-09
cd116	1.84E-09	1.91E-09	1.98E-09	2.05E-09	2.12E-09	2.12E-09
cs134	1.80E-09	1.86E-09	1.92E-09	1.99E-09	2.05E-09	2.05E-09
xe129	1.48E-09	1.59E-09	1.70E-09	1.82E-09	1.94E-09	1.94E-09
xe133	1.94E-09	1.94E-09	1.93E-09	1.93E-09	1.93E-09	1.93E-09
sn120	1.37E-09	1.42E-09	1.47E-09	1.52E-09	1.57E-09	1.57E-09
ce141	1.52E-09	1.52E-09	1.51E-09	1.51E-09	1.51E-09	1.51E-09
te126	1.12E-09	1.19E-09	1.27E-09	1.35E-09	1.44E-09	1.44E-09
ge 73	1.03E-09	1.07E-09	1.10E-09	1.14E-09	1.18E-09	1.18E-09
pm149	9.45E-10	9.45E-10	9.44E-10	9.44E-10	9.44E-10	9.44E-10
nd147	8.98E-10	8.97E-10	8.96E-10	8.95E-10	8.94E-10	8.94E-10
ce144	5.64E-10	5.63E-10	5.63E-10	5.62E-10	5.61E-10	5.61E-10
gd160	4.50E-10	4.72E-10	4.96E-10	5.19E-10	5.43E-10	5.43E-10
kr 85	5.27E-10	5.26E-10	5.25E-10	5.24E-10	5.23E-10	5.23E-10
ho165	4.02E-10	4.29E-10	4.56E-10	4.84E-10	5.13E-10	5.13E-10
ge 76	3.56E-10	3.68E-10	3.80E-10	3.92E-10	4.05E-10	4.05E-10
ru103	3.78E-10	3.78E-10	3.79E-10	3.79E-10	3.80E-10	3.80E-10
dy160	2.47E-10	2.67E-10	2.87E-10	3.09E-10	3.31E-10	3.31E-10
xe128	1.50E-10	1.61E-10	1.72E-10	1.84E-10	1.96E-10	1.96E-10
zr 95	1.58E-10	1.57E-10	1.57E-10	1.57E-10	1.57E-10	1.57E-10
nb 95	1.45E-10	1.44E-10	1.44E-10	1.44E-10	1.44E-10	1.44E-10
y 91	1.31E-10	1.31E-10	1.31E-10	1.30E-10	1.30E-10	1.30E-10
pm151	1.12E-10	1.12E-10	1.12E-10	1.12E-10	1.13E-10	1.13E-10
sr 86	7.87E-11	8.39E-11	8.92E-11	9.47E-11	1.00E-10	1.00E-10
te124	7.80E-11	8.20E-11	8.62E-11	9.04E-11	9.46E-11	9.46E-11
sn116	5.80E-11	6.22E-11	6.66E-11	7.11E-11	7.58E-11	7.58E-11
eu156	5.10E-11	5.15E-11	5.19E-11	5.24E-11	5.28E-11	5.28E-11
sr 87	4.48E-11	4.65E-11	4.82E-11	4.99E-11	5.16E-11	5.16E-11
sm153	4.44E-11	4.46E-11	4.48E-11	4.51E-11	4.53E-11	4.53E-11
ba140	4.51E-11	4.50E-11	4.50E-11	4.49E-11	4.49E-11	4.49E-11
ru106	4.07E-11	4.11E-11	4.16E-11	4.20E-11	4.24E-11	4.24E-11

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0  
0  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
fraction of total absorption rate  
power=.00mw, burnup= 11688.mwd, flux= 2.65E+08n/cm\*\*2-sec  
initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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nb 94	2.97E-11	3.11E-11	3.25E-11	3.39E-11	3.54E-11	3.54E-11
te122	2.40E-11	2.58E-11	2.76E-11	2.95E-11	3.14E-11	3.14E-11
se 76	2.43E-11	2.57E-11	2.72E-11	2.88E-11	3.03E-11	3.03E-11
er166	2.18E-11	2.32E-11	2.47E-11	2.62E-11	2.77E-11	2.77E-11
sr 89	2.79E-11	2.78E-11	2.78E-11	2.77E-11	2.77E-11	2.77E-11
ge 74	2.05E-11	2.12E-11	2.20E-11	2.27E-11	2.34E-11	2.34E-11
kr 87	2.09E-11	2.09E-11	2.08E-11	2.08E-11	2.07E-11	2.07E-11
sb125	1.75E-11	1.76E-11	1.77E-11	1.77E-11	1.78E-11	1.78E-11
ge 72	1.49E-11	1.54E-11	1.60E-11	1.66E-11	1.72E-11	1.72E-11
ce143	1.65E-11	1.65E-11	1.64E-11	1.64E-11	1.64E-11	1.64E-11



ne 20	1.21E-05	1.26E-05	1.30E-05	1.34E-05	1.39E-05	1.39E-05
ne 21	2.52E-09	2.70E-09	2.88E-09	3.06E-09	3.26E-09	3.26E-09
ne 22	8.02E-08	8.31E-08	8.60E-08	8.89E-08	9.18E-08	9.18E-08
ne 23	7.22E-15	7.25E-15	7.25E-15	7.24E-15	7.24E-15	7.24E-15
na 22	4.27E-11	4.29E-11	4.29E-11	4.29E-11	4.28E-11	4.28E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	2.76E-08	2.76E-08	2.76E-08	2.76E-08	2.76E-08	2.76E-08
na 24m	4.53E-15	4.53E-15	4.53E-15	4.53E-15	4.53E-15	4.53E-15
na 25	7.53E-24	8.05E-24	8.58E-24	9.11E-24	9.66E-24	9.66E-24
mg 24	8.54E-02	8.83E-02	9.12E-02	9.40E-02	9.69E-02	9.69E-02
mg 25	2.61E-07	2.78E-07	2.96E-07	3.15E-07	3.34E-07	3.34E-07
mg 26	1.81E-06	1.88E-06	1.94E-06	2.01E-06	2.07E-06	2.07E-06
mg 27	2.15E-12	2.16E-12	2.16E-12	2.16E-12	2.16E-12	2.16E-12
mg 28	4.28E-24	4.30E-24	4.29E-24	4.29E-24	4.29E-24	4.29E-24
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.04E-10	2.05E-10	2.04E-10	2.04E-10	2.04E-10	2.04E-10
al 29	5.96E-22	6.39E-22	6.81E-22	7.25E-22	7.70E-22	7.70E-22
al 30	7.84E-32	8.70E-32	9.59E-32	1.05E-31	1.15E-31	1.15E-31
si 28	2.49E-01	2.57E-01	2.65E-01	2.74E-01	2.82E-01	2.82E-01
si 29	2.31E-06	2.47E-06	2.63E-06	2.80E-06	2.97E-06	2.97E-06
si 30	2.27E-11	2.51E-11	2.77E-11	3.04E-11	3.33E-11	3.33E-11
si 31	1.59E-23	1.76E-23	1.94E-23	2.13E-23	2.34E-23	2.34E-23
si 32	2.48E-29	2.75E-29	3.04E-29	3.35E-29	3.68E-29	3.68E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
flux		2.65E+08	2.65E+08	2.65E+08	2.65E+08	2.64E-07

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 4.000E-03mw, burnup=1.1688E+04mwd, flux= 2.65E+08n/cm\*\*2-sec

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nuclide concentrations, gram atoms  
basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d
he 4	5.00E+00	5.29E+00	5.59E+00	5.90E+00	6.22E+00	6.22E+00
pb206	3.17E-03	3.47E-03	3.77E-03	4.10E-03	4.43E-03	4.43E-03
pb207	3.75E-04	4.03E-04	4.31E-04	4.61E-04	4.91E-04	4.91E-04
pb208	5.89E-05	6.32E-05	6.76E-05	7.22E-05	7.69E-05	7.69E-05
pb209	5.43E-11	5.78E-11	6.14E-11	6.50E-11	6.88E-11	6.88E-11
pb210	3.67E-05	3.86E-05	4.04E-05	4.23E-05	4.42E-05	4.42E-05
pb211	1.07E-11	1.11E-11	1.15E-11	1.19E-11	1.23E-11	1.23E-11
pb212	2.92E-11	3.03E-11	3.13E-11	3.24E-11	3.34E-11	3.34E-11
pb214	8.39E-11	8.81E-11	9.24E-11	9.66E-11	1.01E-10	1.01E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	2.51E-04	2.77E-04	3.05E-04	3.34E-04	3.66E-04	3.66E-04
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	2.26E-08	2.37E-08	2.49E-08	2.60E-08	2.72E-08	2.72E-08
bi211	6.36E-13	6.59E-13	6.82E-13	7.05E-13	7.29E-13	7.29E-13
bi212	2.77E-12	2.87E-12	2.97E-12	3.07E-12	3.17E-12	3.17E-12
bi213	1.27E-11	1.35E-11	1.43E-11	1.52E-11	1.61E-11	1.61E-11
bi214	6.23E-11	6.54E-11	6.86E-11	7.17E-11	7.49E-11	7.49E-11
po210	6.24E-07	6.56E-07	6.87E-07	7.19E-07	7.51E-07	7.51E-07
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	7.03E-18	7.28E-18	7.54E-18	7.79E-18	8.05E-18	8.05E-18
po212	1.46E-22	1.51E-22	1.56E-22	1.61E-22	1.67E-22	1.67E-22
po213	1.91E-20	2.03E-20	2.16E-20	2.28E-20	2.41E-20	2.41E-20
po214	8.57E-18	9.00E-18	9.44E-18	9.87E-18	1.03E-17	1.03E-17
po215	8.81E-18	9.14E-18	9.46E-18	9.78E-18	1.01E-17	1.01E-17
po216	1.11E-16	1.15E-16	1.19E-16	1.23E-16	1.27E-16	1.27E-16
po218	9.71E-12	1.02E-11	1.07E-11	1.12E-11	1.17E-11	1.17E-11
rn218	4.28E-28	4.44E-28	4.59E-28	4.74E-28	4.90E-28	4.90E-28
rn219	1.96E-14	2.03E-14	2.10E-14	2.18E-14	2.25E-14	2.25E-14
rn220	4.24E-14	4.39E-14	4.55E-14	4.70E-14	4.85E-14	4.85E-14

rn222	1.72E-08	1.81E-08	1.90E-08	1.99E-08	2.07E-08	2.07E-08
ra222	4.64E-25	4.82E-25	4.99E-25	5.15E-25	5.32E-25	5.32E-25
ra223	4.89E-09	5.07E-09	5.25E-09	5.43E-09	5.61E-09	5.61E-09
ra224	2.41E-10	2.50E-10	2.59E-10	2.67E-10	2.76E-10	2.76E-10
ra225	5.94E-09	6.32E-09	6.71E-09	7.10E-09	7.51E-09	7.51E-09
ra226	2.64E-03	2.77E-03	2.90E-03	3.03E-03	3.17E-03	3.17E-03
ra228	1.51E-11	1.57E-11	1.62E-11	1.68E-11	1.73E-11	1.73E-11
ac225	4.01E-09	4.27E-09	4.53E-09	4.80E-09	5.07E-09	5.07E-09
ac227	3.40E-06	3.53E-06	3.65E-06	3.77E-06	3.90E-06	3.90E-06
ac228	1.84E-15	1.91E-15	1.98E-15	2.05E-15	2.11E-15	2.11E-15
th226	2.26E-23	2.35E-23	2.43E-23	2.51E-23	2.59E-23	2.59E-23
th227	7.90E-09	8.18E-09	8.47E-09	8.76E-09	9.05E-09	9.05E-09
th228	4.61E-08	4.77E-08	4.94E-08	5.10E-08	5.27E-08	5.27E-08
th229	1.15E-03	1.23E-03	1.30E-03	1.38E-03	1.46E-03	1.46E-03
th230	1.82E-01	1.88E-01	1.95E-01	2.01E-01	2.08E-01	2.08E-01
th231	3.65E-09	3.67E-09	3.70E-09	3.72E-09	3.74E-09	3.74E-09
th232	3.69E-02	3.83E-02	3.96E-02	4.10E-02	4.23E-02	4.23E-02
th233	3.33E-13	3.45E-13	3.57E-13	3.69E-13	3.81E-13	3.81E-13
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	5.11E-03	5.30E-03	5.49E-03	5.67E-03	5.86E-03	5.86E-03
pa232	8.60E-11	8.91E-11	9.22E-11	9.53E-11	9.84E-11	9.84E-11

1  
0  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 4.000E-03mw, burnup=1.1688E+04mwd, flux= 2.65E+08n/cm\*\*2-sec

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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	2.20E-20	2.28E-20	2.36E-20	2.44E-20	2.51E-20	2.51E-20
u231	6.96E-17	7.22E-17	7.45E-17	7.68E-17	7.91E-17	7.91E-17
u232	1.68E-06	1.74E-06	1.80E-06	1.86E-06	1.92E-06	1.92E-06
u233	9.07E-02	9.38E-02	9.68E-02	9.99E-02	1.03E-01	1.03E-01
u234	1.00E+01	1.00E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01
u235	6.83E+02	6.82E+02	6.80E+02	6.79E+02	6.77E+02	6.77E+02
u236	1.82E+02	1.82E+02	1.83E+02	1.83E+02	1.83E+02	1.83E+02
u237	3.23E-06	3.24E-06	3.24E-06	3.25E-06	3.25E-06	3.25E-06
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07
u240	2.13E-36	2.86E-36	3.80E-36	5.00E-36	6.53E-36	6.53E-36
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	8.75E-12	8.79E-12	8.78E-12	8.77E-12	8.77E-12	8.77E-12
np236m	2.08E-12	2.09E-12	2.08E-12	2.08E-12	2.08E-12	2.08E-12
np236	1.36E-06	1.41E-06	1.46E-06	1.50E-06	1.55E-06	1.55E-06
np237	4.16E+01	4.16E+01	4.16E+01	4.16E+01	4.16E+01	4.16E+01
np238	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06
np239	4.58E-05	4.58E-05	4.58E-05	4.58E-05	4.58E-05	4.58E-05
np240m	1.81E-38	2.44E-38	3.24E-38	4.27E-38	5.57E-38	5.57E-38
np240	9.15E-15	9.16E-15	9.15E-15	9.14E-15	9.14E-15	9.14E-15
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.13E-09	1.13E-09	1.13E-09	1.13E-09	1.13E-09	1.13E-09
pu237	4.79E-13	4.89E-13	4.95E-13	5.02E-13	5.09E-13	5.09E-13
pu238	2.29E-02	2.29E-02	2.29E-02	2.29E-02	2.29E-02	2.29E-02
pu239	2.87E+01	2.95E+01	3.03E+01	3.11E+01	3.19E+01	3.19E+01
pu240	7.80E-01	8.24E-01	8.69E-01	9.14E-01	9.60E-01	9.60E-01
pu241	3.20E-04	3.38E-04	3.56E-04	3.75E-04	3.93E-04	3.93E-04
pu242	5.83E-05	6.45E-05	7.10E-05	7.79E-05	8.53E-05	8.53E-05
pu243	1.23E-13	1.36E-13	1.50E-13	1.65E-13	1.80E-13	1.80E-13



pu244	1.06E-25	1.42E-25	1.89E-25	2.49E-25	3.25E-25	3.25E-25
pu245	4.23E-36	5.69E-36	7.56E-36	9.95E-36	1.30E-35	1.30E-35
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	2.28E-18	2.44E-18	2.58E-18	2.73E-18	2.88E-18	2.88E-18
am240	1.04E-15	1.11E-15	1.18E-15	1.25E-15	1.32E-15	1.32E-15
am241	8.13E-03	8.65E-03	9.17E-03	9.70E-03	1.02E-02	1.02E-02
am242m	3.87E-06	4.12E-06	4.37E-06	4.63E-06	4.89E-06	4.89E-06
am242	3.27E-10	3.48E-10	3.68E-10	3.90E-10	4.11E-10	4.11E-10
am243	4.40E-07	4.95E-07	5.55E-07	6.19E-07	6.87E-07	6.87E-07
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	3.34E-15	3.76E-15	4.21E-15	4.69E-15	5.21E-15	5.21E-15
am245	8.86E-37	1.19E-36	1.57E-36	2.07E-36	2.69E-36	2.69E-36
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	1.95E-20	2.08E-20	2.20E-20	2.33E-20	2.45E-20	2.45E-20
cm242	6.60E-08	7.02E-08	7.44E-08	7.87E-08	8.30E-08	8.30E-08
cm243	5.08E-17	5.42E-17	5.76E-17	6.11E-17	6.45E-17	6.45E-17
cm244	5.25E-11	5.91E-11	6.61E-11	7.37E-11	8.19E-11	8.19E-11

1  
0  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 4.000E-03mw, burnup=1.1688E+04mwd, flux= 2.65E+08n/cm\*\*2-sec

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nuclide concentrations, gram atoms  
basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d
cm245	7.57E-14	8.81E-14	1.02E-13	1.17E-13	1.34E-13	1.34E-13
cm246	4.85E-16	5.82E-16	6.94E-16	8.21E-16	9.67E-16	9.67E-16
cm247	5.80E-20	7.24E-20	8.96E-20	1.10E-19	1.34E-19	1.34E-19
cm248	6.82E-23	8.84E-23	1.13E-22	1.44E-22	1.82E-22	1.82E-22
cm249	2.14E-33	2.77E-33	3.56E-33	4.52E-33	5.70E-33	5.70E-33
cm250	7.00E-38	9.39E-38	1.25E-37	1.64E-37	2.13E-37	2.13E-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
flux		2.65E+08	2.65E+08	2.65E+08	2.65E+08	2.64E-07

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

.other identification and sizes of library.  
 data set name: ft33f001  
 8/28/1996 date library was produced  
 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  
 \*\*\*\*\*  
 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= .00mw, burnup= 13149.mwd, flux= 2.64E+08n/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 \*\*\*\*\* d  
 productions 1.175230E+06 1.175964E+06 1.176671E+06 1.177350E+06 1.178002E+06 1.178002E+06  
 absorptions 9.690727E+05 9.697574E+05 9.704266E+05 9.710801E+05 9.717191E+05 9.717191E+05  
 k infinity 1.212737E+00 1.212638E+00 1.212529E+00 1.212412E+00 1.212286E+00 1.212286E+00  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d  
 actinide absorptions 9.555376E+05 9.560779E+05 9.566034E+05 9.571145E+05 9.576114E+05 9.576114E+05  
 non-actinide abs. fracs. 1.396710E-02 1.410609E-02 1.424450E-02 1.438147E-02 1.451826E-02 1.451826E-02  
 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products  
 power= .00mw, burnup= 13149.mwd, flux= 2.64E+08n/cm\*\*2-sec  
 fraction of total absorption rate  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

	5.34E-03	5.34E-03	5.34E-03	5.34E-03	5.34E-03	5.34E-03	5.34E-03
sm149	5.34E-03	5.34E-03	5.34E-03	5.34E-03	5.34E-03	5.34E-03	5.34E-03
eu151	1.23E-03	1.24E-03	1.28E-03	1.31E-03	1.33E-03	1.33E-03	1.33E-03
nd143	1.10E-03	1.13E-03	1.16E-03	1.19E-03	1.22E-03	1.22E-03	1.22E-03
rh103	5.53E-04	5.70E-04	5.88E-04	6.05E-04	6.22E-04	6.22E-04	6.22E-04
xe131	3.63E-04	3.75E-04	3.86E-04	3.97E-04	4.08E-04	4.08E-04	4.08E-04
cs133	2.81E-04	2.89E-04	2.98E-04	3.06E-04	3.15E-04	3.15E-04	3.15E-04
sm147	2.06E-04	2.13E-04	2.19E-04	2.25E-04	2.31E-04	2.31E-04	2.31E-04
tc 99	2.04E-04	2.10E-04	2.16E-04	2.22E-04	2.29E-04	2.29E-04	2.29E-04
gd155	2.15E-04	2.17E-04	2.19E-04	2.20E-04	2.22E-04	2.22E-04	2.22E-04
nd145	1.58E-04	1.62E-04	1.67E-04	1.72E-04	1.76E-04	1.76E-04	1.76E-04
sm152	1.13E-04	1.17E-04	1.21E-04	1.25E-04	1.29E-04	1.29E-04	1.29E-04
mo 95	1.10E-04	1.13E-04	1.16E-04	1.20E-04	1.23E-04	1.23E-04	1.23E-04
cd113	1.01E-04	1.02E-04	1.02E-04	1.03E-04	1.03E-04	1.03E-04	1.03E-04
sm150	7.88E-05	8.14E-05	8.40E-05	8.67E-05	8.93E-05	8.93E-05	8.93E-05
kr 83	6.65E-05	6.84E-05	7.04E-05	7.23E-05	7.43E-05	7.43E-05	7.43E-05
cs135	6.36E-05	6.56E-05	6.75E-05	6.95E-05	7.14E-05	7.14E-05	7.14E-05

gd157	6.29E-05	6.36E-05	6.43E-05	6.50E-05	6.57E-05	6.57E-05
ru101	4.99E-05	5.14E-05	5.29E-05	5.44E-05	5.60E-05	5.60E-05
eu153	4.69E-05	4.85E-05	5.00E-05	5.16E-05	5.32E-05	5.32E-05
pr141	4.67E-05	4.81E-05	4.95E-05	5.09E-05	5.23E-05	5.23E-05
la139	3.81E-05	3.92E-05	4.04E-05	4.16E-05	4.27E-05	4.27E-05
sm151	4.21E-05	4.22E-05	4.23E-05	4.24E-05	4.25E-05	4.25E-05
ag109	1.89E-05	1.98E-05	2.07E-05	2.17E-05	2.26E-05	2.26E-05
pd105	1.95E-05	2.02E-05	2.09E-05	2.16E-05	2.23E-05	2.23E-05
ba137	1.82E-05	1.88E-05	1.93E-05	1.99E-05	2.05E-05	2.05E-05
zr 93	1.54E-05	1.59E-05	1.63E-05	1.68E-05	1.73E-05	1.73E-05
i129	1.24E-05	1.28E-05	1.32E-05	1.36E-05	1.40E-05	1.40E-05
nd144	1.15E-05	1.19E-05	1.23E-05	1.26E-05	1.30E-05	1.30E-05
mo 97	8.68E-06	8.94E-06	9.20E-06	9.47E-06	9.73E-06	9.73E-06
gd152	6.07E-06	6.41E-06	6.76E-06	7.11E-06	7.48E-06	7.48E-06
pd108	4.60E-06	4.80E-06	5.02E-06	5.23E-06	5.45E-06	5.45E-06
zr 91	3.99E-06	4.10E-06	4.22E-06	4.34E-06	4.46E-06	4.46E-06
y 89	3.80E-06	3.92E-06	4.03E-06	4.14E-06	4.25E-06	4.25E-06
ru102	3.61E-06	3.72E-06	3.83E-06	3.94E-06	4.06E-06	4.06E-06
ce142	3.16E-06	3.25E-06	3.35E-06	3.44E-06	3.54E-06	3.54E-06
nd148	3.07E-06	3.16E-06	3.26E-06	3.35E-06	3.44E-06	3.44E-06
nd146	2.56E-06	2.64E-06	2.72E-06	2.79E-06	2.87E-06	2.87E-06
pd107	2.29E-06	2.38E-06	2.48E-06	2.58E-06	2.69E-06	2.69E-06
in115	2.30E-06	2.38E-06	2.45E-06	2.53E-06	2.60E-06	2.60E-06
ba138	2.18E-06	2.25E-06	2.31E-06	2.38E-06	2.44E-06	2.44E-06
ce140	2.04E-06	2.10E-06	2.16E-06	2.23E-06	2.29E-06	2.29E-06
xe135	2.24E-06	2.24E-06	2.24E-06	2.24E-06	2.23E-06	2.23E-06
xe132	1.90E-06	1.96E-06	2.01E-06	2.07E-06	2.13E-06	2.13E-06
mo 98	1.29E-06	1.33E-06	1.37E-06	1.41E-06	1.45E-06	1.45E-06
mo100	1.25E-06	1.29E-06	1.32E-06	1.36E-06	1.40E-06	1.40E-06
xe134	1.21E-06	1.25E-06	1.28E-06	1.32E-06	1.36E-06	1.36E-06
zr 92	9.63E-07	9.91E-07	1.02E-06	1.05E-06	1.08E-06	1.08E-06
i127	9.16E-07	9.47E-07	9.79E-07	1.01E-06	1.04E-06	1.04E-06
ru104	8.39E-07	8.66E-07	8.94E-07	9.22E-07	9.50E-07	9.50E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8X uo2  
 0 fraction of total absorption rate  
 0 power= .00mw, burnup= 13149.mwd, flux= 2.64E+08n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

fission products

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zr 96	7.84E-07	8.08E-07	8.32E-07	8.55E-07	8.79E-07	8.79E-07
nd150	6.98E-07	7.19E-07	7.41E-07	7.63E-07	7.84E-07	7.84E-07
xe136	6.58E-07	6.78E-07	6.98E-07	7.18E-07	7.38E-07	7.38E-07
cd111	5.13E-07	5.34E-07	5.55E-07	5.77E-07	5.98E-07	5.98E-07
br 81	4.93E-07	5.08E-07	5.23E-07	5.38E-07	5.53E-07	5.53E-07
ru 99	4.23E-07	4.50E-07	4.77E-07	5.05E-07	5.33E-07	5.33E-07
rb 85	4.71E-07	4.85E-07	4.99E-07	5.13E-07	5.27E-07	5.27E-07
zr 94	4.16E-07	4.29E-07	4.41E-07	4.54E-07	4.66E-07	4.66E-07
zr 90	3.74E-07	3.85E-07	3.96E-07	4.07E-07	4.18E-07	4.18E-07
sm154	3.24E-07	3.35E-07	3.46E-07	3.57E-07	3.68E-07	3.68E-07
eu152	3.16E-07	3.22E-07	3.29E-07	3.35E-07	3.41E-07	3.41E-07
te130	3.02E-07	3.11E-07	3.21E-07	3.30E-07	3.39E-07	3.39E-07
gd154	2.41E-07	2.57E-07	2.73E-07	2.89E-07	3.06E-07	3.06E-07
rb 87	2.72E-07	2.80E-07	2.88E-07	2.96E-07	3.04E-07	3.04E-07
pm147	2.61E-07	2.60E-07	2.60E-07	2.60E-07	2.60E-07	2.60E-07
pd106	1.98E-07	2.06E-07	2.14E-07	2.21E-07	2.29E-07	2.29E-07
se 77	1.95E-07	2.01E-07	2.07E-07	2.13E-07	2.19E-07	2.19E-07
eu155	2.03E-07	2.04E-07	2.05E-07	2.06E-07	2.07E-07	2.07E-07
gd156	1.74E-07	1.82E-07	1.89E-07	1.96E-07	2.03E-07	2.03E-07
kr 84	1.30E-07	1.34E-07	1.38E-07	1.42E-07	1.46E-07	1.46E-07
dy161	1.13E-07	1.18E-07	1.24E-07	1.29E-07	1.35E-07	1.35E-07
sb121	1.06E-07	1.09E-07	1.12E-07	1.16E-07	1.19E-07	1.19E-07

se 79	1.00E-07	1.03E-07	1.06E-07	1.09E-07	1.13E-07	1.13E-07
sb123	8.52E-08	8.80E-08	9.08E-08	9.35E-08	9.63E-08	9.63E-08
ru100	7.22E-08	7.67E-08	8.14E-08	8.61E-08	9.10E-08	9.10E-08
kr 86	7.10E-08	7.31E-08	7.52E-08	7.73E-08	7.94E-08	7.94E-08
te128	6.91E-08	7.13E-08	7.35E-08	7.57E-08	7.79E-08	7.79E-08
nd142	5.05E-08	5.36E-08	5.68E-08	6.02E-08	6.36E-08	6.36E-08
ba134	4.93E-08	5.24E-08	5.56E-08	5.88E-08	6.22E-08	6.22E-08
tb159	4.92E-08	5.13E-08	5.34E-08	5.55E-08	5.77E-08	5.77E-08
sm148	4.50E-08	4.78E-08	5.07E-08	5.37E-08	5.67E-08	5.67E-08
te125	4.68E-08	4.83E-08	4.99E-08	5.15E-08	5.31E-08	5.31E-08
se 80	4.68E-08	4.83E-08	4.97E-08	5.11E-08	5.25E-08	5.25E-08
ba135	4.08E-08	4.34E-08	4.61E-08	4.88E-08	5.16E-08	5.16E-08
gd158	3.84E-08	3.99E-08	4.15E-08	4.31E-08	4.47E-08	4.47E-08
pd104	3.50E-08	3.72E-08	3.95E-08	4.19E-08	4.43E-08	4.43E-08
cd112	3.54E-08	3.67E-08	3.80E-08	3.93E-08	4.07E-08	4.07E-08
dy164	2.61E-08	2.74E-08	2.88E-08	3.01E-08	3.15E-08	3.15E-08
dy162	2.42E-08	2.54E-08	2.67E-08	2.80E-08	2.94E-08	2.94E-08
sn117	2.52E-08	2.61E-08	2.69E-08	2.78E-08	2.87E-08	2.87E-08
li 6	2.54E-08	2.61E-08	2.68E-08	2.75E-08	2.82E-08	2.82E-08
eu154	2.34E-08	2.42E-08	2.50E-08	2.57E-08	2.65E-08	2.65E-08
cd114	2.09E-08	2.17E-08	2.24E-08	2.32E-08	2.40E-08	2.40E-08
sn119	1.92E-08	1.98E-08	2.04E-08	2.11E-08	2.17E-08	2.17E-08
pd110	1.74E-08	1.82E-08	1.89E-08	1.97E-08	2.05E-08	2.05E-08
sn115	1.75E-08	1.81E-08	1.87E-08	1.93E-08	1.98E-08	1.98E-08
sr 90	1.54E-08	1.54E-08	1.54E-08	1.53E-08	1.53E-08	1.53E-08
sr 88	1.31E-08	1.34E-08	1.38E-08	1.42E-08	1.46E-08	1.46E-08
mo 96	1.16E-08	1.23E-08	1.31E-08	1.38E-08	1.46E-08	1.46E-08

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 0 fraction of total absorption rate  
 0 power= .00mw, burnup= 13149.mwd, flux= 2.64E+08n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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cd110	1.07E-08	1.16E-08	1.25E-08	1.34E-08	1.44E-08	1.44E-08
rh105	1.09E-08	1.09E-08	1.10E-08	1.10E-08	1.11E-08	1.11E-08
se 82	8.96E-09	9.23E-09	9.50E-09	9.76E-09	1.00E-08	1.00E-08
sn126	8.72E-09	9.02E-09	9.33E-09	9.63E-09	9.94E-09	9.94E-09
nb 93	6.48E-09	6.88E-09	7.30E-09	7.73E-09	8.17E-09	8.17E-09
se 78	7.06E-09	7.28E-09	7.50E-09	7.72E-09	7.94E-09	7.94E-09
ba136	6.44E-09	6.76E-09	7.10E-09	7.43E-09	7.78E-09	7.78E-09
xe130	6.07E-09	6.42E-09	6.79E-09	7.16E-09	7.55E-09	7.55E-09
dy163	6.13E-09	6.45E-09	6.78E-09	7.12E-09	7.47E-09	7.47E-09
sn124	6.26E-09	6.46E-09	6.67E-09	6.88E-09	7.09E-09	7.09E-09
kr 82	5.36E-09	5.64E-09	5.92E-09	6.21E-09	6.51E-09	6.51E-09
as 75	4.16E-09	4.29E-09	4.41E-09	4.54E-09	4.67E-09	4.67E-09
br 79	3.30E-09	3.51E-09	3.72E-09	3.94E-09	4.17E-09	4.17E-09
in113	3.52E-09	3.64E-09	3.76E-09	3.88E-09	4.00E-09	4.00E-09
ag107	2.79E-09	3.00E-09	3.21E-09	3.44E-09	3.67E-09	3.67E-09
cs137	3.65E-09	3.65E-09	3.65E-09	3.65E-09	3.64E-09	3.64E-09
sn118	2.54E-09	2.62E-09	2.71E-09	2.79E-09	2.88E-09	2.88E-09
pr143	2.50E-09	2.50E-09	2.49E-09	2.49E-09	2.49E-09	2.49E-09
xe129	1.94E-09	2.06E-09	2.19E-09	2.32E-09	2.45E-09	2.45E-09
sn122	2.12E-09	2.19E-09	2.26E-09	2.33E-09	2.40E-09	2.40E-09
cd116	2.12E-09	2.19E-09	2.26E-09	2.33E-09	2.40E-09	2.40E-09
cs134	2.05E-09	2.11E-09	2.17E-09	2.23E-09	2.29E-09	2.29E-09
xe133	1.93E-09	1.93E-09	1.93E-09	1.93E-09	1.92E-09	1.92E-09
te126	1.44E-09	1.52E-09	1.61E-09	1.70E-09	1.80E-09	1.80E-09
sn120	1.57E-09	1.62E-09	1.68E-09	1.73E-09	1.78E-09	1.78E-09
ce141	1.51E-09	1.51E-09	1.51E-09	1.51E-09	1.50E-09	1.50E-09
ge 73	1.18E-09	1.21E-09	1.25E-09	1.29E-09	1.33E-09	1.33E-09
pm149	9.43E-10	9.42E-10	9.42E-10	9.41E-10	9.41E-10	9.41E-10

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nd147      8.95E-10  8.94E-10  8.93E-10  8.92E-10  8.91E-10  8.91E-10
gd160      5.43E-10  5.67E-10  5.92E-10  6.16E-10  6.42E-10  6.42E-10
ho165      5.13E-10  5.43E-10  5.74E-10  6.05E-10  6.37E-10  6.37E-10
ce144      5.61E-10  5.60E-10  5.59E-10  5.58E-10  5.57E-10  5.57E-10
kr 85      5.23E-10  5.22E-10  5.21E-10  5.20E-10  5.19E-10  5.19E-10
ge 76      4.05E-10  4.17E-10  4.29E-10  4.41E-10  4.53E-10  4.53E-10
dy160      3.31E-10  3.54E-10  3.79E-10  4.04E-10  4.30E-10  4.30E-10
ru103      3.80E-10  3.81E-10  3.81E-10  3.82E-10  3.82E-10  3.82E-10
xe128      1.96E-10  2.08E-10  2.21E-10  2.35E-10  2.49E-10  2.49E-10
zr 95      1.57E-10  1.57E-10  1.56E-10  1.56E-10  1.56E-10  1.56E-10
nb 95      1.44E-10  1.44E-10  1.43E-10  1.43E-10  1.43E-10  1.43E-10
y 91      1.30E-10  1.30E-10  1.29E-10  1.29E-10  1.29E-10  1.29E-10
sr 86      1.00E-10  1.06E-10  1.12E-10  1.18E-10  1.24E-10  1.24E-10
pm151      1.12E-10  1.13E-10  1.13E-10  1.13E-10  1.13E-10  1.13E-10
te124      9.46E-11  9.89E-11  1.03E-10  1.08E-10  1.13E-10  1.13E-10
sn116      7.59E-11  8.07E-11  8.58E-11  9.09E-11  9.62E-11  9.62E-11
sr 87      5.16E-11  5.33E-11  5.50E-11  5.67E-11  5.84E-11  5.84E-11
eu156      5.28E-11  5.32E-11  5.37E-11  5.41E-11  5.45E-11  5.45E-11
sm153      4.53E-11  4.56E-11  4.58E-11  4.60E-11  4.63E-11  4.63E-11
ba140      4.49E-11  4.48E-11  4.48E-11  4.47E-11  4.47E-11  4.47E-11
ru106      4.24E-11  4.28E-11  4.32E-11  4.36E-11  4.40E-11  4.40E-11
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
          fraction of total absorption rate
power= .00mw, burnup= 13149.mwd, flux= 2.64E+08n/cm**2-sec
initial ***** d ***** d ***** d ***** d ***** d

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nb 94      3.55E-11  3.70E-11  3.86E-11  4.02E-11  4.18E-11  4.18E-11
te122      3.14E-11  3.34E-11  3.55E-11  3.76E-11  3.98E-11  3.98E-11
se 76      3.03E-11  3.19E-11  3.35E-11  3.52E-11  3.69E-11  3.69E-11
er166      2.77E-11  2.92E-11  3.08E-11  3.24E-11  3.41E-11  3.41E-11
sr 89      2.76E-11  2.76E-11  2.75E-11  2.74E-11  2.74E-11  2.74E-11
ge 74      2.34E-11  2.42E-11  2.49E-11  2.56E-11  2.64E-11  2.64E-11
kr 87      2.07E-11  2.07E-11  2.06E-11  2.06E-11  2.05E-11  2.05E-11
ge 72      1.71E-11  1.77E-11  1.83E-11  1.89E-11  1.95E-11  1.95E-11
sb125      1.78E-11  1.79E-11  1.79E-11  1.80E-11  1.81E-11  1.81E-11
ce143      1.64E-11  1.64E-11  1.63E-11  1.63E-11  1.63E-11  1.63E-11
la140      1.46E-11  1.46E-11  1.46E-11  1.46E-11  1.46E-11  1.46E-11
y 90      1.47E-11  1.46E-11  1.46E-11  1.46E-11  1.45E-11  1.45E-11
mo 99      1.26E-11  1.26E-11  1.26E-11  1.26E-11  1.26E-11  1.26E-11
pm148m     9.65E-12  9.67E-12  9.67E-12  9.68E-12  9.68E-12  9.68E-12
te127m     8.93E-12  8.97E-12  9.01E-12  9.04E-12  9.08E-12  9.08E-12
i131      6.69E-12  6.69E-12  6.69E-12  6.68E-12  6.68E-12  6.68E-12
kr 80      3.17E-12  3.40E-12  3.65E-12  3.91E-12  4.19E-12  4.19E-12
er167      1.67E-12  1.81E-12  1.95E-12  2.10E-12  2.27E-12  2.27E-12
te129m     1.88E-12  1.88E-12  1.88E-12  1.88E-12  1.89E-12  1.89E-12
te123      8.96E-13  9.74E-13  1.06E-12  1.14E-12  1.24E-12  1.24E-12
ag111      6.54E-13  6.62E-13  6.69E-13  6.77E-13  6.85E-13  6.85E-13
eu157      5.20E-13  5.25E-13  5.30E-13  5.35E-13  5.40E-13  5.40E-13
pm148      3.64E-13  3.64E-13  3.64E-13  3.63E-13  3.63E-13  3.63E-13
cd115m     2.72E-13  2.73E-13  2.74E-13  2.75E-13  2.75E-13  2.75E-13
cs136      2.52E-13  2.58E-13  2.63E-13  2.68E-13  2.74E-13  2.74E-13
cd108      1.32E-13  1.46E-13  1.60E-13  1.76E-13  1.92E-13  1.92E-13
tb160      1.22E-13  1.27E-13  1.32E-13  1.37E-13  1.42E-13  1.42E-13
be 9      5.23E-14  5.39E-14  5.55E-14  5.70E-14  5.86E-14  5.86E-14
pr142      5.19E-14  5.35E-14  5.50E-14  5.66E-14  5.81E-14  5.81E-14
ru105      3.90E-14  3.92E-14  3.94E-14  3.96E-14  3.98E-14  3.98E-14
sn125      3.25E-14  3.25E-14  3.26E-14  3.27E-14  3.28E-14  3.28E-14
sn114      1.90E-14  2.02E-14  2.15E-14  2.28E-14  2.42E-14  2.42E-14
li 7      2.06E-14  2.13E-14  2.19E-14  2.25E-14  2.31E-14  2.31E-14
sb126      1.69E-14  1.73E-14  1.77E-14  1.82E-14  1.86E-14  1.86E-14

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0 flux 2.64E+08 2.64E+08 2.64E+08 2.64E+08 2.64E-07

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.000E-03mw, burnup=1.3149E+04mwd, flux= 2.64E+08n/cm\*\*2-sec

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0 nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d	***** d
he 4	6.22E+00	6.54E+00	6.87E+00	7.21E+00	7.56E+00	7.56E+00	
pb206	4.43E-03	4.78E-03	5.15E-03	5.53E-03	5.93E-03	5.93E-03	
pb207	4.91E-04	5.22E-04	5.55E-04	5.88E-04	6.23E-04	6.23E-04	
pb208	7.69E-05	8.18E-05	8.68E-05	9.20E-05	9.73E-05	9.73E-05	
pb209	6.88E-11	7.25E-11	7.64E-11	8.03E-11	8.43E-11	8.43E-11	
pb210	4.42E-05	4.61E-05	4.79E-05	4.98E-05	5.17E-05	5.17E-05	
pb211	1.23E-11	1.27E-11	1.31E-11	1.35E-11	1.39E-11	1.39E-11	
pb212	3.34E-11	3.45E-11	3.55E-11	3.66E-11	3.76E-11	3.76E-11	
pb214	1.01E-10	1.05E-10	1.10E-10	1.14E-10	1.18E-10	1.18E-10	
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
bi209	3.66E-04	3.99E-04	4.33E-04	4.70E-04	5.09E-04	5.09E-04	
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
bi210	2.72E-08	2.83E-08	2.95E-08	3.07E-08	3.18E-08	3.18E-08	
bi211	7.29E-13	7.52E-13	7.75E-13	7.98E-13	8.22E-13	8.22E-13	
bi212	3.17E-12	3.27E-12	3.37E-12	3.47E-12	3.57E-12	3.57E-12	
bi213	1.61E-11	1.69E-11	1.78E-11	1.88E-11	1.97E-11	1.97E-11	
bi214	7.49E-11	7.81E-11	8.13E-11	8.45E-11	8.78E-11	8.78E-11	
po210	7.51E-07	7.83E-07	8.15E-07	8.47E-07	8.79E-07	8.79E-07	
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	
po211	8.05E-18	8.31E-18	8.57E-18	8.82E-18	9.08E-18	9.08E-18	
po212	1.67E-22	1.72E-22	1.77E-22	1.82E-22	1.88E-22	1.88E-22	
po213	2.41E-20	2.55E-20	2.68E-20	2.82E-20	2.96E-20	2.96E-20	
po214	1.03E-17	1.07E-17	1.12E-17	1.16E-17	1.21E-17	1.21E-17	
po215	1.01E-17	1.04E-17	1.07E-17	1.11E-17	1.14E-17	1.14E-17	
po216	1.27E-16	1.31E-16	1.35E-16	1.39E-16	1.43E-16	1.43E-16	
po218	1.17E-11	1.22E-11	1.27E-11	1.32E-11	1.37E-11	1.37E-11	
rn218	4.90E-28	5.06E-28	5.22E-28	5.37E-28	5.52E-28	5.52E-28	
rn219	2.25E-14	2.32E-14	2.39E-14	2.46E-14	2.53E-14	2.53E-14	
rn220	4.85E-14	5.00E-14	5.16E-14	5.31E-14	5.46E-14	5.46E-14	
rn222	2.07E-08	2.16E-08	2.25E-08	2.34E-08	2.43E-08	2.43E-08	
ra222	5.32E-25	5.50E-25	5.66E-25	5.83E-25	6.00E-25	6.00E-25	
ra223	5.61E-09	5.78E-09	5.96E-09	6.14E-09	6.32E-09	6.32E-09	
ra224	2.76E-10	2.85E-10	2.93E-10	3.02E-10	3.11E-10	3.11E-10	
ra225	7.51E-09	7.92E-09	8.35E-09	8.78E-09	9.21E-09	9.21E-09	
ra226	3.17E-03	3.30E-03	3.44E-03	3.58E-03	3.71E-03	3.71E-03	
ra228	1.73E-11	1.79E-11	1.84E-11	1.90E-11	1.95E-11	1.95E-11	
ac225	5.07E-09	5.35E-09	5.64E-09	5.93E-09	6.22E-09	6.22E-09	
ac227	3.90E-06	4.02E-06	4.15E-06	4.27E-06	4.40E-06	4.40E-06	
ac228	2.11E-15	2.18E-15	2.25E-15	2.32E-15	2.38E-15	2.38E-15	
th226	2.59E-23	2.68E-23	2.76E-23	2.85E-23	2.93E-23	2.93E-23	
th227	9.05E-09	9.34E-09	9.63E-09	9.92E-09	1.02E-08	1.02E-08	
th228	5.27E-08	5.43E-08	5.60E-08	5.77E-08	5.93E-08	5.93E-08	
th229	1.46E-03	1.54E-03	1.62E-03	1.71E-03	1.79E-03	1.79E-03	
th230	2.08E-01	2.15E-01	2.21E-01	2.28E-01	2.34E-01	2.34E-01	
th231	3.74E-09	3.77E-09	3.79E-09	3.81E-09	3.84E-09	3.84E-09	
th232	4.23E-02	4.37E-02	4.50E-02	4.64E-02	4.77E-02	4.77E-02	
th233	3.81E-13	3.94E-13	4.06E-13	4.18E-13	4.30E-13	4.30E-13	
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	
pa231	5.86E-03	6.05E-03	6.24E-03	6.42E-03	6.61E-03	6.61E-03	
pa232	9.84E-11	1.02E-10	1.05E-10	1.08E-10	1.11E-10	1.11E-10	

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.000E-03mw, burnup=1.3149E+04mwd, flux= 2.64E+08n/cm\*\*2-sec

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	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	2.51E-20	2.60E-20	2.68E-20	2.76E-20	2.84E-20	2.84E-20
u231	7.91E-17	8.17E-17	8.40E-17	8.62E-17	8.85E-17	8.85E-17
u232	1.92E-06	1.98E-06	2.04E-06	2.10E-06	2.16E-06	2.16E-06
u233	1.03E-01	1.06E-01	1.09E-01	1.12E-01	1.15E-01	1.15E-01
u234	1.01E+01	1.02E+01	1.02E+01	1.02E+01	1.03E+01	1.03E+01
u235	6.77E+02	6.76E+02	6.74E+02	6.73E+02	6.71E+02	6.71E+02
u236	1.83E+02	1.83E+02	1.84E+02	1.84E+02	1.84E+02	1.84E+02
u237	3.25E-06	3.26E-06	3.26E-06	3.26E-06	3.27E-06	3.27E-06
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07
u240	6.53E-36	8.44E-36	1.08E-35	1.38E-35	1.74E-35	1.74E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	8.77E-12	8.80E-12	8.79E-12	8.79E-12	8.78E-12	8.78E-12
np236m	2.08E-12	2.09E-12	2.09E-12	2.09E-12	2.08E-12	2.08E-12
np236	1.55E-06	1.60E-06	1.64E-06	1.69E-06	1.74E-06	1.74E-06
np237	4.16E+01	4.16E+01	4.15E+01	4.15E+01	4.15E+01	4.15E+01
np238	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06	1.51E-06
np239	4.58E-05	4.58E-05	4.58E-05	4.58E-05	4.58E-05	4.58E-05
np240m	5.57E-38	7.20E-38	9.24E-38	1.18E-37	1.49E-37	1.49E-37
np240	9.14E-15	9.15E-15	9.14E-15	9.14E-15	9.13E-15	9.13E-15
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.13E-09	1.14E-09	1.14E-09	1.14E-09	1.13E-09	1.13E-09
pu237	5.09E-13	5.18E-13	5.24E-13	5.31E-13	5.37E-13	5.37E-13
pu238	2.29E-02	2.29E-02	2.29E-02	2.28E-02	2.28E-02	2.28E-02
pu239	3.19E+01	3.27E+01	3.34E+01	3.42E+01	3.49E+01	3.49E+01
pu240	9.60E-01	1.01E+00	1.05E+00	1.10E+00	1.15E+00	1.15E+00
pu241	3.93E-04	4.12E-04	4.31E-04	4.50E-04	4.69E-04	4.69E-04
pu242	8.53E-05	9.29E-05	1.01E-04	1.09E-04	1.18E-04	1.18E-04
pu243	1.80E-13	1.97E-13	2.14E-13	2.32E-13	2.50E-13	2.50E-13
pu244	3.25E-25	4.20E-25	5.39E-25	6.86E-25	8.67E-25	8.67E-25
pu245	1.30E-35	1.68E-35	2.15E-35	2.74E-35	3.46E-35	3.46E-35
pu246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am239	2.88E-18	3.05E-18	3.20E-18	3.35E-18	3.51E-18	3.51E-18
am240	1.32E-15	1.39E-15	1.46E-15	1.53E-15	1.60E-15	1.60E-15
am241	1.02E-02	1.08E-02	1.13E-02	1.19E-02	1.24E-02	1.24E-02
am242m	4.89E-06	5.16E-06	5.42E-06	5.69E-06	5.97E-06	5.97E-06
am242	4.11E-10	4.33E-10	4.54E-10	4.77E-10	4.99E-10	4.99E-10
am243	6.87E-07	7.61E-07	8.39E-07	9.23E-07	1.01E-06	1.01E-06
am244m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
am244	5.21E-15	5.78E-15	6.37E-15	7.00E-15	7.67E-15	7.67E-15
am245	2.69E-36	3.47E-36	4.44E-36	5.64E-36	7.12E-36	7.12E-36
am246	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	2.45E-20	2.59E-20	2.72E-20	2.85E-20	2.99E-20	2.99E-20
cm242	8.30E-08	8.74E-08	9.18E-08	9.62E-08	1.01E-07	1.01E-07
cm243	6.45E-17	6.81E-17	7.17E-17	7.53E-17	7.89E-17	7.89E-17
cm244	8.19E-11	9.07E-11	1.00E-10	1.10E-10	1.21E-10	1.21E-10

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.000E-03mw, burnup=1.3149E+04mwd, flux= 2.64E+08n/cm\*\*2-sec

actinides

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	nuclide concentrations, gram atoms					
	basis = single reactor assembly					
	charge	***** d	***** d	***** d	***** d	***** d
cm245	1.34E-13	1.53E-13	1.73E-13	1.95E-13	2.20E-13	2.20E-13



cm246	9.67E-16	1.13E-15	1.32E-15	1.53E-15	1.76E-15	1.76E-15
cm247	1.34E-19	1.62E-19	1.95E-19	2.34E-19	2.78E-19	2.78E-19
cm248	1.82E-22	2.27E-22	2.82E-22	3.49E-22	4.27E-22	4.27E-22
cm249	5.70E-33	7.14E-33	8.87E-33	1.09E-32	1.34E-32	1.34E-32
cm250	2.13E-37	2.76E-37	3.53E-37	4.49E-37	5.66E-37	5.66E-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
flux		2.64E+08	2.64E+08	2.64E+08	2.64E+08	2.64E+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 1 of library on unit 15.

```

pass 10
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
*
*****
*
*
*      .other identification and sizes of library.
*      data set name: ft15f001
*      8/28/1996  date library was produced
*      1697     total number of nuclides in library
*      689     number of light-element nuclides
*      129     number of actinide nuclides

```

0  
0  
0  
0

0 879 number of fission product nuclides  
 0 7993 number of nonzero off-diagonal matrix elements  
 1 \*\*\*\*\*  
 1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 page 93  
 power= .00mw, burnup= 14610.mwd, flux= 2.64E+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 \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d  
 productions 1.178193E+06 1.178826E+06 1.179432E+06 1.180014E+06 1.180570E+06  
 absorptions 9.724615E+05 9.730900E+05 9.737038E+05 9.743031E+05 9.748882E+05  
 0 k infinity 1.211557E+00 1.211425E+00 1.211285E+00 1.211136E+00 1.210979E+00  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d  
 actinide  
 absorptions 9.583446E+05 9.588312E+05 9.593039E+05 9.597630E+05 9.602088E+05  
 non-actinide  
 abs. fracs. 1.451671E-02 1.465315E-02 1.478875E-02 1.492357E-02 1.505756E-02  
 1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 94  
 0 fraction of total absorption rate  
 power= .00mw, burnup= 14610.mwd, flux= 2.64E+08n/cm\*\*2-sec  
 0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

sm149	5.33E-03	5.33E-03	5.33E-03	5.33E-03	5.33E-03
eu151	1.33E-03	1.36E-03	1.38E-03	1.40E-03	1.43E-03
nd143	1.22E-03	1.26E-03	1.29E-03	1.32E-03	1.35E-03
rh103	6.22E-04	6.40E-04	6.57E-04	6.75E-04	6.92E-04
xe131	4.08E-04	4.19E-04	4.30E-04	4.41E-04	4.52E-04
cs133	3.15E-04	3.23E-04	3.32E-04	3.40E-04	3.49E-04
sm147	2.31E-04	2.37E-04	2.44E-04	2.50E-04	2.56E-04
tc 99	2.29E-04	2.35E-04	2.41E-04	2.47E-04	2.53E-04
gd155	2.22E-04	2.23E-04	2.25E-04	2.26E-04	2.27E-04
nd145	1.76E-04	1.81E-04	1.86E-04	1.91E-04	1.95E-04
sm152	1.29E-04	1.34E-04	1.38E-04	1.42E-04	1.46E-04
mo 95	1.23E-04	1.26E-04	1.29E-04	1.33E-04	1.36E-04
cd113	1.03E-04	1.03E-04	1.04E-04	1.04E-04	1.05E-04
sm150	8.93E-05	9.19E-05	9.46E-05	9.72E-05	9.98E-05
kr 83	7.42E-05	7.61E-05	7.81E-05	8.00E-05	8.19E-05
cs135	7.15E-05	7.34E-05	7.53E-05	7.73E-05	7.92E-05
gd157	6.56E-05	6.63E-05	6.69E-05	6.76E-05	6.82E-05
ru101	5.60E-05	5.75E-05	5.91E-05	6.06E-05	6.21E-05
eu153	5.32E-05	5.48E-05	5.64E-05	5.80E-05	5.96E-05
pr141	5.23E-05	5.37E-05	5.51E-05	5.65E-05	5.79E-05
la139	4.27E-05	4.38E-05	4.50E-05	4.61E-05	4.73E-05
sm151	4.24E-05	4.25E-05	4.26E-05	4.27E-05	4.28E-05
ag109	2.27E-05	2.36E-05	2.46E-05	2.56E-05	2.67E-05
pd105	2.23E-05	2.30E-05	2.37E-05	2.44E-05	2.51E-05
ba137	2.04E-05	2.10E-05	2.16E-05	2.21E-05	2.27E-05
zr 93	1.73E-05	1.77E-05	1.82E-05	1.86E-05	1.91E-05
i129	1.39E-05	1.43E-05	1.47E-05	1.51E-05	1.55E-05
nd144	1.29E-05	1.33E-05	1.37E-05	1.40E-05	1.44E-05
mo 97	9.73E-06	9.99E-06	1.03E-05	1.05E-05	1.08E-05
gd152	7.47E-06	7.84E-06	8.21E-06	8.59E-06	8.98E-06
pd108	5.45E-06	5.67E-06	5.89E-06	6.12E-06	6.35E-06
zr 91	4.46E-06	4.57E-06	4.69E-06	4.81E-06	4.92E-06
y 89	4.25E-06	4.36E-06	4.47E-06	4.58E-06	4.69E-06
ru102	4.05E-06	4.16E-06	4.28E-06	4.39E-06	4.50E-06
ce142	3.53E-06	3.63E-06	3.72E-06	3.82E-06	3.91E-06
nd148	3.44E-06	3.53E-06	3.63E-06	3.72E-06	3.81E-06
nd146	2.87E-06	2.95E-06	3.02E-06	3.10E-06	3.18E-06
pd107	2.69E-06	2.79E-06	2.89E-06	3.00E-06	3.11E-06
in115	2.60E-06	2.68E-06	2.75E-06	2.83E-06	2.90E-06

ba138	2.44E-06	2.51E-06	2.57E-06	2.64E-06	2.71E-06
ce140	2.29E-06	2.35E-06	2.41E-06	2.47E-06	2.53E-06
xe132	2.13E-06	2.19E-06	2.25E-06	2.31E-06	2.37E-06
xe135	2.23E-06	2.23E-06	2.23E-06	2.23E-06	2.23E-06
mo 98	1.45E-06	1.49E-06	1.53E-06	1.57E-06	1.61E-06
mo100	1.40E-06	1.44E-06	1.48E-06	1.51E-06	1.55E-06
xe134	1.36E-06	1.39E-06	1.43E-06	1.47E-06	1.50E-06
zr 92	1.08E-06	1.10E-06	1.13E-06	1.16E-06	1.19E-06
i127	1.04E-06	1.07E-06	1.10E-06	1.14E-06	1.17E-06
ru104	9.50E-07	9.78E-07	1.01E-06	1.03E-06	1.06E-06

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 fraction of total absorption rate  
 power= .00mw, burnup= 14610.mwd, flux= 2.64E+08n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

zr 96	8.80E-07	9.04E-07	9.27E-07	9.51E-07	9.74E-07
nd150	7.84E-07	8.06E-07	8.28E-07	8.49E-07	8.71E-07
xe136	7.38E-07	7.58E-07	7.78E-07	7.98E-07	8.18E-07
cd111	5.98E-07	6.20E-07	6.42E-07	6.64E-07	6.87E-07
ru 99	5.33E-07	5.63E-07	5.93E-07	6.24E-07	6.56E-07
br 81	5.53E-07	5.68E-07	5.83E-07	5.97E-07	6.12E-07
rb 85	5.27E-07	5.41E-07	5.55E-07	5.69E-07	5.83E-07
zr 94	4.66E-07	4.79E-07	4.91E-07	5.04E-07	5.16E-07
zr 90	4.18E-07	4.29E-07	4.40E-07	4.51E-07	4.62E-07
sm154	3.67E-07	3.78E-07	3.89E-07	4.00E-07	4.11E-07
gd154	3.06E-07	3.23E-07	3.42E-07	3.60E-07	3.79E-07
te130	3.39E-07	3.48E-07	3.58E-07	3.67E-07	3.76E-07
eu152	3.41E-07	3.47E-07	3.53E-07	3.59E-07	3.65E-07
rb 87	3.04E-07	3.12E-07	3.20E-07	3.28E-07	3.36E-07
pd106	2.29E-07	2.37E-07	2.45E-07	2.53E-07	2.61E-07
pm147	2.60E-07	2.60E-07	2.59E-07	2.59E-07	2.59E-07
se 77	2.19E-07	2.25E-07	2.31E-07	2.36E-07	2.42E-07
gd156	2.03E-07	2.11E-07	2.18E-07	2.26E-07	2.33E-07
eu155	2.07E-07	2.08E-07	2.09E-07	2.10E-07	2.11E-07
kr 84	1.46E-07	1.50E-07	1.54E-07	1.58E-07	1.62E-07
dy161	1.35E-07	1.40E-07	1.46E-07	1.52E-07	1.58E-07
sb121	1.19E-07	1.23E-07	1.26E-07	1.30E-07	1.33E-07
se 79	1.12E-07	1.15E-07	1.18E-07	1.21E-07	1.24E-07
ru100	9.09E-08	9.59E-08	1.01E-07	1.06E-07	1.12E-07
sb123	9.64E-08	9.91E-08	1.02E-07	1.05E-07	1.08E-07
kr 86	7.93E-08	8.14E-08	8.35E-08	8.56E-08	8.76E-08
te128	7.79E-08	8.01E-08	8.23E-08	8.45E-08	8.67E-08
nd142	6.35E-08	6.70E-08	7.06E-08	7.43E-08	7.81E-08
ba134	6.22E-08	6.56E-08	6.91E-08	7.28E-08	7.65E-08
sm148	5.67E-08	5.99E-08	6.31E-08	6.64E-08	6.97E-08
tb159	5.77E-08	5.98E-08	6.21E-08	6.43E-08	6.65E-08
ba135	5.16E-08	5.44E-08	5.74E-08	6.04E-08	6.35E-08
te125	5.31E-08	5.47E-08	5.63E-08	5.79E-08	5.95E-08
se 80	5.25E-08	5.39E-08	5.53E-08	5.67E-08	5.81E-08
pd104	4.43E-08	4.68E-08	4.93E-08	5.20E-08	5.47E-08
gd158	4.47E-08	4.63E-08	4.80E-08	4.96E-08	5.13E-08
cd112	4.07E-08	4.20E-08	4.34E-08	4.47E-08	4.61E-08
dy164	3.15E-08	3.29E-08	3.43E-08	3.57E-08	3.72E-08
dy162	2.94E-08	3.07E-08	3.21E-08	3.36E-08	3.50E-08
sn117	2.87E-08	2.96E-08	3.05E-08	3.14E-08	3.23E-08
li 6	2.82E-08	2.89E-08	2.97E-08	3.04E-08	3.11E-08
eu154	2.65E-08	2.73E-08	2.81E-08	2.89E-08	2.97E-08
cd114	2.40E-08	2.48E-08	2.56E-08	2.64E-08	2.72E-08
sn119	2.17E-08	2.23E-08	2.29E-08	2.36E-08	2.42E-08
pd110	2.05E-08	2.13E-08	2.20E-08	2.28E-08	2.37E-08

1	sn115	1.98E-08	2.04E-08	2.10E-08	2.16E-08	2.22E-08			
0	cd110	1.44E-08	1.54E-08	1.65E-08	1.76E-08	1.87E-08			
	mo 96	1.46E-08	1.54E-08	1.62E-08	1.70E-08	1.78E-08			
	sr 88	1.46E-08	1.50E-08	1.54E-08	1.57E-08	1.61E-08			
1	sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2						fission products	page	96
0		fraction of total absorption rate							
	power=	.00mw	burnup=	14610.mwd	flux=	2.64E+08n/cm**2-sec			
0		initial	***** d	***** d	***** d	***** d			

	sr 90	1.53E-08	1.53E-08	1.52E-08	1.52E-08	1.52E-08			
	rh105	1.11E-08	1.12E-08	1.12E-08	1.13E-08	1.13E-08			
	sn126	9.93E-09	1.02E-08	1.05E-08	1.09E-08	1.12E-08			
	se 82	1.00E-08	1.03E-08	1.06E-08	1.08E-08	1.11E-08			
	nb 93	8.17E-09	8.62E-09	9.08E-09	9.55E-09	1.00E-08			
	ba136	7.78E-09	8.13E-09	8.49E-09	8.86E-09	9.23E-09			
	xe130	7.54E-09	7.93E-09	8.33E-09	8.75E-09	9.17E-09			
	dy163	7.46E-09	7.81E-09	8.17E-09	8.53E-09	8.90E-09			
	se 78	7.94E-09	8.15E-09	8.37E-09	8.59E-09	8.81E-09			
	sn124	7.10E-09	7.31E-09	7.52E-09	7.73E-09	7.94E-09			
	kr 82	6.51E-09	6.81E-09	7.12E-09	7.43E-09	7.75E-09			
	as 75	4.67E-09	4.79E-09	4.92E-09	5.04E-09	5.17E-09			
	br 79	4.17E-09	4.40E-09	4.64E-09	4.88E-09	5.13E-09			
	ag107	3.67E-09	3.91E-09	4.16E-09	4.42E-09	4.68E-09			
	in113	4.00E-09	4.12E-09	4.25E-09	4.37E-09	4.49E-09			
	cs137	3.64E-09	3.64E-09	3.64E-09	3.64E-09	3.64E-09			
	sn118	2.88E-09	2.97E-09	3.05E-09	3.14E-09	3.22E-09			
	xe129	2.45E-09	2.59E-09	2.73E-09	2.88E-09	3.03E-09			
	sn122	2.40E-09	2.47E-09	2.54E-09	2.61E-09	2.68E-09			
	cd116	2.40E-09	2.47E-09	2.54E-09	2.61E-09	2.68E-09			
	cs134	2.29E-09	2.36E-09	2.42E-09	2.48E-09	2.54E-09			
	pr143	2.49E-09	2.48E-09	2.48E-09	2.48E-09	2.47E-09			
	te126	1.80E-09	1.90E-09	1.99E-09	2.10E-09	2.20E-09			
	sn120	1.78E-09	1.83E-09	1.88E-09	1.94E-09	1.99E-09			
	xe133	1.92E-09	1.92E-09	1.92E-09	1.92E-09	1.92E-09			
	ce141	1.50E-09	1.50E-09	1.50E-09	1.50E-09	1.50E-09			
	ge 73	1.33E-09	1.36E-09	1.40E-09	1.44E-09	1.48E-09			
	pm149	9.40E-10	9.40E-10	9.40E-10	9.39E-10	9.39E-10			
	nd147	8.92E-10	8.91E-10	8.90E-10	8.89E-10	8.88E-10			
	ho165	6.37E-10	6.70E-10	7.04E-10	7.39E-10	7.75E-10			
	gd160	6.42E-10	6.67E-10	6.93E-10	7.19E-10	7.46E-10			
	ce144	5.57E-10	5.56E-10	5.56E-10	5.55E-10	5.54E-10			
	dy160	4.30E-10	4.57E-10	4.85E-10	5.14E-10	5.44E-10			
	kr 85	5.18E-10	5.17E-10	5.16E-10	5.15E-10	5.14E-10			
	ge 76	4.53E-10	4.65E-10	4.77E-10	4.89E-10	5.01E-10			
	ru103	3.82E-10	3.83E-10	3.83E-10	3.84E-10	3.84E-10			
	xe128	2.48E-10	2.63E-10	2.77E-10	2.92E-10	3.08E-10			
	zr 95	1.56E-10	1.56E-10	1.56E-10	1.55E-10	1.55E-10			
	sr 86	1.24E-10	1.30E-10	1.37E-10	1.44E-10	1.50E-10			
	nb 95	1.43E-10	1.43E-10	1.43E-10	1.43E-10	1.42E-10			
	te124	1.12E-10	1.17E-10	1.22E-10	1.27E-10	1.32E-10			
	y 91	1.29E-10	1.28E-10	1.28E-10	1.28E-10	1.28E-10			
	sn116	9.63E-11	1.02E-10	1.07E-10	1.13E-10	1.19E-10			
	pm151	1.13E-10	1.13E-10	1.13E-10	1.13E-10	1.13E-10			
	sr 87	5.84E-11	6.01E-11	6.19E-11	6.36E-11	6.54E-11			
	eu156	5.45E-11	5.49E-11	5.53E-11	5.57E-11	5.61E-11			
	te122	3.99E-11	4.21E-11	4.45E-11	4.69E-11	4.93E-11			
	nb 94	4.18E-11	4.35E-11	4.52E-11	4.70E-11	4.88E-11			
	sm153	4.63E-11	4.65E-11	4.67E-11	4.70E-11	4.72E-11			
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							

0 power= .00mw, burnup= 14610.mwd, flux= 2.64E+08n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

ru106	4.40E-11	4.44E-11	4.48E-11	4.51E-11	4.55E-11
ba140	4.47E-11	4.46E-11	4.46E-11	4.46E-11	4.45E-11
se 76	3.69E-11	3.87E-11	4.05E-11	4.23E-11	4.42E-11
er166	3.41E-11	3.58E-11	3.75E-11	3.93E-11	4.11E-11
ge 74	2.64E-11	2.71E-11	2.78E-11	2.86E-11	2.93E-11
sr 89	2.74E-11	2.73E-11	2.72E-11	2.72E-11	2.71E-11
ge 72	1.94E-11	2.00E-11	2.06E-11	2.12E-11	2.18E-11
kr 87	2.05E-11	2.05E-11	2.04E-11	2.04E-11	2.03E-11
sb125	1.81E-11	1.81E-11	1.82E-11	1.83E-11	1.83E-11
ce143	1.63E-11	1.63E-11	1.62E-11	1.62E-11	1.62E-11
la140	1.46E-11	1.46E-11	1.45E-11	1.45E-11	1.45E-11
y 90	1.45E-11	1.45E-11	1.45E-11	1.44E-11	1.44E-11
mo 99	1.26E-11	1.26E-11	1.26E-11	1.26E-11	1.26E-11
pm148m	9.68E-12	9.69E-12	9.70E-12	9.70E-12	9.71E-12
te127m	9.07E-12	9.11E-12	9.14E-12	9.18E-12	9.21E-12
i131	6.68E-12	6.68E-12	6.68E-12	6.68E-12	6.68E-12
kr 80	4.19E-12	4.47E-12	4.77E-12	5.09E-12	5.41E-12
er167	2.26E-12	2.43E-12	2.61E-12	2.79E-12	2.98E-12
te129m	1.89E-12	1.89E-12	1.89E-12	1.89E-12	1.90E-12
te123	1.24E-12	1.33E-12	1.44E-12	1.54E-12	1.66E-12
eg111	6.85E-13	6.92E-13	7.00E-13	7.07E-13	7.14E-13
eu157	5.40E-13	5.45E-13	5.50E-13	5.55E-13	5.59E-13
pm148	3.64E-13	3.64E-13	3.64E-13	3.63E-13	3.63E-13
cs136	2.74E-13	2.80E-13	2.85E-13	2.90E-13	2.96E-13
cd115m	2.75E-13	2.76E-13	2.77E-13	2.78E-13	2.79E-13
cd108	1.92E-13	2.10E-13	2.28E-13	2.48E-13	2.69E-13
tb160	1.42E-13	1.47E-13	1.53E-13	1.58E-13	1.63E-13
be 9	5.87E-14	6.03E-14	6.19E-14	6.35E-14	6.51E-14
pr142	5.81E-14	5.96E-14	6.12E-14	6.27E-14	6.43E-14
ru105	3.99E-14	4.01E-14	4.03E-14	4.05E-14	4.07E-14
sn125	3.28E-14	3.28E-14	3.29E-14	3.30E-14	3.31E-14
sn114	2.42E-14	2.56E-14	2.70E-14	2.85E-14	3.00E-14
li 7	2.31E-14	2.37E-14	2.44E-14	2.50E-14	2.56E-14
sb126	1.86E-14	1.91E-14	1.95E-14	1.99E-14	2.04E-14
i130	1.14E-14	1.17E-14	1.20E-14	1.22E-14	1.25E-14
rb 88	1.15E-14	1.15E-14	1.15E-14	1.14E-14	1.14E-14
sn123	1.06E-14	1.06E-14	1.06E-14	1.06E-14	1.06E-14
i135	9.66E-15	9.65E-15	9.64E-15	9.64E-15	9.63E-15
te132	9.30E-15	9.30E-15	9.29E-15	9.29E-15	9.29E-15
sb124	6.56E-15	6.68E-15	6.80E-15	6.92E-15	7.04E-15
te134	5.38E-15	5.37E-15	5.36E-15	5.35E-15	5.34E-15
rb 86	3.58E-15	3.67E-15	3.75E-15	3.84E-15	3.92E-15
dy165	2.66E-15	2.72E-15	2.79E-15	2.86E-15	2.93E-15
in117m	2.70E-15	2.71E-15	2.72E-15	2.74E-15	2.75E-15
in117	8.11E-16	8.15E-16	8.19E-16	8.23E-16	8.27E-16
cs134m	4.29E-16	4.41E-16	4.52E-16	4.64E-16	4.75E-16
cd118	1.38E-16	1.38E-16	1.39E-16	1.39E-16	1.39E-16
ge 75	8.25E-17	8.25E-17	8.24E-17	8.24E-17	8.23E-17
eg110	2.89E-17	3.02E-17	3.15E-17	3.28E-17	3.41E-17

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

fission products

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0 power= .00mw, burnup= 14610.mwd, flux= 2.64E+08n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

in119m	3.36E-17	3.37E-17	3.37E-17	3.38E-17	3.39E-17
cd109	1.86E-17	1.95E-17	2.04E-17	2.13E-17	2.23E-17
in119	2.78E-18	2.78E-18	2.79E-18	2.80E-18	2.81E-18

in120 4.62E-22 4.63E-22 4.64E-22 4.65E-22 4.66E-22  
 in120m 7.96E-23 8.04E-23 8.11E-23 8.18E-23 8.25E-23

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

light elements

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	charge	***** d	***** d	***** d	***** d
h 1	7.83E-04	8.05E-04	8.27E-04	8.49E-04	8.71E-04
h 2	2.34E-06	2.41E-06	2.47E-06	2.54E-06	2.60E-06
h 3	5.30E-11	5.36E-11	5.39E-11	5.43E-11	5.46E-11
h 4	2.10E-34	2.12E-34	2.13E-34	2.14E-34	2.16E-34
he 3	1.34E-08	1.37E-08	1.39E-08	1.42E-08	1.45E-08
he 4	1.30E-04	1.34E-04	1.37E-04	1.41E-04	1.45E-04
he 6	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 20	1.56E-05	1.61E-05	1.65E-05	1.69E-05	1.74E-05
ne 21	4.09E-09	4.31E-09	4.53E-09	4.77E-09	5.01E-09
ne 22	1.03E-07	1.06E-07	1.09E-07	1.12E-07	1.15E-07
ne 23	7.26E-15	7.29E-15	7.29E-15	7.29E-15	7.29E-15
na 22	4.30E-11	4.32E-11	4.32E-11	4.32E-11	4.32E-11
na 23	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24	2.76E-08	2.76E-08	2.76E-08	2.76E-08	2.76E-08
na 24m	4.53E-15	4.54E-15	4.54E-15	4.54E-15	4.54E-15
na 25	1.21E-23	1.27E-23	1.34E-23	1.40E-23	1.47E-23
mg 24	1.08E-01	1.11E-01	1.14E-01	1.17E-01	1.20E-01
mg 25	4.16E-07	4.38E-07	4.61E-07	4.84E-07	5.08E-07
mg 26	2.34E-06	2.40E-06	2.47E-06	2.53E-06	2.60E-06
mg 27	2.16E-12	2.17E-12	2.17E-12	2.17E-12	2.17E-12
mg 28	4.29E-24	4.31E-24	4.31E-24	4.30E-24	4.30E-24
al 27	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04
al 28	2.04E-10	2.05E-10	2.05E-10	2.05E-10	2.05E-10
al 29	9.66E-22	1.02E-21	1.07E-21	1.13E-21	1.18E-21
al 30	1.62E-31	1.76E-31	1.90E-31	2.05E-31	2.20E-31
si 28	3.15E-01	3.24E-01	3.32E-01	3.40E-01	3.49E-01
si 29	3.72E-06	3.92E-06	4.13E-06	4.34E-06	4.55E-06
si 30	4.68E-11	5.07E-11	5.47E-11	5.90E-11	6.35E-11
si 31	3.28E-23	3.54E-23	3.83E-23	4.12E-23	4.44E-23
si 32	5.20E-29	5.64E-29	6.10E-29	6.58E-29	7.09E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
flux		2.64E+08	2.64E+08	2.64E+08	2.64E+08

0

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides

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	charge	***** d	***** d	***** d	***** d
he 4	7.56E+00	7.91E+00	8.27E+00	8.63E+00	9.00E+00
pb206	5.93E-03	6.34E-03	6.76E-03	7.20E-03	7.66E-03
pb207	6.23E-04	6.58E-04	6.95E-04	7.32E-04	7.70E-04
pb208	9.73E-05	1.03E-04	1.08E-04	1.14E-04	1.20E-04
pb209	8.43E-11	8.84E-11	9.25E-11	9.67E-11	1.01E-10
pb210	5.17E-05	5.37E-05	5.56E-05	5.75E-05	5.94E-05
pb211	1.39E-11	1.43E-11	1.47E-11	1.51E-11	1.54E-11
pb212	3.76E-11	3.87E-11	3.98E-11	4.08E-11	4.19E-11
pb214	1.18E-10	1.23E-10	1.27E-10	1.31E-10	1.36E-10
bi208	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi209	5.09E+04	5.49E+04	5.91E+04	6.35E+04	6.81E+04
bi210m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
bi210	3.18E-08	3.30E-08	3.42E-08	3.54E-08	3.66E-08
bi211	8.22E-13	8.45E-13	8.69E-13	8.92E-13	9.16E-13

bi212	3.57E-12	3.67E-12	3.77E-12	3.87E-12	3.97E-12
bi213	1.97E-11	2.06E-11	2.16E-11	2.26E-11	2.36E-11
bi214	8.78E-11	9.10E-11	9.43E-11	9.75E-11	1.01E-10
po210	8.79E-07	9.12E-07	9.44E-07	9.77E-07	1.01E-06
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	9.08E-18	9.34E-18	9.60E-18	9.86E-18	1.01E-17
po212	1.88E-22	1.93E-22	1.98E-22	2.03E-22	2.09E-22
po213	2.96E-20	3.10E-20	3.25E-20	3.40E-20	3.54E-20
po214	1.21E-17	1.25E-17	1.30E-17	1.34E-17	1.39E-17
po215	1.14E-17	1.17E-17	1.20E-17	1.24E-17	1.27E-17
po216	1.43E-16	1.47E-16	1.51E-16	1.55E-16	1.59E-16
po218	1.37E-11	1.42E-11	1.47E-11	1.52E-11	1.57E-11
rn218	5.52E-28	5.69E-28	5.85E-28	6.00E-28	6.16E-28
rn219	2.53E-14	2.61E-14	2.68E-14	2.75E-14	2.82E-14
rn220	5.46E-14	5.62E-14	5.77E-14	5.93E-14	6.08E-14
rn222	2.43E-08	2.52E-08	2.61E-08	2.70E-08	2.79E-08
ra222	6.00E-25	6.18E-25	6.35E-25	6.52E-25	6.69E-25
ra223	6.32E-09	6.50E-09	6.68E-09	6.86E-09	7.05E-09
ra224	3.11E-10	3.20E-10	3.28E-10	3.37E-10	3.46E-10
ra225	9.21E-09	9.66E-09	1.01E-08	1.06E-08	1.10E-08
ra226	3.71E-03	3.85E-03	3.99E-03	4.12E-03	4.26E-03
ra228	1.95E-11	2.01E-11	2.06E-11	2.12E-11	2.18E-11
ac225	6.22E-09	6.52E-09	6.83E-09	7.13E-09	7.45E-09
ac227	4.40E-06	4.52E-06	4.65E-06	4.77E-06	4.90E-06
ac228	2.38E-15	2.45E-15	2.52E-15	2.59E-15	2.66E-15
th226	2.93E-23	3.02E-23	3.10E-23	3.18E-23	3.26E-23
th227	1.02E-08	1.05E-08	1.08E-08	1.11E-08	1.14E-08
th228	5.93E-08	6.10E-08	6.27E-08	6.44E-08	6.60E-08
th229	1.79E-03	1.88E-03	1.96E-03	2.05E-03	2.14E-03
th230	2.34E-01	2.41E-01	2.48E-01	2.54E-01	2.61E-01
th231	3.84E-09	3.86E-09	3.89E-09	3.91E-09	3.94E-09
th232	4.77E-02	4.91E-02	5.05E-02	5.18E-02	5.32E-02
th233	4.30E-13	4.42E-13	4.54E-13	4.67E-13	4.79E-13
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	6.61E-03	6.80E-03	6.99E-03	7.18E-03	7.37E-03
pa232	1.11E-10	1.14E-10	1.17E-10	1.20E-10	1.23E-10

1  
0

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8X uo2  
 power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	charge	***** d	***** d	***** d	***** d
pa233	1.44E-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
pa234	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
u230	2.84E-20	2.92E-20	3.00E-20	3.08E-20	3.16E-20
u231	8.85E-17	9.10E-17	9.33E-17	9.56E-17	9.78E-17
u232	2.16E-06	2.22E-06	2.28E-06	2.34E-06	2.40E-06
u233	1.15E-01	1.18E-01	1.21E-01	1.24E-01	1.27E-01
u234	1.03E+01	1.03E+01	1.03E+01	1.04E+01	1.04E+01
u235	6.71E+02	6.70E+02	6.68E+02	6.67E+02	6.65E+02
u236	1.84E+02	1.85E+02	1.85E+02	1.85E+02	1.85E+02
u237	3.27E-06	3.28E-06	3.28E-06	3.29E-06	3.29E-06
u238	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04
u239	3.17E-07	3.17E-07	3.17E-07	3.17E-07	3.17E-07
u240	1.74E-35	2.18E-35	2.72E-35	3.38E-35	4.16E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	8.78E-12	8.82E-12	8.81E-12	8.81E-12	8.80E-12
np236m	2.08E-12	2.09E-12	2.09E-12	2.09E-12	2.09E-12







np236	1.93E-06	1.93E-06	1.93E-06	1.93E-06	1.93E-06	1.93E-06	1.93E-06
np237	4.15E+01	4.15E+01	4.15E+01	4.15E+01	4.15E+01	4.15E+01	4.15E+01
pu238	2.28E-02	2.27E-02	2.25E-02	2.24E-02	2.22E-02	2.21E-02	2.19E-02
pu239	3.78E+01	3.78E+01	3.78E+01	3.78E+01	3.78E+01	3.78E+01	3.78E+01
pu240	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00
pu241	5.47E-04	5.26E-04	5.05E-04	4.85E-04	4.66E-04	4.47E-04	4.30E-04
pu242	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04	1.58E-04
am241	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02
am242m	7.07E-06	7.05E-06	7.02E-06	6.99E-06	6.96E-06	6.93E-06	6.90E-06
am243	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06	1.42E-06
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 108  
 decay, following reactor irradiation identified by: power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec  
 0 element concentrations, gram atoms  
 basis = single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
he	9.00E+00	9.01E+00	9.01E+00	9.01E+00	9.01E+00	9.01E+00	9.01E+00
pb	8.61E-03	8.61E-03	8.61E-03	8.61E-03	8.61E-03	8.62E-03	8.62E-03
bi	6.81E-04	6.82E-04	6.82E-04	6.82E-04	6.82E-04	6.82E-04	6.82E-04
po	1.01E-06	1.00E-06	9.97E-07	9.97E-07	9.97E-07	9.97E-07	9.97E-07
ra	4.26E-03	4.26E-03	4.26E-03	4.26E-03	4.26E-03	4.27E-03	4.27E-03
ac	4.91E-06	4.91E-06	4.91E-06	4.91E-06	4.91E-06	4.91E-06	4.91E-06
th	3.16E-01	3.16E-01	3.16E-01	3.16E-01	3.16E-01	3.17E-01	3.17E-01
pa	7.37E-03	7.37E-03	7.37E-03	7.37E-03	7.37E-03	7.37E-03	7.37E-03
u	3.72E+04	3.72E+04	3.72E+04	3.72E+04	3.72E+04	3.72E+04	3.72E+04
np	4.15E+01	4.15E+01	4.15E+01	4.15E+01	4.15E+01	4.15E+01	4.15E+01
pu	3.92E+01	3.92E+01	3.92E+01	3.92E+01	3.92E+01	3.92E+01	3.92E+01
am	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02
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 109  
 decay, following reactor irradiation identified by: power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec  
 0 nuclide concentrations, grams  
 basis =single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
he 4	3.60E+01	3.60E+01	3.60E+01	3.60E+01	3.60E+01	3.60E+01	3.60E+01
pb206	1.58E+00	1.58E+00	1.58E+00	1.58E+00	1.58E+00	1.58E+00	1.58E+00
pb207	1.59E-01	1.59E-01	1.60E-01	1.60E-01	1.60E-01	1.60E-01	1.60E-01
pb208	2.50E-02	2.50E-02	2.50E-02	2.50E-02	2.50E-02	2.50E-02	2.50E-02
pb210	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02	1.25E-02
bi209	1.42E-01	1.42E-01	1.42E-01	1.43E-01	1.43E-01	1.43E-01	1.43E-01
bi210	7.68E-06	7.68E-06	7.68E-06	7.68E-06	7.68E-06	7.68E-06	7.68E-06
po210	2.12E-04	2.10E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04	2.09E-04
rn222	6.19E-06	6.19E-06	6.19E-06	6.19E-06	6.20E-06	6.20E-06	6.20E-06
ra223	1.57E-06	1.57E-06	1.57E-06	1.57E-06	1.57E-06	1.57E-06	1.57E-06
ra225	2.48E-06	2.48E-06	2.48E-06	2.48E-06	2.48E-06	2.48E-06	2.48E-06
ra226	9.63E-01	9.64E-01	9.64E-01	9.64E-01	9.64E-01	9.64E-01	9.64E-01
ac225	1.68E-06	1.68E-06	1.68E-06	1.68E-06	1.68E-06	1.68E-06	1.68E-06
ac227	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03
th227	2.58E-06	2.59E-06	2.59E-06	2.59E-06	2.59E-06	2.59E-06	2.59E-06
th228	1.51E-05	1.50E-05	1.50E-05	1.49E-05	1.48E-05	1.47E-05	1.46E-05
th229	4.91E-01	4.91E-01	4.91E-01	4.91E-01	4.91E-01	4.91E-01	4.91E-01
th230	6.00E+01	6.00E+01	6.00E+01	6.01E+01	6.01E+01	6.01E+01	6.01E+01
th231	9.09E-07	6.36E-07	6.36E-07	6.36E-07	6.36E-07	6.36E-07	6.36E-07
th232	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01
th234	1.25E-04	1.25E-04	1.25E-04	1.25E-04	1.25E-04	1.25E-04	1.25E-04
pa231	1.70E+00	1.70E+00	1.70E+00	1.70E+00	1.70E+00	1.70E+00	1.70E+00
pa233	3.34E-04	3.34E-04	3.34E-04	3.34E-04	3.34E-04	3.34E-04	3.34E-04
u232	5.58E-04	5.53E-04	5.49E-04	5.44E-04	5.40E-04	5.35E-04	5.31E-04



po212	7.91E-03	7.93E-03	7.90E-03	7.86E-03	7.82E-03	7.77E-03	7.72E-03
po213	9.52E-02	9.53E-02	9.53E-02	9.53E-02	9.53E-02	9.53E-02	9.53E-02
po214	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01
po215	8.05E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02
po216	1.23E-02	1.24E-02	1.23E-02	1.23E-02	1.22E-02	1.21E-02	1.20E-02
po218	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.54E-01
at217	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.74E-02	9.74E-02
rn219	8.05E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02
rn220	1.23E-02	1.24E-02	1.23E-02	1.23E-02	1.22E-02	1.21E-02	1.20E-02
rn222	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.54E-01
fr221	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.74E-02	9.74E-02
fr223	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03
ra223	8.05E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02	8.07E-02
ra224	1.23E-02	1.24E-02	1.23E-02	1.23E-02	1.22E-02	1.21E-02	1.20E-02
ra225	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.74E-02	9.74E-02
ra226	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.53E-01	9.54E-01
ra228	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.35E-06
ac225	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.74E-02	9.74E-02
ac227	8.05E-02	8.05E-02	8.05E-02	8.05E-02	8.05E-02	8.05E-02	8.05E-02
ac228	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.35E-06
th227	7.94E-02	7.96E-02	7.96E-02	7.96E-02	7.96E-02	7.96E-02	7.96E-02
th228	1.23E-02	1.23E-02	1.23E-02	1.22E-02	1.22E-02	1.21E-02	1.20E-02
th229	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.73E-02	9.74E-02	9.74E-02
th230	1.24E+00	1.24E+00	1.24E+00	1.24E+00	1.24E+00	1.24E+00	1.24E+00
th231	4.83E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01
th232	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.35E-06	1.36E-06
th234	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00
pa231	8.04E-02	8.04E-02	8.04E-02	8.04E-02	8.04E-02	8.04E-02	8.04E-02
pa233	6.93E+00	6.93E+00	6.93E+00	6.93E+00	6.93E+00	6.93E+00	6.93E+00
pa234m	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00
pa234	3.78E-03	3.78E-03	3.78E-03	3.78E-03	3.78E-03	3.78E-03	3.78E-03
u232	1.23E-02	1.22E-02	1.21E-02	1.20E-02	1.19E-02	1.18E-02	1.17E-02
u233	2.85E-01	2.85E-01	2.85E-01	2.85E-01	2.85E-01	2.85E-01	2.85E-01
u234	1.51E+01	1.51E+01	1.51E+01	1.51E+01	1.51E+01	1.51E+01	1.51E+01
u235	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01	3.38E-01
u236	2.83E+00	2.83E+00	2.83E+00	2.83E+00	2.83E+00	2.83E+00	2.83E+00

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 actinides page 112  
 decay, following reactor irradiation identified by: power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec

0 nuclide radioactivity, curies  
 basis =single reactor assembly

	Initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
u237	6.37E+01	3.13E-04	3.01E-04	2.89E-04	2.78E-04	2.67E-04	2.56E-04
u238	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00	2.91E+00
np236	5.99E-06	5.99E-06	5.99E-06	5.99E-06	5.99E-06	5.99E-06	5.99E-06
np237	6.93E+00	6.93E+00	6.93E+00	6.93E+00	6.93E+00	6.93E+00	6.93E+00
np238	9.29E+01	8.04E-05	8.01E-05	7.98E-05	7.94E-05	7.91E-05	7.88E-05
np239	2.54E+03	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05
pu236	1.40E-04	1.15E-04	9.44E-05	7.75E-05	6.36E-05	5.22E-05	4.29E-05
pu238	9.30E+01	9.24E+01	9.18E+01	9.12E+01	9.06E+01	9.00E+01	8.94E+01
pu239	5.61E+02	5.61E+02	5.61E+02	5.61E+02	5.61E+02	5.61E+02	5.61E+02
pu240	7.28E+01	7.28E+01	7.28E+01	7.28E+01	7.28E+01	7.28E+01	7.28E+01
pu241	1.36E+01	1.31E+01	1.26E+01	1.21E+01	1.16E+01	1.12E+01	1.07E+01
pu242	1.51E-04	1.51E-04	1.51E-04	1.51E-04	1.51E-04	1.51E-04	1.51E-04
am241	1.21E+01	1.21E+01	1.21E+01	1.21E+01	1.21E+01	1.21E+01	1.21E+01
am242m	1.79E-02	1.79E-02	1.78E-02	1.77E-02	1.77E-02	1.76E-02	1.75E-02
am242	1.15E-01	1.78E-02	1.77E-02	1.76E-02	1.76E-02	1.75E-02	1.74E-02
am243	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05	6.91E-05
cm242	9.53E-02	3.69E-02	2.07E-02	1.63E-02	1.50E-02	1.46E-02	1.45E-02
cm244	3.35E-06	3.25E-06	3.15E-06	3.05E-06	2.95E-06	2.86E-06	2.77E-06











pm147	8.14E-02	6.60E-02	5.30E-02	4.25E-02	3.41E-02	2.74E-02	2.20E-02
sm147	2.14E+02	2.14E+02	2.14E+02	2.14E+02	2.14E+02	2.14E+02	2.14E+02
nd148	1.63E+02	1.63E+02	1.63E+02	1.63E+02	1.63E+02	1.63E+02	1.63E+02
sm148	2.58E+00	2.58E+00	2.58E+00	2.58E+00	2.58E+00	2.58E+00	2.58E+00
sm149	8.02E+00	8.02E+00	8.02E+00	8.02E+00	8.02E+00	8.02E+00	8.02E+00
nd150	6.73E+01	6.73E+01	6.73E+01	6.73E+01	6.73E+01	6.73E+01	6.73E+01
sm150	9.83E+01	9.83E+01	9.83E+01	9.83E+01	9.83E+01	9.83E+01	9.83E+01
sm151	6.13E-01	6.09E-01	6.05E-01	6.01E-01	5.97E-01	5.93E-01	5.89E-01
eu151	2.77E+01	2.77E+01	2.77E+01	2.77E+01	2.77E+01	2.77E+01	2.77E+01
sm152	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01	3.80E+01
eu152	3.64E-02	3.49E-02	3.34E-02	3.20E-02	3.06E-02	2.93E-02	2.81E-02
gd152	7.10E+00	7.10E+00	7.10E+00	7.10E+00	7.10E+00	7.10E+00	7.10E+00
eu153	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01	1.90E+01
sm154	8.99E+00	8.99E+00	8.99E+00	8.99E+00	8.99E+00	8.99E+00	8.99E+00
eu154	1.53E-03	1.43E-03	1.34E-03	1.25E-03	1.17E-03	1.10E-03	1.02E-03
gd154	5.95E-01	5.95E-01	5.95E-01	5.96E-01	5.96E-01	5.96E-01	5.96E-01
eu155	3.36E-03	2.97E-03	2.63E-03	2.32E-03	2.05E-03	1.81E-03	1.60E-03
gd155	8.59E-01	8.59E-01	8.60E-01	8.60E-01	8.60E-01	8.60E-01	8.61E-01
gd156	5.66E+00	5.66E+00	5.66E+00	5.66E+00	5.66E+00	5.66E+00	5.66E+00
gd157	7.02E-02	7.02E-02	7.02E-02	7.02E-02	7.02E-02	7.02E-02	7.02E-02
gd158	1.65E+00	1.65E+00	1.65E+00	1.65E+00	1.65E+00	1.65E+00	1.65E+00
tb159	2.45E-01	2.45E-01	2.45E-01	2.45E-01	2.45E-01	2.45E-01	2.45E-01
gd160	9.96E-02	9.96E-02	9.96E-02	9.96E-02	9.96E-02	9.96E-02	9.96E-02
dy160	6.86E-04	6.86E-04	6.86E-04	6.86E-04	6.86E-04	6.86E-04	6.86E-04
dy161	4.06E-02	4.06E-02	4.06E-02	4.06E-02	4.06E-02	4.06E-02	4.06E-02
dy162	1.93E-02	1.93E-02	1.93E-02	1.93E-02	1.93E-02	1.93E-02	1.93E-02
dy163	7.35E-03	7.35E-03	7.35E-03	7.35E-03	7.35E-03	7.35E-03	7.35E-03
dy164	2.40E-03	2.40E-03	2.40E-03	2.40E-03	2.40E-03	2.40E-03	2.40E-03

1  
 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 119  
 decay, following reactor irradiation identified by: power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec

0  
 nuclide concentrations, grams  
 basis =single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
ho165	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03
ho166m	6.34E-07	6.34E-07	6.34E-07	6.33E-07	6.33E-07	6.33E-07	6.32E-07
er166	1.64E-04	1.64E-04	1.64E-04	1.64E-04	1.64E-04	1.64E-04	1.64E-04
total	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04

1  
 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 120  
 decay, following reactor irradiation identified by: power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec

0  
 nuclide radioactivity, curies  
 basis =single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
h 3	3.81E-01	3.64E-01	3.47E-01	3.31E-01	3.16E-01	3.01E-01	2.88E-01
be 10	1.31E-06	1.31E-06	1.31E-06	1.31E-06	1.31E-06	1.31E-06	1.31E-06
c 14	3.08E-05	3.08E-05	3.08E-05	3.08E-05	3.08E-05	3.08E-05	3.08E-05
se 79	3.09E-02	3.09E-02	3.09E-02	3.09E-02	3.09E-02	3.09E-02	3.09E-02
kr 85	8.31E+00	7.88E+00	7.46E+00	7.07E+00	6.70E+00	6.35E+00	6.02E+00
rb 87	1.18E-05	1.18E-05	1.18E-05	1.18E-05	1.18E-05	1.18E-05	1.18E-05
sr 90	1.82E+02	1.79E+02	1.75E+02	1.71E+02	1.68E+02	1.65E+02	1.61E+02
y 90	1.82E+02	1.79E+02	1.75E+02	1.72E+02	1.68E+02	1.65E+02	1.61E+02
y 91	1.86E+02	5.08E+00	1.38E-01	3.75E-03	1.02E-04	2.77E-06	7.51E-08
zr 93	6.25E-01	6.25E-01	6.25E-01	6.25E-01	6.25E-01	6.25E-01	6.25E-01
nb 93m	6.25E-01	6.25E-01	6.25E-01	6.25E-01	6.25E-01	6.25E-01	6.25E-01
nb 94	2.74E-05	2.74E-05	2.74E-05	2.74E-05	2.74E-05	2.74E-05	2.74E-05
zr 95	2.12E+02	7.84E+00	2.90E-01	1.08E-02	3.98E-04	1.48E-05	5.47E-07
nb 95	2.11E+02	1.67E+01	6.38E-01	2.37E-02	8.77E-04	3.25E-05	1.20E-06
tc 99	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00
rh102	1.61E-05	1.32E-05	1.08E-05	8.87E-06	7.27E-06	5.96E-06	4.88E-06

ru106	2.95E+01	1.67E+01	9.47E+00	5.37E+00	3.04E+00	1.72E+00	9.78E-01
rh106	2.95E+01	1.67E+01	9.47E+00	5.37E+00	3.04E+00	1.72E+00	9.78E-01
pd107	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02	1.31E-02
ag110	1.78E-01	4.17E-05	1.79E-05	7.70E-06	3.31E-06	1.42E-06	6.11E-07
ag110m	7.14E-03	3.07E-03	1.32E-03	5.67E-04	2.43E-04	1.05E-04	4.49E-05
cd113m	1.26E-02	1.21E-02	1.16E-02	1.11E-02	1.07E-02	1.02E-02	9.82E-03
sn119m	1.95E-03	9.49E-04	4.62E-04	2.25E-04	1.10E-04	5.33E-05	2.59E-05
sn121	5.57E-01	3.60E-03	3.56E-03	3.53E-03	3.49E-03	3.45E-03	3.42E-03
sn121m	4.69E-03	4.64E-03	4.59E-03	4.54E-03	4.50E-03	4.45E-03	4.40E-03
sn123	6.29E-02	1.23E-02	2.40E-03	4.68E-04	9.14E-05	1.78E-05	3.49E-06
sb125	1.30E+00	1.06E+00	8.55E-01	6.92E-01	5.60E-01	4.53E-01	3.67E-01
te125m	3.00E-01	2.58E-01	2.09E-01	1.69E-01	1.37E-01	1.11E-01	8.96E-02
sn126	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01
sb126	2.73E-02	1.73E-02	1.73E-02	1.73E-02	1.73E-02	1.73E-02	1.73E-02
sb126m	1.37E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01	1.24E-01
te127	5.45E+00	1.41E-01	2.03E-02	2.93E-03	4.23E-04	6.11E-05	8.82E-06
te127m	9.59E-01	1.44E-01	2.07E-02	2.99E-03	4.32E-04	6.23E-05	9.00E-06
i129	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02	1.19E-02
cs134	2.43E+00	1.84E+00	1.39E+00	1.05E+00	7.92E-01	5.98E-01	4.52E-01
cs135	6.70E-01	6.70E-01	6.70E-01	6.70E-01	6.70E-01	6.70E-01	6.70E-01
cs137	2.13E+02	2.09E+02	2.05E+02	2.01E+02	1.97E+02	1.93E+02	1.90E+02
ba137m	2.01E+02	1.97E+02	1.93E+02	1.90E+02	1.86E+02	1.83E+02	1.79E+02
ce142	1.29E-05	1.29E-05	1.29E-05	1.29E-05	1.29E-05	1.29E-05	1.29E-05
ce144	1.77E+02	8.45E+01	4.03E+01	1.92E+01	9.17E+00	4.37E+00	2.09E+00
pr144	1.77E+02	8.45E+01	4.03E+01	1.92E+01	9.17E+00	4.37E+00	2.09E+00
pr144m	2.48E+00	1.18E+00	5.64E-01	2.69E-01	1.28E-01	6.12E-02	2.92E-02
pm147	7.55E+01	6.12E+01	4.91E+01	3.94E+01	3.16E+01	2.54E+01	2.04E+01
sm147	4.91E-06	4.91E-06	4.91E-06	4.91E-06	4.91E-06	4.91E-06	4.91E-06
eu150	1.88E-06	1.85E-06	1.82E-06	1.79E-06	1.76E-06	1.73E-06	1.70E-06
sm151	1.61E+01	1.60E+01	1.59E+01	1.58E+01	1.57E+01	1.56E+01	1.55E+01
eu152	6.43E+00	6.16E+00	5.90E+00	5.65E+00	5.41E+00	5.18E+00	4.96E+00
gd153	6.24E-02	2.61E-02	1.09E-02	4.54E-03	1.90E-03	7.92E-04	3.31E-04
eu154	4.15E-01	3.88E-01	3.62E-01	3.39E-01	3.17E-01	2.96E-01	2.77E-01
eu155	1.66E+00	1.47E+00	1.30E+00	1.15E+00	1.01E+00	8.95E-01	7.91E-01
ho166m	1.14E-06	1.14E-06	1.14E-06	1.14E-06	1.14E-06	1.14E-06	1.14E-06
total	2.05E+04	1.11E+03	9.42E+02	8.64E+02	8.15E+02	7.82E+02	7.56E+02

1  
 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 121  
 decay, following reactor irradiation identified by: power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec  
 0 element thermal power, watts

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
h	1.29E-05	1.23E-05	1.17E-05	1.12E-05	1.07E-05	1.02E-05	9.70E-06
c	9.02E-09	9.02E-09	9.02E-09	9.02E-09	9.02E-09	9.02E-09	9.02E-09
se	3.07E+00	9.70E-06	9.70E-06	9.70E-06	9.70E-06	9.70E-06	9.70E-06
kr	1.19E+01	1.18E-02	1.12E-02	1.06E-02	1.00E-02	9.52E-03	9.02E-03
rb	2.35E+01	5.98E-09	5.73E-09	5.73E-09	5.73E-09	5.73E-09	5.73E-09
sr	1.91E+01	2.16E-01	2.03E-01	1.99E-01	1.95E-01	1.91E-01	1.87E-01
y	2.71E+01	1.01E+00	9.70E-01	9.50E-01	9.30E-01	9.12E-01	8.93E-01
zr	1.18E+01	3.96E-02	1.53E-03	1.25E-04	7.24E-05	7.05E-05	7.04E-05
nb	2.17E+01	8.01E-02	3.17E-03	2.21E-04	1.12E-04	1.08E-04	1.08E-04
tc	7.72E+00	3.32E-03	3.32E-03	3.32E-03	3.32E-03	3.32E-03	3.32E-03
ru	1.08E+00	2.84E-03	5.72E-04	3.19E-04	1.81E-04	1.03E-04	5.81E-05
rh	8.41E-01	1.60E-01	9.08E-02	5.15E-02	2.92E-02	1.65E-02	9.37E-03
pd	5.90E-02	7.20E-07	7.20E-07	7.20E-07	7.20E-07	7.20E-07	7.20E-07
ag	9.78E-02	5.15E-05	2.21E-05	9.50E-06	4.09E-06	1.76E-06	7.57E-07
cd	7.63E-02	1.38E-05	1.26E-05	1.21E-05	1.16E-05	1.11E-05	1.07E-05
sn	1.87E+00	2.35E-04	2.04E-04	1.98E-04	1.97E-04	1.96E-04	1.96E-04
sb	7.45E+00	5.26E-03	4.63E-03	4.11E-03	3.69E-03	3.36E-03	3.08E-03
te	9.06E+00	5.25E-04	2.15E-04	1.48E-04	1.16E-04	9.33E-05	7.54E-05

i	2.05E+01	5.58E-06	5.58E-06	5.58E-06	5.58E-06	5.58E-06	5.58E-06
cs	1.78E+01	2.51E-01	2.42E-01	2.34E-01	2.27E-01	2.21E-01	2.16E-01
ba	1.16E+01	7.75E-01	7.60E-01	7.46E-01	7.31E-01	7.18E-01	7.04E-01
ce	4.29E+00	5.57E-02	2.64E-02	1.26E-02	6.00E-03	2.86E-03	1.36E-03
pr	6.13E+00	6.21E-01	2.96E-01	1.41E-01	6.73E-02	3.21E-02	1.53E-02
pm	3.77E-01	2.25E-02	1.80E-02	1.45E-02	1.16E-02	9.32E-03	7.48E-03
sm	3.07E-02	1.88E-03	1.87E-03	1.86E-03	1.85E-03	1.84E-03	1.82E-03
eu	8.63E-02	5.17E-02	4.93E-02	4.71E-02	4.50E-02	4.29E-02	4.10E-02
gd	5.02E-04	2.29E-05	9.57E-06	3.99E-06	1.67E-06	6.96E-07	2.91E-07
ho	4.01E-07	1.20E-08	1.20E-08	1.20E-08	1.20E-08	1.19E-08	1.19E-08
totals	2.55E+02	3.31E+00	2.68E+00	2.42E+00	2.26E+00	2.16E+00	2.09E+00

1  
 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 122  
 decay, following reactor irradiation identified by: power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec

0  
 nuclide gamma power, watts  
 basis =single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr 85	1.10E-04	1.04E-04	9.86E-05	9.35E-05	8.86E-05	8.39E-05	7.95E-05
y 90	1.84E-06	1.80E-06	1.76E-06	1.73E-06	1.69E-06	1.66E-06	1.63E-06
nb 93m	6.97E-06	6.97E-06	6.97E-06	6.97E-06	6.97E-06	6.97E-06	6.97E-06
nb 94	2.55E-07	2.55E-07	2.55E-07	2.55E-07	2.55E-07	2.55E-07	2.55E-07
zr 95	9.18E-01	3.40E-02	1.26E-03	4.67E-05	1.73E-06	6.40E-08	2.37E-09
nb 95	9.58E-01	7.54E-02	2.89E-03	1.07E-04	3.98E-06	1.47E-07	5.45E-09
tc 99	2.43E-08	2.43E-08	2.43E-08	2.43E-08	2.43E-08	2.43E-08	2.43E-08
rh102	2.06E-07	1.69E-07	1.39E-07	1.14E-07	9.31E-08	7.63E-08	6.25E-08
rh106	3.60E-02	2.04E-02	1.16E-02	6.56E-03	3.72E-03	2.11E-03	1.19E-03
ag110m	1.16E-04	4.98E-05	2.14E-05	9.20E-06	3.95E-06	1.70E-06	7.30E-07
sn121m	1.39E-07	1.38E-07	1.36E-07	1.35E-07	1.33E-07	1.32E-07	1.31E-07
sb125	3.35E-03	2.72E-03	2.20E-03	1.78E-03	1.44E-03	1.17E-03	9.44E-04
te125m	6.32E-05	5.44E-05	4.41E-05	3.57E-05	2.89E-05	2.34E-05	1.89E-05
sn126	9.57E-05	9.57E-05	9.57E-05	9.57E-05	9.57E-05	9.57E-05	9.57E-05
sb126	4.45E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04	2.83E-04
sb126m	1.27E-03	1.14E-03	1.14E-03	1.14E-03	1.14E-03	1.14E-03	1.14E-03
i129	1.74E-06	1.74E-06	1.74E-06	1.74E-06	1.74E-06	1.74E-06	1.74E-06
cs134	2.24E-02	1.69E-02	1.28E-02	9.66E-03	7.30E-03	5.52E-03	4.17E-03
ba137m	7.14E-01	7.00E-01	6.87E-01	6.74E-01	6.61E-01	6.48E-01	6.36E-01
ce144	2.00E-02	9.52E-03	4.54E-03	2.16E-03	1.03E-03	4.92E-04	2.35E-04
pr144	3.04E-02	1.45E-02	6.91E-03	3.29E-03	1.57E-03	7.49E-04	3.57E-04
pr144m	1.84E-04	8.77E-05	4.18E-05	1.99E-05	9.51E-06	4.54E-06	2.16E-06
pm147	1.96E-06	1.59E-06	1.28E-06	1.02E-06	8.21E-07	6.59E-07	5.29E-07
eu150	1.71E-08	1.68E-08	1.65E-08	1.63E-08	1.60E-08	1.58E-08	1.55E-08
sm151	1.36E-06	1.35E-06	1.34E-06	1.33E-06	1.32E-06	1.31E-06	1.31E-06
eu152	4.43E-02	4.24E-02	4.06E-02	3.89E-02	3.73E-02	3.57E-02	3.42E-02
gd153	3.98E-05	1.66E-05	6.94E-06	2.90E-06	1.21E-06	5.05E-07	2.11E-07
eu154	3.08E-03	2.88E-03	2.69E-03	2.52E-03	2.35E-03	2.20E-03	2.06E-03
eu155	6.36E-04	5.62E-04	4.97E-04	4.39E-04	3.88E-04	3.43E-04	3.03E-04
ho166m	1.10E-08	1.10E-08	1.10E-08	1.10E-08	1.10E-08	1.10E-08	1.10E-08
total	1.26E+02	9.23E-01	7.75E-01	7.41E-01	7.18E-01	6.98E-01	6.81E-01

1  
 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 123  
 decay, following reactor irradiation identified by: power= 4.000E-03mw, burnup=1.4610E+04mwd, flux= 2.71E+08n/cm\*\*2-sec

0  
 element gamma power, watts  
 basis =single reactor assembly

	initial	304.4 d	608.8 d	913.1 d	1217.5 d	1521.9 d	1826.3 d
kr	6.21E+00	1.04E-04	9.86E-05	9.35E-05	8.86E-05	8.39E-05	7.95E-05
y	9.41E+00	1.11E-04	4.73E-06	1.81E-06	1.70E-06	1.66E-06	1.63E-06
zr	4.70E+00	3.40E-02	1.26E-03	4.67E-05	1.73E-06	6.40E-08	2.37E-09
nb	9.20E+00	7.55E-02	2.90E-03	1.15E-04	1.12E-05	7.37E-06	7.23E-06
tc	3.91E+00	2.49E-08	2.49E-08	2.49E-08	2.49E-08	2.49E-08	2.49E-08
rh	2.55E-01	2.04E-02	1.16E-02	6.56E-03	3.72E-03	2.11E-03	1.19E-03

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

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

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emean (mev)	initial	time after discharge					
		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
total	2.19E+12	5.59E+05	4.48E+05	3.59E+05	2.87E+05	2.30E+05	1.84E+05
mev/sec	2.11E+12	3.92E+05	3.14E+05	2.51E+05	2.01E+05	1.61E+05	1.29E+05

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

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emean (mev)	initial	time after discharge					
		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
total	5.28E+08	9.79E+01	7.84E+01	6.28E+01	5.03E+01	4.03E+01	3.23E+01
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

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

e-mean (mev)	initial	time after discharge					
		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
total	1.04E+15	2.62E+13	2.10E+13	1.88E+13	1.76E+13	1.68E+13	1.62E+13
mev/sec	4.36E+14	6.80E+12	5.61E+12	5.27E+12	5.06E+12	4.90E+12	4.77E+12

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

e-mean (mev)	initial	time after discharge					
		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	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	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	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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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	

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	

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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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	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	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

1 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	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	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

0 eu152 6.73E+10 6.45E+10 6.17E+10 5.91E+10 5.66E+10 5.42E+10 5.19E+10  
 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 initial time after discharge  
 y 90 2.11E+10 304.4 d 608.8 d 913.1 d 1217.5 d 1521.9 d 1826.3 d  
 rh106 3.31E+10 2.07E+10 2.03E+10 1.99E+10 1.95E+10 1.91E+10 1.87E+10  
 sb126m 1.65E+08 1.88E+10 1.06E+10 6.03E+09 3.42E+09 1.94E+09 1.10E+09  
 cs134 2.51E+09 1.49E+08 1.49E+08 1.49E+08 1.49E+08 1.49E+08 1.49E+08  
 pr144 4.78E+10 1.90E+09 1.43E+09 1.08E+09 8.18E+08 6.18E+08 4.67E+08  
 eu152 1.00E+11 2.28E+10 1.09E+10 5.18E+09 2.47E+09 1.18E+09 5.62E+08  
 eu154 1.03E+10 9.57E+10 9.17E+10 8.78E+10 8.40E+10 8.05E+10 7.71E+10  
 eu154 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 initial time after discharge  
 y 90 2.70E+09 304.4 d 608.8 d 913.1 d 1217.5 d 1521.9 d 1826.3 d  
 rh106 6.25E+09 2.64E+09 2.59E+09 2.54E+09 2.48E+09 2.43E+09 2.38E+09  
 cs134 2.37E+09 3.54E+09 2.01E+09 1.14E+09 6.45E+08 3.66E+08 2.07E+08  
 pr144 2.97E+10 1.79E+09 1.35E+09 1.02E+09 7.72E+08 5.83E+08 4.41E+08  
 eu152 4.59E+10 1.42E+10 6.76E+09 3.23E+09 1.54E+09 7.34E+08 3.50E+08  
 eu154 3.73E+08 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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1 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 initial time after discharge  
 y 90 1.61E+08 304.4 d 608.8 d 913.1 d 1217.5 d 1521.9 d 1826.3 d  
 rh106 2.03E+09 1.58E+08 1.55E+08 1.52E+08 1.49E+08 1.46E+08 1.43E+08  
 pr144 5.77E+10 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 initial time after discharge  
 y 90 9.41E+04 304.4 d 608.8 d 913.1 d 1217.5 d 1521.9 d 1826.3 d  
 rh106 1.13E+09 9.22E+04 9.04E+04 8.85E+04 8.67E+04 8.50E+04 8.32E+04  
 pr144 5.45E+08 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 initial time after discharge  
 rh106 1.91E+08 304.4 d 608.8 d 913.1 d 1217.5 d 1521.9 d 1826.3 d  
 pr144 4.39E+07 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 initial time after discharge  
 rh106 3.29E+07 304.4 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 initial time after discharge  
 rh106 1.45E+04 304.4 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 initial time after discharge  
 ce142 1.44E-05 304.4 d 608.8 d 913.1 d 1217.5 d 1521.9 d 1826.3 d  
 sm147 5.48E-06 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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0 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

nuclide	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

0 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

nuclide	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

1 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= 14610.mwd, flux= 2.71E+08 n\*\*2-sec  
 0 actinide photon release rates, photons/sec  
 0 basis = single reactor assembly

e m e a n (mev)	time after discharge							
	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	

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

e m e a n (mev)	time after discharge							
	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	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	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	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	8.78E+00
	5.50E+00	9.13E+00	9.12E+00	9.12E+00	9.11E+00	9.11E+00	9.11E+00	9.11E+00	9.10E+00
	total	6.28E+09	4.32E+07	4.32E+07	4.32E+07	4.32E+07	4.32E+07	4.32E+07	4.32E+07
0	gamma	4.03E+00	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02	2.77E-02
0	watts								
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	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	5.79E+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

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
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

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	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	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	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	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	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	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	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	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	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	2.38E-04
am244	4.81E-12	.00E+00	.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	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	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	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	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	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	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	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	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	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	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	3.95E-21
total	4.65E+05	4.65E+05	4.64E+05	4.64E+05	4.64E+05	4.64E+05	4.64E+05	4.64E+05

0

0

1

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)

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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
2	3.00E+00	- 6.43E+00	1.055E+05	1.052E+05	1.051E+05	1.050E+05	1.049E+05
3	1.85E+00	- 3.00E+00	2.981E+05	2.978E+05	2.975E+05	2.972E+05	2.969E+05
4	1.40E+00	- 1.85E+00	8.002E+04	7.997E+04	7.990E+04	7.982E+04	7.974E+04
5	9.00E-01	- 1.40E+00	4.500E+04	4.498E+04	4.494E+04	4.490E+04	4.485E+04
6	4.00E-01	- 9.00E-01	1.307E+04	1.306E+04	1.305E+04	1.304E+04	1.303E+04
7	1.00E-01	- 4.00E-01	2.042E+03	2.042E+03	2.040E+03	2.038E+03	2.036E+03
8	1.70E-02	- 1.00E-01	.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
10	5.50E-04	- 3.00E-03	.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
12	3.00E-05	- 1.00E-04	.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
14	3.05E-06	- 1.00E-05	.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
16	1.30E-06	- 1.77E-06	.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
18	1.00E-06	- 1.13E-06	.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
20	4.00E-07	- 8.00E-07	.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
22	2.25E-07	- 3.25E-07	.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
24	5.00E-08	- 1.00E-07	.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



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11 1.00E-04 - 5.50E-04 .000E+00 .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 .000E+00
13 1.00E-05 - 3.00E-05 .000E+00 .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 .000E+00
15 1.77E-06 - 3.05E-06 .000E+00 .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 .000E+00
17 1.13E-06 - 1.30E-06 .000E+00 .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 .000E+00
19 8.00E-07 - 1.00E-06 .000E+00 .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 .000E+00
21 3.25E-07 - 4.00E-07 .000E+00 .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 .000E+00
23 1.00E-07 - 2.25E-07 .000E+00 .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 .000E+00
25 3.00E-08 - 5.00E-08 .000E+00 .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 .000E+00
27 1.00E-11 - 1.00E-08 .000E+00 .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 *
0 case 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)
0 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 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

```
1  oooooooooo  rrrrrrrrrrr  iiiiiiiiiii  ggggggggggg  eeeeeeeeeeee  nn      nn  sssssssssss
   oooooooooo  rrrrrrrrrrr  iiiiiiiiiii  ggggggggggg  eeeeeeeeeeee  nnn     nn  sssssssssss
   oo         oo  rr      rr      ii      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  rrrrrrrrrrr  ii      gg      gggggggg  eeeeeeeee  nn  nn  nn  sssssssssss
   oo         oo  rrrrrrrrrrr  ii      gg      gggggggg  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  nn  nn  ss
   oooooooooo  rr      rr  iiiiiiiiiii  ggggggggggg  eeeeeeeeeeee  nn      nnn  sssssssssss
   oooooooooo  rr      rr  iiiiiiiiiii  ggggggggggg  eeeeeeeeeeee  nn      nn  sssssssssss
```

```
0  ddddddddddd  aaaaaaaaaa  vv      vv  iiiiiiiiiii  sssssssssss
   ddddddddddd  aaaaaaaaaa  vv      vv  iiiiiiiiiii  sssssssssss
   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  aaaaaaaaaa  vv      vv  ii      sssssssssss
   dd         dd  aaaaaaaaaa  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
   ddddddddddd  aa      aa  vvv      iiiiiiiiiii  ss      ss
   ddddddddddd  aa      aa  v      iiiiiiiiiii  sssssssssss
```

```
0  oooooo  8888888888  //  2222222222  9999999999  //  9999999999  6666666666
   oooooo  8888888888  //  2222222222  9999999999  //  9999999999  6666666666
   oo     oo  88      88  //  22      22  99      99  //  99      99  66      66
   oo     oo  88      88  //  22      22  99      99  //  99      99  66      66
   oo     oo  88      88  //  22      22  99      99  //  99      99  66      66
   oo     oo  8888888888  //  22      22  9999999999  //  9999999999  6666666666
   oo     oo  8888888888  //  22      22  9999999999  //  9999999999  6666666666
   oo     oo  88      88  //  22      22  99      99  //  99      99  66      66
   oo     oo  88      88  //  22      22  99      99  //  99      99  66      66
   oo     oo  88      88  //  22      22  99      99  //  99      99  66      66
   oo     oo  88      88  //  22      22  99      99  //  99      99  66      66
   oooooo  8888888888  //  2222222222  9999999999  //  9999999999  6666666666
```





\*\*\*\* 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      .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
0      129 number of actinide nuclides
0      879 number of fission product nuclides
0      7993 number of nonzero off-diagonal matrix elements
*****

```

```

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
0      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
0      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
0      power= .00mw, burnup= 1340.mwd, flux= 1.07E+08n/cm**2-sec
0      basis =

```

(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
0      productions 1.048802E+06 1.049862E+06 1.050874E+06 1.051840E+06 1.052761E+06 1.052761E+06
0      absorptions 8.541503E+05 8.561003E+05 8.577262E+05 8.591095E+05 8.603048E+05 8.603048E+05
0      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

```

```

0      actinide
0      absorptions 8.502696E+05 8.508874E+05 8.514795E+05 8.520488E+05 8.525959E+05 8.525959E+05
0      non-actinide
0      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
0      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  
0  
0  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
fraction of total absorption rate  
power=.00mw, burnup= 1340.mwd, flux= 1.07E+08n/cm\*\*2-sec  
initial 228281. d 456563. d 684844. d 913125. d 913125. d

fission products

page 5

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

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

fission products

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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	3.53E-10	3.52E-10	3.49E-10
nd147	.00E+00	3.49E-10	3.48E-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

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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
0 fraction of total absorption rate
0 power= .00mw, burnup= 1340.mwd, flux= 1.07E+08n/cm**2-sec
initial 228281. d 456563. d 684844. d 913125. d 913125. d

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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  2.84E-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  1.32E-13
eu157     .00E+00  1.11E-13  1.14E-13  1.16E-13  1.19E-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

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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  
 0 power= .00mw, burnup= 1340.mwd, flux= 1.07E+08n/cm\*\*2-sec  
 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
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1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 9  
 0 power= 1.468E-03mw, burnup=1.3405E+03mwd, flux= 1.07E+08n/cm\*\*2-sec  
 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
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  
power= 1.468E-03mw, burnup=1.3405E+03mwd, flux= 1.07E+08n/cm\*\*2-sec

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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  
 power= 1.468E-03mw, burnup=1.3405E+03mwd, flux= 1.07E+08n/cm\*\*2-sec

actinides

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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  
 power= 1.468E-03mw, burnup=1.3405E+03mwd, flux= 1.07E+08n/cm\*\*2-sec

actinides

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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+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.  
 1 library 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 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
*
*****
*
*****
.other identification and sizes of library.
data set name: ft33f001
8/29/1996 date library was produced
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
*****
0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 page 13
0 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
0 productions 1.147176E+06 1.148034E+06 1.148847E+06 1.149617E+06 1.150344E+06 1.150344E+06
0 absorptions 9.285851E+05 9.296731E+05 9.306356E+05 9.314987E+05 9.322818E+05 9.322817E+05
0 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
0 actinide
0 absorptions 9.209394E+05 9.214599E+05 9.219582E+05 9.224346E+05 9.228896E+05 9.228896E+05
0 non-actinide
0 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 fraction of total absorption rate fission products page 14
0 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 6.83E-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 1.42E-06 1.78E-06 2.13E-06 2.49E-06 2.85E-06 2.85E-06
nd144 1.37E-06 1.71E-06 2.05E-06 2.39E-06 2.73E-06 2.73E-06
ag109 9.01E-07 1.18E-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

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

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

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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

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
i 131	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
i 135	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
i 130	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	2.13E-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

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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  
 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
flux		9.84E+07	9.84E+07	9.83E+07	9.83E+07	9.83E+07

0 1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 1.468E-03mw, burnup=2.6809E+03mwd, flux= 9.84E+07n/cm\*\*2-sec

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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	4.65E-05	7.27E-05	1.05E-04	1.42E-04	1.85E-04	1.85E-04
pb208	2.73E-06	4.24E-06	6.07E-06	8.23E-06	1.07E-05	1.07E-05
pb209	8.13E-12	1.24E-11	1.75E-11	2.34E-11	2.99E-11	2.99E-11
pb210	7.31E-06	1.06E-05	1.42E-05	1.81E-05	2.21E-05	2.21E-05
pb211	3.71E-12	4.63E-12	5.53E-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





np240m	.00E+00	.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	1.21E-15	5.68E-17
np241	.00E+00	.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	4.11E-10
pu237	4.55E-14	4.70E-14	5.00E-14	5.30E-14	5.59E-14	5.57E-14	5.57E-14
pu238	8.55E-03	8.45E-03	8.44E-03	8.43E-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	8.13E+00
pu240	1.47E-02	2.23E-02	3.10E-02	4.08E-02	5.16E-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	7.71E-06
pu242	3.25E-08	6.76E-08	1.21E-07	1.97E-07	2.99E-07	2.99E-07	2.99E-07
pu243	1.88E-17	5.24E-17	9.40E-17	1.53E-16	2.31E-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	1.96E-31
pu245	.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
am239	3.86E-21	6.95E-21	1.03E-20	1.41E-20	1.85E-20	1.42E-20	1.42E-20
am240	1.96E-18	3.18E-18	4.70E-18	6.47E-18	8.46E-18	7.95E-18	7.95E-18
am241	4.22E-05	6.87E-05	1.01E-04	1.40E-04	1.83E-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	2.89E-08
am242	5.25E-13	9.25E-13	1.37E-12	1.89E-12	2.48E-12	2.10E-12	2.10E-12
am243	5.41E-11	1.25E-10	2.45E-10	4.27E-10	6.88E-10	6.88E-10	6.88E-10
am244m	.00E+00	.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	1.40E-18
am245	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	4.48E-44	4.48E-44
am246	.00E+00	.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	5.31E-23
cm242	1.15E-10	1.87E-10	2.77E-10	3.82E-10	5.01E-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	4.18E-15
cm244	2.41E-15	5.46E-15	1.07E-14	1.86E-14	3.00E-14	3.00E-14	3.00E-14

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0

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 1.468E-03mw, burnup=2.6809E+03mwd, flux= 9.84E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	charge	***** d	***** d	***** d	***** d	***** d	***** d
cm245	4.67E-19	1.33E-18	3.12E-18	6.36E-18	1.17E-17	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	1.99E-20
cm247	5.76E-27	2.64E-26	9.00E-26	2.51E-25	6.04E-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	1.81E-28
cm249	1.78E-42	5.45E-41	2.33E-40	7.55E-40	2.09E-39	1.09E-40	1.09E-40
cm250	.00E+00	.00E+00	1.40E-45	5.61E-45	1.82E-44	1.82E-44	1.82E-44
cm251	.00E+00	.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	3.73E+04
flux		9.84E+07	9.84E+07	9.83E+07	9.83E+07	9.83E+08	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.					
1	library 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 densitiities  
 pass n applies mid time densities of nth library interval  
 first library updated was...



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	6.88E-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	5.88E-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  
 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

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nd150	1.62E-07	1.83E-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  
0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
fraction of total absorption rate  
power= .00mw, burnup= 4021.mwd, flux= 9.45E+07n/cm\*\*2-sec  
0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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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	7.33E-10	9.07E-10	1.10E-09	1.31E-09	1.54E-09	1.54E-09
as 75	9.83E-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  
 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

fission products

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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	1.29E-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  
 power= 1.468E-03mw, burnup=4.0214E+03mwd, flux= 9.45E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

light elements page 28

	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
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  
 power= 1.468E-03mw, burnup=4.0214E+03mwd, flux= 9.45E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides page 29

	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	2.98E-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	1.35E-05	1.66E-05	2.01E-05	2.38E-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	3.92E-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  
power= 1.468E-03mw, burnup=4.0214E+03mwd, flux= 9.45E+07n/cm\*\*2-sec  
nuclide concentrations, gram atoms  
basis = single reactor assembly

actinides page 30

	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	9.92E-02	9.92E-02
u234	9.24E+00	9.26E+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  
 power= 1.468E-03mw, burnup=4.0214E+03mwd, flux= 9.45E+07n/cm\*\*2-sec

actinides

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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
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

3q array has 1 entries.

0

3q array has 1 entries.

0

4q array has 1 entries.

0

54q array has 12 entries.

0

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 densities





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  
 0 fraction of total absorption rate  
 0 power= .00mw, burnup= 5362.mwd, flux= 9.28E+07n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

fission products

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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  
 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

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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

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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  
 power= 1.468E-03mw, burnup=5.3618E+03mwd, flux= 9.28E+07n/cm\*\*2-sec

light elements

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nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** d	***** 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	
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  
 power= 1.468E-03mw, burnup=5.3618E+03mwd, flux= 9.28E+07n/cm\*\*2-sec

actinides

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nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** d	***** 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	4.18E-05	4.18E-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  
power= 1.468E-03mw, burnup=5.3618E+03mwd, flux= 9.28E+07n/cm\*\*2-sec  
nuclide concentrations, gram atoms  
basis = single reactor assembly

actinides page 39

	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	9.33E+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  
 power= 1.468E-03mw, burnup=5.3618E+03mwd, flux= 9.28E+07n/cm\*\*2-sec

actinides

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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
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





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  
 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

fission products

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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

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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	3.66E-09	3.88E-09	4.10E-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

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0 power= .00mw, burnup= fraction of total absorption rate  
 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
pm148m	2.97E-15	1.37E-12	1.38E-12	1.38E-12	1.38E-12	6.50E-16
sn123	5.30E-16	3.77E-15	3.77E-15	3.77E-15	3.78E-15	3.26E-16
tb160	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

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power= 1.468E-03mw, burnup=6.7023E+03mwd, flux= 9.23E+07n/cm\*\*2-sec



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  
 power= 1.468E-03mw, burnup=6.7023E+03mwd, flux= 9.23E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides

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	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	1.78E+02	1.79E+02	1.79E+02	1.79E+02	1.79E+02	1.79E+02
u237	6.96E-13	1.14E-06	1.14E-06	1.14E-06	1.14E-06	9.56E-13
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

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

actinides

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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
flux		9.23E+07	9.23E+07	9.23E+07	9.23E+07	9.23E+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 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 densities  
 pass n applies mid time densities of nth library interval  
 first library updated was...  
 pass 1



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	1.22E-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  
 0 fraction of total absorption rate  
 0 power=.00mw, burnup= 8043.mwd, flux= 9.22E+07n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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zr 96	4.54E-07	4.77E-07	4.99E-07	5.21E-07	5.44E-07	5.44E-07
nd150	4.06E-07	4.26E-07	4.46E-07	4.66E-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	2.90E-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  
 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

fission products

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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	2.52E-09	2.82E-09	3.15E-09	3.50E-09	3.87E-09	3.87E-09
ba136	2.63E-09	2.83E-09	3.03E-09	3.24E-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  
 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

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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  
 0 power= 1.468E-03mw, burnup=8.0428E+03mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly  
 charge \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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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
flux			9.22E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

0  
1  
0

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

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	charge	***** d	***** d	***** d	***** d	***** d
he	4	5.11E+00	5.53E+00	5.96E+00	6.41E+00	6.87E+00
pb206		1.26E-02	1.41E-02	1.57E-02	1.74E-02	1.91E-02
pb207		1.13E-03	1.24E-03	1.36E-03	1.49E-03	1.61E-03
pb208		6.47E-05	7.12E-05	7.79E-05	8.49E-05	9.23E-05
pb209		1.51E-10	1.63E-10	1.76E-10	1.89E-10	2.03E-10
pb210		7.49E-05	7.93E-05	8.37E-05	8.82E-05	9.26E-05
pb211		1.76E-11	1.84E-11	1.92E-11	2.00E-11	2.08E-11
pb212		1.76E-11	1.84E-11	1.92E-11	2.00E-11	2.08E-11
pb214		1.71E-10	1.81E-10	1.91E-10	2.01E-10	2.12E-10
bi208		.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
bi210m		.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
bi211		1.04E-12	1.09E-12	1.14E-12	1.18E-12	1.23E-12
bi212		1.67E-12	1.75E-12	1.82E-12	1.90E-12	1.98E-12
bi213		3.52E-11	3.81E-11	4.11E-11	4.42E-11	4.73E-11
bi214		1.27E-10	1.35E-10	1.42E-10	1.50E-10	1.57E-10
po210		1.26E-06	1.35E-06	1.42E-06	1.50E-06	1.57E-06
po211m		.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
po212		8.78E-23	9.17E-23	9.58E-23	9.98E-23	1.04E-22
po213		5.29E-20	5.73E-20	6.18E-20	6.64E-20	7.11E-20
po214		1.75E-17	1.85E-17	1.96E-17	2.06E-17	2.16E-17
po215		1.44E-17	1.51E-17	1.57E-17	1.64E-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  
 power= 1.468E-03mw, burnup=8.0428E+03mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides page 57

	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

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

actinides page 58

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
flux		9.22E+07	9.22E+07	9.22E+07	9.22E+07	9.22E+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 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 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
0      689      number of light-element nuclides
0      129      number of actinide nuclides
0      879      number of fission product nuclides
0      7993      number of nonzero off-diagonal matrix elements
0
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

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

	initial	***** d	***** d	***** d	***** d	***** d
productions	1.232141E+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

	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 page 60  
 fraction of total absorption rate  
 power= .00mw, burnup= 9383.mwd, flux= 9.22E+07n/cm\*\*2-sec

	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	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

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

fission products

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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  
 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

fission products

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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
in113	2.35E-09	2.45E-09	2.56E-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

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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

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

light elements page 64

0 power= 1.468E-03mw, burnup=9.3832E+03mwd, flux= 9.22E+07n/cm\*\*2-sec  
 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
flux		9.21E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

0  
1  
0

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

actinides page 65

	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	1.72E-10	1.79E-10	1.87E-10	1.87E-10
po210	1.56E-06	1.65E-06	1.72E-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  
 power= 1.468E-03mw, burnup=9.3832E+03mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	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	3.64E-14	5.48E-07	5.48E-07	5.48E-07	5.47E-07	4.52E-14
np239	2.34E-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	1.10E-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	8.28E-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

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

actinides page 67

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
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 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 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
0      879      number of fission product nuclides
0      7993     number of nonzero off-diagonal matrix elements
*****

```

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.)

	initial	***** d	***** 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	
	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 page 69  
 fraction of total absorption rate

0 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	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	4.38E-04	4.54E-04	4.69E-04	4.85E-04	5.01E-04	5.01E-04	
xe131	2.96E-04	3.06E-04	3.17E-04	3.27E-04	3.38E-04	3.38E-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	1.30E-04	1.34E-04	1.39E-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  
 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

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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, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 0 fraction of total absorption rate  
 power=.00mw, burnup=10724.mwd, flux= 9.22E+07n/cm\*\*2-sec  
 0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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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	6.38E-09	6.61E-09	6.84E-09	7.08E-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	5.98E-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	1.99E-09	2.06E-09	2.13E-09	2.21E-09	2.28E-09	2.28E-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 power= .00mw, burnup= 10724.mwd, flux= 9.22E+07n/cm\*\*2-sec fraction of total absorption rate  
0 initial \*\*\*\*\* d \*\*\*\*\* 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-18	5.45E-18	5.82E-18	6.21E-18	2.07E-18
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

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 light elements page 73  
0 power= 1.468E-03mw, burnup=1.0724E+04mwd, flux= 9.22E+07n/cm\*\*2-sec nuclide concentrations, gram atoms  
0 basis = single reactor assembly  
charge \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

h 1	5.56E-04	5.76E-04	5.96E-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
flux		9.21E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

0  
1  
0

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 1.468E-03mw, burnup=1.0724E+04mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	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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0  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 1.468E-03mw, burnup=1.0724E+04mwd, flux= 9.22E+07n/cm\*\*2-sec

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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-10	4.04E-10	4.04E-10	4.04E-10	4.04E-10	2.52E-10
pu237	5.47E-18	1.02E-13	1.03E-13	1.05E-13	1.07E-13	1.43E-18
pu238	8.17E-03	8.28E-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	1.26E-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

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

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 1.468E-03mw, burnup=1.0724E+04mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	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
flux		9.21E+07	9.22E+07	9.22E+07	9.22E+07	9.22E-08

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0  
1

1q array has 20 entries.  
 3q array has 1 entries.  
 3q array has 1 entries.  
 3q array has 1 entries.  
 4q array has 1 entries.  
 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 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
*
    
```



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  
 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

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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	6.53E-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

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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	7.53E-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	5.38E-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
ge 73	1.10E-09	1.13E-09	1.17E-09	1.20E-09	1.24E-09	1.24E-09
gd160	4.31E-10	4.49E-10	4.67E-10	4.85E-10	5.04E-10	5.04E-10
ho165	3.66E-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 \*\*\*\*\* 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-16	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  
 0 power= 1.468E-03mw, burnup=1.2064E+04mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	1.09E-04	1.12E-04	1.15E-04	1.19E-04	1.19E-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	9.58E-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	3.03E-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
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  
 power= 1.468E-03mw, burnup=1.2064E+04mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	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
rn219	4.94E-14	5.07E-14	5.20E-14	5.34E-14	5.47E-14	5.49E-14
rn220	3.92E-14	4.04E-14	4.15E-14	4.26E-14	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  
 power= 1.468E-03mw, burnup=1.2064E+04mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	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	1.39E-05	1.50E-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	1.43E-29
pu244	1.86E-26	2.36E-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	1.75E-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	4.33E-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

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  
0

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

actinides page 85

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
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 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 .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  
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 1.234425E+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  
0 k infinity 1.233703E+00 1.233389E+00 1.233069E+00 1.232746E+00 1.232415E+00 1.232415E+00  
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  
fraction of total absorption rate

0 power= .00mw, burnup= 13405.mwd, flux= 9.22E+07n/cm\*\*2-sec  
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	7.14E-05	7.33E-05	7.52E-05	7.71E-05	7.90E-05	7.90E-05
cs135	6.66E-05	6.85E-05	7.03E-05	7.21E-05	7.40E-05	7.40E-05
gd157	5.70E-05	5.74E-05	5.78E-05	5.81E-05	5.85E-05	5.85E-05
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  
 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

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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
dy161	1.02E-07	1.06E-07	1.10E-07	1.14E-07	1.19E-07	1.19E-07
se 79	1.05E-07	1.08E-07	1.11E-07	1.14E-07	1.17E-07	1.17E-07
sb123	8.78E-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  
 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

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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	6.39E-09	6.73E-09	7.07E-09	7.42E-09	7.78E-09	7.78E-09
ba136	6.48E-09	6.77E-09	7.07E-09	7.37E-09	7.67E-09	7.67E-09
sn124	6.38E-09	6.56E-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	2.88E-09	2.88E-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
gd160	5.04E-10	5.23E-10	5.42E-10	5.61E-10	5.81E-10	5.81E-10
ce141	1.40E-10	5.74E-10	5.73E-10	5.73E-10	5.73E-10	5.73E-10
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	1.08E-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

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0 power= .00mw, burnup= fraction of total absorption rate  
 0 initial \*\*\*\*\* d 13405.mwd flux= 9.22E+07n/cm\*\*2-sec \*\*\*\*\* 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	5.48E-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	9.78E-15	1.23E-14	1.26E-14	1.29E-14	1.32E-14	1.32E-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  
 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  
 0 power= 1.468E-03mw, burnup=1.3405E+04mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** 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
0 totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
1 flux		9.22E+07	9.22E+07	9.22E+07	9.23E+07	9.23E+08

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

	charge	***** 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-08
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-08	4.44E-08	4.61E-08	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-08	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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0

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

actinides page 94

nuclide concentrations, gram atoms  
basis = single reactor assembly

charge	***** d	***** 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	4.33E-12	2.83E-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  
 0 power= 1.468E-03mw, burnup=1.3405E+04mwd, flux= 9.22E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	charge	***** 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
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.  
 1 library 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 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
0 689 number of light-element nuclides
0 129 number of actinide nuclides
0 879 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  
 power= .00mw, burnup= 14299.mwd, flux= 5.99E+07n/cm\*\*2-sec

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

	initial	***** d	***** d	***** d	***** d	***** d
productions	1.269097E+06	1.268572E+06	1.268044E+06	1.267512E+06	1.266977E+06	1.266973E+06
absorptions	1.026357E+06	1.026214E+06	1.026069E+06	1.025919E+06	1.025763E+06	1.025760E+06
k infinity	1.236506E+00	1.236167E+00	1.235827E+00	1.235490E+00	1.235155E+00	1.235155E+00
	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. frags. 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  
 0 power=.00mw, burnup= 14299.mwd, flux= 5.99E+07n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* 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	2.59E-06	2.63E-06	2.67E-06	2.72E-06	2.76E-06	2.76E-06
pd107	2.48E-06	2.54E-06	2.59E-06	2.64E-06	2.70E-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

0 power= .00mw, burnup= 14299.mwd, flux= 5.99E+07n/cm\*\*2-sec  
 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	9.98E-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	1.88E-08	1.92E-08	1.96E-08	2.00E-08	2.04E-08	2.04E-08
mo 96	1.54E-08	1.59E-08	1.64E-08	1.69E-08	1.74E-08	1.74E-08
sr 88	1.55E-08	1.58E-08	1.60E-08	1.63E-08	1.65E-08	1.65E-08
cd110	1.32E-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  
 0 fraction of total absorption rate

fission products

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0 power= .00mw, burnup= 14299.mwd, flux= 5.99E+07n/cm\*\*2-sec  
 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	9.88E-11	1.02E-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  
 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

fission products

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sb126	1.32E-14	1.26E-14	1.28E-14	1.29E-14	1.31E-14	1.16E-14
te127m	3.23E-12	2.15E-12	2.15E-12	2.15E-12	2.16E-12	3.75E-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	3.27E-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

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 9.790E-04mw, burnup=1.4299E+04mwd, flux= 5.99E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

light elements

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	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	2.98E-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
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  
 power= 9.790E-04mw, burnup=1.4299E+04mwd, flux= 5.99E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides

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	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	2.25E-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

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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	6.53E-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  
 power= 9.790E-04mw, burnup=1.4299E+04mwd, flux= 5.99E+07n/cm\*\*2-sec

actinides

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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	8.08E-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	8.97E-21	4.06E-21	4.13E-21	4.21E-21	4.29E-21	1.64E-35
u231	8.48E-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	1.18E-06	7.85E-07	7.86E-07	7.87E-07	7.88E-07	1.38E-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	.00E+00
np235	3.12E-12	2.07E-12	2.08E-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-13	4.93E-28
np236	1.64E-06	1.67E-06	1.69E-06	1.71E-06	1.74E-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	4.12E+01
np238	5.46E-07	3.63E-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	1.08E-05	1.18E-13
np240m	1.81E-38	2.17E-38	2.58E-38	3.04E-38	3.54E-38	3.54E-38	3.54E-38
np240	1.19E-15	5.27E-16	5.27E-16	5.28E-16	5.28E-16	5.28E-16	6.16E-39
np241	.00E+00	.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	2.71E-10	1.42E-10
pu237	1.19E-13	7.29E-14	7.31E-14	7.34E-14	7.37E-14	7.37E-14	1.48E-20
pu238	8.26E-03	5.52E-03	5.50E-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	2.87E+01
pu240	5.33E-01	5.30E-01	5.27E-01	5.24E-01	5.22E-01	5.22E-01	5.22E-01
pu241	7.87E-05	5.20E-05	5.17E-05	5.15E-05	5.13E-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	2.63E-05
pu243	1.81E-14	1.25E-14	1.28E-14	1.31E-14	1.34E-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	2.07E-25
pu245	1.56E-36	1.25E-36	1.49E-36	1.75E-36	2.05E-36	2.05E-36	.00E+00
pu246	.00E+00	.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-19	1.04E-34
am240	1.05E-16	5.59E-17	5.04E-17	4.83E-17	4.74E-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	1.54E-03
am242m	3.84E-07	2.24E-07	1.91E-07	1.80E-07	1.75E-07	1.73E-07	1.73E-07
am242	3.10E-11	1.67E-11	1.49E-11	1.42E-11	1.39E-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	1.35E-07
am244m	.00E+00	.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-16	2.47E-31
am245	3.11E-37	2.49E-37	2.96E-37	3.47E-37	4.05E-37	4.05E-37	6.27E-40
am246	.00E+00	.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	1.99E-22	1.19E-31
cm242	6.26E-09	3.37E-09	3.01E-09	2.87E-09	2.81E-09	2.81E-09	4.84E-10
cm243	5.19E-14	1.86E-14	1.66E-14	1.59E-14	1.56E-14	1.56E-14	1.46E-14
cm244	5.31E-12	3.62E-12	3.70E-12	3.79E-12	3.87E-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  
 power= 9.790E-04mw, burnup=1.4299E+04mwd, flux= 5.99E+07n/cm\*\*2-sec

actinides

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0

nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d	***** d
cm245	8.62E-15	8.72E-15	8.82E-15	8.93E-15	9.04E-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	6.54E-17
cm247	1.01E-20	1.11E-20	1.21E-20	1.31E-20	1.41E-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	2.64E-23
cm249	1.98E-34	1.47E-34	1.63E-34	1.81E-34	2.01E-34	.00E+00	.00E+00
cm250	8.64E-39	9.29E-39	1.00E-38	1.08E-38	1.17E-38	1.17E-38	1.17E-38
cm251	.00E+00	.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	3.73E+04
flux		5.98E+07	5.99E+07	5.99E+07	5.99E+07	5.99E+07	5.99E+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 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 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  
\*  
\*\*\*\*\*

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1  
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.other identification and sizes of library.  
data set name: ft33f001  
8/29/1996 date library was produced  
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

\*\*\*\*\*  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= .00mw, burnup= 15192.mwd, flux= 5.99E+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	1.268396E+06	1.267856E+06	1.267312E+06	1.266765E+06	1.266216E+06	1.266211E+06
absorptions	1.026710E+06	1.026550E+06	1.026386E+06	1.026217E+06	1.026046E+06	1.026042E+06
k infinity	1.235398E+00	1.235065E+00	1.234733E+00	1.234403E+00	1.234073E+00	1.234073E+00
	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. frags. 1.500005E-02 1.509905E-02 1.519519E-02 1.528919E-02 1.538122E-02 1.538050E-02

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
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	1.22E-06	1.24E-06	1.26E-06	1.27E-06	1.29E-06	1.29E-06
i127	1.12E-06	1.14E-06	1.16E-06	1.18E-06	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

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0 power= .00mw, burnup= fraction of total absorption rate  
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	8.68E-07	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

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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

ag107	1.21E-08	1.27E-08	1.33E-08	1.40E-08	1.46E-08	1.46E-08
se 82	1.13E-08	1.15E-08	1.17E-08	1.19E-08	1.20E-08	1.20E-08
sn126	1.01E-08	1.03E-08	1.04E-08	1.06E-08	1.07E-08	1.07E-08
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	8.98E-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  
 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

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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	7.33E-16	3.90E-11	3.90E-11	3.90E-11	3.90E-11	2.74E-16
y 91	2.26E-16	3.33E-11	3.33E-11	3.33E-11	3.33E-11	7.69E-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	9.36E-18	1.81E-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	9.35E-11	9.35E-11	3.70E-19
ce141	1.92E-19	3.83E-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  
 0 power= 9.790E-04mw, burnup=1.5192E+04mwd, flux= 5.99E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms

light elements page 110

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
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  
power= 9.790E-04mw, burnup=1.5192E+04mwd, flux= 5.99E+07n/cm\*\*2-sec

actinides page 111

0

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	1.02E-02	1.08E-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	2.23E-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	3.02E-10	3.09E-10	3.16E-10	3.23E-10	3.30E-10	3.30E-10
po210	3.00E-06	3.09E-06	3.16E-06	3.23E-06	3.30E-06	3.28E-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	2.48E-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  
 power= 9.790E-04mw, burnup=1.5192E+04mwd flux= 5.99E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides

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	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	8.08E-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	7.89E-07	7.90E-07	7.91E-07	7.92E-07	1.35E-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	7.18E-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	4.11E+01	4.11E+01
np238	3.19E-14	3.63E-07	3.63E-07	3.63E-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	5.29E-16	5.30E-16	6.95E-39

np241	.00E+00	.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	2.71E-10	1.35E-10
pu237	1.48E-20	7.39E-14	7.41E-14	7.43E-14	7.46E-14	7.46E-14	3.70E-21
pu238	5.38E-03	5.50E-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	2.89E+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	5.15E-01
pu241	4.49E-05	5.10E-05	5.09E-05	5.08E-05	5.07E-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	2.87E-05
pu243	1.39E-29	1.37E-14	1.40E-14	1.43E-14	1.46E-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	3.58E-25
pu245	.00E+00	2.37E-36	2.73E-36	3.12E-36	3.55E-36	3.55E-36	.00E+00
pu246	.00E+00	.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-19	1.01E-34
am240	4.74E-32	4.68E-17	4.66E-17	4.65E-17	4.64E-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	1.51E-03
am242m	1.73E-07	1.72E-07	1.72E-07	1.71E-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	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	1.47E-07
am244m	.00E+00	.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-16	2.69E-31
am245	6.27E-40	4.69E-37	5.39E-37	6.16E-37	7.01E-37	7.01E-37	7.61E-40
am246	.00E+00	.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	1.95E-22	1.70E-32
cm242	4.84E-10	2.78E-09	2.77E-09	2.76E-09	2.75E-09	2.75E-09	4.61E-10
cm243	1.46E-14	1.54E-14	1.53E-14	1.53E-14	1.53E-14	1.53E-14	1.42E-14
cm244	3.49E-12	3.96E-12	4.05E-12	4.14E-12	4.23E-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  
 0 power= 9.790E-04mw, burnup=1.5192E+04mwd, flux= 5.99E+07n/cm\*\*2-sec

actinides

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nuclide concentrations, gram atoms  
 basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d	***** d
cm245	9.04E-15	9.16E-15	9.28E-15	9.42E-15	9.56E-15	9.56E-15	9.56E-15
cm246	6.54E-17	6.73E-17	6.91E-17	7.09E-17	7.27E-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	1.86E-20
cm248	2.64E-23	2.92E-23	3.21E-23	3.53E-23	3.87E-23	3.87E-23	3.87E-23
cm249	.00E+00	2.22E-34	2.44E-34	2.68E-34	2.94E-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	1.65E-38
cm251	.00E+00	.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	3.73E+04
flux		5.99E+07	5.99E+07	5.99E+07	6.00E+07	6.00E+07	6.00E+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 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 densiities  
 pass n applies mid time densities of nth library interval  
 first library updated was...  
 pass 1  
 pass 0





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	4.83E-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

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0 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	9.25E-07	9.39E-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	6.65E-07	6.77E-07	6.89E-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	4.85E-07	4.86E-07
sm154	4.29E-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	3.62E-07	3.67E-07	3.73E-07	3.78E-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	2.80E-08
eu155	2.88E-08	4.49E-08	4.49E-08	4.50E-08	4.50E-08	2.78E-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  
 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

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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	3.35E-09	3.40E-09	3.45E-09	3.50E-09	3.50E-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	7.86E-13	8.28E-13	8.72E-13	9.18E-13	9.66E-13	9.66E-13
be 9	6.82E-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 \*\*\*\*\* 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  
 0 power= 9.790E-04mw, burnup=1.6086E+04mwd, flux= 6.00E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

h 1	9.02E-04	9.15E-04	9.29E-04	9.42E-04	9.55E-04	9.55E-04
h 2	2.69E-06	2.73E-06	2.77E-06	2.81E-06	2.85E-06	2.85E-06
h 3	1.11E-11	1.32E-11	1.33E-11	1.33E-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	1.80E-05	1.82E-05	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
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  
power= 9.790E-04mw, burnup=1.6086E+04mwd, flux= 6.00E+07n/cm\*\*2-sec

actinides

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nuclide concentrations, gram atoms  
basis = single reactor assembly

	charge	***** 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
po211m	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
po211	2.48E-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	2.08E-19	2.14E-19	2.19E-19	2.19E-19
po214	4.54E-17	4.63E-17	4.72E-17	4.82E-17	4.91E-17	4.91E-17
po215	3.11E-17	3.15E-17	3.20E-17	3.24E-17	3.29E-17	3.30E-17
po216	9.52E-17	9.76E-17	9.92E-17	1.01E-16	1.02E-16	1.01E-16
po218	5.14E-11	5.24E-11	5.35E-11	5.46E-11	5.56E-11	5.56E-11
rn218	9.95E-44	9.08E-29	9.23E-29	9.37E-29	9.52E-29	9.25E-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

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 9.790E-04mw, burnup=1.6086E+04mwd, flux= 6.00E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	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	8.08E-12	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	6.13E-38	6.94E-38	7.83E-38	8.79E-38	9.84E-38	9.84E-38
np240	6.95E-39	5.30E-16	5.30E-16	5.31E-16	5.31E-16	7.90E-39
np241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
pu236	1.35E-10	2.71E-10	2.71E-10	2.71E-10	2.71E-10	1.27E-10
pu237	3.70E-21	7.48E-14	7.50E-14	7.52E-14	7.54E-14	9.16E-22
pu238	5.37E-03	5.50E-03	5.50E-03	5.50E-03	5.50E-03	5.36E-03
pu239	2.91E+01	2.92E+01	2.93E+01	2.94E+01	2.95E+01	2.95E+01
pu240	5.15E-01	5.14E-01	5.13E-01	5.12E-01	5.12E-01	5.11E-01
pu241	4.38E-05	5.05E-05	5.05E-05	5.04E-05	5.04E-05	4.30E-05
pu242	2.87E-05	2.92E-05	2.98E-05	3.04E-05	3.09E-05	3.09E-05
pu243	1.53E-29	1.49E-14	1.52E-14	1.55E-14	1.58E-14	1.66E-29
pu244	3.58E-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  
0

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

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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
flux		5.99E+07	5.99E+07	6.00E+07	6.00E+07	6.00E+08

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0  
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0  
1

1q array has 20 entries.  
3q array has 1 entries.  
3q array has 1 entries.  
3q array has 1 entries.  
4q array has 1 entries.  
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 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  
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.other identification and sizes of library.  
 data set name: ft33f001  
 8/29/1996 date library was produced  
 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  
 \*\*\*\*\*

sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= .00mw, burnup= 16980.mwd, flux= 6.00E+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 1.266238E+06 1.265670E+06 1.265100E+06 1.264527E+06 1.263952E+06 1.263946E+06  
 absorptions 1.026683E+06 1.026498E+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  
 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  
 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 fraction of total absorption rate  
 power= .00mw, burnup= 16980.mwd, flux= 6.00E+07n/cm\*\*2-sec  
 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	3.93E-04	3.98E-04	4.04E-04	4.09E-04	4.15E-04	4.15E-04
sm147	2.89E-04	2.93E-04	2.97E-04	3.01E-04	3.05E-04	3.05E-04
tc 99	2.73E-04	2.76E-04	2.80E-04	2.83E-04	2.87E-04	2.87E-04
nd145	2.22E-04	2.25E-04	2.28E-04	2.31E-04	2.34E-04	2.34E-04
gd155	2.22E-04	2.22E-04	2.22E-04	2.22E-04	2.22E-04	2.22E-04
sm152	1.64E-04	1.67E-04	1.70E-04	1.72E-04	1.75E-04	1.75E-04
mo 95	1.54E-04	1.56E-04	1.58E-04	1.60E-04	1.62E-04	1.62E-04
sm150	1.14E-04	1.16E-04	1.17E-04	1.19E-04	1.21E-04	1.21E-04
cd113	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04	1.02E-04
kr 83	9.49E-05	9.61E-05	9.74E-05	9.87E-05	1.00E-04	1.00E-04
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	1.28E-06	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  
0  
0  
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
fraction of total absorption rate  
power= .00mw, burnup= 16980.mwd, flux= 6.00E+07n/cm\*\*2-sec  
initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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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	3.83E-07	3.89E-07	3.94E-07	3.99E-07	4.04E-07	4.04E-07
se 77	2.79E-07	2.83E-07	2.87E-07	2.91E-07	2.95E-07	2.95E-07
pd106	2.72E-07	2.77E-07	2.81E-07	2.86E-07	2.90E-07	2.90E-07
ba135	2.48E-07	2.57E-07	2.66E-07	2.76E-07	2.85E-07	2.85E-07
gd156	2.56E-07	2.60E-07	2.64E-07	2.69E-07	2.73E-07	2.73E-07
kr 84	1.82E-07	1.85E-07	1.88E-07	1.90E-07	1.93E-07	1.93E-07
dy161	1.53E-07	1.55E-07	1.58E-07	1.61E-07	1.64E-07	1.64E-07
sb121	1.47E-07	1.49E-07	1.51E-07	1.53E-07	1.56E-07	1.56E-07
ru100	1.37E-07	1.41E-07	1.45E-07	1.49E-07	1.53E-07	1.53E-07
se 79	1.39E-07	1.41E-07	1.43E-07	1.45E-07	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	1.05E-07	1.08E-07	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  
 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

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sr 88	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	2.98E-09	3.03E-09	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	2.34E-09
ge 73	1.67E-09	1.69E-09	1.72E-09	1.74E-09	1.77E-09	1.77E-09
cs137	8.46E-10	9.12E-10	9.12E-10	9.12E-10	9.12E-10	8.41E-10
ho165	7.47E-10	7.65E-10	7.83E-10	8.02E-10	8.20E-10	8.20E-10
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	6.48E-10	6.67E-10	6.87E-10	6.87E-10
ge 76	5.73E-10	5.81E-10	5.89E-10	5.97E-10	6.05E-10	6.05E-10
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	1.58E-10	1.61E-10	1.65E-10	1.65E-10
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  
 0 power= 9.790E-04mw, burnup=1.6980E+04mwd, flux= 6.00E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	1.90E-05	1.93E-05	1.96E-05	1.98E-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	1.05E-11	1.05E-11	1.05E-11	1.05E-11	4.13E-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	6.40E-09	6.40E-09	6.41E-09	6.41E-09	6.41E-24
na 24m	1.05E-30	1.05E-15	1.05E-15	1.05E-15	1.05E-15	1.05E-30
na 25	4.09E-39	4.20E-24	4.31E-24	4.42E-24	4.54E-24	4.54E-39
mg 24	1.25E-01	1.27E-01	1.28E-01	1.30E-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
flux		6.00E+07	6.00E+07	6.00E+07	6.01E+07	6.01E-08

0  
1  
0

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

actinides

page 129

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	9.88E-08	1.01E-07	1.03E-07	1.04E-07	1.06E-07	1.06E-07
ra222	1.01E-40	1.05E-25	1.06E-25	1.08E-25	1.10E-25	1.06E-40
ra223	1.83E-08	1.85E-08	1.88E-08	1.91E-08	1.93E-08	1.93E-08
ra224	2.20E-10	2.26E-10	2.30E-10	2.33E-10	2.36E-10	2.33E-10
ra225	6.82E-08	6.99E-08	7.16E-08	7.33E-08	7.51E-08	7.51E-08
ra226	1.51E-02	1.54E-02	1.57E-02	1.59E-02	1.62E-02	1.62E-02
ra228	7.12E-11	7.26E-11	7.40E-11	7.54E-11	7.68E-11	7.68E-11
ac225	4.61E-08	4.72E-08	4.84E-08	4.95E-08	5.07E-08	5.07E-08
ac227	1.27E-05	1.29E-05	1.31E-05	1.32E-05	1.34E-05	1.34E-05
ac228	8.69E-15	8.86E-15	9.03E-15	9.21E-15	9.38E-15	9.38E-15
th226	4.92E-39	5.11E-24	5.19E-24	5.27E-24	5.34E-24	5.17E-39
th227	2.96E-08	2.99E-08	3.03E-08	3.08E-08	3.12E-08	3.12E-08
th228	4.20E-08	4.32E-08	4.38E-08	4.44E-08	4.51E-08	4.44E-08



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

1  
0

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

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	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
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 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
*
    
```

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*
*****
*
*****

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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
0      689      number of light-element nuclides
0      129      number of actinide nuclides
0      879      number of fission product nuclides
0      7993     number of nonzero off-diagonal matrix elements
0      *****

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```

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
          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	1.264834E+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
	initial	***** d	***** d	***** d	***** d	***** d

```

0  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           page 133
    fraction of total absorption rate
    fission products
0  power= .00mw, burnup= 17874.mwd, flux= 6.01E+07n/cm**2-sec

```

```

    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	7.36E-05	7.36E-05
gd157	6.00E-05	6.01E-05	6.02E-05	6.02E-05	6.03E-05	6.03E-05
la139	5.71E-05	5.79E-05	5.87E-05	5.94E-05	6.02E-05	6.02E-05
pd105	2.87E-05	2.92E-05	2.96E-05	3.00E-05	3.04E-05	3.04E-05
ag109	2.72E-05	2.77E-05	2.82E-05	2.87E-05	2.92E-05	2.92E-05
ba137	2.76E-05	2.80E-05	2.83E-05	2.87E-05	2.91E-05	2.91E-05
zr 93	2.26E-05	2.29E-05	2.32E-05	2.35E-05	2.38E-05	2.38E-05
i129	1.86E-05	1.89E-05	1.91E-05	1.94E-05	1.96E-05	1.96E-05
nd144	1.76E-05	1.78E-05	1.80E-05	1.83E-05	1.85E-05	1.85E-05
mo 97	1.30E-05	1.32E-05	1.33E-05	1.35E-05	1.37E-05	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

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

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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	1.23E-07
ba134	1.06E-07	1.09E-07	1.12E-07	1.15E-07	1.18E-07	1.18E-07
kr 86	1.07E-07	1.08E-07	1.10E-07	1.11E-07	1.13E-07	1.13E-07
te128	1.03E-07	1.04E-07	1.05E-07	1.07E-07	1.08E-07	1.08E-07
sm148	9.67E-08	9.93E-08	1.02E-07	1.05E-07	1.07E-07	1.07E-07
eu152	8.66E-08	1.05E-07	1.06E-07	1.06E-07	1.07E-07	8.82E-08
pd104	7.28E-08	7.47E-08	7.67E-08	7.87E-08	8.08E-08	8.08E-08
tb159	7.21E-08	7.33E-08	7.45E-08	7.56E-08	7.68E-08	7.68E-08
se 80	7.06E-08	7.15E-08	7.24E-08	7.34E-08	7.43E-08	7.43E-08
te125	6.93E-08	7.03E-08	7.13E-08	7.23E-08	7.33E-08	7.33E-08
gd158	5.73E-08	5.82E-08	5.91E-08	6.00E-08	6.10E-08	6.10E-08
cd112	5.26E-08	5.34E-08	5.41E-08	5.49E-08	5.57E-08	5.57E-08
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

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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	1.38E-08	1.40E-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	1.33E-10	1.33E-10	1.33E-10	1.05E-10
sr 87	8.62E-11	8.76E-11	8.90E-11	9.05E-11	9.19E-11	9.19E-11
nb 94	7.55E-11	7.76E-11	7.97E-11	8.18E-11	8.41E-11	8.41E-11
te122	6.69E-11	6.88E-11	7.06E-11	7.25E-11	7.44E-11	7.44E-11
se 76	5.94E-11	6.08E-11	6.22E-11	6.37E-11	6.51E-11	6.51E-11
er166	4.13E-11	4.22E-11	4.31E-11	4.39E-11	4.48E-11	4.48E-11
ge 74	3.53E-11	3.58E-11	3.63E-11	3.68E-11	3.73E-11	3.73E-11
ge 72	2.58E-11	2.62E-11	2.66E-11	2.69E-11	2.73E-11	2.73E-11
kr 80	1.91E-11	1.99E-11	2.07E-11	2.16E-11	2.25E-11	2.25E-11
ce144	6.32E-12	1.42E-10	1.42E-10	1.42E-10	1.42E-10	5.05E-12
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

0 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

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

nuclide concentrations, gram atoms

basis = single reactor assembly

	charge	***** d	***** 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	5.28E-28	5.28E-13	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	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	4.99E+04	
al 28	4.75E-26	4.75E-11	4.75E-11	4.75E-11	4.76E-11	4.76E-26	
al 29	3.66E-37	3.75E-22	3.85E-22	3.95E-22	4.05E-22	4.05E-37	
al 30	.00E+00	8.31E-32	8.63E-32	8.97E-32	9.31E-32	.00E+00	
si 28	3.84E-01	3.88E-01	3.93E-01	3.98E-01	4.03E-01	4.03E-01	
si 29	5.88E-06	6.03E-06	6.19E-06	6.34E-06	6.50E-06	6.50E-06	
si 30	9.62E-11	9.99E-11	1.04E-10	1.08E-10	1.12E-10	1.12E-10	
si 31	1.68E-38	1.74E-23	1.81E-23	1.88E-23	1.95E-23	1.96E-38	
si 32	6.99E-30	7.37E-30	7.67E-30	7.97E-30	8.28E-30	8.16E-30	
0 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  
 power= 9.790E-04mw, burnup=1.7874E+04mwd, flux= 6.01E+07n/cm\*\*2-sec  
 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	4.69E-08	4.75E-08	4.67E-08
th229	1.46E-02	1.49E-02	1.53E-02	1.56E-02	1.59E-02	1.59E-02
th230	8.14E-01	8.26E-01	8.39E-01	8.52E-01	8.65E-01	8.65E-01
th231	2.76E-09	3.67E-09	3.68E-09	3.69E-09	3.71E-09	2.75E-09
th232	1.88E-01	1.91E-01	1.95E-01	1.98E-01	2.02E-01	2.02E-01
th233	4.18E-28	4.26E-13	4.34E-13	4.42E-13	4.50E-13	4.50E-28
th234	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07	5.36E-07
pa231	2.02E-02	2.05E-02	2.07E-02	2.10E-02	2.12E-02	2.12E-02
pa232	8.43E-26	8.54E-11	8.66E-11	8.77E-11	8.88E-11	8.89E-26

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 9.790E-04mw, burnup=1.7874E+04mwd, flux= 6.01E+07n/cm\*\*2-sec  
 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	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
cm241	3.55E-34	1.93E-22	1.94E-22	1.94E-22	1.95E-22	5.06E-35
cm242	4.45E-10	2.73E-09	2.74E-09	2.74E-09	2.74E-09	4.43E-10
cm243	1.40E-14	1.52E-14	1.52E-14	1.52E-14	1.53E-14	1.39E-14
cm244	4.36E-12	5.08E-12	5.18E-12	5.28E-12	5.39E-12	4.67E-12

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

actinides

page 140

	basis = single reactor assembly					
	charge	***** d	***** d	***** d	***** d	***** d
cm245	1.09E-14	1.11E-14	1.13E-14	1.15E-14	1.17E-14	1.17E-14
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
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.  
 1 library 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 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 .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  
 0 129 number of actinide nuclides  
 0 879 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.)

	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
	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						

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 page 142  
 0 fraction of total absorption rate  
 0 power= .00mw, burnup= 18768.mwd, flux= 6.02E+07n/cm\*\*2-sec

	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	1.38E-05	1.40E-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	1.26E-05
pd108	7.09E-06	7.20E-06	7.32E-06	7.44E-06	7.55E-06	7.55E-06
zr 91	6.29E-06	6.37E-06	6.45E-06	6.53E-06	6.61E-06	6.61E-06
y 89	6.02E-06	6.09E-06	6.17E-06	6.24E-06	6.32E-06	6.32E-06
ru102	5.71E-06	5.78E-06	5.86E-06	5.93E-06	6.00E-06	6.00E-06
ce142	5.01E-06	5.08E-06	5.14E-06	5.20E-06	5.27E-06	5.27E-06
nd148	4.83E-06	4.89E-06	4.95E-06	5.02E-06	5.08E-06	5.08E-06
nd146	4.07E-06	4.12E-06	4.17E-06	4.22E-06	4.27E-06	4.27E-06
pd107	3.59E-06	3.64E-06	3.70E-06	3.76E-06	3.81E-06	3.81E-06
in115	3.57E-06	3.62E-06	3.66E-06	3.71E-06	3.76E-06	3.76E-06
ba138	3.46E-06	3.51E-06	3.55E-06	3.60E-06	3.64E-06	3.64E-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					
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	5.17E-08	5.33E-08	5.49E-08	5.65E-08	5.82E-08	5.82E-08
dy164	3.95E-08	4.02E-08	4.08E-08	4.15E-08	4.21E-08	4.21E-08
sn117	3.96E-08	4.02E-08	4.07E-08	4.13E-08	4.18E-08	4.18E-08
dy162	3.89E-08	3.96E-08	4.04E-08	4.11E-08	4.18E-08	4.18E-08
li 6	3.91E-08	3.96E-08	4.01E-08	4.05E-08	4.10E-08	4.10E-08
cd114	3.35E-08	3.40E-08	3.45E-08	3.49E-08	3.54E-08	3.54E-08
sn119	3.04E-08	3.08E-08	3.12E-08	3.16E-08	3.20E-08	3.20E-08
cd110	2.67E-08	2.75E-08	2.84E-08	2.92E-08	3.01E-08	3.01E-08
mo 96	2.71E-08	2.77E-08	2.84E-08	2.91E-08	2.98E-08	2.98E-08
sn115	2.78E-08	2.81E-08	2.85E-08	2.89E-08	2.93E-08	2.93E-08
br 79	2.58E-08	2.66E-08	2.74E-08	2.83E-08	2.91E-08	2.91E-08
pd110	2.70E-08	2.75E-08	2.79E-08	2.83E-08	2.87E-08	2.87E-08
ag107	2.34E-08	2.42E-08	2.50E-08	2.58E-08	2.67E-08	2.67E-08

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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

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

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nuclide concentrations, gram atoms  
basis = single reactor assembly

	charge	***** d	***** 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	1.12E-03
h 2	3.17E-06	3.21E-06	3.25E-06	3.29E-06	3.33E-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	1.11E-11
h 4	.00E+00	1.37E-35	1.37E-35	1.38E-35	1.38E-35	.00E+00	.00E+00
he 3	1.55E-08	1.56E-08	1.57E-08	1.58E-08	1.59E-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	1.85E-04
he 6	.00E+00	.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	2.22E-05
ne 21	6.93E-09	7.10E-09	7.27E-09	7.45E-09	7.62E-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	1.46E-07
ne 23	1.77E-30	1.77E-15	1.77E-15	1.77E-15	1.77E-15	1.77E-15	1.77E-30
na 22	3.87E-12	1.05E-11	1.05E-11	1.05E-11	1.05E-11	3.62E-12	3.62E-12
na 23	7.53E+03	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	6.42E-24
na 24m	1.05E-30	1.05E-15	1.05E-15	1.05E-15	1.06E-15	1.06E-30	1.06E-30
na 25	5.01E-39	5.13E-24	5.25E-24	5.38E-24	5.51E-24	5.51E-39	5.51E-39
mg 24	1.38E-01	1.40E-01	1.42E-01	1.43E-01	1.45E-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	7.91E-07
mg 26	3.17E-06	3.21E-06	3.25E-06	3.29E-06	3.33E-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	5.29E-28
mg 28	.00E+00	2.63E-25	2.63E-25	2.63E-25	2.63E-25	.00E+00	.00E+00
al 27	4.99E+04	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	4.76E-26
al 29	4.05E-37	4.15E-22	4.25E-22	4.35E-22	4.46E-22	4.46E-37	4.46E-37
al 30	.00E+00	9.65E-32	1.00E-31	1.04E-31	1.08E-31	.00E+00	.00E+00
si 28	4.03E-01	4.08E-01	4.13E-01	4.17E-01	4.22E-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	7.15E-06
si 30	1.12E-10	1.16E-10	1.20E-10	1.25E-10	1.29E-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	2.26E-38
si 32	8.16E-30	8.59E-30	8.93E-30	9.26E-30	9.61E-30	9.45E-30	9.45E-30
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
flux		6.01E+07	6.02E+07	6.02E+07	6.02E+07	6.02E+07	6.02E+07

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

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nuclide concentrations, gram atoms  
basis = single reactor assembly

	charge	***** d	***** d	***** d	***** d	***** d	***** d
he 4	2.89E+01	2.96E+01	3.03E+01	3.10E+01	3.16E+01	3.16E+01	3.16E+01
pb206	1.38E-01	1.43E-01	1.48E-01	1.52E-01	1.57E-01	1.57E-01	1.57E-01
pb207	9.24E-03	9.52E-03	9.81E-03	1.01E-02	1.04E-02	1.04E-02	1.04E-02
pb208	4.36E-04	4.46E-04	4.57E-04	4.69E-04	4.80E-04	4.80E-04	4.80E-04
pb209	7.50E-10	7.65E-10	7.81E-10	7.96E-10	8.12E-10	8.12E-10	8.12E-10
pb210	2.42E-04	2.45E-04	2.49E-04	2.53E-04	2.57E-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	2.13E-08	2.13E-08
ra224	2.45E-10	2.52E-10	2.55E-10	2.58E-10	2.61E-10	2.57E-10
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

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 9.790E-04mw, burnup=1.8768E+04mwd, flux= 6.02E+07n/cm\*\*2-sec  
nuclide concentrations, gram atoms  
basis = single reactor assembly

actinides

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	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	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	5.27E-36	5.53E-21	5.60E-21	5.68E-21	5.75E-21	5.53E-36
u231	8.17E-32	8.29E-17	8.41E-17	8.53E-17	8.65E-17	8.66E-32
u232	1.67E-06	1.75E-06	1.78E-06	1.80E-06	1.82E-06	1.75E-06
u233	4.44E-01	4.50E-01	4.57E-01	4.63E-01	4.69E-01	4.69E-01
u234	1.01E+01	1.01E+01	1.01E+01	1.02E+01	1.02E+01	1.02E+01
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	1.02E-19	1.02E-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  
 power= 9.790E-04mw, burnup=1.8768E+04mwd, flux= 6.02E+07n/cm\*\*2-sec

actinides

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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	7.98E-34	8.52E-34	9.07E-34	9.65E-34	.00E+00
cm250	4.55E-38	4.92E-38	5.31E-38	5.73E-38	6.18E-38	6.18E-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
flux		6.01E+07	6.02E+07	6.02E+07	6.02E+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 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 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
0 689 number of light-element nuclides
0 129 number of actinide nuclides
0 879 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
0 power= .00mw, burnup= 19662.mwd, flux= 6.03E+07n/cm**2-sec
0 basis =
```

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

	initial	***** d	***** d	***** d	***** d	***** d
productions	1.261778E+06	1.261179E+06	1.260578E+06	1.259975E+06	1.259371E+06	1.259364E+06
absorptions	1.025688E+06	1.025483E+06	1.025275E+06	1.025067E+06	1.024858E+06	1.024853E+06
k infinity	1.230177E+00	1.229839E+00	1.229502E+00	1.229164E+00	1.228825E+00	1.228824E+00
	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. frags. 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	6.06E-05	6.07E-05	6.07E-05	6.08E-05	6.08E-05
pd105	3.21E-05	3.25E-05	3.29E-05	3.33E-05	3.38E-05	3.38E-05
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	3.68E-06	3.73E-06	3.77E-06	3.82E-06	3.82E-06
ce140	3.41E-06	3.45E-06	3.49E-06	3.53E-06	3.57E-06	3.57E-06
xe132	3.13E-06	3.17E-06	3.21E-06	3.25E-06	3.28E-06	3.28E-06
mo 98	2.10E-06	2.13E-06	2.15E-06	2.18E-06	2.20E-06	2.20E-06
mo100	2.05E-06	2.07E-06	2.10E-06	2.12E-06	2.15E-06	2.15E-06
xe134	2.02E-06	2.04E-06	2.06E-06	2.09E-06	2.11E-06	2.11E-06
zr 92	1.60E-06	1.62E-06	1.64E-06	1.66E-06	1.68E-06	1.68E-06
i127	1.51E-06	1.53E-06	1.55E-06	1.57E-06	1.59E-06	1.59E-06
ru104	1.38E-06	1.40E-06	1.42E-06	1.43E-06	1.45E-06	1.45E-06

```

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2 fission products page 152
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

```

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	1.14E-07	1.15E-07	1.17E-07	1.18E-07	1.20E-07	1.20E-07
pd104	8.92E-08	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	2.17E-08	2.20E-08	2.22E-08	2.25E-08	2.27E-08	2.27E-08
pm147	2.30E-08	6.54E-08	6.55E-08	6.55E-08	6.55E-08	2.15E-08
xe129	1.75E-08	1.80E-08	1.85E-08	1.90E-08	1.96E-08	1.96E-08
xe130	1.48E-08	1.51E-08	1.55E-08	1.58E-08	1.62E-08	1.62E-08
se 82	1.49E-08	1.51E-08	1.53E-08	1.54E-08	1.56E-08	1.56E-08
ba136	1.33E-08	1.36E-08	1.38E-08	1.41E-08	1.44E-08	1.44E-08

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

fission products

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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	2.88E-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  
 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

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sb126	1.50E-14	1.67E-14	1.69E-14	1.70E-14	1.72E-14	1.56E-14
te127m	2.08E-16	2.19E-12	2.19E-12	2.20E-12	2.20E-12	1.16E-16
nb 95	1.06E-17	3.62E-11	3.62E-11	3.62E-11	3.62E-11	3.89E-18
cd109	2.02E-18	1.88E-17	1.96E-17	2.03E-17	2.11E-17	2.06E-18
zr 95	5.19E-18	3.90E-11	3.90E-11	3.90E-11	3.90E-11	1.90E-18
sn123	1.01E-18	2.57E-15	2.58E-15	2.58E-15	2.58E-15	6.15E-19
y 91	1.01E-18	3.34E-11	3.34E-11	3.34E-11	3.34E-11	3.41E-19
tb160	4.09E-20	4.92E-14	4.99E-14	5.06E-14	5.13E-14	1.37E-20

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 9.790E-04mw, burnup=1.9662E+04mwd, flux= 6.03E+07n/cm\*\*2-sec

light elements page 155



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

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
power= 9.790E-04mw, burnup=1.9662E+04mwd, flux= 6.03E+07n/cm\*\*2-sec

actinides

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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
u239	7.50E-23	7.49E-08	7.50E-08	7.50E-08	7.50E-08	7.51E-23
u240	3.61E-35	3.92E-35	4.24E-35	4.58E-35	4.95E-35	4.95E-35
u241	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
np235	1.60E-13	2.07E-12	2.07E-12	2.07E-12	2.07E-12	1.36E-13
np236m	4.92E-28	4.92E-13	4.92E-13	4.92E-13	4.92E-13	4.92E-28
np236	2.17E-06	2.19E-06	2.21E-06	2.23E-06	2.25E-06	2.25E-06
np237	4.09E+01	4.09E+01	4.09E+01	4.09E+01	4.08E+01	4.08E+01
np238	3.10E-14	3.63E-07	3.64E-07	3.64E-07	3.64E-07	3.12E-14
np239	1.76E-13	1.08E-05	1.08E-05	1.08E-05	1.08E-05	1.88E-13
np240m	3.08E-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

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 9.790E-04mw, burnup=1.9662E+04mwd, flux= 6.03E+07n/cm\*\*2-sec

actinides

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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
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 18 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-v
\*
\* 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
0 689 number of light-element nuclides
0 129 number of actinide nuclides
0 879 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
0 productions 1.260138E+06 1.259530E+06 1.258921E+06 1.258311E+06 1.257699E+06 1.257691E+06
0 absorptions 1.025244E+06 1.025033E+06 1.024821E+06 1.024607E+06 1.024393E+06 1.024388E+06
0 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
0 actinide
0 absorptions 1.007740E+06 1.007449E+06 1.007157E+06 1.006864E+06 1.006570E+06 1.006566E+06
0 non-actinide
0 abs. fracs. 1.707274E-02 1.715469E-02 1.723617E-02 1.731735E-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 page 160
fraction of total absorption rate fission products
0 power= .00mw, burnup= 20556.mwd, flux= 6.03E+07n/cm\*\*2-sec

Table with 2 columns: isotope and values. Rows include sm149, nd143, eu151, rh103, xe131, cs133 and their various isotopes.

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
i 129	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
i 127	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  
 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

fission products

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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	1.15E-06	1.16E-06	1.17E-06	1.19E-06	1.20E-06	1.20E-06
cd111	9.12E-07	9.24E-07	9.37E-07	9.49E-07	9.62E-07	9.62E-07
br 81	8.49E-07	8.59E-07	8.69E-07	8.79E-07	8.88E-07	8.88E-07
rb 85	8.13E-07	8.23E-07	8.32E-07	8.41E-07	8.50E-07	8.50E-07
gd154	7.41E-07	7.59E-07	7.77E-07	7.95E-07	8.14E-07	8.14E-07
zr 94	7.11E-07	7.19E-07	7.27E-07	7.35E-07	7.43E-07	7.43E-07
zr 90	6.53E-07	6.60E-07	6.68E-07	6.75E-07	6.83E-07	6.83E-07
sm154	5.66E-07	5.73E-07	5.80E-07	5.87E-07	5.94E-07	5.94E-07
te130	5.29E-07	5.35E-07	5.41E-07	5.47E-07	5.53E-07	5.53E-07
rb 87	4.68E-07	4.73E-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  
 0 fraction of total absorption rate  
 0 power= .00mw, burnup= 20556.mwd, flux= 6.03E+07n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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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	1.36E-08	1.37E-08	1.39E-08	1.40E-08	1.42E-08	1.42E-08
se 78	1.22E-08	1.24E-08	1.25E-08	1.27E-08	1.28E-08	1.28E-08
te126	1.10E-08	1.13E-08	1.16E-08	1.19E-08	1.22E-08	1.22E-08
dy163	1.12E-08	1.14E-08	1.16E-08	1.18E-08	1.20E-08	1.20E-08
kr 82	1.08E-08	1.10E-08	1.12E-08	1.14E-08	1.16E-08	1.16E-08
sn124	1.07E-08	1.08E-08	1.10E-08	1.11E-08	1.12E-08	1.12E-08
as 75	7.20E-09	7.28E-09	7.37E-09	7.45E-09	7.53E-09	7.53E-09
eu154	6.42E-09	9.17E-09	9.29E-09	9.42E-09	9.54E-09	6.63E-09
in113	6.13E-09	6.20E-09	6.28E-09	6.35E-09	6.43E-09	6.43E-09
sn118	4.32E-09	4.38E-09	4.43E-09	4.48E-09	4.53E-09	4.53E-09
sn122	3.70E-09	3.75E-09	3.79E-09	3.84E-09	3.88E-09	3.88E-09
cd116	3.63E-09	3.68E-09	3.72E-09	3.76E-09	3.81E-09	3.81E-09
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  
 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

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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  
 0 power= 9.790E-04mw, burnup=2.0556E+04mwd, flux= 6.03E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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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-15	1.78E-30
na 22	3.39E-12	1.05E-11	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	7.53E+03
na 24	6.43E-24	6.43E-09	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-15	1.06E-30
na 25	6.03E-39	6.16E-24	6.30E-24	6.44E-24	6.58E-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	1.58E-01
mg 25	8.65E-07	8.84E-07	9.03E-07	9.23E-07	9.42E-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	3.65E-06
mg 27	5.30E-28	5.29E-13	5.30E-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	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	4.99E+04
al 28	4.77E-26	4.77E-11	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-22	5.34E-37
al 30	.00E+00	1.28E-31	1.32E-31	1.36E-31	1.41E-31	.00E+00	.00E+00
si 28	4.42E-01	4.46E-01	4.51E-01	4.56E-01	4.61E-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	8.54E-06
si 30	1.48E-10	1.53E-10	1.58E-10	1.63E-10	1.69E-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-23	2.97E-38
si 32	1.09E-29	1.14E-29	1.19E-29	1.23E-29	1.27E-29	1.25E-29	1.25E-29
totals	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04	5.75E+04
flux		6.03E+07	6.03E+07	6.04E+07	6.04E+07	6.04E+07	6.04E-08

0  
1  
0

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

actinides

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	charge	***** d	***** 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	3.72E+01
pb206	1.78E-01	1.84E-01	1.89E-01	1.94E-01	2.00E-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	1.29E-02
pb208	5.26E-04	5.38E-04	5.50E-04	5.63E-04	5.75E-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	9.34E-10
pb210	2.72E-04	2.75E-04	2.79E-04	2.83E-04	2.86E-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	5.09E-11
pb212	3.25E-11	3.35E-11	3.39E-11	3.42E-11	3.46E-11	3.39E-11	3.39E-11
pb214	6.21E-10	6.30E-10	6.38E-10	6.46E-10	6.55E-10	6.55E-10	6.55E-10
bi208	.00E+00	.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	3.37E-02
bi210m	.00E+00	.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	1.76E-07
bi211	2.90E-12	2.92E-12	2.95E-12	2.98E-12	3.01E-12	3.02E-12	3.02E-12
bi212	3.08E-12	3.18E-12	3.21E-12	3.25E-12	3.28E-12	3.21E-12	3.21E-12
bi213	2.04E-10	2.08E-10	2.11E-10	2.15E-10	2.18E-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	4.86E-10
po210	4.62E-06	4.68E-06	4.74E-06	4.81E-06	4.87E-06	4.87E-06	4.87E-06
po211m	.00E+00	.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	3.34E-17
po212	1.62E-22	1.67E-22	1.69E-22	1.71E-22	1.72E-22	1.69E-22	1.69E-22
po213	3.07E-19	3.12E-19	3.17E-19	3.23E-19	3.28E-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	6.69E-17
po215	4.02E-17	4.05E-17	4.09E-17	4.14E-17	4.18E-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	1.28E-16
po218	7.19E-11	7.28E-11	7.38E-11	7.48E-11	7.57E-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	1.18E-43
rn219	8.94E-14	9.01E-14	9.11E-14	9.20E-14	9.29E-14	9.31E-14	9.31E-14
rn220	4.72E-14	4.86E-14	4.92E-14	4.97E-14	5.02E-14	4.91E-14	4.91E-14
rn222	1.28E-07	1.29E-07	1.31E-07	1.33E-07	1.35E-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	1.27E-40
ra223	2.23E-08	2.25E-08	2.27E-08	2.29E-08	2.32E-08	2.32E-08	2.32E-08



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  
 0 power= 9.790E-04mw, burnup=2.0556E+04mwd, flux= 6.03E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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	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
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 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
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
0 129 number of actinide nuclides
0 879 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
0 power= .00mw, burnup= 21450.mwd, flux= 6.04E+07n/cm\*\*2-sec
0 basis =

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(note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d
productions 1.258714E+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
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
0 fraction of total absorption rate
0 power= .00mw, burnup= 21450.mwd, flux= 6.04E+07n/cm\*\*2-sec
0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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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

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  
 0 fraction of total absorption rate  
 power= .00mw, burnup= 21450.mwd, flux= 6.04E+07n/cm\*\*2-sec  
 0 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

fission products

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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  
 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

fission products

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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

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

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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  
 power= 9.790E-04mw, burnup=2.1450E+04mwd, flux= 6.04E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

light elements page 173

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-38	3.17E-38	3.27E-38	3.38E-38	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
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  
power= 9.790E-04mw, burnup=2.1450E+04mwd, flux= 6.04E+07n/cm\*\*2-sec

actinides

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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-43	1.25E-43	1.26E-43	1.28E-43	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-40	1.36E-40	1.37E-40	1.39E-40	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-39	6.63E-39	6.70E-39	6.77E-39	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

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

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

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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	
flux		6.04E+07	6.04E+07	6.04E+07	6.05E+07	6.05E-08	

1q array has 20 entries.  
 3q array has 1 entries.  
 3q array has 1 entries.  
 3q array has 1 entries.  
 4q array has 1 entries.  
 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 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
0      689 number of light-element nuclides
0      129 number of actinide nuclides
0      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
0 power= .00mw, burnup= 22344.mwd, flux= 6.05E+07n/cm**2-sec
0 basis =

```

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

```

0      initial ***** d ***** d ***** d ***** d ***** d
0      productions 1.256850E+06 1.256228E+06 1.255605E+06 1.254980E+06 1.254355E+06 1.254355E+06
0      absorptions 1.024347E+06 1.024127E+06 1.023905E+06 1.023683E+06 1.023460E+06 1.023460E+06
0      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

```

```

0      actinide
0      absorptions 1.006195E+06 1.005896E+06 1.005597E+06 1.005296E+06 1.004996E+06 1.004996E+06
0      non-actinide
0      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
0 fraction of total absorption rate
0 power= .00mw, burnup= 22344.mwd, flux= 6.05E+07n/cm**2-sec
0 initial ***** d ***** d ***** d ***** d ***** d

```

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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
i 129	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					
0	fraction of total absorption rate					
0	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

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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  
 0 power= .00mw, burnup= 22344.mwd, flux= 6.05E+07n/cm\*\*2-sec  
 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	1.27E-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



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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0

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

actinides

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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

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

actinides

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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
flux		6.05E+07	6.05E+07	6.05E+07	6.06E+07	6.06E+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 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 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      .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
0      129      number of actinide nuclides
0      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
0      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
0      productions  1.292597E+06  1.291740E+06  1.290894E+06  1.290058E+06  1.289232E+06  1.289224E+06
0      absorptions  1.050823E+06  1.050404E+06  1.049996E+06  1.049592E+06  1.049194E+06  1.049188E+06
0      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
0      actinide
0      absorptions  1.031996E+06  1.031525E+06  1.031063E+06  1.030608E+06  1.030158E+06  1.030153E+06
0      non-actinide
0      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
0      fraction of total absorption rate
0

```

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  
 0 fraction of total absorption rate

fission products

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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  
 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

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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

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

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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

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

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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
flux			2.94E+07	2.94E+07	2.94E+07	2.94E+07	2.94E-08

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

actinides

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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
pb206		2.47E-01	2.53E-01	2.60E-01	2.66E-01	2.72E-01
pb207		1.55E-02	1.59E-02	1.62E-02	1.66E-02	1.69E-02
pb208		6.78E-04	6.86E-04	6.93E-04	7.00E-04	7.06E-04
pb209		1.05E-09	1.07E-09	1.08E-09	1.10E-09	1.11E-09
pb210		3.15E-04	3.18E-04	3.22E-04	3.25E-04	3.29E-04
pb211		5.47E-11	5.50E-11	5.53E-11	5.56E-11	5.59E-11
pb212		3.74E-11	1.88E-11	1.89E-11	1.90E-11	1.91E-11
pb214		7.20E-10	7.28E-10	7.36E-10	7.44E-10	7.51E-10
bi208		.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
bi210m		.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
bi211		3.25E-12	3.26E-12	3.28E-12	3.30E-12	3.32E-12
bi212		3.55E-12	1.79E-12	1.79E-12	1.80E-12	1.81E-12
bi213		2.46E-10	2.50E-10	2.53E-10	2.56E-10	2.60E-10
bi214		5.34E-10	5.40E-10	5.46E-10	5.52E-10	5.58E-10
po210		5.35E-06	5.41E-06	5.47E-06	5.53E-06	5.59E-06
po211m		.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
po212		1.86E-22	9.38E-23	9.42E-23	9.47E-23	9.53E-23
po213		3.70E-19	3.75E-19	3.80E-19	3.86E-19	3.91E-19
po214		7.35E-17	7.43E-17	7.52E-17	7.60E-17	7.68E-17
po215		4.50E-17	4.52E-17	4.55E-17	4.57E-17	4.60E-17
po216		1.42E-16	7.13E-17	7.15E-17	7.20E-17	7.24E-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

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

actinides

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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

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

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

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	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
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 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
*
*****

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```

      .other identification and sizes of library.
      data set name: ft33f001
      8/29/1996 date library was produced
      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
      *****
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
power= .00mw, burnup= 23237.mwd, flux= 2.94E+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 1.291305E+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
      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
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
power= .00mw, burnup= 23237.mwd, flux= 2.94E+07n/cm**2-sec
      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

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  
 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

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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

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

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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  
 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

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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  
 0 power= 4.890E-04mw, burnup=2.3237E+04mwd, flux= 2.94E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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h 1	charge	***** d	***** d	***** d	***** d	***** d
h 2	1.36E-03	1.36E-03	1.37E-03	1.38E-03	1.38E-03	1.38E-03
h 3	4.06E-06	4.08E-06	4.10E-06	4.12E-06	4.14E-06	4.14E-06
h 4	5.44E-12	7.31E-12	7.32E-12	7.33E-12	7.34E-12	5.39E-12
he 3	.00E+00	3.66E-36	3.67E-36	3.67E-36	3.68E-36	.00E+00
he 4	1.77E-08	1.78E-08	1.78E-08	1.79E-08	1.79E-08	1.79E-08
he 6	2.25E-04	2.26E-04	2.27E-04	2.29E-04	2.30E-04	2.30E-04
ne 20	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00	.00E+00
ne 21	2.71E-05	2.72E-05	2.73E-05	2.75E-05	2.76E-05	2.76E-05
ne 22	1.11E-08	1.12E-08	1.13E-08	1.14E-08	1.16E-08	1.16E-08
ne 23	1.78E-07	1.79E-07	1.80E-07	1.81E-07	1.82E-07	1.82E-07
na 22	8.87E-31	8.85E-16	8.85E-16	8.85E-16	8.86E-16	8.86E-31
na 23	1.30E-12	5.25E-12	5.25E-12	5.26E-12	5.26E-12	1.21E-12
na 24	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03	7.53E+03
na 24m	3.23E-24	3.22E-09	3.22E-09	3.22E-09	3.22E-09	3.22E-24
na 25	5.31E-31	5.28E-16	5.29E-16	5.29E-16	5.29E-16	5.29E-31
mg 24	4.01E-39	4.05E-24	4.09E-24	4.13E-24	4.17E-24	4.17E-39
mg 25	1.75E-01	1.76E-01	1.77E-01	1.78E-01	1.78E-01	1.78E-01
mg 26	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
flux		2.94E+07	2.94E+07	2.94E+07	2.94E+07	2.94E-08

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

actinides page 202

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

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

actinides

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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

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  
0

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

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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
flux		2.94E+07	2.94E+07	2.94E+07	2.94E+07	2.94E+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 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 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-v
*
*   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
0
0
0
```

```
other identification and sizes of library.
data set name: ft33f001
8/29/1996 date library was produced
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
*****
```

```
0
0
```

```
sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2
power= .00mw, burnup= 23684.mwd, flux= 2.95E+07n/cm**2-sec
```

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```
0
0
```

```
basis =
(note, k-infinities, clad and moderator absorptions are correct, only, if correctly weighted cross sections are applied.)
initial ***** d ***** d ***** d ***** d ***** d ***** d
```

```
0
0
0
0
```

```
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
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
0
```

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

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```
0
```

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

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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

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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

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

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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  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

h 1	charge	***** 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
flux		2.94E+07	2.94E+07	2.95E+07	2.95E+07	2.95E+08

0  
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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  
 nuclide concentrations, gram atoms









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	1.286968E+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

	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 fraction of total absorption rate fission products page 215

0 power= .00mw, burnup= 24130.mwd, flux= 2.95E+07n/cm\*\*2-sec  
 initial \*\*\*\*\* 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
i 129	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	***** 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	1.48E-06	1.49E-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	6.49E-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							

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

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

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.890E-04mw, burnup=2.4130E+04mwd, flux= 2.95E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

light elements

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	charge	***** d	***** 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	
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  
 power= 4.890E-04mw, burnup=2.4130E+04mwd, flux= 2.95E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides

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





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

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sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.890E-04mw, burnup=2.4130E+04mwd, flux= 2.95E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides

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	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
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.

0

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 densities



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  
 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

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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	6.68E-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  
 0 fraction of total absorption rate  
 0 power= .00mw, burnup= 24577.mwd, flux= 2.95E+07n/cm\*\*2-sec  
 initial \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d \*\*\*\*\* d

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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

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

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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

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

light elements page 228

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
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  
 power= 4.890E-04mw, burnup=2.4577E+04mwd, flux= 2.95E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

actinides page 229

	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

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

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	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

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

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

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	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
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               \*  
 \*               \*  
 \*\*\*\*\*





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  
 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

fission products

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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	4.50E-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  
 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

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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  
initial \*\*\*\*\* d \*\*\*\*\* 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  
0 power= 4.890E-04mw, burnup=2.5023E+04mwd, flux= 2.96E+07n/cm\*\*2-sec  
nuclide concentrations, gram atoms  
basis = single reactor assembly

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

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

0 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 power= 4.890E-04mw, burnup=2.5023E+04mwd, flux= 2.96E+07n/cm\*\*2-sec

actinides page 238

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

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0 power= 4.890E-04mw, burnup=2.5023E+04mwd, flux= 2.96E+07n/cm\*\*2-sec  
 nuclide concentrations, gram atoms  
 basis = single reactor assembly

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

1 sas2h: far-field crit based on b&w 15x15, 3.00wt%, 20gwd/mtu 40% h2o/ 8% uo2  
 0 power= 4.890E-04mw, burnup=2.5023E+04mwd, flux= 2.96E+07n/cm\*\*2-sec  
 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 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
*
*****
*
*      .other identification and sizes of library.
*      data set name: ft33f001
*      8/29/1996 date library was produced
*      1697 total number of nuclides in library
*      689 number of light-element nuclides
*      129 number of actinide nuclides
    
```

0  
0  
0  
0  
0

```

0          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
0 power= .00mw, burnup= 25470.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 ***** d
0 productions 1.280524E+06 1.279857E+06 1.279196E+06 1.278541E+06 1.277893E+06 1.277883E+06
0 absorptions 1.044879E+06 1.044567E+06 1.044258E+06 1.043953E+06 1.043652E+06 1.043646E+06
0 k infinity, 1.225524E+00 1.225251E+00 1.224980E+00 1.224711E+00 1.224444E+00 1.224442E+00
0 initial ***** d ***** d ***** d ***** d ***** d
0 actinide
0 absorptions 1.024956E+06 1.024606E+06 1.024260E+06 1.023918E+06 1.023578E+06 1.023573E+06
0 non-actinide
0 abs. frags. 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
0 fraction of total absorption rate
0 power= .00mw, burnup= 25470.mwd, flux= 2.96E+07n/cm**2-sec
0 initial ***** d ***** d ***** d ***** d ***** d ***** d
0
0 sm149 5.42E-03 5.42E-03 5.42E-03 5.42E-03 5.42E-03 5.42E-03
0 nd143 2.43E-03 2.44E-03 2.45E-03 2.46E-03 2.47E-03 2.47E-03
0 eu151 2.01E-03 2.01E-03 2.02E-03 2.02E-03 2.02E-03 2.03E-03
0 rh103 1.18E-03 1.19E-03 1.19E-03 1.20E-03 1.21E-03 1.21E-03
0 xe131 7.89E-04 7.93E-04 7.97E-04 8.00E-04 8.04E-04 8.04E-04
0 cs133 6.16E-04 6.19E-04 6.22E-04 6.24E-04 6.27E-04 6.27E-04
0 sm147 4.50E-04 4.53E-04 4.55E-04 4.57E-04 4.59E-04 4.59E-04
0 tc 99 3.99E-04 4.00E-04 4.01E-04 4.02E-04 4.04E-04 4.04E-04
0 nd145 3.48E-04 3.49E-04 3.51E-04 3.53E-04 3.54E-04 3.54E-04
0 sm152 2.78E-04 2.80E-04 2.81E-04 2.83E-04 2.84E-04 2.84E-04
0 mo 95 2.41E-04 2.42E-04 2.43E-04 2.44E-04 2.46E-04 2.46E-04
0 gd155 2.25E-04 2.25E-04 2.25E-04 2.24E-04 2.24E-04 2.24E-04
0 sm150 1.85E-04 1.86E-04 1.86E-04 1.87E-04 1.88E-04 1.88E-04
0 kr 83 1.48E-04 1.49E-04 1.50E-04 1.50E-04 1.51E-04 1.51E-04
0 cs135 1.39E-04 1.40E-04 1.41E-04 1.41E-04 1.42E-04 1.42E-04
0 eu153 1.14E-04 1.15E-04 1.15E-04 1.16E-04 1.17E-04 1.17E-04
0 ru101 1.08E-04 1.09E-04 1.09E-04 1.10E-04 1.11E-04 1.11E-04
0 pr141 1.05E-04 1.05E-04 1.06E-04 1.06E-04 1.07E-04 1.07E-04
0 cd113 1.02E-04 1.02E-04 1.02E-04 1.02E-04 1.02E-04 1.02E-04
0 la139 8.56E-05 8.60E-05 8.64E-05 8.68E-05 8.72E-05 8.72E-05
0 gd157 5.85E-05 5.83E-05 5.82E-05 5.80E-05 5.79E-05 5.79E-05
0 ag109 4.51E-05 4.53E-05 4.55E-05 4.58E-05 4.60E-05 4.60E-05
0 pd105 4.41E-05 4.43E-05 4.45E-05 4.47E-05 4.49E-05 4.49E-05
0 ba137 4.15E-05 4.17E-05 4.19E-05 4.21E-05 4.23E-05 4.23E-05
0 zr 93 3.32E-05 3.33E-05 3.35E-05 3.36E-05 3.38E-05 3.38E-05
0 i129 2.81E-05 2.83E-05 2.84E-05 2.85E-05 2.87E-05 2.87E-05
0 nd144 2.67E-05 2.68E-05 2.69E-05 2.71E-05 2.72E-05 2.72E-05
0 gd152 2.43E-05 2.45E-05 2.47E-05 2.49E-05 2.50E-05 2.50E-05
0 mo 97 1.94E-05 1.95E-05 1.96E-05 1.97E-05 1.98E-05 1.98E-05
0 pd108 1.08E-05 1.09E-05 1.09E-05 1.10E-05 1.10E-05 1.10E-05
0 zr 91 8.91E-06 8.96E-06 9.00E-06 9.04E-06 9.08E-06 9.08E-06
0 ru 99 8.44E-06 8.57E-06 8.70E-06 8.84E-06 8.97E-06 8.97E-06
0 y 89 8.53E-06 8.57E-06 8.61E-06 8.65E-06 8.69E-06 8.69E-06
0 ru102 8.16E-06 8.19E-06 8.23E-06 8.27E-06 8.31E-06 8.31E-06
0 ce142 7.14E-06 7.17E-06 7.21E-06 7.24E-06 7.27E-06 7.27E-06
0 nd148 6.86E-06 6.90E-06 6.93E-06 6.96E-06 6.99E-06 6.99E-06
0 sm151 6.61E-06 6.95E-06 6.96E-06 6.96E-06 6.96E-06 6.61E-06
0 nd146 5.80E-06 5.83E-06 5.86E-06 5.89E-06 5.92E-06 5.92E-06
0 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

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0 fraction of total absorption rate  
 power= .00mw, burnup= 25470.mwd flux= 2.96E+07n/cm\*\*2-sec  
 0 initial \*\*\*\*\* 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	4.56E-08	4.58E-08	4.60E-08	4.61E-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						
0	power=	.00mw, burnup=	25470.mwd, flux=	2.96E+07n/cm**2-sec			
	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						