

## **Attachment C**

### **MACCS2 Meteorological Input File for CR-3 (cr3met.inp)**

(Note – This attachment has been re-formatted from the original BAW-2369. The attachment was changed from a one-column to a three-column computer input stream. No data was deleted.)

CR3 NUCLEAR PLANT:  
 WEATHER DATA (1998)  
 FILE

MACCS FORMAT

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359	17	10	246	5	362	6	7	351	0	364	19	11	464	0
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359	19	10	286	0	362	8	3	441	0	364	21	12	424	0
359	20	12	56	5	362	9	5	271	0	364	22	12	484	5
359	21	15	156	0	362	10	5	284	0	364	23	12	374	0
359	22	12	176	5	362	11	6	294	0	364	24	12	464	0
359	23	14	86	0	362	12	5	275	0	365	1	5	345	0
359	24	10	226	0	362	13	7	175	5	365	2	6	245	0
360	1	12	225	0	362	14	8	275	0	365	3	5	215	0
360	2	12	272	5	362	15	9	165	0	365	4	6	275	0
360	3	12	391	0	362	16	12	444	0	365	5	6	265	0
360	4	11	341	0	362	17	12	434	0	365	6	7	245	0
360	5	10	291	0	362	18	12	424	5	365	7	8	175	0
360	6	11	321	0	362	19	11	374	0	365	8	10	125	0
360	7	11	371	5	362	20	11	464	5	365	9	9	125	0
360	8	11	424	0	362	21	12	474	0	365	10	9	205	0
360	9	11	425	0	362	22	12	494	0	365	11	9	205	0
360	10	12	206	0	362	23	11	464	0	365	12	9	225	0
360	11	12	276	0	362	24	12	444	0	365	13	13	115	5
360	12	12	276	0	363	1	12	424	0	365	14	9	105	0
360	13	12	256	0	363	2	12	484	5	365	15	11	65	0
360	14	12	276	0	363	3	12	374	0	365	16	12	195	0
360	15	12	326	0	363	4	12	464	0	365	17	12	185	0
360	16	12	376	0	363	5	12	662	5	365	18	12	245	5
360	17	12	376	5	363	6	3	441	0	365	19	12	255	0
360	18	12	386	0	363	7	5	271	0	365	20	11	226	0
360	19	13	286	0	363	8	5	284	0	365	21	13	175	0
360	20	12	246	5	363	9	6	294	0	365	22	12	205	0
360	21	12	246	0	363	10	5	275	0	365	23	5	362	0
360	22	12	376	0	363	11	7	175	5	365	24	5	362	0
360	23	12	375	0	363	12	8	275	0	11.0				
360	24	12	265	0	363	13	9	165	0	16.0			16.0	
361	1	12	316	0	363	14	12	444	0	14.0			11.0	
361	2	14	251	0	363	15	12	434	0	16.0			16.0	
361	3	15	431	5	363	16	12	424	5	14.				
361	4	15	511	0	363	17	11	374	0	•				
361	5	1	484	5	363	18	11	464	5					
361	6	4	343	0	363	19	12	474	0					
361	7	6	331	5	363	20	12	494	0					
361	8	7	351	0	363	21	11	464	0					
361	9	7	384	0	363	22	12	444	0					
361	10	7	384	0	363	23	12	424	0					
361	11	7	384	0	363	24	12	484	5					
361	12	7	384	0	364	1	12	374	0					
361	13	7	384	0	364	2	12	464	0					
361	14	7	384	0	364	3	12	662	0					
361	15	7	384	0	364	4	12	662	0					
361	16	7	384	0	364	5	12	662	0					
361	17	7	384	0	364	6	12	662	0					
361	18	7	384	0	364	7	11	464	5					

## **Attachment D**

### **MACCS2 Site Input File for CR-3 (cr3site.inp)**

MACCS SITE DATA FILE FOR CR3  
 SECPOP POP DISTRIBUTION FROM 2000 CENSUS DATA

10 SPATIAL INTERVALS

16 WIND DIRECTIONS

7 CROP CATEGORIES

4 WATER PATHWAY ISOTOPES

2 WATERSHEDS

59 ECONOMIC REGIONS

SPATIAL DISTANCES

	1.61	3.22	4.83	6.44	8.05	16.10	32.21	48.31
64.41	80.52							
POPULATION								
0.	0.	0.	0.	270.	302.	1216.	2061.	
2825.	15643.							
0.	0.	0.	0.	540.	302.	1216.	2061.	
5895.	39230.							
0.	0.	0.	23.	0.	302.	3334.	6768.	
13463.	15578.							
0.	0.	0.	169.	75.	2675.	5770.	9616.	
61515.	17309.							
0.	0.	0.	40.	93.	2675.	10692.	4623.	
11589.	17788.							
0.	0.	0.	0.	270.	2675.	10692.	17730.	
821.	10692.							
0.	0.	0.	0.	60.	9364.	10692.	17828.	
16675.	28713.							
0.	0.	0.	0.	30.	2675.	10692.	15074.	
28189.	68713.							
0.	0.	0.	0.	0.	1338.	5346.	6970.	
9757.	73158.							
0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.							
0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.							
0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.							
0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.							
0.	0.	0.	0.	0.	0.	0.	1614.	
1356.	2224.							
0.	0.	0.	0.	405.	302.	1216.	2061.	
3619.	2894.							

LAND FRACTION

1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

REGION INDEX

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WATERSHED INDEX

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CROP SEASON AND SHARE

1 PASTURE	90.	270.	0.41
2 STORED FORAGE	150.	240.	0.13
3 GRAINS	150.	240.	0.21
4 GRN LEAFY VEGETABLES	150.	240.	0.002
5 OTHER FOOD CROPS	150.	240.	0.004
6 LEGUMES AND SEEDS	150.	240.	0.15
7 ROOTS AND TUBERS	150.	240.	0.003

WATERSHED DEFINITION 1111111111222222222222222233333333333344444444444

1 Sr-89	5.0e-6	0.0
2 Sr-90	5.0e-6	0.0
3 Cs-134	5.0e-6	0.0
4 Cs-137	5.0e-6	0.0

REGIONAL ECONOMIC DATA

1 ALA	.354	.040	459.	1824.	62000.
2 ARIZ	.516	.104	110.	682.	74000.
3 ARK	.483	.041	466.	2049.	61000.
4 CALIF	.330	.144	1022.	4394.	93000.
5 COLO	.522	.048	211.	971.	83000.
6 CONN	.160	.294	1605.	4980.	107000.
7 DEL	.534	.042	1723.	3428.	82000.
8 FLA	.375	.080	832.	3341.	80000.
9 GA	.363	.060	613.	1885.	73000.
10 IDAHO	.279	.144	343.	1562.	61000.
11 ILL	.806	.044	709.	3900.	86000.
12 IND	.713	.079	611.	3283.	72000.
13 IOWA	.938	.060	695.	3133.	73000.
14 KANS	.917	.035	281.	1204.	81000.
15 KY	.571	.112	482.	1838.	61000.
16 LA	.354	.074	459.	3284.	61000.
17 MAINE	.079	.260	662.	1133.	70000.

18 MD	.429	.216	956.	4489.	93000.
19 MASS	.136	.249	1349.	2563.	97000.
20 MICH	.313	.247	658.	2187.	81000.
21 MINN	.597	.223	516.	2111.	82000.
22 MISS	.470	.054	403.	2084.	53000.
23 MO	.703	.102	322.	1647.	76000.
24 MONT	.657	.030	61.	563.	65000.
25 NEBR	.962	.031	318.	1148.	75000.
26 NEV	.127	.139	63.	601.	84000.
27 N.H.	.096	.482	518.	2018.	87000.
28 N.J.	.203	.129	1399.	6477.	102000.
29 N.MEX	.590	.144	53.	473.	63000.
30 N.Y.	.310	.589	711.	1378.	94000.
31 N.C.	.352	.065	860.	2658.	68000.
32 N.DAK	.924	.048	164.	948.	69000.
33 OHIO	.602	.175	581.	2686.	76000.
34 OKLA	.751	.060	204.	1508.	67000.
35 OREG	.292	.111	236.	1203.	73000.
36 PA	.303	.447	855.	2534.	78000.
37 R.I.	.108	.213	1062.	6438.	80000.
38 S.C.	.290	.084	472.	1843.	62000.
39 S.DAK	.915	.091	145.	587.	65000.
40 TENN	.509	.153	360.	1850.	66000.
41 TEX	.816	.064	164.	1492.	74000.
42 UTAH	.225	.259	123.	1286.	60000.
43 VT	.286	.789	628.	1472.	73000.
44 VA	.382	.198	371.	2075.	84000.
45 WASH	.377	.154	476.	1948.	82000.
46 W.VA	.246	.224	150.	1728.	58000.
47 WIS	.517	.591	723.	1751.	76000.
48 WYO	.561	.028	43.	380.	70000.
49 BRIT COL	.377	.154	476.	1948.	60000.
50 OCEAN	.000	.000	0.	0.	0.
51 SASKAT	.657	.030	61.	563.	60000.
52 MANITOBA	.924	.048	164.	948.	60000.
53 ONTARIO	.597	.223	516.	2111.	60000.
54 QUEBEC	.310	.589	711.	1378.	60000.
55 NOVA SCOT	.079	.260	662.	1133.	60000.
56 BAJA CAL	.330	.144	1022.	4394.	10000.
57 SONORA	.516	.104	110.	682.	10000.
58 CHIHUAHUA	.590	.144	53.	473.	10000.
59 COAHUILA	.816	.064	164.	1492.	10000.

END

## **Attachment E**

### **MACCS2 ATMOS Input File for CR-3 (cr3atmos.inp)**

```

* GENERAL DESCRIPTIVE TITLE DESCRIBING THIS "ATMOS" INPUT
*
RIATNAM1001 'CR3ATMOS.INP, Using Table-Lookup Sigmas, ATMOS input'
*****
* GEOMETRY DATA BLOCK, LOADED BY INPGE0, STORED IN /GEOM/
*
* NUMBER OF RADIAL SPATIAL ELEMENTS
*
GENUMRAD001  10
*
*   CR3
*
GESPAEND001   1.61      3.22      4.83      6.44      8.05
GESPAEND002   16.10     32.21     48.31     64.41     80.52
*****
* NUCLIDE DATA BLOCK, LOADED BY INPISO, STORED IN /ISOGRP/, /ISONAM/
*
* Number of pseudo-stable nuclides (used to truncate the decay chains)
*
ISNUMSTB001   27
*
* List of pseudo-stable nuclides
*
ISNAMSTB001    I-129      (daughter of Te-129 and Te-129m)
ISNAMSTB002    Xe-131m    (daughter of I-131)
ISNAMSTB003    Xe-133m    (daughter of I-133)
ISNAMSTB004    Xe-135m    (daughter of I-135)
ISNAMSTB005    Cs-135     (daughter of Xe-135 and Xe-135m)
ISNAMSTB006    Sm-147     (daughter of Pm-147)
ISNAMSTB007    U-234      (daughter of Pu-238)
ISNAMSTB008    U-235      (daughter of Pu-239)
ISNAMSTB009    U-236      (daughter of Pu-240)
ISNAMSTB010    U-237      (daughter of Pu-241)
ISNAMSTB011    Np-237     (daughter of Am-241)
ISNAMSTB012    Rb-87      (daughter of Kr-87)
ISNAMSTB013    Ba-137m    (daughter of Cs-137)
ISNAMSTB014    Rb-88      (daughter of Kr-88)
ISNAMSTB015    Y-91m      (daughter of Sr-91)
ISNAMSTB016    Zr-93      (daughter of Y-93)
ISNAMSTB017    Nb-93m     (daughter of Zr-93)
ISNAMSTB018    Nb-95m     (daughter of Zr-95)
ISNAMSTB019    Nb-97      (daughter of Zr-97 and Nb-97m)
ISNAMSTB020    Nb-97m     (daughter of Zr-97)
ISNAMSTB021    Tc-99      (daughter of Mo-99)
ISNAMSTB022    Rh-103m    (daughter of Ru-103)
ISNAMSTB023    Rh-106     (daughter of Ru-106)
ISNAMSTB024    Te-131     (daughter of Te-131m)
ISNAMSTB025    Pr-144     (daughter of Ce-144 and Pr-144m)
ISNAMSTB026    Pr-144m    (daughter of Ce-144)
ISNAMSTB027    Pm-147     (daughter of Nd-147)
*
* Number of radioactive nuclides to be considered
*
ISNUMISO001  60
*
* NUMBER OF NUCLIDE GROUPS
*
ISMAXGRP001   9
*
* WET AND DRY DEPOSITION FLAGS FOR EACH NUCLIDE GROUP
*
*           WETDEP      DRYDEP
*
ISDEPFLA001   .FALSE.   .FALSE.

```

ISDEPFLA002	.TRUE.	.TRUE.
ISDEPFLA003	.TRUE.	.TRUE.
ISDEPFLA004	.TRUE.	.TRUE.
ISDEPFLA005	.TRUE.	.TRUE.
ISDEPFLA006	.TRUE.	.TRUE.
ISDEPFLA007	.TRUE.	.TRUE.
ISDEPFLA008	.TRUE.	.TRUE.
ISDEPFLA009	.TRUE.	.TRUE.

\*

\* NUCLIDE GROUP DATA FOR 9 NUCLIDE GROUPS

\*

	NUCNAM	IGROUP
--	--------	--------

\*

ISOTPGRP001	Co-58	6
ISOTPGRP002	Co-60	6
ISOTPGRP003	Kr-85	1
ISOTPGRP004	Kr-85m	1
ISOTPGRP005	Kr-87	1
ISOTPGRP006	Kr-88	1
ISOTPGRP007	Rb-86	3
ISOTPGRP008	Sr-89	5
ISOTPGRP009	Sr-90	5
ISOTPGRP010	Sr-91	5
ISOTPGRP011	Sr-92	5
ISOTPGRP012	Y-90	7
ISOTPGRP013	Y-91	7
ISOTPGRP014	Y-92	7
ISOTPGRP015	Y-93	7
ISOTPGRP016	Zr-95	7
ISOTPGRP017	Zr-97	7
ISOTPGRP018	Nb-95	7
ISOTPGRP019	Mo-99	6
ISOTPGRP020	Tc-99m	6
ISOTPGRP021	Ru-103	6
ISOTPGRP022	Ru-105	6
ISOTPGRP023	Ru-106	6
ISOTPGRP024	Rh-105	6
ISOTPGRP025	Sb-127	4
ISOTPGRP026	Sb-129	4
ISOTPGRP027	Te-127	4
ISOTPGRP028	Te-127m	4
ISOTPGRP029	Te-129	4
ISOTPGRP030	Te-129m	4
ISOTPGRP031	Te-131m	4
ISOTPGRP032	Te-132	4
ISOTPGRP033	I-131	2
ISOTPGRP034	I-132	2
ISOTPGRP035	I-133	2
ISOTPGRP036	I-134	2
ISOTPGRP037	I-135	2
ISOTPGRP038	Xe-133	1
ISOTPGRP039	Xe-135	1
ISOTPGRP040	Cs-134	3
ISOTPGRP041	Cs-136	3
ISOTPGRP042	Cs-137	3
ISOTPGRP043	Ba-139	9
ISOTPGRP044	Ba-140	9
ISOTPGRP045	La-140	7
ISOTPGRP046	La-141	7
ISOTPGRP047	La-142	7
ISOTPGRP048	Ce-141	8
ISOTPGRP049	Ce-143	8
ISOTPGRP050	Ce-144	8
ISOTPGRP051	Pr-143	7



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ISOTPGRP052      Nd-147      7
ISOTPGRP053      Np-239      8
ISOTPGRP054      Pu-238      8
ISOTPGRP055      Pu-239      8
ISOTPGRP056      Pu-240      8
ISOTPGRP057      Pu-241      8
ISOTPGRP058      Am-241      7
ISOTPGRP059      Cm-242      7
ISOTPGRP060      Cm-244      7
*****
* WET DEPOSITION DATA BLOCK, LOADED BY INPWET, STORED IN /WETCON/
*
* WASHOUT COEFFICIENT NUMBER ONE, LINEAR FACTOR
*
WDCWASH1001  9.5E-5  (JON HELTON AFTER JONES, 1986)
*
* WASHOUT COEFFICIENT NUMBER TWO, EXPONENTIAL FACTOR
*
WDCWASH2001  0.8    (JON HELTON AFTER JONES, 1986)
*****
* DRY DEPOSITION DATA BLOCK, LOADED BY INPDY, STORED IN /DRYCON/
*
* NUMBER OF PARTICLE SIZE GROUPS
*
DDNPSGRP001    1
*
* DEPOSITION VELOCITY OF EACH PARTICLE SIZE GROUP (M/S)
*
DDVDEPOS001    0.01  (VALUE SELECTED BY S. ACHARYA, NRC)
*****
* DISPERSION PARAMETER DATA BLOCK, LOADED BY INPDIS, STORED IN /DISPY/, /DISPZ/
*
* # of distances in plume-size tables--which can be used as an alternative to the power-
law model:
* (to utilize the power-law model, set NUM_DIST to zero or delete the following data card)
*
NUM_DIST001    50
*
* A-stability      Distance (m)  Sigma-y (m)      Sigma-z (m)
A-STB/DIS01      1.000E+00      3.6580E-01      2.5000E-04      Tadmor/Gur (0.5-5 km)
A-STB/DIS02      1.400E+00      4.9569E-01      5.1105E-04      Tadmor/Gur (0.5-5 km)
A-STB/DIS03      2.000E+00      6.8408E-01      1.0905E-03      Tadmor/Gur (0.5-5 km)
A-STB/DIS04      3.000E+00      9.8658E-01      2.5812E-03      Tadmor/Gur (0.5-5 km)
A-STB/DIS05      4.000E+00      1.2793E+00      4.7568E-03      Tadmor/Gur (0.5-5 km)
A-STB/DIS06      5.000E+00      1.5649E+00      7.6428E-03      Tadmor/Gur (0.5-5 km)
A-STB/DIS07      6.000E+00      1.8450E+00      1.1259E-02      Tadmor/Gur (0.5-5 km)
A-STB/DIS08      8.000E+00      2.3923E+00      2.0749E-02      Tadmor/Gur (0.5-5 km)
A-STB/DIS09      1.000E+01      2.9265E+00      3.3338E-02      Tadmor/Gur (0.5-5 km)
A-STB/DIS10      1.000E+02      2.3412E+01      4.4457E+00      Tadmor/Gur (0.5-5 km)
A-STB/DIS11      1.400E+02      3.1726E+01      9.0879E+00      Tadmor/Gur (0.5-5 km)
A-STB/DIS12      2.000E+02      4.3783E+01      1.9392E+01      Tadmor/Gur (0.5-5 km)
A-STB/DIS13      3.000E+02      6.3144E+01      4.5901E+01      Tadmor/Gur (0.5-5 km)
A-STB/DIS14      4.000E+02      8.1877E+01      8.4590E+01      Tadmor/Gur (0.5-5 km)
A-STB/DIS15      5.000E+02      1.0016E+02      1.3591E+02      Tadmor/Gur (0.5-5 km)
A-STB/DIS16      6.000E+02      1.1808E+02      2.0022E+02      Tadmor/Gur (0.5-5 km)
A-STB/DIS17      8.000E+02      1.5312E+02      3.6898E+02      Tadmor/Gur (0.5-5 km)
A-STB/DIS18      1.000E+03      1.8730E+02      5.9284E+02      Tadmor/Gur (0.5-5 km)
A-STB/DIS19      1.400E+03      2.5381E+02      1.2119E+03      Tadmor/Gur (0.5-5 km)
A-STB/DIS20      2.000E+03      3.5027E+02      2.5860E+03      Tadmor/Gur (0.5-5 km)
A-STB/DIS21      3.000E+03      5.0516E+02      6.1210E+03      Tadmor/Gur (0.5-5 km)
A-STB/DIS22      4.000E+03      6.5503E+02      1.1280E+04      Tadmor/Gur (0.5-5 km)
A-STB/DIS23      5.000E+03      8.0128E+02      1.8124E+04      Tadmor/Gur (0.5-5 km)
A-STB/DIS24      6.000E+03      9.4470E+02      2.6700E+04      Tadmor/Gur (0.5-5 km)
A-STB/DIS25      8.000E+03      1.2250E+03      4.9205E+04      Tadmor/Gur (0.5-5 km)
A-STB/DIS26      1.000E+04      1.4985E+03      7.9057E+04      Tadmor/Gur (0.5-5 km)

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A-STB/DIS27	1.400E+04	2.0305E+03	1.6161E+05	Tadmor/Gur	(0.5-5 km)
A-STB/DIS28	2.000E+04	2.8022E+03	3.4485E+05	Tadmor/Gur	(0.5-5 km)
A-STB/DIS29	3.000E+04	4.0414E+03	8.1625E+05	Tadmor/Gur	(0.5-5 km)
A-STB/DIS30	4.000E+04	5.2404E+03	1.5042E+06	Tadmor/Gur	(0.5-5 km)
A-STB/DIS31	5.000E+04	6.4104E+03	2.4169E+06	Tadmor/Gur	(0.5-5 km)
A-STB/DIS32	6.000E+04	7.5577E+03	3.5605E+06	Tadmor/Gur	(0.5-5 km)
A-STB/DIS33	8.000E+04	9.8000E+03	6.5615E+06	Tadmor/Gur	(0.5-5 km)
A-STB/DIS34	1.000E+05	1.1988E+04	1.0542E+07	Tadmor/Gur	(0.5-5 km)
A-STB/DIS35	1.400E+05	1.6245E+04	2.1551E+07	Tadmor/Gur	(0.5-5 km)
A-STB/DIS36	2.000E+05	2.2418E+04	4.5986E+07	Tadmor/Gur	(0.5-5 km)
A-STB/DIS37	3.000E+05	3.2332E+04	1.0885E+08	Tadmor/Gur	(0.5-5 km)
A-STB/DIS38	4.000E+05	4.1924E+04	2.0059E+08	Tadmor/Gur	(0.5-5 km)
A-STB/DIS39	5.000E+05	5.1284E+04	3.2229E+08	Tadmor/Gur	(0.5-5 km)
A-STB/DIS40	6.000E+05	6.0463E+04	4.7480E+08	Tadmor/Gur	(0.5-5 km)
A-STB/DIS41	8.000E+05	7.8401E+04	8.7500E+08	Tadmor/Gur	(0.5-5 km)
A-STB/DIS42	1.000E+06	9.5906E+04	1.4059E+09	Tadmor/Gur	(0.5-5 km)
A-STB/DIS43	1.400E+06	1.2996E+05	2.8738E+09	Tadmor/Gur	(0.5-5 km)
A-STB/DIS44	2.000E+06	1.7935E+05	6.1324E+09	Tadmor/Gur	(0.5-5 km)
A-STB/DIS45	3.000E+06	2.5866E+05	1.4515E+10	Tadmor/Gur	(0.5-5 km)
A-STB/DIS46	4.000E+06	3.3540E+05	2.6750E+10	Tadmor/Gur	(0.5-5 km)
A-STB/DIS47	5.000E+06	4.1028E+05	4.2979E+10	Tadmor/Gur	(0.5-5 km)
A-STB/DIS48	6.000E+06	4.8372E+05	6.3316E+10	Tadmor/Gur	(0.5-5 km)
A-STB/DIS49	8.000E+06	6.2723E+05	1.1668E+11	Tadmor/Gur	(0.5-5 km)
A-STB/DIS50	1.000E+07	7.6726E+05	1.8747E+11	Tadmor/Gur	(0.5-5 km)

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* B-stability	Distance (m)	Sigma-y (m)	Sigma-z (m)		
B-STB/DIS01	1.000E+00	2.7510E-01	1.9000E-03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS02	1.400E+00	3.7279E-01	3.2574E-03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS03	2.000E+00	5.1446E-01	5.7681E-03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS04	3.000E+00	7.4196E-01	1.1045E-02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS05	4.000E+00	9.6208E-01	1.7511E-02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS06	5.000E+00	1.1769E+00	2.5036E-02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS07	6.000E+00	1.3875E+00	3.3530E-02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS08	8.000E+00	1.7992E+00	5.3161E-02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS09	1.000E+01	2.2009E+00	7.6007E-02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS10	1.000E+02	1.7607E+01	3.0406E+00	Tadmor/Gur	(0.5-5 km)
B-STB/DIS11	1.400E+02	2.3859E+01	5.2127E+00	Tadmor/Gur	(0.5-5 km)
B-STB/DIS12	2.000E+02	3.2927E+01	9.2307E+00	Tadmor/Gur	(0.5-5 km)
B-STB/DIS13	3.000E+02	4.7487E+01	1.7675E+01	Tadmor/Gur	(0.5-5 km)
B-STB/DIS14	4.000E+02	6.1576E+01	2.8023E+01	Tadmor/Gur	(0.5-5 km)
B-STB/DIS15	5.000E+02	7.5323E+01	4.0066E+01	Tadmor/Gur	(0.5-5 km)
B-STB/DIS16	6.000E+02	8.8805E+01	5.3657E+01	Tadmor/Gur	(0.5-5 km)
B-STB/DIS17	8.000E+02	1.1515E+02	8.5073E+01	Tadmor/Gur	(0.5-5 km)
B-STB/DIS18	1.000E+03	1.4086E+02	1.2163E+02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS19	1.400E+03	1.9088E+02	2.0853E+02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS20	2.000E+03	2.6342E+02	3.6926E+02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS21	3.000E+03	3.7991E+02	7.0705E+02	Tadmor/Gur	(0.5-5 km)
B-STB/DIS22	4.000E+03	4.9262E+02	1.1210E+03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS23	5.000E+03	6.0260E+02	1.6028E+03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS24	6.000E+03	7.1046E+02	2.1465E+03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS25	8.000E+03	9.2124E+02	3.4033E+03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS26	1.000E+04	1.1269E+03	4.8658E+03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS27	1.400E+04	1.5271E+03	8.3419E+03	Tadmor/Gur	(0.5-5 km)
B-STB/DIS28	2.000E+04	2.1074E+03	1.4772E+04	Tadmor/Gur	(0.5-5 km)
B-STB/DIS29	3.000E+04	3.0393E+03	2.8285E+04	Tadmor/Gur	(0.5-5 km)
B-STB/DIS30	4.000E+04	3.9410E+03	4.4845E+04	Tadmor/Gur	(0.5-5 km)
B-STB/DIS31	5.000E+04	4.8209E+03	6.4117E+04	Tadmor/Gur	(0.5-5 km)
B-STB/DIS32	6.000E+04	5.6838E+03	8.5868E+04	Tadmor/Gur	(0.5-5 km)
B-STB/DIS33	8.000E+04	7.3701E+03	1.3614E+05	Tadmor/Gur	(0.5-5 km)
B-STB/DIS34	1.000E+05	9.0155E+03	1.9465E+05	Tadmor/Gur	(0.5-5 km)
B-STB/DIS35	1.400E+05	1.2217E+04	3.3371E+05	Tadmor/Gur	(0.5-5 km)
B-STB/DIS36	2.000E+05	1.6860E+04	5.9093E+05	Tadmor/Gur	(0.5-5 km)
B-STB/DIS37	3.000E+05	2.4315E+04	1.1315E+06	Tadmor/Gur	(0.5-5 km)
B-STB/DIS38	4.000E+05	3.1529E+04	1.7940E+06	Tadmor/Gur	(0.5-5 km)

B-STB/DIS39	5.000E+05	3.8568E+04	2.5649E+06	Tadmor/Gur	(0.5-5 km)
B-STB/DIS40	6.000E+05	4.5471E+04	3.4350E+06	Tadmor/Gur	(0.5-5 km)
B-STB/DIS41	8.000E+05	5.8962E+04	5.4462E+06	Tadmor/Gur	(0.5-5 km)
B-STB/DIS42	1.000E+06	7.2126E+04	7.7867E+06	Tadmor/Gur	(0.5-5 km)
B-STB/DIS43	1.400E+06	9.7737E+04	1.3350E+07	Tadmor/Gur	(0.5-5 km)
B-STB/DIS44	2.000E+06	1.3488E+05	2.3639E+07	Tadmor/Gur	(0.5-5 km)
B-STB/DIS45	3.000E+06	1.9453E+05	4.5264E+07	Tadmor/Gur	(0.5-5 km)
B-STB/DIS46	4.000E+06	2.5224E+05	7.1765E+07	Tadmor/Gur	(0.5-5 km)
B-STB/DIS47	5.000E+06	3.0855E+05	1.0261E+08	Tadmor/Gur	(0.5-5 km)
B-STB/DIS48	6.000E+06	3.6378E+05	1.3741E+08	Tadmor/Gur	(0.5-5 km)
B-STB/DIS49	8.000E+06	4.7171E+05	2.1787E+08	Tadmor/Gur	(0.5-5 km)
B-STB/DIS50	1.000E+07	5.7702E+05	3.1150E+08	Tadmor/Gur	(0.5-5 km)

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* C-stability	Distance (m)	Sigma-y (m)	Sigma-z (m)		
C-STB/DIS01	1.000E+00	2.0890E-01	2.0000E-01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS02	1.400E+00	2.8308E-01	2.6660E-01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS03	2.000E+00	3.9066E-01	3.6158E-01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS04	3.000E+00	5.6341E-01	5.1125E-01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS05	4.000E+00	7.3056E-01	6.5369E-01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS06	5.000E+00	8.9367E-01	7.9097E-01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS07	6.000E+00	1.0536E+00	9.2428E-01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS08	8.000E+00	1.3662E+00	1.1818E+00	Tadmor/Gur	(0.5-5 km)
C-STB/DIS09	1.000E+01	1.6712E+00	1.4300E+00	Tadmor/Gur	(0.5-5 km)
C-STB/DIS10	1.000E+02	1.3370E+01	1.0224E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS11	1.400E+02	1.8118E+01	1.3629E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS12	2.000E+02	2.5003E+01	1.8484E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS13	3.000E+02	3.6060E+01	2.6136E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS14	4.000E+02	4.6758E+01	3.3417E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS15	5.000E+02	5.7198E+01	4.0435E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS16	6.000E+02	6.7435E+01	4.7250E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS17	8.000E+02	8.7442E+01	6.0414E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS18	1.000E+03	1.0696E+02	7.3102E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS19	1.400E+03	1.4495E+02	9.7447E+01	Tadmor/Gur	(0.5-5 km)
C-STB/DIS20	2.000E+03	2.0003E+02	1.3216E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS21	3.000E+03	2.8849E+02	1.8687E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS22	4.000E+03	3.7408E+02	2.3893E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS23	5.000E+03	4.5759E+02	2.8911E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS24	6.000E+03	5.3949E+02	3.3784E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS25	8.000E+03	6.9955E+02	4.3196E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS26	1.000E+04	8.5573E+02	5.2267E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS27	1.400E+04	1.1596E+03	6.9673E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS28	2.000E+04	1.6003E+03	9.4493E+02	Tadmor/Gur	(0.5-5 km)
C-STB/DIS29	3.000E+04	2.3080E+03	1.3361E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS30	4.000E+04	2.9927E+03	1.7083E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS31	5.000E+04	3.6608E+03	2.0671E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS32	6.000E+04	4.3161E+03	2.4155E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS33	8.000E+04	5.5965E+03	3.0884E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS34	1.000E+05	6.8460E+03	3.7371E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS35	1.400E+05	9.2770E+03	4.9816E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS36	2.000E+05	1.2803E+04	6.7562E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS37	3.000E+05	1.8464E+04	9.5529E+03	Tadmor/Gur	(0.5-5 km)
C-STB/DIS38	4.000E+05	2.3942E+04	1.2214E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS39	5.000E+05	2.9287E+04	1.4780E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS40	6.000E+05	3.4529E+04	1.7270E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS41	8.000E+05	4.4773E+04	2.2082E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS42	1.000E+06	5.4769E+04	2.6720E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS43	1.400E+06	7.4218E+04	3.5618E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS44	2.000E+06	1.0242E+05	4.8306E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS45	3.000E+06	1.4772E+05	6.8302E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS46	4.000E+06	1.9154E+05	8.7331E+04	Tadmor/Gur	(0.5-5 km)
C-STB/DIS47	5.000E+06	2.3430E+05	1.0567E+05	Tadmor/Gur	(0.5-5 km)
C-STB/DIS48	6.000E+06	2.7624E+05	1.2348E+05	Tadmor/Gur	(0.5-5 km)
C-STB/DIS49	8.000E+06	3.5819E+05	1.5788E+05	Tadmor/Gur	(0.5-5 km)
C-STB/DIS50	1.000E+07	4.3817E+05	1.9104E+05	Tadmor/Gur	(0.5-5 km)

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* D-stability	Distance (m)	Sigma-y (m)	Sigma-z (m)		
D-STB/DIS01	1.000E+00	1.4740E-01	3.0000E-01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS02	1.400E+00	1.9974E-01	3.7374E-01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS03	2.000E+00	2.7565E-01	4.7180E-01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS04	3.000E+00	3.9754E-01	6.1486E-01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS05	4.000E+00	5.1549E-01	7.4197E-01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS06	5.000E+00	6.3058E-01	8.5840E-01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS07	6.000E+00	7.4344E-01	9.6696E-01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS08	8.000E+00	9.6400E-01	1.1669E+00	Tadmor/Gur	(0.5-5 km)
D-STB/DIS09	1.000E+01	1.1792E+00	1.3500E+00	Tadmor/Gur	(0.5-5 km)
D-STB/DIS10	1.000E+02	9.4340E+00	6.0746E+00	Tadmor/Gur	(0.5-5 km)
D-STB/DIS11	1.400E+02	1.2784E+01	7.5678E+00	Tadmor/Gur	(0.5-5 km)
D-STB/DIS12	2.000E+02	1.7642E+01	9.5533E+00	Tadmor/Gur	(0.5-5 km)
D-STB/DIS13	3.000E+02	2.5444E+01	1.2450E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS14	4.000E+02	3.2993E+01	1.5024E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS15	5.000E+02	4.0359E+01	1.7382E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS16	6.000E+02	4.7582E+01	1.9580E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS17	8.000E+02	6.1699E+01	2.3628E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS18	1.000E+03	7.5474E+01	2.7335E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS19	1.400E+03	1.0227E+02	3.4054E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS20	2.000E+03	1.4114E+02	4.2989E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS21	3.000E+03	2.0356E+02	5.6024E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS22	4.000E+03	2.6395E+02	6.7606E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS23	5.000E+03	3.2288E+02	7.8215E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS24	6.000E+03	3.8067E+02	8.8107E+01	Tadmor/Gur	(0.5-5 km)
D-STB/DIS25	8.000E+03	4.9360E+02	1.0632E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS26	1.000E+04	6.0381E+02	1.2300E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS27	1.400E+04	8.1821E+02	1.5324E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS28	2.000E+04	1.1292E+03	1.9344E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS29	3.000E+04	1.6285E+03	2.5210E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS30	4.000E+04	2.1116E+03	3.0422E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS31	5.000E+04	2.5831E+03	3.5196E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS32	6.000E+04	3.0454E+03	3.9647E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS33	8.000E+04	3.9489E+03	4.7843E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS34	1.000E+05	4.8306E+03	5.5350E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS35	1.400E+05	6.5458E+03	6.8956E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS36	2.000E+05	9.0335E+03	8.7047E+02	Tadmor/Gur	(0.5-5 km)
D-STB/DIS37	3.000E+05	1.3028E+04	1.1344E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS38	4.000E+05	1.6893E+04	1.3689E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS39	5.000E+05	2.0665E+04	1.5838E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS40	6.000E+05	2.4364E+04	1.7841E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS41	8.000E+05	3.1592E+04	2.1529E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS42	1.000E+06	3.8645E+04	2.4907E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS43	1.400E+06	5.2368E+04	3.1029E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS44	2.000E+06	7.2270E+04	3.9170E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS45	3.000E+06	1.0423E+05	5.1048E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS46	4.000E+06	1.3515E+05	6.1601E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS47	5.000E+06	1.6532E+05	7.1267E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS48	6.000E+06	1.9492E+05	8.0280E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS49	8.000E+06	2.5274E+05	9.6877E+03	Tadmor/Gur	(0.5-5 km)
D-STB/DIS50	1.000E+07	3.0917E+05	1.1208E+04	Tadmor/Gur	(0.5-5 km)

\*

* E-stability	Distance (m)	Sigma-y (m)	Sigma-z (m)		
E-STB/DIS01	1.000E+00	1.0460E-01	4.0000E-01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS02	1.400E+00	1.4174E-01	4.8983E-01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS03	2.000E+00	1.9561E-01	6.0717E-01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS04	3.000E+00	2.8211E-01	7.7506E-01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS05	4.000E+00	3.6581E-01	9.2164E-01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS06	5.000E+00	4.4748E-01	1.0542E+00	Tadmor/Gur	(0.5-5 km)
E-STB/DIS07	6.000E+00	5.2757E-01	1.1765E+00	Tadmor/Gur	(0.5-5 km)
E-STB/DIS08	8.000E+00	6.8409E-01	1.3990E+00	Tadmor/Gur	(0.5-5 km)
E-STB/DIS09	1.000E+01	8.3682E-01	1.6001E+00	Tadmor/Gur	(0.5-5 km)
E-STB/DIS10	1.000E+02	6.6947E+00	6.4012E+00	Tadmor/Gur	(0.5-5 km)

E-STB/DIS11	1.400E+02	9.0719E+00	7.8387E+00	Tadmor/Gur	(0.5-5 km)
E-STB/DIS12	2.000E+02	1.2520E+01	9.7165E+00	Tadmor/Gur	(0.5-5 km)
E-STB/DIS13	3.000E+02	1.8056E+01	1.2403E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS14	4.000E+02	2.3413E+01	1.4749E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS15	5.000E+02	2.8640E+01	1.6870E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS16	6.000E+02	3.3766E+01	1.8827E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS17	8.000E+02	4.3784E+01	2.2388E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS18	1.000E+03	5.3559E+01	2.5607E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS19	1.400E+03	7.2577E+01	3.1358E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS20	2.000E+03	1.0016E+02	3.8870E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS21	3.000E+03	1.4445E+02	4.9617E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS22	4.000E+03	1.8731E+02	5.9001E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS23	5.000E+03	2.2912E+02	6.7485E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS24	6.000E+03	2.7013E+02	7.5316E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS25	8.000E+03	3.5028E+02	8.9559E+01	Tadmor/Gur	(0.5-5 km)
E-STB/DIS26	1.000E+04	4.2848E+02	1.0244E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS27	1.400E+04	5.8063E+02	1.2544E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS28	2.000E+04	8.0129E+02	1.5549E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS29	3.000E+04	1.1556E+03	1.9849E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS30	4.000E+04	1.4985E+03	2.3603E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS31	5.000E+04	1.8330E+03	2.6997E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS32	6.000E+04	2.1611E+03	3.0129E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS33	8.000E+04	2.8023E+03	3.5827E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS34	1.000E+05	3.4279E+03	4.0979E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS35	1.400E+05	4.6452E+03	5.0182E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS36	2.000E+05	6.4105E+03	6.2203E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS37	3.000E+05	9.2453E+03	7.9403E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS38	4.000E+05	1.1988E+04	9.4419E+02	Tadmor/Gur	(0.5-5 km)
E-STB/DIS39	5.000E+05	1.4665E+04	1.0800E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS40	6.000E+05	1.7289E+04	1.2053E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS41	8.000E+05	2.2419E+04	1.4332E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS42	1.000E+06	2.7424E+04	1.6393E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS43	1.400E+06	3.7162E+04	2.0074E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS44	2.000E+06	5.1285E+04	2.4883E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS45	3.000E+06	7.3964E+04	3.1764E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS46	4.000E+06	9.5907E+04	3.7771E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS47	5.000E+06	1.1732E+05	4.3203E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS48	6.000E+06	1.3832E+05	4.8215E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS49	8.000E+06	1.7935E+05	5.7334E+03	Tadmor/Gur	(0.5-5 km)
E-STB/DIS50	1.000E+07	2.1940E+05	6.5578E+03	Tadmor/Gur	(0.5-5 km)

\*

* F-stability	Distance (m)	Sigma-y (m)	Sigma-z (m)		
F-STB/DIS01	1.000E+00	7.2200E-02	2.0000E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS02	1.400E+00	9.7838E-02	2.4491E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS03	2.000E+00	1.3502E-01	3.0356E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS04	3.000E+00	1.9473E-01	3.8749E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS05	4.000E+00	2.5250E-01	4.6076E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS06	5.000E+00	3.0887E-01	5.2700E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS07	6.000E+00	3.6415E-01	5.8814E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS08	8.000E+00	4.7219E-01	6.9934E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS09	1.000E+01	5.7761E-01	7.9989E-01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS10	1.000E+02	4.6210E+00	3.1991E+00	Tadmor/Gur	(0.5-5 km)
F-STB/DIS11	1.400E+02	6.2619E+00	3.9174E+00	Tadmor/Gur	(0.5-5 km)
F-STB/DIS12	2.000E+02	8.6417E+00	4.8557E+00	Tadmor/Gur	(0.5-5 km)
F-STB/DIS13	3.000E+02	1.2463E+01	6.1981E+00	Tadmor/Gur	(0.5-5 km)
F-STB/DIS14	4.000E+02	1.6161E+01	7.3700E+00	Tadmor/Gur	(0.5-5 km)
F-STB/DIS15	5.000E+02	1.9769E+01	8.4297E+00	Tadmor/Gur	(0.5-5 km)
F-STB/DIS16	6.000E+02	2.3307E+01	9.4076E+00	Tadmor/Gur	(0.5-5 km)
F-STB/DIS17	8.000E+02	3.0222E+01	1.1186E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS18	1.000E+03	3.6969E+01	1.2795E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS19	1.400E+03	5.0096E+01	1.5667E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS20	2.000E+03	6.9135E+01	1.9420E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS21	3.000E+03	9.9707E+01	2.4789E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS22	4.000E+03	1.2929E+02	2.9476E+01	Tadmor/Gur	(0.5-5 km)

F-STB/DIS23	5.000E+03	1.5815E+02	3.3714E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS24	6.000E+03	1.8646E+02	3.7625E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS25	8.000E+03	2.4178E+02	4.4739E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS26	1.000E+04	2.9576E+02	5.1172E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS27	1.400E+04	4.0078E+02	6.2661E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS28	2.000E+04	5.5309E+02	7.7669E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS29	3.000E+04	7.9767E+02	9.9142E+01	Tadmor/Gur	(0.5-5 km)
F-STB/DIS30	4.000E+04	1.0343E+03	1.1789E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS31	5.000E+04	1.2653E+03	1.3484E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS32	6.000E+04	1.4917E+03	1.5048E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS33	8.000E+04	1.9343E+03	1.7893E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS34	1.000E+05	2.3661E+03	2.0466E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS35	1.400E+05	3.2063E+03	2.5061E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS36	2.000E+05	4.4248E+03	3.1063E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS37	3.000E+05	6.3815E+03	3.9651E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS38	4.000E+05	8.2748E+03	4.7149E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS39	5.000E+05	1.0122E+04	5.3927E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS40	6.000E+05	1.1934E+04	6.0183E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS41	8.000E+05	1.5475E+04	7.1563E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS42	1.000E+06	1.8929E+04	8.1852E+02	Tadmor/Gur	(0.5-5 km)
F-STB/DIS43	1.400E+06	2.5651E+04	1.0023E+03	Tadmor/Gur	(0.5-5 km)
F-STB/DIS44	2.000E+06	3.5400E+04	1.2424E+03	Tadmor/Gur	(0.5-5 km)
F-STB/DIS45	3.000E+06	5.1053E+04	1.5858E+03	Tadmor/Gur	(0.5-5 km)
F-STB/DIS46	4.000E+06	6.6200E+04	1.8857E+03	Tadmor/Gur	(0.5-5 km)
F-STB/DIS47	5.000E+06	8.0980E+04	2.1568E+03	Tadmor/Gur	(0.5-5 km)
F-STB/DIS48	6.000E+06	9.5474E+04	2.4070E+03	Tadmor/Gur	(0.5-5 km)
F-STB/DIS49	8.000E+06	1.2380E+05	2.8621E+03	Tadmor/Gur	(0.5-5 km)
F-STB/DIS50	1.000E+07	1.5144E+05	3.2736E+03	Tadmor/Gur	(0.5-5 km)

\*  
 \* LINEAR SCALING FACTOR FOR SIGMA-Y FUNCTION, NORMALLY 1  
 \*  
 DPYSCALE001 1.  
 \*  
 \* LINEAR SCALING FACTOR FOR SIGMA-Z FUNCTION,  
 \* NORMALLY USED FOR SURFACE ROUGHNESS LENGTH CORRECTION.  
 \* (Z1 / Z0) \*\* 0.2, FROM CRAC2 WE HAVE (10 CM / 3 CM) \*\* 0.2 = 1.27  
 \*

DPZSCALE001 1.27  
 \*\*\*\*\*  
 \* EXPANSION FACTOR DATA BLOCK, LOADED BY INPEXP, STORED IN /EXPAND/  
 \*  
 \* TIME BASE FOR EXPANSION FACTOR (SECONDS)  
 \*  
 PMTIMBAS001 600. (10 MINUTES)  
 \*  
 \* BREAK POINT FOR FORMULA CHANGE (SECONDS)  
 \*  
 PMBRKPNT001 3600. (1 HOUR)  
 \*  
 \* EXPONENTIAL EXPANSION FACTOR NUMBER 1  
 \*  
 PMXPFAC1001 0.2  
 \*  
 \* EXPONENTIAL EXPANSION FACTOR NUMBER 2  
 \*  
 PMXPFAC2001 0.25  
 \*\*\*\*\*  
 \* PLUME RISE DATA BLOCK, LOADED BY INPLRS, STORED IN /PLUMRS/  
 \*  
 \* SCALING FACTOR FOR THE CRITICAL WIND SPEED FOR ENTRAINMENT OF A BOUYANT PLUME  
 \* (USED BY FUNCTION CAUGHT)  
 \*  
 PRSCLCRW001 1.  
 \*

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* SCALING FACTOR FOR THE A-D STABILITY PLUME RISE FORMULA
* (USED BY FUNCTION PLMRIS)
*
PRSCCLADP001    1.
*
* SCALING FACTOR FOR THE E-F STABILITY PLUME RISE FORMULA
* (USED BY FUNCTION PLMRIS)
*
PRSCLEFP001    1.
*****
* RELEASE DATA BLOCK, LOADED BY INPREL, STORED IN /ATNAM2/, /MULREL/
*
RDATNAM2001 'RELEASE CATEGORY 101 - RC101'
*
* TIME AFTER ACCIDENT INITIATION WHEN THE ACCIDENT REACHES GENERAL EMERGENCY
* CONDITIONS (AS DEFINED IN NUREG-0654), OR WHEN PLANT PERSONNEL CAN RELIABLY
* PREDICT THAT GENERAL EMERGENCY CONDITIONS WILL BE ATTAINED
*
RDOALARM001      19800.
*
* NUMBER OF PLUME SEGMENTS THAT ARE RELEASED
*
RDNUMREL001      1
*
* SELECTION OF RISK DOMINANT PLUME
*
RDMAXRIS001      1
*
* REFERENCE TIME FOR DISPERSION AND RADIOACTIVE DECAY
*
RDREFTIM001      0.00
*
* HEAT CONTENT OF THE RELEASE SEGMENTS (W)
* A VALUE SPECIFIED FOR EACH OF THE RELEASE SEGMENTS
*
RDPLHEAT001      4.2E+4
*
* HEIGHT OF THE PLUME SEGMENTS AT RELEASE (M)
* A VALUE SPECIFIED FOR EACH OF THE RELEASE SEGMENTS
*
RDPLHITE001      10.
*
* DURATION OF THE PLUME SEGMENTS (S)
* A VALUE SPECIFIED FOR EACH OF THE RELEASE SEGMENTS
*
RDPLUDUR001      3600.
*
* TIME OF RELEASE FOR EACH PLUME (S AFTER SCRAM)
* A VALUE SPECIFIED FOR EACH OF THE RELEASE SEGMENTS
*
RDPDELAY001      21600.
*
* Initial value of sigma-y for each plume--Note: values required for each plume
*
SIGYINIT001  10.23      (initial sigma-y, calculated for 44 meter wide bldg.)
*
* Initial value of sigma-z for each plume--Note: values required for each plume
*
SIGZINIT001  24.65      (initial sigma-z, calculated for 53 meter high bldg.)
*
* Building height (meters)--Note: values required for each plume
*
WEBUILDH001  53.0      (CR3)
*

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\* PARTICLE SIZE DISTRIBUTION OF EACH NUCLIDE GROUP  
 \* YOU MUST SPECIFY A COLUMN OF DATA FOR EACH OF THE PARTICLE SIZE GROUPS  
 \*

RDPSDIST001 1.  
 RDPSDIST002 1.  
 RDPSDIST003 1.  
 RDPSDIST004 1.  
 RDPSDIST005 1.  
 RDPSDIST006 1.  
 RDPSDIST007 1.  
 RDPSDIST008 1.  
 RDPSDIST009 1.

\*  
 \* 2568 MWTH PWR CORE INVENTORY, END-OF-CYCLE  
 \*

	NUCNAM	CORINV (Bq)
RDCORINV001	Co-58	1.480E+16
RDCORINV002	Co-60	1.776E+16
RDCORINV003	Kr-85	4.070E+16
RDCORINV004	Kr-85m	8.287E+17
RDCORINV005	Kr-87	1.513E+18
RDCORINV006	Kr-88	2.101E+18
RDCORINV007	Rb-86	1.280E+16
RDCORINV008	Sr-89	2.804E+18
RDCORINV009	Sr-90	3.071E+17
RDCORINV010	Sr-91	3.640E+18
RDCORINV011	Sr-92	3.570E+18
RDCORINV012	Y-90	3.060E+17
RDCORINV013	Y-91	3.737E+18
RDCORINV014	Y-92	2.457E+18
RDCORINV015	Y-93	3.063E+18
RDCORINV016	Zr-95	3.700E+18
RDCORINV017	Zr-97	4.070E+18
RDCORINV018	Nb-95	3.700E+18
RDCORINV019	Mo-99	4.883E+18
RDCORINV020	Tc-99m	4.144E+18
RDCORINV021	Ru-103	5.216E+18
RDCORINV022	Ru-105	3.922E+18
RDCORINV023	Ru-106	1.295E+18
RDCORINV024	Rh-105	1.776E+18
RDCORINV025	Sb-127	4.366E+17
RDCORINV026	Sb-129	7.806E+17
RDCORINV027	Te-127	4.366E+17
RDCORINV028	Te-127m	5.919E+16
RDCORINV029	Te-129	1.077E+18
RDCORINV030	Te-129m	1.617E+17
RDCORINV031	Te-131m	4.661E+17
RDCORINV032	Te-132	3.996E+18
RDCORINV033	I-131	2.808E+18
RDCORINV034	I-132	3.737E+18
RDCORINV035	I-133	5.475E+18
RDCORINV036	I-134	6.067E+18
RDCORINV037	I-135	4.403E+18
RDCORINV038	Xe-133	5.438E+18
RDCORINV039	Xe-135	1.480E+18
RDCORINV040	Cs-134	5.475E+17
RDCORINV041	Cs-136	1.565E+17
RDCORINV042	Cs-137	4.070E+17
RDCORINV043	Ba-139	4.772E+18
RDCORINV044	Ba-140	4.735E+18
RDCORINV045	La-140	4.809E+18
RDCORINV046	La-141	4.218E+18
RDCORINV047	La-142	3.774E+18



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RDCORINV048      Ce-141      4.255E+18
RDCORINV049      Ce-143      3.441E+18
RDCORINV050      Ce-144      3.589E+18
RDCORINV051      Pr-143      3.359E+18
RDCORINV052      Nd-147      1.680E+18
RDCORINV053      Np-239      8.028E+19
RDCORINV054      Pu-238      2.682E+15
RDCORINV055      Pu-239      1.191E+16
RDCORINV056      Pu-240      6.992E+15
RDCORINV057      Pu-241      3.663E+17
RDCORINV058      Am-241      1.521E+15
RDCORINV059      Cm-242      8.731E+16
RDCORINV060      Cm-244      1.443E+14
*
*   SCALING FACTOR TO ADJUST THE CORE INVENTORY FOR POWER LEVEL
*
RDCORSCA001      1.000      *   CR3
*
*
RDAPLFRC001      PARENT      (apply rel fracs the same as prior versions)
*
*   RELEASE FRACTIONS FOR RELEASE CATEGORY 101 - RC101 (BXDAU)
*
*   ISOTOPE GROUPS:
*
*           XE/KR      I      CS      TE      SR      RU      LA      CE      BA
*
RDRELFRC001 4.3E-1 1.2E-2 1.0E-2 4.4E-3 7.0E-6 1.9E-4 1.5E-6 1.5E-6 6.7E-5
*****
*   OUTPUT CONTROL DATA BLOCK, LOADED BY INPOPT, STORED IN /STOPME/, /ATMOPT/
*
*   FLAG TO INDICATE THAT THIS IS THE LAST PROGRAM IN THE SERIES TO BE RUN
*
OCENDAT1001 .FALSE. (SET THIS VALUE TO .TRUE. TO SKIP EARLY AND CHRONC)
*
OCIDEBUG001 0
*
*   NAME OF THE NUCLIDE TO BE LISTED ON THE DISPERSION LISTINGS
*
OCNUCOUT001 Cs-137      * Commented by SHL ... look in output before RC101 output
*                       Error when commented ... looking for this card ... why?
*
*           NUM0
TYPE0NUMBER      2
*
*           INDREL      INDRAD
TYPE0OUT001      1      9
TYPE0OUT002      1      10      XCCDF
*****
*   METEOROLOGICAL SAMPLING DATA BLOCK
*
*   METEOROLOGICAL SAMPLING OPTION CODE:
*
*   METCOD = 1, USER SPECIFIED DAY AND HOUR IN THE YEAR (FROM MET FILE),
*           2, WEATHER CATEGORY BIN SAMPLING,
*           3, 120 HOURS OF WEATHER SPECIFIED ON THE ATMOS USER INPUT FILE,
*           4, CONSTANT MET (BOUNDARY WEATHER USED FROM THE START),
*           5, STRATIFIED RANDOM SAMPLES FOR EACH DAY OF THE YEAR.
*
MIMETCOD001 2
*
*   LAST SPATIAL INTERVAL FOR MEASURED WEATHER
*
**SHL**M2LIMSPA001 9      * Use penultimate spatial interval; boundary weather condition
beyond
M2LIMSPA001 10      * Use last spatial interval (at 50 miles); boundary weather
condition beyond

```

```

* BOUNDARY WEATHER MIXING LAYER HEIGHT
*
M2BNDMXH001  1400.  (METERS)
*
* BOUNDARY WEATHER STABILITY CLASS INDEX
*
M2IBDSTB001  4      (D-STABILITY)
*
* BOUNDARY WEATHER RAIN RATE
*
M2BNDRAN001  0.0    (MM/HR)
*
* BOUNDARY WEATHER WIND SPEED
*
M2BNDWND001  2.5    (M/S)
*
* NUMBER OF RAIN DISTANCE INTERVALS FOR BINNING
*
M4NRNINT001  4
*
* ENDPOINTS OF THE RAIN DISTANCE INTERVALS (KILOMETERS)
*
* NOTE: THESE MUST BE CHOSEN TO MATCH THE SPATIAL ENDPOINT DISTANCES
*       SPECIFIED FOR THE ARRAY SPAEND (10 % ERROR IS ALLOWED).
*
M4RNDSTS001  16.10 32.21 48.31 80.52
*
* NUMBER OF RAIN INTENSITIY BREAKPOINTS
*
M4NRINTN001  2
*
* RAIN INTENSITY BREAKPOINTS FOR WEATHER BINNING (MILLIMETERS PER HOUR)
*
M4RNRATE001  99.9  100.
*
* NUMBER OF SAMPLES PER BIN
*
M4NSMPLS001  8  (THIS NUMBER SHOULD BE SET TO at least 4 FOR RISK ASSESSMENT)
*
* INITIAL SEED FOR RANDOM NUMBER GENERATOR
*
M4IRSEED001  179
*
***** RC102 *****
RDATNAM2001  'RELEASE CATEGORY 102 - RC102 (BXEUL)'
RDOALARM001  19800.
RDPLHEAT001  4.2E+04
RDPLHITE001  10.
RDPLUDUR001  3600.
RDPDELAY001  21600.
*          XE/KR    I      CS      TE      SR      RU      LA      CE      BA
*
RDRELFRC001  4.3E-1 1.2E-2 1.0E-2 4.4E-3 7.1E-6 1.9E-4 1.5E-6 1.5E-6 6.7E-5
*
***** RC103 *****
RDATNAM2001  'RELEASE CATEGORY 103 - RC103 (BXEUH)'
RDOALARM001  19800.
RDPLHEAT001  4.2E+04
RDPLHITE001  10.
RDPLUDUR001  3600.
RDPDELAY001  21600.
*          XE/KR    I      CS      TE      SR      RU      LA      CE      BA
*

```

RDRELFRC001 4.3E-1 1.2E-2 1.0E-2 4.4E-3 7.0E-6 1.9E-4 1.5E-6 1.5E-6 6.7E-5

\*\*\*\*\* RC501 \*\*\*\*\*

RDATNAM2001 'RELEASE CATEGORY 501 - RC501 (IE)'

RDOALARM001 8100.

RDPLHEAT001 8.4E+07

RDPLHITE001 10.

RDPLUDUR001 1800.

RDPDELAY001 9900.

\* XE/KR I CS TE SR RU LA CE BA

\*

RDRELFRC001 1.0E+0 1.4E-1 1.4E-1 2.0E-1 8.0E-4 3.1E-2 1.5E-4 1.5E-4 1.2E-2

\*\*\*\*\* RC502 \*\*\*\*\*

RDATNAM2001 'RELEASE CATEGORY 502 - RC502 (XEQI)'

RDOALARM001 13500.

RDPLHEAT001 8.4E+07

RDPLHITE001 10.

RDPLUDUR001 1800.

RDPDELAY001 15300.

\* XE/KR I CS TE SR RU LA CE BA

\*

RDRELFRC001 1.0E+0 7.2E-2 7.9E-2 8.4E-2 1.4E-3 6.1E-2 6.8E-3 6.8E-3 7.9E-2

\*\*\*\*\* RC503 \*\*\*\*\*

RDATNAM2001 'RELEASE CATEGORY 503 - RC503 (XEQH)'

RDOALARM001 13500.

RDPLHEAT001 8.4E+07

RDPLHITE001 10.

RDPLUDUR001 1800.

RDPDELAY001 15300.

\* XE/KR I CS TE SR RU LA CE BA

\*

RDRELFRC001 1.0E+0 7.2E-2 7.9E-2 8.4E-2 1.5E-3 6.1E-2 6.8E-3 6.8E-3 7.9E-2

\*\*\*\*\* RC504 \*\*\*\*\*

RDATNAM2001 'RELEASE CATEGORY 504 - RC504 (XESL)'

RDOALARM001 13500.

RDPLHEAT001 8.4E+07

RDPLHITE001 10.

RDPLUDUR001 1800.

RDPDELAY001 15300.

\* XE/KR I CS TE SR RU LA CE BA

\*

RDRELFRC001 1.0E+0 7.2E-2 7.9E-2 8.4E-2 1.4E-3 6.1E-2 6.8E-3 6.8E-3 7.9E-2

\*\*\*\*\* RC505 \*\*\*\*\*

RDATNAM2001 'RELEASE CATEGORY 505 - RC505 (XESH)'

RDOALARM001 13500.

RDPLHEAT001 8.4E+07

RDPLHITE001 10.

RDPLUDUR001 1800.

RDPDELAY001 15300.

\* XE/KR I CS TE SR RU LA CE BA

\*

RDRELFRC001 1.0E+0 7.2E-2 7.9E-2 8.4E-2 1.5E-3 6.1E-2 6.8E-3 6.8E-3 7.9E-2

\*\*\*\*\* RC506 \*\*\*\*\*

RDATNAM2001 'RELEASE CATEGORY 506 - RC506 (XEUL)'

RDOALARM001 13500.

RDPLHEAT001 8.4E+07

RDPLHITE001 10.

RDPLUDUR001 1800.

RDPDELAY001 15300.

	XE/KR	I	CS	TE	SR	RU	LA	CE	BA
* RDRELFRC001 1.0E+0 7.2E-2 7.9E-2 8.4E-2 1.4E-3 6.1E-2 6.8E-3 6.8E-3 7.9E-2									
***** RC507 *****									
RDATNAM2001 'RELEASE CATEGORY 507 - RC507 (XEUH)'									
RDOALARM001 13500.									
RDPLHEAT001 8.4E+07									
RDPLHITE001 10.									
RDPLUDUR001 1800.									
RDPDELAY001 15300.									
* XE/KR I CS TE SR RU LA CE BA									
* RDRELFRC001 1.0E+0 7.2E-2 7.9E-2 8.4E-2 1.5E-3 6.1E-2 6.8E-3 6.8E-3 7.9E-2									
***** RC601 *****									
RDATNAM2001 'RELEASE CATEGORY 601 - RC601 (XDAS)'									
RDOALARM001 91800.									
RDPLHEAT001 4.2E+07									
RDPLHITE001 10.									
RDPLUDUR001 1800.									
RDPDELAY001 93600.									
* XE/KR I CS TE SR RU LA CE BA									
* RDRELFRC001 1.0E+0 4.2E-4 4.5E-4 1.9E-2 5.9E-5 1.4E-4 1.8E-6 1.8E-6 7.9E-5									
***** RC602 *****									
RDATNAM2001 'RELEASE CATEGORY 602 - RC602 (XDAQ)'									
RDOALARM001 97200.									
RDPLHEAT001 4.2E+07									
RDPLHITE001 10.									
RDPLUDUR001 1800.									
RDPDELAY001 99000.									
* XE/KR I CS TE SR RU LA CE BA									
* RDRELFRC001 1.0E+0 8.4E-3 9.0E-3 1.9E-2 5.9E-5 1.4E-4 1.8E-6 1.8E-6 7.9E-5									
***** RC603 *****									
RDATNAM2001 'RELEASE CATEGORY 603 - RC603 (XDAU)'									
RDOALARM001 97200.									
RDPLHEAT001 4.2E+07									
RDPLHITE001 10.									
RDPLUDUR001 1800.									
RDPDELAY001 99000.									
* XE/KR I CS TE SR RU LA CE BA									
* RDRELFRC001 1.0E+0 8.4E-3 9.0E-3 1.9E-2 6.0E-5 1.4E-4 1.8E-6 1.8E-6 7.9E-5									
***** RC801 *****									
RDATNAM2001 'RELEASE CATEGORY 801 - RC801 (XDMS)'									
RDOALARM001 102600.									
RDPLHEAT001 0.0E+00									
RDPLHITE001 0.									
RDPLUDUR001 36000.									
RDPDELAY001 104400.									
* XE/KR I CS TE SR RU LA CE BA									
* RDRELFRC001 1.0E+0 7.7E-6 1.2E-5 2.1E-5 2.2E-7 1.7E-6 1.3E-8 1.3E-8 5.4E-7									
***** RC802 *****									
RDATNAM2001 'RELEASE CATEGORY 802 - RC802 (XDMU)'									
RDOALARM001 102600.									
RDPLHEAT001 0.0E+00									
RDPLHITE001 0.									

```

RDPLUDUR001      36000.
RDPDELAY001      104400.
*                XE/KR      I      CS      TE      SR      RU      LA      CE      BA
*
RDRELFRC001 1.0E+0 7.7E-6 1.2E-5 2.1E-5 2.3E-7 1.7E-6 1.3E-8 1.3E-8 5.4E-7
.
***** RC901 *****
RDATNAM2001 'RELEASE CATEGORY 901 - RC901 (IN)'
RDOALARM001      11700.
RDPLHEAT001      0.0E+00
RDPLHITE001      0.
RDPLUDUR001      36000.
RDPDELAY001      13500.
*                XE/KR      I      CS      TE      SR      RU      LA      CE      BA
*
RDRELFRC001 7.3E-4 8.7E-6 8.2E-6 6.3E-6 1.4E-8 6.8E-7 2.3E-9 2.3E-9 1.7E-7
.
***** RC902 *****
RDATNAM2001 'RELEASE CATEGORY 902 - RC902 (XN)'
RDOALARM001      16200.
RDPLHEAT001      0.0E+00
RDPLHITE001      0.
RDPLUDUR001      36000.
RDPDELAY001      18000.
*                XE/KR      I      CS      TE      SR      RU      LA      CE      BA
*
RDRELFRC001 9.0E-4 7.8E-6 1.1E-5 2.0E-5 2.2E-7 1.7E-6 1.3E-8 1.3E-8 5.4E-7
.

```

## **Attachment F**

**MACCS2 EARLY Input File for CR-3  
(cr3early.inp)**

```

* GENERAL DESCRIPTIVE TITLE DESCRIBING THIS "EARLY" INPUT FILE
*
MIEANAM1001 'CR3EARLY.INP, CR3, EARLY input'
DCF_FILE001 'DOSDATA.INP' (DCF file of MACCS 1.5.11.1)
*
*          ORGNAM          ORGFLG
*
MIORGDEF001 'A-SKIN'          .TRUE.
MIORGDEF002 'A-RED MARR'      .TRUE.
MIORGDEF003 'A-LUNGS'        .TRUE.
MIORGDEF004 'A-THYROIDH'     .TRUE.
MIORGDEF005 'A-STOMACH'      .TRUE.
MIORGDEF006 'A-LOWER LI'     .FALSE. (does not contribute to early fatalities)
MIORGDEF007 'L-EDEWBODY'     .TRUE.
MIORGDEF008 'L-RED MARR'     .TRUE.
MIORGDEF009 'L-BONE SUR'     .TRUE.
MIORGDEF010 'L-BREAST'       .TRUE.
MIORGDEF011 'L-LUNGS'        .TRUE.
MIORGDEF012 'L-THYROID'     .TRUE.
MIORGDEF013 'L-LOWER LI'     .TRUE. (lower large intestine)
MIORGDEF014 'L-BLAD WAL'     .TRUE.
MIORGDEF015 'L-LIVER'        .FALSE.
MIORGDEF016 'L-THYROIDH'     .TRUE. (pseudothyroid just for health effects)
*
* FLAG TO INDICATE THAT THIS IS THE LAST PROGRAM IN THE SERIES TO BE RUN
*
MIENDAT2001 .FALSE. (SET THIS VALUE TO .TRUE. TO SKIP CHRONC)
**SHL** MIENDAT2001 .TRUE. (SET THIS VALUE TO .TRUE. TO SKIP CHRONC)
*
* DISPERSION MODEL OPTION CODE:  1 * STRAIGHT LINE
*                                2 * WIND-SHIFT WITH ROTATION
*                                3 * WIND-SHIFT WITHOUT ROTATION
*
MIIPLUME001 2
*
* NUMBER OF FINE GRID SUBDIVISIONS USED BY THE MODEL
*
MINUMFIN001 7 (3, 5 OR 7 ALLOWED)
*
* LEVEL OF DEBUG OUTPUT REQUIRED, NORMAL RUNS SHOULD SPECIFY ZERO
*
MIIPRINT001 0
*
* LOGICAL FLAG SIGNIFYING THAT THE BREAKDOWN OF RISK BY WEATHER CATEGORY
* BIN ARE TO BE PRESENTED TO SHOW THEIR RELATIVE CONTRIBUTION TO THE MEAN
*
*          RISBIN
*
MIRISCAT001 .FALSE.
*
* FLAG INDICATING IF WIND-ROSES FROM ATMOS ARE TO BE OVERRIDDEN
*
MIOVRRID001 .FALSE. (USE THE WIND ROSE CALCULATED FOR EACH WEATHER BIN)
*****
* POPULATION DISTRIBUTION DATA BLOCK, LOADED BY INPOPU, STORED IN /POPDAT/
*
PDPOPFLG001 FILE
*
*PDPOPFLG001 UNIFORM
*PDIBEGIN001 1 (SPATIAL INTERVAL AT WHICH POPULATION BEGINS)
*PDPOPDEN001 50. (POPULATION DENSITY (PEOPLE PER SQUARE KILOMETER))
*****
* SHIELDING AND EXPOSURE FACTORS, LOADED BY INDFAC, STORED IN /EADFAC/
*

```

```

* THREE VALUES OF EACH PROTECTION FACTOR ARE SUPPLIED,
* ONE FOR EACH TYPE OF ACTIVITY:
*
* ACTIVITY TYPE:
*   1 - EVACUEES WHILE MOVING
*   2 - NORMAL ACTIVITY IN SHELTERING AND EVACUATION ZONE
*   3 - SHELTERED ACTIVITY
*
* CLOUD SHIELDING FACTOR
*
*   CR3 - CRAC2 MODEL - SEE EVACUATE PARAMETERS:
*       EVACUEES MOVING      1.
*       NO EMERGENCY ACTION  0.75
*       SHELTERING          0.6
*
*       EVACUEES  NORMAL  SHELTER
*
SECSFACT001      1.      0.75      0.6
*
* PROTECTION FACTOR FOR INHALATION
*
SEPROTIN001      1.      0.41      0.33  * VALUES FOR NORMAL ACTIVITY AND
                                         SHELTERING SELECTED BY NRC STAFF
*
* BREATHING RATE (CUBIC METERS PER SECOND)
*
SEBRRATE001  2.66E-4  2.66E-4  2.66E-4
*
* SKIN PROTECTION FACTOR
*
SESKPFAC001  1.0      0.41      0.33  * VALUES FOR NORMAL ACTIVITY AND
                                         SHELTERING SELECTED BY NRC STAFF
*
* GROUND SHIELDING FACTOR
*
*   CR3 - CRAC2 MODEL - SEE EVACUATE PARAMETERS
*       EVACUEES MOVING      0.5
*       NO EMERGENCY ACTION  0.33
*       SHELTERING          0.2
*
SEGSHFAC001      0.5      0.33      0.2
*
* RESUSPENSION INHALATION MODEL CONCENTRATION COEFFICIENT (/METER)
*
*   RESCON = 1.E-4 IS APPROPRIATE FOR MECHANICAL RESUSPENSION BY VEHICLES.
*   RESHAF = 2.11 DAYS CAUSES 1.E-4 TO DECAY IN ONE WEEK TO 1.E-5, THE VALUE
*   OF RESCON USED IN THE FIRST TERM OF THE LONG-TERM RESUSPENSION EQUATION
*   USED IN CHRONC.
*
SERESCON001  1.E-4      (RESUSPENSION IS TURNED ON)
*
* RESUSPENSION CONCENTRATION COEFFICIENT HALF-LIFE (SEC)
*
SERESHAF001  1.82E5      (2.11 DAYS)
*****
* EVACUATION ZONE DATA BLOCK, LOADED BY EVNETW, STORED IN /NETWOR/, /EOPTIO/
*
* SPECIFIC DESCRIPTION OF THE EMERGENCY RESPONSE SCENARIO BEING USED
*
EZEANAM2001  'EVACUATION OF 95% OF POPULATION EVAUATES IN 600 SECONDS'
*
* THE TYPE OF WEIGHTING TO BE APPLIED TO THE EMERGENCY RESPONSE SCENARIOS
* YOU MUST SUPPLY A VALUE OF 'TIME' OR 'PEOPLE'
*
EZWTNAME001  'PEOPLE'

```



```

*
* WEIGHTING FRACTION APPLICABLE TO THIS SCENARIO
*
EZWTFRAC001  0.95
*
* LAST RING IN THE MOVEMENT ZONE
*
EZLASMOV001      8      (EVACUEES DISAPPEAR AFTER TRAVELING TO 30 MILES)
*
*   Flag defining the time at which evacuees "enter" the destination element
*
*TRAVELPOINT  'BOUNDARY' (new option implemented at MACCS2 v. 1.11f)
TRAVELPOINT  'BOUNDARY'
*
* RADIAL EVACUATION SPEED (M/S) - CR3
*
EZESPEED001      2.0    2.0    2.0          (CR3)
EZEVATYP001      'RADIAL'
EZDURBEG001      3600.0
EZDURMID001      20000.0
EZREFPNT001      'ALARM'
EZNUMEVA001      8
EZDLTSHL001      0.    0.    0.    0.    0.    0.    0.    0.
EZDLTEVA001      600.  600.  600.  600.  600.  600.  600.  600.
*****
* SHELTER AND RELOCATION ZONE DATA BLOCK, LOADED BY INPEMR,
*                               STORED IN /INPSRZ/, /RELOCA/
*
* DURATION OF THE EMERGENCY PHASE (SECONDS FROM PLUME ARRIVAL)
*
SRENDEMP001  604800.  (ONE WEEK)
*
* CRITICAL ORGAN FOR RELOCATION DECISIONS
*
SRCRIORG001  'L-EDEWBODY'
*
* HOT SPOT RELOCATION TIME (SECONDS FROM PLUME ARRIVAL)
*
SRTIMHOT001  43200.   (ONE-HALF DAY)
*
* NORMAL RELOCATION TIME (SECONDS FROM PLUME ARRIVAL)
*
SRTIMNRM001  86400.   (ONE DAY)
*
* HOT SPOT RELOCATION DOSE CRITERION THRESHOLD (SIEVERTS)
*
SRDOSHOT001  0.5      (50 REM DOSE TO WHOLE BODY IN 1 WEEK TRIGGERS RELOCATION)
*
* NORMAL RELOCATION DOSE CRITERION THRESHOLD (SIEVERTS)
*
SRDOSNRM001  0.25     (25 REM DOSE TO WHOLE BODY IN 1 WEEK TRIGGERS RELOCATION)
*****
* EARLY FATALITY MODEL PARAMETERS, LOADED BY INEFAT, STORED IN /EFATAL/
*
* NUMBER OF EARLY FATALITY EFFECTS
*
EFNUMEFA001  2
*
*           ORGNAM          EFFACA  EFFACB  EFFTHR
*
EFATAGRP001  'A-RED MARR'      3.8      5.0      1.5
EFATAGRP002  'A-LUNGS'        10.0      7.0      5.0
*****
* EARLY INJURY MODEL PARAMETERS, LOADED BY INEINJ, STORED IN /EINJUR/

```

```

*
* NUMBER OF EARLY INJURY EFFECTS
*
EINUMEIN001  7
*
*          EINAME          ORGNAM   EISUSC EITHRE EIFACA EIFACB
*
EINJUGRP001  'PRODROMAL VOMIT' 'A-STOMACH'  1.    .5    2.    3.
EINJUGRP002  'DIARRHEA'        'A-STOMACH'  1.    1.    3.    2.5
EINJUGRP003  'PNEUMONITIS'     'A-LUNGS'   1.    5.   10.    7.
EINJUGRP004  'SKIN ERYTHEMA'    'A-SKIN'    1.    3.    6.    5.
EINJUGRP005  'TRANSEPIDERMAL'   'A-SKIN'    1.   10.   20.    5.
EINJUGRP006  'THYROIDITIS'     'A-THYROIDH' 1.   40.  240.    2.
EINJUGRP007  'HYPOTHYROIDISM'   'A-THYROIDH' 1.    2.   60.   1.3
*****
* ACUTE EXPOSURE CANCER PARAMETERS, LOADED BY INACAN STORED IN /ACANCR/.
*
* NUMBER OF ACUTE EXPOSURE CANCER EFFECTS
*
LCNUMACA001  7
*
* THRESHOLD DOSE FOR APPLYING THE DOSE DEPENDENT REDUCTION FACTOR
*
LCDDTHRE001  0.2 (LOWEST DOSE FOR WHICH DDREFA WILL BE APPLIED)
*
* DOSE THRESHOLD FOR LINEAR DOSE RESPONSE (Sv)
*
LCACTHRE001  0.0 (LINEAR-QUADRATIC MODEL IS NOT BEING USED)
*
*          ACNAME          ORGNAM  ACSUSC DOSEFA DOSEFB CFRISK  CIRISK  DDREFA
*
LCANCERS001  'LEUKEMIA'        'L-RED MARR' 1.0   1.0   0.0   9.70E-3  0.0    2.0
LCANCERS002  'BONE'            'L-BONE SUR' 1.0   1.0   0.0   9.00E-4  0.0    2.0
LCANCERS003  'BREAST'          'L-BREAST'  1.0   1.0   0.0   5.40E-3  1.7E-2  1.0
LCANCERS004  'LUNG'            'L-LUNGS'   1.0   1.0   0.0   1.55E-2  0.0    2.0
LCANCERS005  'THYROID'         'L-THYROIDH' 1.0   1.0   0.0   7.20E-4  7.2E-3  1.0
LCANCERS006  'GI'              'L-LOWER LI' 1.0   1.0   0.0   3.36E-2  0.0    2.0
LCANCERS007  'OTHER'           'L-EDEWBODY' 1.0   1.0   0.0   2.76E-2  0.0    2.0
*****
* RESULT 1 OPTIONS BLOCK, LOADED BY INOUT1, STORED IN /INOUT1/
* TOTAL NUMBER OF A GIVEN EFFECT (LATENT CANCER, EARLY DEATH, EARLY INJURY)
*
* NUMBER OF DESIRED RESULTS OF THIS TYPE
*
* Spreadsheet parameters to specify displayed parameters
**TYPE1DISP
** 1 Early Fatalities
** 2 Early Injuries
** 9 Latent Fatalities
** 11 Thyroid Cancers
** 19
** 20
** 21
** 27
** 28
**TYPE1CCDF
** 1
TYPE1NUMBER  28
*
TYPE1OUT001  'ERL FAT/TOTAL'          1  10  CCDF  (0 TO 50 MILES)
TYPE1OUT002  'ERL INJ/PRODROMAL VOMIT' 1  10  CCDF  (0 TO 50 MILES)
TYPE1OUT003  'ERL INJ/DIARRHEA'        1  10
TYPE1OUT004  'ERL INJ/PNEUMONITIS'     1  10
TYPE1OUT005  'ERL INJ/THYROIDITIS'     1  10

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TYPE1OUT006      'ERL INJ/HYPOTHYROIDISM'      1  10
TYPE1OUT007      'ERL INJ/SKIN ERYTHEMA'        1  10
TYPE1OUT008      'ERL INJ/TRANSEPIDERMAL'       1  10
TYPE1OUT009      'CAN FAT/TOTAL'                1  10      CCDF (0 TO 50 MILES)
TYPE1OUT010      'CAN FAT/LUNG'                 1  10
TYPE1OUT011      'CAN FAT/THYROID'              1  10      CCDF (0 TO 50 MILES)
TYPE1OUT012      'CAN FAT/BREAST'               1  10
TYPE1OUT013      'CAN FAT/GI'                  1  10
TYPE1OUT014      'CAN FAT/LEUKEMIA'             1  10
TYPE1OUT015      'CAN FAT/BONE'                 1  10
TYPE1OUT016      'CAN FAT/OTHER'                1  10
TYPE1OUT017      'CAN INJ/THYROID'              1  10
TYPE1OUT018      'CAN INJ/BREAST'               1  10
TYPE1OUT019      'CAN FAT/TOTAL'                1   8      CCDF (0 TO 30 MILES)
TYPE1OUT020      'ERL FAT/TOTAL'                1   6      CCDF (0 TO 10 MILES)
TYPE1OUT021      'ERL INJ/PRODRMAL VOMIT'       1   6
TYPE1OUT022      'ERL INJ/DIARRHEA'             1   6
TYPE1OUT023      'ERL INJ/PNEUMONITIS'         1   6
TYPE1OUT024      'ERL INJ/THYROIDITIS'         1   6
TYPE1OUT025      'ERL INJ/HYPOTHYROIDISM'       1   6
TYPE1OUT026      'ERL INJ/SKIN ERYTHEMA'       1   6
TYPE1OUT027      'ERL INJ/TRANSEPIDERMAL'       1   6
TYPE1OUT028      'CAN FAT/TOTAL'                1   6
*****
* RESULT 2 OPTIONS BLOCK, LOADED BY INOUT2, STORED IN /INOUT2/
* FURTHEST DISTANCE AT WHICH A GIVEN RISK OF EARLY DEATH IS EXCEEDED.
*
* NUMBER OF DESIRED RESULTS OF THIS TYPE
*
TYPE2NUMBER      1
*
*          FATALITY RISK THRESHOLD
*
TYPE2OUT001      0.
*****
* RESULT 3 OPTIONS BLOCK, LOADED BY INOUT3, STORED IN /INOUT3/
* NUMBER OF PEOPLE WHOSE DOSE TO A GIVEN ORGAN EXCEEDS A GIVEN THRESHOLD.
*
* NUMBER OF DESIRED RESULTS OF THIS TYPE
*
TYPE3NUMBER      3
*
*          ORGAN NAME      DOSE THRESHOLD (Sv)
*
TYPE3OUT001      'A-RED MARR'          1.5
TYPE3OUT002      'A-LUNGS'            5.0
TYPE3OUT003      'L-EDEWBODY'         0.05
*****
* RESULT 4 OPTIONS BLOCK, LOADED BY INOUT4, STORED IN /INOUT4/
* 360 DEGREE AVERAGE RISK OF A GIVEN EFFECT AT A GIVEN DISTANCE.
*
* POSSIBLE TYPES OF EFFECTS ARE:
*
*   'ERL FAT/TOTAL'
*   'ERL INJ/INJURY NAME'
*   'CAN FAT/CANCER NAME'
*   'CAN FAT/TOTAL'
*
* NUMBER OF DESIRED RESULTS OF THIS TYPE
*
TYPE4NUMBER      6
*
*          RADIAL INDEX      TYPE OF EFFECT
*

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TYPE4OUT001      1      'ERL FAT/TOTAL'
TYPE4OUT002      2      'ERL FAT/TOTAL'
TYPE4OUT003      3      'ERL FAT/TOTAL'
TYPE4OUT004      4      'ERL FAT/TOTAL'
TYPE4OUT005      5      'ERL FAT/TOTAL'
TYPE4OUT006     10      'ERL FAT/TOTAL'
*****
* RESULT 5 OPTIONS BLOCK, LOADED BY INOUT5, STORED IN /INOUT5/
*
* TOTAL POPULATION DOSE TO A GIVEN ORGAN BETWEEN TWO DISTANCES.
*
* NUMBER OF DESIRED RESULTS OF THIS TYPE
*
**TYPE5DISP
** 2
** 3 Whole Body Person Rem
**TYPE5CCDF
** 0
TYPE5NUMBER      3
*
*          ORGAN      I1DIS5      I2DIS5
*
TYPE5OUT001 'L-EDEWBODY'      1      1      NOCCDF (0-1 MILE)
TYPE5OUT002 'L-EDEWBODY'      1      6      CCDF (0-10 MILES)
TYPE5OUT003 'L-EDEWBODY'      1     10      CCDF (0-50 MILES)
*****
* RESULT 6 OPTIONS BLOCK, LOADED BY INOUT6, STORED IN /INOUT6/
*
* CENTERLINE DOSE TO AN ORGAN VS DIST BY PATHWAY, PATHWAY NAMES ARE AS FOLLOWS:
*
* PATHWAY NAME:
* 'CLD' - CLOUDSHINE
* 'GRD' - GROUNDSHINE
* 'INH ACU' - "ACUTE DOSE EQUIVALENT" FROM DIRECT INHALATION OF THE CLOUD
* 'INH LIF' - "LIFETIME DOSE COMMITMENT" FROM DIRECT INHALATION OF THE CLOUD
* 'RES ACU' - "ACUTE DOSE EQUIVALENT" FROM RESUSPENSION INHALATION
* 'RES LIF' - "LIFETIME DOSE COMMITMENT" FROM RESUSPENSION INHALATION
* 'TOT ACU' - "ACUTE DOSE EQUIVALENT" FROM ALL PATHWAYS
* 'TOT LIF' - "LIFETIME DOSE COMMITMENT" FROM ALL PATHWAYS
*
* NUMBER OF DESIRED RESULTS OF THIS TYPE
*
TYPE6NUMBER      0
*
*          ORGNAM      PATHNM      I1DIS6      I2DIS6
*
*TYPE6OUT001 'A-RED MARR'      'TOT ACU'      1      6      (0-10 MILES)
*TYPE6OUT002 'A-LUNGS'      'TOT ACU'      1      6      (0-10 MILES)
*TYPE6OUT003 'L-EDEWBODY'      'TOT LIF'      1     10      (0-50 MILES)
*****
* RESULT 7 OPTIONS BLOCK, LOADED BY INOUT7, STORED IN /INOUT7/
*
* CENTERLINE RISK OF A GIVEN EFFECT VS DISTANCE
*
* NUMBER OF DESIRED RESULTS OF THIS TYPE
*
TYPE7NUMBER      0
*
*          NAME      I1DIS7      I2DIS7
*
*TYPE7OUT001 'ERL FAT/TOTAL'      1      6      (0-10 MILES)
*TYPE7OUT002 'CAN FAT/TOTAL'      1     10      (0-50 MILES)
*****
* RESULT 8 OPTIONS BLOCK, LOADED BY INOUT8, STORED IN /INOUT8/

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*
* POPULATION WEIGHTED FATALITY RISK BETWEEN 2 DISTANCES
*
* NUMBER OF DESIRED RESULTS OF THIS TYPE
*
TYPE8NUMBER      2
*
*           NAME           I1DIS8  I2DIS8
*
TYPE8OUT001 'ERL FAT/TOTAL'  1       2      NOCCDF (0-EXCL ZONE + 1 MI = 2 MI)
TYPE8OUT002 'CAN FAT/TOTAL'  1       6      NOCCDF (0-10 MILES)
*****
* RESULT A OPTIONS BLOCK, LOADED BY INOUTA, STORED IN /INOUTA/
*
* peak dose to a given organ
*
*           NUMA
TYPEANUMBER      1
*
*           ORGNAM        I1DISA  I2DISA
TYPEAOUT001 'L-EDEWBODY'  1       10
*
*****
* EMERGENCY RESPONSE SCENARIO NUMBER 2
*****
* EVACUATION ZONE DATA BLOCK, LOADED BY EVNETW, STORED IN /NETWOR/, /EOPTIO/
*
* SPECIFIC DESCRIPTION OF THE EMERGENCY RESPONSE SCENARIO BEING USED
*
EZEANAM2001 'NO EVACUATION OF 5% OF POPULATION'
*
* WEIGHTING FRACTION APPLICABLE TO THIS SCENARIO
*
EZWTFRAC001 0.05
*
* LAST RING IN THE MOVEMENT ZONE
*
EZLASM0V001      0      (A ZERO TURNS OFF THE EVACUATION MODEL)
*

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## **Attachment G**

**MACCS2 CHRONC Input File for CR-3  
(cr3chrnc.inp)**

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* GENERAL DESCRIPTIVE TITLE DESCRIBING THIS "CHRONC" INPUT FILE
*
CHCHNAME001 'CR3CHRONC.INP, CR3, "New" COMIDA2-Based Food Model'
*****
* EMERGENCY RESPONSE COST DATA BLOCK
*
* DAILY COST FOR A PERSON WHO IS EVACUATED (DOLLARS/PERSON-DAY)
*
CHEVACST001 27.00 (INCLUDES FOOD AND HOUSING COSTS BUT NOT LOST INCOME)
*
* DAILY COST FOR A PERSON WHO IS RELOCATED (DOLLARS/PERSON-DAY)
*
CHRELCST001 27.00 (INCLUDES FOOD AND HOUSING COSTS BUT NOT LOST INCOME)
*****
* LONG TERM PROTECTIVE ACTION DATA BLOCK
*
* Duration of the intermediate phase period--at version 1.11c TMIPND is no
* longer processed. The new input variable DUR_INTPHAS is the period's
* duration, not the time after plume arrival at which the period ends.
*
DUR_INTPHAS 0.0 (in seconds) (no intermediate phase)
*
* LONG-TERM PHASE DOSE PROJECTION PERIOD, THE DURATION OF THE EXPOSURE
* PERIOD OVER WHICH THE LONG-TERM DOSE CRITERION IS EVALUATED (SECONDS)
*
CHTMPACT001 1.58E8 (5 YEARS)
*
* DOSE CRITERION FOR INTERMEDIATE PHASE RELOCATION (Sv)
*
CHDSCRTI001 1.0E5 (NO INTERMEDIATE PHASE RELOCATION)
*
* DOSE CRITERION FOR LONG-TERM PHASE RELOCATION (Sv)
*
CHDSCRLT001 0.04
*
* CRITICAL ORGAN NAME FOR LONG-TERM ACTIONS
*
CHCRTOCR001 'L-EDEWBODY'
*
* Long Term Exposure Period Previously permanently set to:
* one million years = 3.15 E13 seconds
* MACCS2 allowable range is 3.15E7 to 1.E10
*
CHEXPTIM001 1.E10 (317 years)
**SHL** CHEXPTIM001 9.461E9 (30 years)
*****
* DECONTAMINATION PLAN DATA BLOCK
*
* NUMBER OF LEVELS OF DECONTAMINATION
*
CHLVLDEC001 2
*
* DECONTAMINATION TIMES CORRESPONDING TO THE LVLDEC LEVELS OF DECONTAMINATION
* (SECONDS)
*
CHTIMDEC001 5.184E6 1.0368E7 (60, 120 DAYS)
*
* DOSE REDUCTION FACTORS CORRESPONDING TO THE LVLDEC LEVELS OF DECONTAMINATION
*
CHDSRFCT001 3. 15.
*
* COST OF FARM DECONTAMINATION PER FARMLAND UNIT AREA (DOLLARS/HECTARE)
* FOR THE VARIOUS LEVELS OF DECONTAMINATION
*

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CHCDFRM0001    562.5    1250.
*
* COST OF NONFARM DECONTAMINATION PER RESIDENT PERSON (DOLLARS/PERSON)
* FOR THE VARIOUS LEVELS OF DECONTAMINATION
*
CHCDNFRM0001    3000.    8000.
*
* FRACTION OF FARMLAND DECONTAMINATION COST DUE TO LABOR
* FOR THE VARIOUS DECONTAMINATION LEVELS
*
CHFRFDL0001    .3        .35
*
* FRACTION OF NON-FARM DECONTAMINATION COST DUE TO LABOR
* FOR THE VARIOUS DECONTAMINATION LEVELS
*
CHFRNFDL001    .7        .5
*
* FRACTION OF TIME WORKERS IN FARM AREAS SPEND IN CONTAMINATED AREAS
* FOR THE VARIOUS DECONTAMINATION LEVELS
*
CHTFWK0001    .10        .33
*
* FRACTION OF TIME WORKERS IN NON-FARM AREAS SPEND IN CONTAMINATED AREAS
* FOR THE VARIOUS DECONTAMINATION LEVELS
*
CHTFWKNF001    .33        .33
*
* AVERAGE COST OF DECONTAMINATION LABOR (DOLLARS/MAN-YEAR)
*
CHDLBCST001    35000.
*****
* INTERDICTION COST DATA BLOCK
*
* DEPRECIATION (DETERIORATION) RATE DURING INTERDICTION PERIOD (PER YEAR)
*
CHDPRATE001    .20        (VALUE OBTAINED FROM WASH-1400, APPENDIX 6)
*
* INVESTMENT INCOME RETURN (DISCOUNT RATE) DURING INTERDICTION PERIOD (PER YEAR)
* THIS VALUE SHOULD BE DERIVED AS A REAL RETURN RATE ADJUSTED FOR INFLATION
*
CHDSRATE001    .12        (VALUE OBTAINED FROM WASH-1400, APPENDIX 6)
*
* POPULATION RELOCATION COST (DOLLARS/PERSON):
* ALTERNATIVE HOUSING, MOVING COSTS, AND LOST INCOME FOR PEOPLE IN
* AREAS WHICH REQUIRE DECONTAMINATION, INTERDICTION, OR CONDEMNATION
*
CHPOPCST001    5000.
*****
* GROUNDSHINE WEATHERING DEFINITION DATA BLOCK
*
* NUMBER OF TERMS IN THE GROUNDSHINE WEATHERING RELATIONSHIP (EITHER 1 OR 2)
*
CHNGWTRM001    2
*
* GROUNDSHINE WEATHERING COEFFICIENTS
*
CHGWCOEF001    0.5        0.5        (JON HELTON)
*
* HALF LIVES CORRESPONDING TO THE GROUNDSHINE WEATHERING COEFFICIENTS (S)
*
CHTGWHLF001    1.6E7    2.8E9        (JON HELTON)
*****
* RESUSPENSION WEATHERING DEFINITION DATA BLOCK
*

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* NUMBER OF TERMS IN THE RESUSPENSION WEATHERING RELATIONSHIP
*
CHNRWTRM001      3
*
* RESUSPENSION CONCENTRATION COEFFICIENTS      (/ METER)
* RELATIONSHIP BETWEEN GROUND CONCENTRATION AND INSTANTANEOUS AIR CONC.
*
CHRWCOEF001  1.0E-5  1.0E-7  1.0E-9  (VALUES HERE SELECTED BY JON HELTON)
*
* HALF-LIVES CORRESPONDING TO THE RESUSPENSION CONCENTRATION COEFFICIENTS (S)
*
CHTRWHLF001  1.6E7   1.6E8   1.6E9   (6 MONTHS, 5 YEARS, 50 YEARS)
*****
* SITE REGION DESCRIPTION DATA BLOCK
*
* FRACTION OF AREA THAT IS LAND IN THE REGION
*
CHFRACLD001   0.95   (ROUGH GUESS VALUE, SITE FILE OVERRIDES THIS VALUE)
*
* FRACTION OF LAND DEVOTED TO FARMING IN THE REGION
*
CHFRCFRM001   0.382  (VIRGINIA STATE VALUE, SITE FILE OVERRIDES THIS VALUE)
*
* AVERAGE VALUE OF ANNUAL FARM PRODUCTION IN THE REGION (DOLLARS/HECTARE)
* (CASH RECEIPTS FROM FARMING PLUS VALUE OF HOME CONSUMPTION)/(LAND IN FARMS)
*
CHFRMPRD001   371.0  (VIRGINIA STATE VALUE, SITE FILE OVERRIDES THIS VALUE)
*
* FRACTION OF FARM PRODUCTION RESULTING FROM DAIRY PRODUCTION IN THE REGION
* (VALUE OF MILK PRODUCED)/(CASH RECEIPTS FROM FARMING PLUS HOME CONSUMPTION)
*
CHDPPRCT001   0.198  (VIRGINIA STATE VALUE, SITE FILE OVERRIDES THIS VALUE)
*
* VALUE OF FARM WEALTH (DOLLARS/HECTARE)
* (AVERAGE VALUE PER HECTARE OF FARM LAND AND BUILDINGS TO 100 MILES)
*
CHVALWF0001   2613.  * CR3
*
* FRACTION OF FARM WEALTH IN IMPROVEMENTS FOR THE REGION
*
CHFRFIM0001   0.25  * CR3
*
* NON-FARM WEALTH, PROPERTY AND IMPROVEMENTS FOR THE REGION (DOLLARS/PERSON)
* THE VALUE OF ALL RESIDENTIAL, BUSINESS, AND PUBLIC ASSETS WHICH WOULD BE
* LOST IN THE EVENT OF PERMANENT INTERDICTION (CONDEMNATION) OF THE AREA
*
CHVALWNF001   84000. * CR3
*
* FRACTION OF NON-FARM WEALTH IN IMPROVEMENTS FOR THE REGION
*
CHFRNFIM001   0.8
*****
CHFDPPATH001  'NEW'
*
* name of the COMIDA2 binary output file
*
BIN_FILE001  'SAMP_A.BIN'  (revised data file of 8/12/95)
*
* Dose limits triggering first year crop disposal of the separate
* milk and non-milk components of the diet, corresponding in purpose,
* more or less, to the MACCS 1.5 input variables PSCMLK and PSCOTH
*
* For NUREG-1150 calculations, the maximum allowable ground concentrations for
* production of milk and non-milk crops contaminated by an accident occurring

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\* in the growing season were derived based on an assumed maximum allowable dose of 5 rem effective or 15 rem thyroid, per the 1982 FDA guidance that's reprinted in the 1992 EPA PAG Manual. For purposes of comparison against the prior results, it is being assumed, for simplicity, that milk and non-milk crops contribute equally to the first year dose. Thus, the 5 rem effective dose limit used in NUREG-1150 is equally split between milk and non-milk crops, with 2.5 rem allowed for each. Similarly, the 15 rem thyroid limit is split into 7.5 and 7.5 rem for the milk and non-milk portions of the diet.

	effective	thyroid (doses in sieverts)
DOSEMILK001	0.025	0.075
DOSEOTHR001	0.025	0.075

\* Annual dose limits for the subsequent year's (i.e., after the first year) interdiction of BOTH the milk and non-milk (combined) components of the diet

\* Note: the long-term food criteria, GCMAXR, used for NUREG-1150 were based on an ingestion dose integrated from zero to infinity. It is not possible to translate those parameter values into corresponding annual dose limits, as is required by the COMIDA2-based food model. The "total" dose limits used in NUREG-1150 for "root uptake", 0.5 rem effective and 1.5 rem thyroid, are used here as annual dose limits for interdiction of food production in years the years subsequent to the accident.

	effective	thyroid (doses in sieverts)
DOSELONG001	0.005	0.015

\* NUMBER OF NUCLIDES IN THE WATER INGESTION PATHWAY MODEL

CHNUMWPI001 4

\* TABLE OF NUCLIDE DEFINITIONS IN THE WATER INGESTION PATHWAY MODEL

\* IF A SITE DATA FILE IS DEFINED, THE DATA DEFINING THE WATERSHED INGESTION FACTOR IS SUPERSEDED BY THE CORRESPONDING DATA IN THE SITE DATA FILE

	WATER NUCLIDE	INITIAL WASHOFF FRACTION	ANNUAL WASHOFF RATE	INGESTION FACTOR (Bq INGESTED)/ (Bq IN WATER))
	NAMWPI	WSHFRI	WSHRTA	WINGF
CHWTRISO001	Sr-89	0.01	0.004	5.0E-6
CHWTRISO002	Sr-90	0.01	0.004	5.0E-6
CHWTRISO003	Cs-134	0.005	0.001	5.0E-6
CHWTRISO004	Cs-137	0.005	0.001	5.0E-6

\* SPECIAL OPTIONS DATA BLOCK

\* DETAILED PRINT OPTION CONTROL SWITCHES, LOOK AT THE CODE BEFORE TURNING ON!!  
KSWDSC

CHKSWTCH001 0

\* DEFINE THE TYPE 9 RESULTS

\* LONG-TERM POPULATION DOSE IN A GIVEN REGION BROKEN DOWN BY THE 12 PATHWAYS

\* NUMBER OF RESULTS OF THIS TYPE THAT ARE BEING REQUESTED  
\* FOR EACH RESULT YOU REQUEST, THE CODE WILL PRODUCE A SET OF 12

TYPE9NUMBER 3 (UP TO 10 ALLOWED)

	ORGNAM	INNER	OUTER
--	--------	-------	-------

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*
TYPE9OUT001  'L-EDEWBODY'      1          10    (0-50 MILES)
TYPE9OUT002  'L-EDEWBODY'      1          6     (0-10 MILES)
TYPE9OUT003  'L-EDEWBODY'      1          2     (0-2 MILES)
*****
* ECONOMIC COST RESULTS IN A REGION BROKEN DOWN BY 12 TYPES OF COSTS
*
* NUMBER OF RESULTS OF THIS TYPE THAT ARE BEING REQUESTED
* FOR EACH RESULT YOU REQUEST, THE CODE WILL PRODUCE A SET OF 12
*
TYP10NUMBER  2          (UP TO 10 ALLOWED)
*
*          INNER          OUTER
*
TYP10OUT001  1          10    (0-50 MILES)
TYP10OUT002  1          6     (0-10 MILES)
*****
* DEFINE A FLAG THAT CONTROLS THE PRODUCTION OF THE ACTION DISTANCE RESULTS
*
* SPECIFYING A VALUE OF .TRUE. TURNS ON ALL 8 OF THE ACTION DISTANCE RESULTS,
* A VALUE OF .FALSE. WILL ELIMINATE THE ACTION DISTANCE RESULTS FROM THE OUTPUT.
*
TYP11FLAG11  .TRUE.
*****
* IMPACTED AREA/POPULATION RESULTS IN A REGION BROKEN DOWN BY 6 TYPES OF IMPACTS
*
* NUMBER OF RESULTS OF THIS TYPE THAT ARE BEING REQUESTED
* FOR EACH RESULT YOU REQUEST, THE CODE WILL PRODUCE A SET OF 8
*
TYP12NUMBER  2          (UP TO 10 ALLOWED)
*
*          INNER          OUTER
*
TYP12OUT001  1          10    (0-50 MILES)
TYP12OUT002  1          6     (0-10 MILES)
*****
* Maximal annual food ingestion dose to an individual, requested by IXOT13
*
* This result is calculated after accounting for temporary or
* permanent interdiction. It is only available for the "new" food model.
*
* NUMBER OF RESULTS OF THIS TYPE THAT ARE BEING REQUESTED
*
TYP13NUMBER  20    (UP TO 20 ALLOWED)
*
* IRAD13 is the radial spatial interval at which results are requested
*
* ORGN13 is the name of the organ for which results are requested
* (allowable values for ORGN13 are 'EFFECTIVE' or 'THYROID')
*
*          IRAD13    ORGN13
*
TYP13OUT001  1    EFFECTIVE
TYP13OUT002  2    EFFECTIVE
TYP13OUT003  3    EFFECTIVE
TYP13OUT004  4    EFFECTIVE
TYP13OUT005  5    EFFECTIVE
TYP13OUT006  6    EFFECTIVE
TYP13OUT007  7    EFFECTIVE
TYP13OUT008  8    EFFECTIVE
TYP13OUT009  9    EFFECTIVE
TYP13OUT010  10   EFFECTIVE
TYP13OUT011  1    THYROID
TYP13OUT012  2    THYROID

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TYP13OUT013	3	THYROID
TYP13OUT014	4	THYROID
TYP13OUT015	5	THYROID
TYP13OUT016	6	THYROID
TYP13OUT017	7	THYROID
TYP13OUT018	8	THYROID
TYP13OUT019	9	THYROID
TYP13OUT020	10	THYROID

.

## **Attachment H**

### **Description of Major/Minor Released Category Definitions used by Oconee Nuclear Station**

## Description of Major/Minor Released Category Definitions used by Oconee Nuclear Station

Release Category	Description
RC101	Containment Bypass (SGTR), which also bypasses the Auxiliary Building, <i>without</i> an Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC102	Containment Bypass (SGTR), which also bypasses the Auxiliary Building, <i>without</i> an Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC103	Containment Bypass (SGTR), which also bypasses the Auxiliary Building, <i>with</i> an Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC104	Containment Bypass (SGTR), which also bypasses the Auxiliary Building, <i>with</i> an Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC201	Containment Bypass, to the Auxiliary Building (ISLOCA), <i>without</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC202	Containment Bypass, to the Auxiliary Building (ISLOCA), <i>without</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC203	Containment Bypass, to the Auxiliary Building (ISLOCA), <i>with</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC204	Containment Bypass, to the Auxiliary Building (ISLOCA), <i>with</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC301	Large Isolation Failure, to the <b>Auxiliary Building</b> , <i>without</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC302	Large Isolation Failure, to the <b>Auxiliary Building</b> , <i>without</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC303	Large Isolation Failure, to the <b>Auxiliary Building</b> , <i>with</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC304	Large Isolation Failure, to the <b>Auxiliary Building</b> , <i>with</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC305	Large Isolation Failure, to the <b>Environment</b> , <i>without</i> Ex-Vessel Release of Fission Products
RC306	Large Isolation Failure, to the <b>Environment</b> , <i>with</i> Ex-Vessel Release of Fission Products
RC401	Small Isolation Failure, to the <b>Auxiliary Building</b> , <i>without</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC402	Small Isolation Failure, to the <b>Auxiliary Building</b> , <i>without</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC403	Small Isolation Failure, to the <b>Auxiliary Building</b> , <i>with</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC404	Small Isolation Failure, to the <b>Auxiliary Building</b> , <i>with</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC405	Small Isolation Failure, to the <b>Environment</b> , <i>without</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC406	Small Isolation Failure, to the <b>Environment</b> , <i>without</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing

Release Category	Description
RC407	Small Isolation Failure, to the <b>Environment</b> , <i>with</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC408	Small Isolation Failure, to the <b>Environment</b> , <i>with</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC501	Early Containment Failure, <i>without</i> Ex-Vessel Fission Product Release
RC502	Early Containment Failure, <i>with</i> Ex-Vessel Fission Product Release
RC601	Late Overpressurization, with Catastrophic Containment Failure, <i>without</i> Ex-Vessel Release of Fission Products, <i>without</i> Revaporization, <i>with</i> Fission Product Scrubbing
RC602	Late Overpressurization, with Catastrophic Containment Failure, <i>without</i> Ex-Vessel Release of Fission Products, <i>without</i> Revaporization, <i>without</i> Fission Product Scrubbing
RC603	Late Overpressurization, with Catastrophic Containment Failure, <i>without</i> Ex-Vessel Release of Fission Products, <i>with</i> Revaporization, <i>with</i> Fission Product Scrubbing
RC604	Late Overpressurization, with Catastrophic Containment Failure, <i>without</i> Ex-Vessel Release of Fission Products, <i>with</i> Revaporization, <i>without</i> Fission Product Scrubbing
RC605	Late Overpressurization, with Catastrophic Containment Failure, <i>with</i> Ex-Vessel Release of Fission Products, <i>without</i> Revaporization, <i>with</i> Fission Product Scrubbing
RC606	Late Overpressurization, with Catastrophic Containment Failure, <i>with</i> Ex-Vessel Release of Fission Products, <i>without</i> Revaporization, <i>without</i> Fission Product Scrubbing
RC607	Late Overpressurization, with Catastrophic Containment Failure, <i>with</i> Ex-Vessel Release of Fission Products, <i>with</i> Revaporization, <i>with</i> Fission Product Scrubbing
RC608	Late Overpressurization, with Catastrophic Containment Failure, <i>with</i> Ex-Vessel Release of Fission Products, <i>with</i> Revaporization, <i>without</i> Fission Product Scrubbing
RC701	Late Overpressurization, with Benign Containment Failure, <i>without</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC702	Late Overpressurization, with Benign Containment Failure, <i>without</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC703	Late Overpressurization, with Benign Containment Failure, <i>with</i> Ex-Vessel Release of Fission Products, <i>with</i> Fission Product Scrubbing
RC704	Late Overpressurization, with Benign Containment Failure, <i>with</i> Ex-Vessel Release of Fission Products, <i>without</i> Fission Product Scrubbing
RC801	Containment Failure from Basemat Melt-Through, <i>without</i> Ex-Vessel Release of Fission Products
RC802	Containment Failure from Basemat Melt-Through, <i>with</i> Ex-Vessel Release of Fission Products
RC901	No Containment Failure, <i>without</i> Ex-Vessel Fission Product Release, <i>with</i> Fission Product Scrubbing
RC902	No Containment Failure, <i>without</i> Ex-Vessel Fission Product Release, <i>without</i> Fission Product Scrubbing
RC903	No Containment Failure, <i>with</i> Ex-Vessel Fission Product Release, <i>with</i> Fission Product Scrubbing
RC904	No Containment Failure, <i>with</i> Ex-Vessel Fission Product Release, <i>without</i> Fission Product Scrubbing

## **Attachment I**

**Partial Output File for CR-3 MACCS2 Base  
Case (from cr3pra.out)**



DATE AND TIME OF RUN = MACCS2 02/03/00 15:55:37 VERSION 1.12

"ATMOS" DESCRIPTION = CR3ATMOS.INP, Using Table-Lookup Sigmas, ATMOS input

AMCOS		DESCRIPTION = CROSMOS.INI, Using Public Storage Sigsco, AMOS									
		PROB		QUANTILES					PEAK	PEAK	PEAK
		NON-ZERO	MEAN	50TH	90TH	95TH	99TH	99.5TH	CONS	PROB	TRIAL
Source Term 1: Plume 1, at 48.3-64.4 km											
Cs-137	Center Air Conc. (Bq-s/m3)	1.0000	7.25E+07	5.34E+07	1.41E+08	1.80E+08	NOT-FOUND	NOT-FOUND	3.94E+08	1.01E-02	11
Cs-137	Ground Air Conc. (Bq-s/m3)	1.0000	7.26E+07	5.34E+07	1.41E+08	1.80E+08	NOT-FOUND	NOT-FOUND	3.94E+08	1.01E-02	11
Cs-137	Center Ground Conc. (Bq/m2)	1.0000	9.37E+05	6.46E+05	1.71E+06	2.56E+06	5.63E+06	NOT-FOUND	8.45E+06	6.39E-03	158
Total	Center Ground Conc. (Bq/m2)	1.0000	3.45E+07	2.40E+07	7.13E+07	9.51E+07	2.31E+08	NOT-FOUND	3.18E+08	6.39E-03	158
Ground-Level Dilution, X/Q (s/m3)		1.0000	5.32E-08	2.41E-08	1.22E-07	1.90E-07	4.57E-07	6.19E-07	6.52E-07	4.37E-03	84
Cs-137	Adjusted Source, Q (Bq)	1.0000	2.13E+15	2.12E+15	3.40E+15	3.72E+15	NOT-FOUND	NOT-FOUND	3.80E+15	4.25E-02	131
Plume Sigma-y (m)		1.0000	5.22E+03	4.25E+03	9.00E+03	1.00E+04	NOT-FOUND	NOT-FOUND	1.02E+04	2.13E-02	126
Plume Sigma-z (m)		1.0000	5.28E+02	4.91E+02	6.12E+02	6.68E+02	1.57E+03	NOT-FOUND	2.12E+03	6.39E-03	158
Plume Height (m)		1.0000	1.00E+01	NOT-FOUND	NOT-FOUND	NOT-FOUND	NOT-FOUND	NOT-FOUND	1.00E+01	1.00E+00	1
Plume Arrival Time (s)		1.0000	4.04E+04	3.52E+04	5.04E+04	5.25E+04	5.77E+04	6.00E+04	7.08E+04	3.57E-04	113
Source Term 1: Plume 1, at 64.4-80.5 km											
Cs-137	Center Air Conc. (Bq-s/m3)	1.0000	4.38E+07	3.12E+07	9.23E+07	1.07E+08	1.39E+08	1.55E+08	1.57E+08	4.58E-03	98
Cs-137	Ground Air Conc. (Bq-s/m3)	1.0000	4.38E+07	3.12E+07	9.23E+07	1.07E+08	1.39E+08	1.55E+08	1.57E+08	4.58E-03	98
Cs-137	Center Ground Conc. (Bq/m2)	1.0000	6.35E+05	3.80E+05	1.15E+06	1.61E+06	5.59E+06	NOT-FOUND	7.59E+06	6.25E-03	118
Total	Center Ground Conc. (Bq/m2)	1.0000	2.28E+07	1.24E+07	3.89E+07	4.82E+07	1.64E+08	NOT-FOUND	2.99E+08	6.25E-03	118
Ground-Level Dilution, X/Q (s/m3)		1.0000	3.26E-08	1.84E-08	6.64E-08	1.11E-07	1.91E-07	2.77E-07	3.63E-07	4.37E-03	84
Cs-137	Adjusted Source, Q (Bq)	1.0000	1.99E+15	2.04E+15	3.34E+15	3.65E+15	NOT-FOUND	NOT-FOUND	3.72E+15	4.25E-02	131
Plume Sigma-y (m)		1.0000	6.57E+03	5.70E+03	1.09E+04	1.24E+04	NOT-FOUND	NOT-FOUND	1.28E+04	4.25E-02	131
Plume Sigma-z (m)		1.0000	5.80E+02	5.15E+02	6.48E+02	8.84E+02	1.71E+03	NOT-FOUND	2.15E+03	6.39E-03	158
Plume Height (m)		1.0000	1.00E+01	NOT-FOUND	NOT-FOUND	NOT-FOUND	NOT-FOUND	NOT-FOUND	1.00E+01	1.00E+00	1
Plume Arrival Time (s)		1.0000	4.52E+04	3.82E+04	5.70E+04	6.34E+04	7.21E+04	7.36E+04	7.96E+04	3.57E-04	113

DATE AND TIME OF RUN = MACCS2 02/03/00 15:55:37 VERSION 1.12  
 "ATMOS" DESCRIPTION = CR3ATMOS.INP, Using Table-Lookup Sigmas, ATMOS input  
 "EARLY" DESCRIPTION = CR3EARLY.INP, CR3, EARLY input  
 "CHRONC" DESCRIPTION = CR3CHRONC.INP, CR3, "New" COMIDA2-Based Food Model

SOURCE TERM 1 OF 17:  
 RELEASE CATEGORY 101 - RC101

OVERALL RESULTS OBTAINED BY COMBINING 2 EMERGENCY RESPONSE COHORTS FROM "EARLY" WITH THE WEIGHTING FRACTIONS BELOW APPLIED TO THEM:

	FRACTION OF THE PEOPLE
COHORT 1 = EVACUATION OF 95% OF POPULATION EVACUATES IN 600 SECONDS	0.950
COHORT 2 = NO EVACUATION OF 5% OF POPULATION	0.050

AND THEN MERGING THE 2 RESULTS ABOVE WITH THE SINGLE SET OF RESULTS FROM "CHRONC" DESCRIBED BELOW:

COHORT 3 = CR3CHRONC.INP, CR3, "New" COMIDA2-Based Food Model

RESULTS WHICH ARE PRODUCED ONLY BY "EARLY" OR ONLY BY "CHRONC" ARE PRESENTED IN LATER SECTIONS.

02/03/00	15:55:37	PAGE	1	PROB NON-ZERO	MEAN	50TH	90TH	95TH	99TH	99.5TH	PEAK CONS	PEAK PROB	PEAK TRIAL
HEALTH EFFECTS CASES													
ERL FAT/TOTAL	0-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/PRODRMAL VOMIT	0-80.5 km	0.0001	7.21E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-02	4.28E-05	34
ERL INJ/DIARRHEA	0-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/PNEUMONITIS	0-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/THYROIDITIS	0-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/HYPOTHYROIDISM	0-80.5 km	0.0037	2.46E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.33E-02	4.28E-05	34
ERL INJ/SKIN ERYTHEMA	0-80.5 km	0.0333	2.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.79E-01	1.66E+00	6.66E+00	4.28E-05	6
ERL INJ/TRANSEPIDERMAL	0-80.5 km	0.0001	1.59E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-01	4.28E-05	34
CAN FAT/TOTAL	0-80.5 km	0.6838	8.97E+01	7.53E+01	2.14E+02	2.58E+02	3.41E+02	3.71E+02	5.04E+02	4.32E-04	87		
CAN FAT/LUNG	0-80.5 km	0.6838	1.34E+01	1.05E+01	3.18E+01	3.74E+01	5.23E+01	5.68E+01	7.56E+01	4.32E-04	87		
CAN FAT/THYROID	0-80.5 km	0.6838	1.61E+00	1.11E+00	3.98E+00	5.12E+00	6.58E+00	7.17E+00	9.14E+00	2.13E-04	73		
CAN FAT/BREAST	0-80.5 km	0.6838	1.08E+01	8.82E+00	2.59E+01	3.15E+01	4.13E+01	4.64E+01	6.23E+01	4.32E-04	87		
CAN FAT/GI	0-80.5 km	0.6838	2.67E+01	2.22E+01	6.27E+01	7.54E+01	1.03E+02	1.11E+02	1.48E+02	4.32E-04	87		
CAN FAT/LEUKEMIA	0-80.5 km	0.6838	8.37E+00	7.12E+00	2.01E+01	2.39E+01	3.26E+01	3.54E+01	4.74E+01	4.32E-04	87		
CAN FAT/BONE	0-80.5 km	0.6838	8.54E-01	7.16E-01	2.05E+00	2.46E+00	3.33E+00	3.62E+00	4.87E+00	4.32E-04	87		
CAN FAT/OTHER	0-80.5 km	0.6838	2.79E+01	2.27E+01	6.61E+01	7.96E+01	1.08E+02	1.17E+02	1.57E+02	4.32E-04	87		
CAN INJ/THYROID	0-80.5 km	0.6838	1.61E+01	1.11E+01	3.98E+01	5.12E+01	6.58E+01	7.17E+01	9.14E+01	2.13E-04	73		
CAN INJ/BREAST	0-80.5 km	0.6838	3.42E+01	2.93E+01	8.25E+01	1.03E+02	1.28E+02	1.40E+02	1.96E+02	4.32E-04	87		
CAN FAT/TOTAL	0-48.3 km	0.6768	3.56E+01	2.72E+01	8.46E+01	1.05E+02	1.43E+02	1.63E+02	3.17E+02	2.53E-04	17		
ERL FAT/TOTAL	0-16.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/PRODRMAL VOMIT	0-16.1 km	0.0001	7.21E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.37E-02	4.28E-05	34
ERL INJ/DIARRHEA	0-16.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/PNEUMONITIS	0-16.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/THYROIDITIS	0-16.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/HYPOTHYROIDISM	0-16.1 km	0.0037	2.46E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.33E-02	4.28E-05	34
ERL INJ/SKIN ERYTHEMA	0-16.1 km	0.0333	2.90E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.79E-01	1.66E+00	6.66E+00	4.28E-05	6
ERL INJ/TRANSEPIDERMAL	0-16.1 km	0.0001	1.59E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-01	4.28E-05	34
CAN FAT/TOTAL	0-16.1 km	0.6386	7.07E+00	4.46E+00	1.69E+01	2.38E+01	4.77E+01	5.36E+01	7.76E+01	5.24E-04	79		
EARLY FATALITY DISTANCE (km)													
ERL FAT/TOTAL RISK > 0.000		0.1872	1.52E-02	0.00E+00	7.32E-02	7.68E-02	8.60E-02	9.04E-02	1.61E-01	1.18E-03	159		

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		PROB NON-ZERO	MEAN	50TH	QUANTILES				99.5TH	PEAK CONS	PEAK PROB	PEAK TRIAL
					90TH	95TH	99TH					
POPULATION EXCEEDING DOSE												
EARLY dose A-RED MARR > 1.50 Sv		0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
EARLY dose A-LUNGS > 5.00 Sv		0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
EARLY dose L-EDEWBODY > 5.000E-02 Sv		0.3839	2.94E+01	0.00E+00	5.99E+01	1.40E+02	3.21E+02	4.83E+02	9.36E+03	1.91E-04	84	
AVERAGE INDIVIDUAL RISK												
ERL FAT/TOTAL	0-1.6 km	0.1872	2.30E-05	0.00E+00	2.28E-05	1.05E-04	7.96E-04	1.02E-03	1.21E-03	1.18E-03	123	
ERL FAT/TOTAL	1.6-3.2 km	0.0012	4.11E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.47E-06	1.18E-03	159	
ERL FAT/TOTAL	3.2-4.8 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	
ERL FAT/TOTAL	4.8-6.4 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	
ERL FAT/TOTAL	6.4-8.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	
ERL FAT/TOTAL	64.4-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	
POPULATION DOSE (Sv)												
L-EDEWBODY TOT LIF	0-1.6 km	0.4044	7.63E-02	0.00E+00	2.37E-01	3.04E-01	3.72E-01	4.06E-01	4.36E-01	2.81E-03	63	
L-EDEWBODY TOT LIF	0-16.1 km	0.6386	1.60E+02	1.02E+02	3.83E+02	5.24E+02	1.03E+03	1.17E+03	1.77E+03	5.24E-04	79	
L-EDEWBODY TOT LIF	0-80.5 km	0.6838	2.02E+03	1.61E+03	4.85E+03	5.87E+03	7.96E+03	8.77E+03	1.14E+04	4.32E-04	87	
POPULATION WEIGHTED RISK												
ERL FAT/TOTAL	0-3.2 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0	
CAN FAT/TOTAL	0-16.1 km	0.6251	2.50E-04	1.32E-04	6.19E-04	8.83E-04	1.80E-03	2.11E-03	2.73E-03	5.24E-04	79	
PEAK DOSE FOUND ON SPATIAL GRID (Sv)												
L-EDEWBODY	0-1.6 km	1.0000	2.78E-01	2.40E-01	4.78E-01	5.57E-01	8.13E-01	1.03E+00	1.27E+00	1.18E-03	123	
L-EDEWBODY	1.6-3.2 km	1.0000	1.23E-01	1.10E-01	2.02E-01	2.14E-01	2.44E-01	2.59E-01	2.80E-01	1.91E-03	137	
L-EDEWBODY	3.2-4.8 km	1.0000	1.51E-01	1.35E-01	2.31E-01	2.50E-01	3.01E-01	3.76E-01	3.93E-01	4.37E-03	84	
L-EDEWBODY	4.8-6.4 km	1.0000	1.53E-01	1.22E-01	2.27E-01	2.57E-01	3.08E-01	3.15E-01	3.25E-01	1.91E-03	137	
L-EDEWBODY	6.4-8.1 km	1.0000	1.31E-01	1.11E-01	1.83E-01	2.11E-01	NOT-FOUND	NOT-FOUND	2.52E-01	1.29E-02	79	
L-EDEWBODY	8.1-16.1 km	1.0000	8.54E-02	7.99E-02	1.19E-01	1.34E-01	NOT-FOUND	NOT-FOUND	1.68E-01	1.29E-02	79	
L-EDEWBODY	16.1-32.2 km	1.0000	6.47E-02	6.24E-02	1.01E-01	1.04E-01	1.13E-01	1.17E-01	1.17E-01	4.58E-03	60	
L-EDEWBODY	32.2-48.3 km	1.0000	5.11E-02	4.32E-02	8.59E-02	1.00E-01	NOT-FOUND	NOT-FOUND	1.10E-01	1.06E-02	1	
L-EDEWBODY	48.3-64.4 km	1.0000	4.30E-02	3.74E-02	7.41E-02	8.48E-02	1.10E-01	NOT-FOUND	1.17E-01	6.39E-03	32	
L-EDEWBODY	64.4-80.5 km	1.0000	2.95E-02	2.52E-02	5.58E-02	7.12E-02	9.26E-02	NOT-FOUND	1.08E-01	6.25E-03	118	

[illegible]

02/03/00 15:55:37 PAGE 4		PROB	MEAN	50TH	QUANTILES		99TH	99.5TH	PEAK	PEAK	PEAK
		NON-ZERO			90TH	95TH			CONS	PROB	TRIAL
AVERAGE INDIVIDUAL RISK											
ERL FAT/TOTAL	6.4-8.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL FAT/TOTAL	64.4-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
POPULATION DOSE (Sv)											
L-EDEWBODY TOT LIF	0-1.6 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
L-EDEWBODY TOT LIF	0-16.1 km	0.5199	1.36E+01	2.73E-01	4.38E+01	6.94E+01	1.61E+02	2.26E+02	6.59E+02	1.43E-05	62
L-EDEWBODY TOT LIF	0-80.5 km	0.6768	5.91E+01	2.97E+01	1.57E+02	2.21E+02	3.72E+02	4.67E+02	9.42E+02	4.05E-04	158
POPULATION WEIGHTED RISK											
ERL FAT/TOTAL	0-3.2 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
CAN FAT/TOTAL	0-16.1 km	0.5199	2.23E-05	4.64E-07	7.28E-05	1.10E-04	2.51E-04	3.68E-04	1.09E-03	1.43E-05	62
PEAK DOSE FOUND ON SPATIAL GRID (Sv)											
L-EDEWBODY	0-1.6 km	0.9283	6.43E-02	2.78E-02	1.39E-01	1.72E-01	3.07E-01	3.36E-01	3.80E-01	1.91E-03	62
L-EDEWBODY	1.6-3.2 km	0.8967	4.07E-02	1.72E-02	8.75E-02	1.09E-01	2.07E-01	2.34E-01	2.40E-01	4.37E-03	84
L-EDEWBODY	3.2-4.8 km	0.8850	3.05E-02	9.86E-03	7.40E-02	8.83E-02	1.44E-01	1.81E-01	1.90E-01	4.37E-03	84
L-EDEWBODY	4.8-6.4 km	0.8670	2.27E-02	7.87E-03	5.44E-02	6.38E-02	1.27E-01	1.49E-01	1.54E-01	4.37E-03	84
L-EDEWBODY	6.4-8.1 km	0.8417	1.66E-02	5.46E-03	3.99E-02	5.23E-02	8.57E-02	9.75E-02	1.17E-01	4.37E-03	84
L-EDEWBODY	8.1-16.1 km	0.7369	9.84E-03	3.30E-03	3.04E-02	3.49E-02	4.81E-02	5.60E-02	6.99E-02	1.91E-03	62
L-EDEWBODY	16.1-32.2 km	0.4162	8.99E-04	0.00E+00	3.36E-03	5.22E-03	6.77E-03	7.86E-03	9.87E-03	1.91E-03	62
L-EDEWBODY	32.2-48.3 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
L-EDEWBODY	48.3-64.4 km	1.0000	3.95E-03	2.73E-03	7.98E-03	9.79E-03	1.71E-02	NOT-FOUND	2.29E-02	6.39E-03	158
L-EDEWBODY	64.4-80.5 km	1.0000	2.51E-03	2.02E-03	5.15E-03	6.36E-03	1.64E-02	NOT-FOUND	2.10E-02	6.25E-03	118

02/03/00	15:55:37	PAGE	5		PROB				QUANTILES			PEAK	PEAK	PEAK
					NON-ZERO	MEAN	50TH	90TH	95TH	99TH	99.5TH	CONS	PROB	TRIAL
HEALTH EFFECTS CASES														
ERL FAT/TOTAL	0-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/PRODROMAL VOMIT	0-80.5 km	0.0001	1.44E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-01	4.28E-05	34
ERL INJ/DIARRHEA	0-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/PNEUMONITIS	0-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/THYROIDITIS	0-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/HYPOTHYROIDISM	0-80.5 km	0.0037	4.93E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.67E-01	4.28E-05	34
ERL INJ/SKIN ERYTHEMA	0-80.5 km	0.0333	5.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E+01	3.77E+01	1.33E+02	4.28E-05	6
ERL INJ/TRANSEPIDERMAL	0-80.5 km	0.0001	3.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.07E+00	4.28E-05	34
CAN FAT/TOTAL	0-80.5 km	0.6797	5.71E+00	3.42E+00	1.44E+01	1.98E+01	3.19E+01	3.52E+01	3.52E+01	3.52E+01	3.52E+01	6.62E+01	2.59E-04	72
CAN FAT/LUNG	0-80.5 km	0.6797	9.62E-01	6.05E-01	2.54E+00	3.33E+00	5.39E+00	6.15E+00	6.15E+00	6.15E+00	6.15E+00	1.23E+01	2.59E-04	72
CAN FAT/THYROID	0-80.5 km	0.6797	4.74E-01	3.08E-01	1.21E+00	1.56E+00	2.54E+00	3.02E+00	3.02E+00	3.02E+00	3.02E+00	5.19E+00	2.59E-04	72
CAN FAT/BREAST	0-80.5 km	0.6797	5.41E-01	3.25E-01	1.35E+00	1.85E+00	3.16E+00	3.56E+00	3.56E+00	3.56E+00	3.56E+00	5.61E+00	2.59E-04	72
CAN FAT/GI	0-80.5 km	0.6797	1.39E+00	8.51E-01	3.58E+00	4.80E+00	8.05E+00	9.45E+00	9.45E+00	9.45E+00	9.45E+00	1.45E+01	2.59E-04	72
CAN FAT/LEUKEMIA	0-80.5 km	0.6797	4.09E-01	2.43E-01	1.08E+00	1.41E+00	2.41E+00	2.87E+00	2.87E+00	2.87E+00	2.87E+00	4.26E+00	2.59E-04	72
CAN FAT/BONE	0-80.5 km	0.6797	4.49E-02	2.67E-02	1.16E-01	1.55E-01	2.68E-01	3.13E-01	3.13E-01	3.13E-01	3.13E-01	4.67E-01	2.59E-04	72
CAN FAT/OTHER	0-80.5 km	0.6797	1.89E+00	1.12E+00	5.10E+00	6.47E+00	1.07E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	2.39E+01	2.59E-04	72
CAN INJ/THYROID	0-80.5 km	0.6797	4.74E+00	3.08E+00	1.21E+01	1.56E+01	2.54E+01	3.02E+01	3.02E+01	3.02E+01	3.02E+01	5.19E+01	2.59E-04	72
CAN INJ/BREAST	0-80.5 km	0.6797	1.70E+00	1.04E+00	4.43E+00	5.99E+00	1.01E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.77E+01	2.59E-04	72
CAN FAT/TOTAL	0-48.3 km	0.6725	3.94E+00	1.57E+00	1.11E+01	1.52E+01	2.84E+01	3.29E+01	3.29E+01	3.29E+01	3.29E+01	6.25E+01	2.59E-04	72
ERL FAT/TOTAL	0-16.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/PRODROMAL VOMIT	0-16.1 km	0.0001	1.44E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-01	4.28E-05	34
ERL INJ/DIARRHEA	0-16.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/PNEUMONITIS	0-16.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/THYROIDITIS	0-16.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL INJ/HYPOTHYROIDISM	0-16.1 km	0.0037	4.93E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.67E-01	4.28E-05	34
ERL INJ/SKIN ERYTHEMA	0-16.1 km	0.0333	5.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E+01	3.77E+01	1.33E+02	4.28E-05	6
ERL INJ/TRANSEPIDERMAL	0-16.1 km	0.0001	3.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.07E+00	4.28E-05	34
CAN FAT/TOTAL	0-16.1 km	0.6251	1.89E+00	4.36E-01	5.39E+00	7.46E+00	1.71E+01	2.17E+01	2.17E+01	2.17E+01	2.17E+01	5.14E+01	2.59E-04	72
EARLY FATALITY DISTANCE (km)														
ERL FAT/TOTAL RISK > 0.000			0.1872	3.03E-01	0.00E+00	1.09E+00	1.20E+00	1.49E+00	1.64E+00	1.64E+00	1.64E+00	3.22E+00	1.18E-03	159
POPULATION EXCEEDING DOSE														
EARLY dose A-RED MARR > 1.50 Sv		0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
EARLY dose A-LUNGS > 5.00 Sv		0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
EARLY dose L-EDEWBODY > 5.000E-02 Sv		0.3839	3.63E+02	0.00E+00	1.25E+03	1.92E+03	4.03E+03	5.12E+03	8.26E+03	8.26E+03	8.26E+03	4.39E-04		51
AVERAGE INDIVIDUAL RISK														
ERL FAT/TOTAL	0-1.6 km	0.1872	4.59E-04	0.00E+00	5.43E-04	2.24E-03	1.28E-02	2.04E-02	2.41E-02	2.41E-02	2.41E-02	1.18E-03		123
ERL FAT/TOTAL	1.6-3.2 km	0.0012	8.23E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.95E-05	1.18E-03	159
ERL FAT/TOTAL	3.2-4.8 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL FAT/TOTAL	4.8-6.4 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0

		PROB	QUANTILES							PEAK	PEAK	PEAK
		NON-ZERO	MEAN	50TH	90TH	95TH	99TH	99.5TH	CONS	PROB	TRIAL	
AVERAGE INDIVIDUAL RISK												
ERL FAT/TOTAL	6.4-8.1 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
ERL FAT/TOTAL	64.4-80.5 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
POPULATION DOSE (Sv)												
L-EDEWBODY TOT LIF	0-1.6 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
L-EDEWBODY TOT LIF	0-16.1 km	0.6251	4.35E+01	1.04E+01	1.20E+02	1.71E+02	4.12E+02	5.18E+02	1.07E+03	2.59E-04	2.59E-04	72
L-EDEWBODY TOT LIF	0-80.5 km	0.6797	1.34E+02	8.22E+01	3.48E+02	4.55E+02	7.55E+02	8.45E+02	1.42E+03	2.59E-04	2.59E-04	72
POPULATION WEIGHTED RISK												
ERL FAT/TOTAL	0-3.2 km	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
CAN FAT/TOTAL	0-16.1 km	0.6251	7.71E-05	1.77E-05	2.18E-04	3.12E-04	7.44E-04	9.76E-04	2.09E-03	2.59E-04	2.59E-04	72
PEAK DOSE FOUND ON SPATIAL GRID (Sv)												
L-EDEWBODY	0-1.6 km	1.0000	3.23E+00	2.21E+00	7.92E+00	1.00E+01	1.69E+01	2.05E+01	2.54E+01	1.18E-03	1.18E-03	123
L-EDEWBODY	1.6-3.2 km	1.0000	7.40E-01	5.33E-01	1.96E+00	2.30E+00	3.17E+00	3.55E+00	4.50E+00	1.18E-03	1.18E-03	159
L-EDEWBODY	3.2-4.8 km	1.0000	3.51E-01	2.57E-01	8.77E-01	1.08E+00	1.34E+00	1.48E+00	1.80E+00	1.18E-03	1.18E-03	159
L-EDEWBODY	4.8-6.4 km	1.0000	2.31E-01	2.01E-01	5.25E-01	6.45E-01	1.14E+00	1.35E+00	1.38E+00	4.65E-03	4.65E-03	34
L-EDEWBODY	6.4-8.1 km	1.0000	1.69E-01	1.40E-01	3.27E-01	4.15E-01	NOT-FOUND	NOT-FOUND	6.71E-01	1.29E-02	1.29E-02	74
L-EDEWBODY	8.1-16.1 km	1.0000	8.50E-02	7.22E-02	1.72E-01	2.03E-01	2.22E-01	2.31E-01	2.43E-01	1.91E-03	1.91E-03	108
L-EDEWBODY	16.1-32.2 km	1.0000	2.48E-02	1.72E-02	5.63E-02	7.07E-02	8.89E-02	9.81E-02	1.05E-01	4.37E-03	4.37E-03	84
L-EDEWBODY	32.2-48.3 km	1.0000	8.30E-03	5.84E-03	1.64E-02	2.16E-02	3.88E-02	4.80E-02	7.12E-02	4.37E-03	4.37E-03	84
L-EDEWBODY	48.3-64.4 km	1.0000	3.95E-03	2.73E-03	7.98E-03	9.79E-03	1.71E-02	NOT-FOUND	2.29E-02	6.39E-03	6.39E-03	158
L-EDEWBODY	64.4-80.5 km	1.0000	2.51E-03	2.02E-03	5.15E-03	6.36E-03	1.64E-02	NOT-FOUND	2.10E-02	6.25E-03	6.25E-03	118

DATE AND TIME OF RUN = MACCS2 02/03/00 15:55:37 VERSION 1.12  
 "ATMOS" DESCRIPTION = CR3ATMOS.INP, Using Table-Lookup Sigmas, ATMOS input  
 "EARLY" DESCRIPTION = CR3EARLY.INP, CR3, EARLY input  
 "CHRONC" DESCRIPTION = CR3CHRONC.INP, CR3, "New" COMIDA2-Based Food Model

SOURCE TERM 1 OF 17:  
 RELEASE CATEGORY 101 - RC101

RESULTS FROM THE "CHRONC" MODULE ALONE

COHORT 3 = CR3CHRONC.INP, CR3, "New" COMIDA2-Based Food Model

02/03/00	15:55:37	PAGE	7	PROB NON-ZERO	MEAN	50TH	QUANTILES				PEAK CONS	PEAK PROB	PEAK TRIAL
							90TH	95TH	99TH	99.5TH			
HEALTH EFFECTS CASES													
CAN FAT/TOTAL	0-80.5 km	0.6838	8.71E+01	7.33E+01	2.07E+02	2.48E+02	3.35E+02	3.65E+02	4.94E+02	4.32E-04	87		
CAN FAT/LUNG	0-80.5 km	0.6838	1.30E+01	1.04E+01	3.10E+01	3.62E+01	5.11E+01	5.53E+01	7.39E+01	4.32E-04	87		
CAN FAT/THYROID	0-80.5 km	0.6838	1.35E+00	1.02E+00	3.29E+00	4.00E+00	5.54E+00	6.04E+00	8.18E+00	4.32E-04	87		
CAN FAT/BREAST	0-80.5 km	0.6838	1.06E+01	8.66E+00	2.55E+01	3.11E+01	3.99E+01	4.44E+01	6.12E+01	4.32E-04	87		
CAN FAT/GI	0-80.5 km	0.6838	2.61E+01	2.19E+01	6.14E+01	7.44E+01	1.02E+02	1.10E+02	1.46E+02	4.32E-04	87		
CAN FAT/LEUKEMIA	0-80.5 km	0.6838	8.19E+00	7.05E+00	1.95E+01	2.33E+01	3.20E+01	3.48E+01	4.66E+01	4.32E-04	87		
CAN FAT/BONE	0-80.5 km	0.6838	8.34E-01	7.04E-01	2.02E+00	2.40E+00	3.27E+00	3.55E+00	4.78E+00	4.32E-04	87		
CAN FAT/OTHER	0-80.5 km	0.6838	2.70E+01	2.23E+01	6.42E+01	7.71E+01	1.05E+02	1.14E+02	1.53E+02	4.32E-04	87		
CAN INJ/THYROID	0-80.5 km	0.6838	1.35E+01	1.02E+01	3.29E+01	4.00E+01	5.54E+01	6.04E+01	8.18E+01	4.32E-04	87		
CAN INJ/BREAST	0-80.5 km	0.6838	3.34E+01	2.78E+01	7.95E+01	1.00E+02	1.25E+02	1.38E+02	1.93E+02	4.32E-04	87		
CAN FAT/TOTAL	0-48.3 km	0.6768	3.47E+01	2.67E+01	8.31E+01	1.04E+02	1.42E+02	1.62E+02	3.15E+02	2.53E-04	17		
CAN FAT/TOTAL	0-16.1 km	0.6386	6.45E+00	3.66E+00	1.54E+01	2.20E+01	4.53E+01	5.20E+01	6.63E+01	2.53E-04	17		
POPULATION DOSE (Sv)													
L-EDEWBODY TOT LIF	0-1.6 km	0.4044	7.63E-02	0.00E+00	2.37E-01	3.04E-01	3.72E-01	4.06E-01	4.36E-01	2.81E-03	63		
L-EDEWBODY TOT LIF	0-16.1 km	0.6386	1.45E+02	8.41E+01	3.60E+02	4.95E+02	1.01E+03	1.09E+03	1.49E+03	2.53E-04	17		
L-EDEWBODY TOT LIF	0-80.5 km	0.6838	1.96E+03	1.52E+03	4.60E+03	5.61E+03	7.51E+03	8.07E+03	1.11E+04	4.32E-04	87		
POPULATION WEIGHTED RISK													
CAN FAT/TOTAL	0-16.1 km	0.6251	2.25E-04	1.17E-04	5.80E-04	7.99E-04	1.58E-03	2.02E-03	2.66E-03	2.53E-04	17		
PEAK DOSE FOUND ON SPATIAL GRID (Sv)													
L-EDEWBODY	0-1.6 km	0.5330	5.56E-02	5.46E-02	1.13E-01	1.22E-01	1.47E-01	1.60E-01	2.00E-01	7.13E-04	103		
L-EDEWBODY	1.6-3.2 km	0.5543	4.75E-02	2.72E-02	1.09E-01	1.24E-01	1.69E-01	1.93E-01	1.98E-01	4.32E-03	83		
L-EDEWBODY	3.2-4.8 km	0.7826	1.04E-01	1.01E-01	1.26E-01	1.39E-01	1.75E-01	1.93E-01	2.00E-01	3.82E-03	80		
L-EDEWBODY	4.8-6.4 km	0.9693	1.20E-01	1.05E-01	1.36E-01	1.53E-01	1.98E-01	NOT-FOUND	2.01E-01	9.30E-03	40		
L-EDEWBODY	6.4-8.1 km	1.0000	1.07E-01	1.03E-01	1.27E-01	1.39E-01	1.71E-01	1.87E-01	1.89E-01	4.65E-03	6		
L-EDEWBODY	8.1-16.1 km	1.0000	7.18E-02	6.68E-02	1.04E-01	1.09E-01	1.21E-01	NOT-FOUND	1.24E-01	6.39E-03	72		
L-EDEWBODY	16.1-32.2 km	1.0000	6.26E-02	5.97E-02	9.99E-02	1.03E-01	1.10E-01	1.13E-01	1.14E-01	4.58E-03	60		
L-EDEWBODY	32.2-48.3 km	1.0000	5.07E-02	4.28E-02	8.59E-02	1.00E-01	NOT-FOUND	NOT-FOUND	1.10E-01	1.06E-02	1		
L-EDEWBODY	48.3-64.4 km	1.0000	3.91E-02	3.32E-02	7.02E-02	7.68E-02	9.44E-02	NOT-FOUND	1.06E-01	6.39E-03	32		
L-EDEWBODY	64.4-80.5 km	1.0000	2.69E-02	2.21E-02	4.79E-02	6.92E-02	8.68E-02	NOT-FOUND	9.25E-02	6.25E-03	90		
L-EDEWBODY POP. DOSE (Sv)													
TOTAL LONG-TERM PATHWAYS DOSE	0-80.5 km	0.6838	1.96E+03	1.52E+03	4.60E+03	5.61E+03	7.51E+03	8.07E+03	1.11E+04	4.32E-04	87		
LONG-TERM DIRECT EXPOSURE PATHWAYS		0.6797	1.72E+03	1.18E+03	4.23E+03	5.33E+03	7.28E+03	7.89E+03	1.06E+04	4.32E-04	87		
TOTAL INGESTION PATHWAYS DOSE		0.6838	2.15E+02	1.31E+02	5.28E+02	5.93E+02	NOT-FOUND	NOT-FOUND	9.44E+02	1.07E-02	36		
LONG-TERM GROUNDSHINE DOSE		0.6797	1.71E+03	1.17E+03	4.19E+03	5.29E+03	7.25E+03	7.87E+03	1.05E+04	4.32E-04	87		
LONG-TERM RESUSPENSION DOSE		0.6797	1.06E+01	7.68E+00	2.63E+01	3.19E+01	4.23E+01	4.77E+01	6.74E+01	4.32E-04	87		
WATER INGESTION DOSE		0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0		



	PROB NON-ZERO	MEAN	50TH	QUANTILES		99TH	99.5TH	PEAK CONS	PEAK PROB	PEAK TRIAL
				90TH	95TH					
L-EDEWBODY POP. DOSE (Sv) 0-80.5 km										
POP.-DEPENDENT DECONTAMINATION DOSE	0.5839	1.74E+01	7.40E-01	5.13E+01	8.50E+01	1.68E+02	2.07E+02	3.08E+02	4.05E-04	158
FARM-DEPENDENT DECONTAMINATION DOSE	0.6489	1.47E+00	1.31E-01	4.65E+00	5.96E+00	8.07E+00	8.87E+00	1.05E+01	2.06E-03	84
INGESTION OF GRAINS	0.6838	7.92E+00	1.40E+00	2.69E+01	3.67E+01	7.10E+01	7.53E+01	9.64E+01	2.57E-04	51
INGESTION OF LEAF VEG	0.6838	7.92E+00	1.40E+00	2.69E+01	3.67E+01	7.10E+01	7.53E+01	9.64E+01	2.57E-04	54
INGESTION OF ROOT CROPS	0.6838	6.96E+00	8.19E-01	2.70E+01	3.44E+01	NOT-FOUND	NOT-FOUND	6.18E+01	1.07E-02	36
INGESTION OF FRUITS	0.6838	1.20E+01	3.83E+00	4.09E+01	5.38E+01	NOT-FOUND	NOT-FOUND	9.18E+01	1.07E-02	36
INGESTION OF LEGUMES	0.6838	6.53E+00	1.55E+00	2.36E+01	3.30E+01	NOT-FOUND	NOT-FOUND	5.28E+01	1.07E-02	36
INGESTION OF BEEF	0.6838	8.75E+01	4.24E+01	2.31E+02	2.69E+02	3.24E+02	3.41E+02	3.68E+02	1.67E-03	111
INGESTION OF MILK	0.6838	6.06E+01	2.03E+01	1.41E+02	1.78E+02	2.25E+02	2.39E+02	2.65E+02	1.67E-03	111
INGESTION OF POULTRY	0.6838	2.12E+01	1.65E+01	5.12E+01	6.18E+01	1.02E+02	1.08E+02	1.37E+02	2.57E-04	54
INGESTION OF OTHER MEAT CROPS	0.6838	7.58E+00	3.22E+00	2.18E+01	2.74E+01	3.45E+01	3.70E+01	3.89E+01	3.08E-03	97
L-EDEWBODY POP. DOSE (Sv) 0-16.1 km										
TOTAL LONG-TERM PATHWAYS DOSE	0.6386	1.45E+02	8.41E+01	3.60E+02	4.95E+02	1.01E+03	1.09E+03	1.49E+03	2.53E-04	17
LONG-TERM DIRECT EXPOSURE PATHWAYS	0.6251	1.24E+02	6.72E+01	3.32E+02	4.43E+02	9.61E+02	1.07E+03	1.47E+03	2.53E-04	17
TOTAL INGESTION PATHWAYS DOSE	0.6386	9.54E+00	3.38E+00	3.01E+01	5.78E+01	NOT-FOUND	NOT-FOUND	7.98E+01	1.07E-02	126
LONG-TERM GROUNDSHINE DOSE	0.6251	1.24E+02	6.57E+01	3.26E+02	4.39E+02	9.61E+02	1.07E+03	1.46E+03	2.53E-04	17
LONG-TERM RESUSPENSION DOSE	0.6251	6.34E-01	2.66E-01	1.76E+00	2.48E+00	4.14E+00	5.05E+00	8.62E+00	3.16E-04	17
WATER INGESTION DOSE	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
POP.-DEPENDENT DECONTAMINATION DOSE	0.5658	9.77E+00	3.11E-01	2.78E+01	4.54E+01	9.61E+01	1.19E+02	2.17E+02	5.24E-04	79
FARM-DEPENDENT DECONTAMINATION DOSE	0.6378	1.01E+00	1.05E-01	2.96E+00	3.24E+00	3.93E+00	4.27E+00	4.66E+00	2.42E-03	72
INGESTION OF GRAINS	0.6386	3.87E-01	1.80E-01	9.29E-01	1.25E+00	2.94E+00	3.44E+00	9.38E+00	8.13E-04	56
INGESTION OF LEAF VEG	0.6386	3.87E-01	1.80E-01	9.29E-01	1.25E+00	2.94E+00	3.44E+00	9.38E+00	8.13E-04	56
INGESTION OF ROOT CROPS	0.6386	2.56E-01	1.10E-01	5.39E-01	1.05E+00	3.02E+00	NOT-FOUND	4.05E+00	6.21E-03	19
INGESTION OF FRUITS	0.6386	8.92E-01	5.30E-01	2.18E+00	2.79E+00	5.38E+00	NOT-FOUND	6.36E+00	6.21E-03	19
INGESTION OF LEGUMES	0.6386	3.99E-01	2.17E-01	9.29E-01	1.22E+00	2.40E+00	NOT-FOUND	3.58E+00	6.21E-03	19
INGESTION OF BEEF	0.6386	3.75E+00	6.21E-01	1.01E+01	2.51E+01	NOT-FOUND	NOT-FOUND	4.16E+01	1.07E-02	126
INGESTION OF MILK	0.6386	2.63E+00	3.55E-01	6.99E+00	2.02E+01	NOT-FOUND	NOT-FOUND	2.99E+01	1.07E-02	126
INGESTION OF POULTRY	0.6386	7.64E-01	2.06E-01	3.02E+00	3.85E+00	5.45E+00	5.84E+00	1.32E+01	8.13E-04	56
INGESTION OF OTHER MEAT CROPS	0.6386	3.00E-01	3.08E-02	9.91E-01	2.13E+00	NOT-FOUND	NOT-FOUND	3.35E+00	1.07E-02	93
L-EDEWBODY POP. DOSE (Sv) 0-3.2 km										
TOTAL LONG-TERM PATHWAYS DOSE	0.4156	2.97E-01	0.00E+00	6.00E-01	9.68E-01	3.78E+00	4.51E+00	5.18E+00	1.67E-03	110
LONG-TERM DIRECT EXPOSURE PATHWAYS	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
TOTAL INGESTION PATHWAYS DOSE	0.4156	2.54E-01	0.00E+00	4.43E-01	6.75E-01	3.53E+00	3.99E+00	4.85E+00	1.67E-03	110
LONG-TERM GROUNDSHINE DOSE	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
LONG-TERM RESUSPENSION DOSE	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
WATER INGESTION DOSE	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
POP.-DEPENDENT DECONTAMINATION DOSE	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
FARM-DEPENDENT DECONTAMINATION DOSE	0.4156	4.34E-02	0.00E+00	1.16E-01	1.98E-01	4.18E-01	NOT-FOUND	5.42E-01	6.16E-03	59
INGESTION OF GRAINS	0.4156	1.07E-02	0.00E+00	3.30E-02	4.21E-02	6.18E-02	7.04E-02	7.82E-02	2.81E-03	63
INGESTION OF LEAF VEG	0.4156	1.07E-02	0.00E+00	3.30E-02	4.21E-02	6.18E-02	7.04E-02	7.82E-02	2.81E-03	63
INGESTION OF ROOT CROPS	0.4156	6.19E-03	0.00E+00	1.76E-02	2.42E-02	3.62E-02	4.08E-02	4.50E-02	2.81E-03	63
INGESTION OF FRUITS	0.4156	3.01E-02	0.00E+00	9.02E-02	1.11E-01	1.69E-01	2.01E-01	2.22E-01	2.81E-03	63
INGESTION OF LEGUMES	0.4156	1.27E-02	0.00E+00	3.70E-02	4.77E-02	7.84E-02	8.58E-02	9.24E-02	2.81E-03	63
INGESTION OF BEEF	0.4156	9.91E-02	0.00E+00	1.07E-01	2.25E-01	2.14E+00	2.26E+00	2.46E+00	1.67E-03	110
INGESTION OF MILK	0.4156	7.28E-02	0.00E+00	6.74E-02	1.65E-01	1.23E+00	1.41E+00	1.76E+00	1.67E-03	110
INGESTION OF POULTRY	0.4156	1.37E-02	0.00E+00	2.23E-02	4.08E-02	2.23E-01	2.43E-01	2.77E-01	1.67E-03	110
INGESTION OF OTHER MEAT CROPS	0.4156	5.28E-03	0.00E+00	3.20E-03	4.88E-03	1.15E-01	1.28E-01	1.52E-01	1.67E-03	110
ECONOMIC COST MEASURES (\$)										
TOTAL ECONOMIC COSTS	0.6567	1.15E+08	5.50E+07	3.17E+08	4.32E+08	8.63E+08	1.08E+09	1.67E+09	4.17E-04	28
POP.-DEPENDENT COSTS	0.5839	8.65E+07	7.06E+06	2.54E+08	3.84E+08	7.69E+08	1.03E+09	1.54E+09	4.17E-04	28

02/03/00	15:55:37	PAGE	9	PROB	QUANTILES					PEAK	PEAK	PEAK	
				NON-ZERO	MEAN	50TH	90TH	95TH	99TH	99.5TH	CONS	PROB	TRIAL
ECONOMIC COST MEASURES (\$)			0-80.5 km										
FARM-DEPENDENT COSTS				0.6567	2.84E+07	1.09E+07	7.60E+07	8.30E+07	1.04E+08	1.31E+08	1.66E+08	2.42E-03	28
POP.-DEPENDENT DECONTAMINATION COST				0.5839	2.59E+07	2.06E+06	7.60E+07	1.20E+08	2.24E+08	2.73E+08	5.89E+08	4.17E-04	28
FARM-DEPENDENT DECONTAMINATION COST				0.6489	4.18E+06	1.10E+06	1.25E+07	1.59E+07	2.29E+07	2.53E+07	2.88E+07	2.06E-03	84
POP.-DEPENDENT INTERDICTION COST				0.5839	6.06E+07	5.45E+06	1.73E+08	2.68E+08	5.45E+08	7.29E+08	1.15E+09	2.13E-04	105
FARM-DEPENDENT INTERDICTION COST				0.6547	1.06E+07	3.08E+06	3.16E+07	3.46E+07	4.27E+07	4.68E+07	6.70E+07	2.42E-03	28
POP.-DEPENDENT CONDEMNATION COST				0.0060	4.31E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E+06	1.44E+07	2.32E-03	6
FARM-DEPENDENT CONDEMNATION COST				0.4325	2.24E+05	0.00E+00	6.57E+05	1.17E+06	NOT-FOUND	NOT-FOUND	1.59E+06	1.85E-02	6
EMERGENCY PHASE COST				0.1851	1.91E+04	0.00E+00	2.77E+04	6.62E+04	3.50E+05	4.31E+05	1.53E+06	2.63E-03	20
INTERMEDIATE PHASE COST				0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
MILK DISPOSAL COST				0.6532	3.22E+05	1.07E+05	9.13E+05	1.05E+06	1.32E+06	1.46E+06	1.62E+06	2.42E-03	28
CROP DISPOSAL COST				0.6513	1.31E+07	5.12E+06	3.36E+07	3.63E+07	4.36E+07	4.72E+07	7.46E+07	2.42E-03	28

ECONOMIC COST MEASURES (\$)	0-16.1 km									
TOTAL ECONOMIC COSTS	0.6379	2.59E+07	1.08E+07	6.36E+07	8.43E+07	2.19E+08	2.35E+08	2.96E+08	5.24E-04	79
POP.-DEPENDENT COSTS	0.5658	2.25E+07	4.23E+06	5.85E+07	7.13E+07	1.42E+08	1.75E+08	2.91E+08	5.24E-04	79
FARM-DEPENDENT COSTS	0.6379	3.37E+06	4.01E+06	6.79E+06	7.88E+06	1.04E+07	1.09E+07	1.15E+07	2.36E-03	89
POP.-DEPENDENT DECONTAMINATION COST	0.5658	7.64E+06	1.02E+06	2.26E+07	2.62E+07	7.39E+07	7.71E+07	9.23E+07	2.53E-04	89
FARM-DEPENDENT DECONTAMINATION COST	0.6378	1.06E+06	4.99E+05	2.23E+06	2.36E+06	2.71E+06	2.87E+06	4.77E+06	2.36E-03	89
POP.-DEPENDENT INTERDICTION COST	0.5658	1.48E+07	3.02E+06	3.74E+07	4.71E+07	1.20E+08	1.38E+08	2.14E+08	2.59E-04	72
FARM-DEPENDENT INTERDICTION COST	0.6379	9.19E+05	7.47E+05	2.29E+06	3.61E+06	NOT-FOUND	NOT-FOUND	4.16E+06	3.75E-02	3
POP.-DEPENDENT CONDEMNATION COST	0.0060	4.31E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E+06	1.44E+07	2.32E-03	6
FARM-DEPENDENT CONDEMNATION COST	0.4325	2.24E+05	0.00E+00	6.57E+05	1.17E+06	NOT-FOUND	NOT-FOUND	1.59E+06	1.85E-02	6
EMERGENCY PHASE COST	0.1851	1.91E+04	0.00E+00	2.77E+04	6.62E+04	3.50E+05	4.31E+05	1.53E+06	2.63E-03	20
INTERMEDIATE PHASE COST	0.0000	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
MILK DISPOSAL COST	0.6379	2.54E+04	3.06E+04	6.19E+04	NOT-FOUND	NOT-FOUND	NOT-FOUND	9.53E+04	8.43E-02	3
CROP DISPOSAL COST	0.6379	1.14E+06	1.03E+06	2.39E+06	NOT-FOUND	NOT-FOUND	NOT-FOUND	4.38E+06	7.25E-02	3

MAXIMUM LONG-TERM ACTION DISTANCE (km)										
FARM-DEPENDENT DECONTAMINATION DIST.	0.6489	1.97E+01	1.07E+01	4.08E+01	4.78E+01	NOT-FOUND	NOT-FOUND	8.05E+01	1.72E-02	28
POP.-DEPENDENT DECONTAMINATION DIST.	0.5839	1.92E+01	1.07E+01	4.08E+01	4.78E+01	NOT-FOUND	NOT-FOUND	8.05E+01	1.72E-02	28
FARM-DEPENDENT INTERDICTION DIST.	0.6547	3.53E+01	3.19E+01	NOT-FOUND	NOT-FOUND	NOT-FOUND	NOT-FOUND	8.05E+01	2.74E-01	1
POP.-DEPENDENT INTERDICTION DIST.	0.5839	1.92E+01	1.07E+01	4.08E+01	4.78E+01	NOT-FOUND	NOT-FOUND	8.05E+01	1.72E-02	28
FARM-DEPENDENT CONDEMNATION DIST.	0.4325	1.86E+00	0.00E+00	4.68E+00	5.59E+00	NOT-FOUND	NOT-FOUND	8.05E+00	1.85E-02	6
POP.-DEPENDENT CONDEMNATION DIST.	0.0060	3.86E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NOT-FOUND	6.44E+00	6.00E-03	6
MILK DISPOSAL DIST.	0.6532	3.49E+01	3.11E+01	NOT-FOUND	NOT-FOUND	NOT-FOUND	NOT-FOUND	8.05E+01	3.16E-01	1
CROP DISPOSAL DIST.	0.6513	3.37E+01	3.07E+01	NOT-FOUND	NOT-FOUND	NOT-FOUND	NOT-FOUND	8.05E+01	2.74E-01	1

AFFECTED AREA/POPULATION	0-80.5 km									
FARM DECONTAMINATION (HECTARES)	0.6489	5.62E+03	1.25E+03	1.33E+04	1.80E+04	3.62E+04	4.17E+04	4.83E+04	2.42E-03	105
POP. DECONTAMINATION (INDIVIDUALS)	0.5839	5.79E+03	5.81E+02	1.61E+04	2.61E+04	5.23E+04	7.23E+04	1.25E+05	2.13E-04	105
FARM INTERDICTION (HECTARES)	0.6547	1.79E+04	7.65E+03	4.58E+04	5.24E+04	6.19E+04	6.65E+04	9.74E+04	2.42E-03	28
POP. INTERDICTION (INDIVIDUALS)	0.5839	5.79E+03	5.81E+02	1.61E+04	2.61E+04	5.23E+04	7.23E+04	1.25E+05	2.13E-04	105
FARM CONDEMNATION (HECTARES)	0.4325	6.72E+01	0.00E+00	1.76E+02	3.50E+02	NOT-FOUND	NOT-FOUND	4.77E+02	1.85E-02	6
POP. CONDEMNATION (INDIVIDUALS)	0.0060	5.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E+01	1.69E+02	2.32E-03	6
MILK DISPOSAL AREA (HECTARES)	0.6532	1.93E+04	7.25E+03	5.19E+04	5.97E+04	7.90E+04	8.75E+04	9.74E+04	2.42E-03	28
CROP DISPOSAL AREA (HECTARES)	0.6513	1.71E+04	7.17E+03	4.57E+04	5.24E+04	6.19E+04	6.65E+04	9.74E+04	2.42E-03	28

AFFECTED AREA/POPULATION	0-16.1 km									
FARM DECONTAMINATION (HECTARES)	0.6378	1.04E+03	6.95E+02	2.11E+03	2.26E+03	2.66E+03	2.85E+03	5.73E+03	2.36E-03	89
POP. DECONTAMINATION (INDIVIDUALS)	0.5658	1.15E+03	3.17E+02	2.40E+03	2.77E+03	7.81E+03	8.35E+03	1.52E+04	3.16E-04	89
FARM INTERDICTION (HECTARES)	0.6379	1.48E+03	1.11E+03	3.46E+03	NOT-FOUND	NOT-FOUND	NOT-FOUND	5.73E+03	6.41E-02	3
POP. INTERDICTION (INDIVIDUALS)	0.5658	1.15E+03	3.17E+02	2.40E+03	2.77E+03	7.81E+03	8.35E+03	1.52E+04	3.16E-04	89
FARM CONDEMNATION (HECTARES)	0.4325	6.72E+01	0.00E+00	1.76E+02	3.50E+02	NOT-FOUND	NOT-FOUND	4.77E+02	1.85E-02	6

	PROB NON-ZERO	MEAN	50TH	QUANTILES				PEAK CONS	PEAK PROB	PEAK TRIAL
				90TH	95TH	99TH	99.5TH			
AFFECTED AREA/POPULATION	0-16.1 km									
POP. CONDEMNATION (INDIVIDUALS)	0.0060	5.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E+01	1.69E+02	2.32E-03	6
MILK DISPOSAL AREA (HECTARES)	0.6379	1.52E+03	1.07E+03	4.15E+03	NOT-FOUND	NOT-FOUND	NOT-FOUND	5.73E+03	8.43E-02	3
CROP DISPOSAL AREA (HECTARES)	0.6379	1.49E+03	1.08E+03	3.46E+03	NOT-FOUND	NOT-FOUND	NOT-FOUND	5.73E+03	7.25E-02	3
MAXIMUM ANNUAL FOOD DOSE (EFFECTIVE)										
PROJECTED FOR INDIVIDUAL	0-1.6 km	0.5303	1.02E-03	7.93E-04	2.47E-03	2.96E-03	4.13E-03	NOT-FOUND	4.71E-03	5.27E-03 63
PROJECTED FOR INDIVIDUAL	1.6-3.2 km	0.5481	2.23E-03	2.16E-04	2.28E-03	8.32E-03	3.42E-02	3.63E-02	3.91E-02	2.14E-03 110
PROJECTED FOR INDIVIDUAL	3.2-4.8 km	0.6443	4.42E-03	2.72E-04	1.76E-02	2.21E-02	NOT-FOUND	NOT-FOUND	2.97E-02	1.06E-02 129
PROJECTED FOR INDIVIDUAL	4.8-6.4 km	0.8254	3.61E-03	1.67E-03	1.03E-02	1.13E-02	1.41E-02	1.54E-02	2.45E-02	3.57E-04 114
PROJECTED FOR INDIVIDUAL	6.4-8.1 km	0.9572	3.76E-03	1.53E-03	7.23E-03	1.65E-02	NOT-FOUND	NOT-FOUND	3.60E-02	4.25E-02 131
PROJECTED FOR INDIVIDUAL	8.1-16.1 km	1.0000	4.25E-03	1.49E-03	1.28E-02	2.16E-02	NOT-FOUND	NOT-FOUND	2.81E-02	2.13E-02 126
PROJECTED FOR INDIVIDUAL	16.1-32.2 km	1.0000	4.82E-03	1.61E-03	1.20E-02	1.37E-02	1.84E-02	2.55E-02	3.90E-02	2.14E-03 110
PROJECTED FOR INDIVIDUAL	32.2-48.3 km	1.0000	6.59E-03	5.15E-03	1.42E-02	1.85E-02	NOT-FOUND	NOT-FOUND	3.07E-02	1.47E-02 109
PROJECTED FOR INDIVIDUAL	48.3-64.4 km	1.0000	5.26E-03	4.61E-03	1.14E-02	1.42E-02	2.05E-02	2.11E-02	2.12E-02	4.37E-03 91
PROJECTED FOR INDIVIDUAL	64.4-80.5 km	1.0000	4.48E-03	3.60E-03	9.14E-03	1.06E-02	1.29E-02	1.40E-02	1.93E-02	3.57E-04 52
MAXIMUM ANNUAL FOOD DOSE (THYROID)										
PROJECTED FOR INDIVIDUAL	0-1.6 km	0.5303	9.23E-04	7.08E-04	2.42E-03	2.96E-03	3.84E-03	NOT-FOUND	4.24E-03	5.27E-03 63
PROJECTED FOR INDIVIDUAL	1.6-3.2 km	0.5481	7.16E-03	2.08E-04	1.83E-03	8.32E-02	1.21E-01	1.31E-01	1.45E-01	2.14E-03 110
PROJECTED FOR INDIVIDUAL	3.2-4.8 km	0.6443	2.01E-02	2.41E-04	9.32E-02	1.03E-01	1.14E-01	1.19E-01	1.40E-01	3.57E-04 103
PROJECTED FOR INDIVIDUAL	4.8-6.4 km	0.8254	1.44E-02	1.53E-03	5.98E-02	7.36E-02	NOT-FOUND	NOT-FOUND	9.61E-02	1.29E-02 67
PROJECTED FOR INDIVIDUAL	6.4-8.1 km	0.9572	1.14E-02	1.39E-03	4.72E-02	7.94E-02	NOT-FOUND	NOT-FOUND	1.34E-01	4.25E-02 131
PROJECTED FOR INDIVIDUAL	8.1-16.1 km	1.0000	1.63E-02	1.48E-03	7.91E-02	1.01E-01	1.19E-01	NOT-FOUND	1.26E-01	5.27E-03 63
PROJECTED FOR INDIVIDUAL	16.1-32.2 km	1.0000	2.52E-02	1.54E-03	7.94E-02	1.01E-01	1.21E-01	1.31E-01	1.45E-01	2.14E-03 110
PROJECTED FOR INDIVIDUAL	32.2-48.3 km	1.0000	3.89E-02	2.74E-02	1.03E-01	1.14E-01	NOT-FOUND	NOT-FOUND	1.38E-01	1.29E-02 79
PROJECTED FOR INDIVIDUAL	48.3-64.4 km	1.0000	3.13E-02	2.82E-02	6.67E-02	8.10E-02	1.14E-01	1.28E-01	1.31E-01	4.37E-03 91
PROJECTED FOR INDIVIDUAL	64.4-80.5 km	1.0000	2.55E-02	2.14E-02	5.78E-02	7.09E-02	8.31E-02	8.90E-02	1.08E-01	1.18E-03 37



SOURCE TERM 1 OF 17:

RELEASE CATEGORY 101 - RC101

RESULT NAME = HEALTH EFFECTS CASES

ERL INJ/PRODROMAL VOMIT	0-80.5 km
-------------------------	-----------

PEOPLE FRACTION = 0.9500

0.0500

[illegible]















## **Attachment J**

**CR-3 Conditional Probability Matrix File  
(cr3-r1.cpm)**

### CONDITIONAL PROBABILITY MATRIX

CLASS	\ IE_A	IE_M	IE_S	IE_R	IE_T1	IE_T2	IE_T3	IE_T4	IE_T5	IE_T6	IE_T7	IE_T8	IE_T9	IE_T10	IE_T11	IE_T12	IE_T13	IE_T14	IE_T15
-------	--------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--------	--------	--------	--------	--------	--------

[illegible]

## **Attachment K**

### **CR-3 Release Category Matrix File (cr3-r1.rcm)**

[illegible]

## **Attachment L**

### **CR-3 Initiating Event Lookup Table (cr3\_init.xls)**



InitCodes Lookup			
Initiator	i/x	Group	Description
IE_A	i	Loss of Coolant Accidents	Large LOCA
IE_M	i	Loss of Coolant Accidents	Medium LOCA
IE_R	i		Steam Generator Tube Rupture
IE_S	i	Loss of Coolant Accidents	Small LOCA
IE_T1	i	Transients	Reactor Trip
IE_T10	i	Transients	Loss of SW
IE_T11	i	Transients	Loss of RW Flush Water
IE_T12	i	Transients	Loss of "A" DC Power
IE_T13	i	Transients	Loss of "B" DC Power
IE_T14	i	Transients	Loss of Offsite Power Transformer
IE_T15	i	Transients	Loss of Backup ES Transformer
IE_T2	i	Transients	Loss Of Main Feedwater
IE_T3	i	Transients	Loss of Offsite Power
IE_T4	i	Transients	Excessive Feedwater
IE_T5	i	Transients	Steam/Feedline Break
IE_T6	i	Transients	Spurious Pressurizer Low Pressure Signal
IE_T7	i	Transients	Spurious ES Actuation
IE_T8	i	Transients	Loss of 4160KV BUS 3A
IE_T9	i	Transients	Loss of 4160KV BUS 3B

This table is used as a Look-Up table to correctly sort the matrix table by Initiator Code.

You may alter this data manually, adjusting ONLY the TABLE LENGTH. The left column must be in ALL CAPS and the 2nd must be either "i" or "x". It is recommended to use the 'Verify Initiator Database Button' in the calculation portion of the Graphical Interface.

The 3rd column is for grouping initiators for Table 6.1-1, while the last Column is for descriptions.

SysAdmin

**FLORIDA POWER CORPORATION**

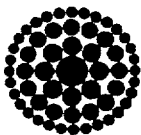
**CRYSTAL RIVER UNIT - 3**

**DOCKET NUMBER 50-302 / LICENSE NUMBER DPR-72**

**ATTACHMENT D**

**LICENSE AMENDMENT REQUEST #267, REVISION 1  
Containment Leakage Rate Testing Program**

**FPC Engineering Evaluation EEF-01-003,  
Level 3 PRA Check – Containment Leakage**



**Florida  
Power**  
CORPORATION

# INTEROFFICE CORRESPONDENCE

EE-XMTL.FRM

Nuclear Engineering

Office

NA1A

3865

MAC

Telephone

SUBJECT: Crystal River Unit 3

Quality Record Transmittal - Engineering Evaluations

TO: Records Management

The following Engineering Evaluation is submitted as the QA Record copy:

DOCNO (IFPC DOCUMENT IDENTIFICATION NUMBER) EEF-01-003	REV. 0	SYSTEM(S) NA	TOTAL PAGES TRANSMITTED <b>18</b>
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TITLE

Level 3 PRA Check - Containment Leakage

KWDS (IDENTIFY KEYWORDS FOR LATER RETRIEVAL)  
Level 3, PRA, Population Dose, ILRT, Containment Leakage

DXREF (Document Cross-Reference) (REFERENCES OR FILES - LIST PRIMARY FILE FIRST)

N-00-0002

VEND (VENDOR NAME)  
NA

VENDOR DOCUMENT NUMBER (DXREF)

SUPERSEDED DOCUMENTS (DXREF)

TAG

None

PART NO.

None

COMMENTS (USAGE RESTRICTIONS, PROPRIETARY, ETC.)

## NOTE:

Use Tag number only for valid tag numbers (i.e., RCV-8, SWV-34, DCH-99); otherwise, use Part number field (i.e., CSC14599, AC1459). If more space is required, write "See Attachment" and list on separate sheet.

**\*\*FOR RECORDS MANAGEMENT USE ONLY \*\***

Quality Record Transmittal received and information entered into SEEK.

Entered by: \_\_\_\_\_ Date

(Return copy of Quality Record Transmittal to DC Department Support Specialist.)

ENGINEER

R. A. Crandall

DATE

4/10/01

ENGINEERING SUPERVISOR

R. F. Layton

DATE

4/11/01

cc: Supervisor, Nuclear Configuration Mgmt.

Mgr., Design Control

Mgr., Systems Engineering

D. MISCHIEWICZ

T. HOWARD

Rev. 12/00

### A. Revision Summary

NA - This is the initial issuance of this Engineering Evaluation.

### B. Purpose

The purpose of this Engineering Evaluation is to perform an alternate method check of the population dose attributed to containment leakage scenarios in the pilot CR3 Level 3 MACCS2 (Ref. 6) runs made by FTI (Ref.1). This check will support the use of the Level 3 results in a risk-based analysis of the proposed extension to the ILRT leak rate measurement surveillance.

### C. Scope

This evaluation will use the dose rate results from the DBA LOCA analysis along with assumptions related to meteorology, population and evacuation to determine an order of magnitude estimate of the population dose from design basis containment leakage following a core melt accident. This will then be compared with the containment leakage population dose result from the pilot run of MACCS2 for CR3.

### D. Discussion

#### a. Background

License Amendment Request #267 requested an extension to the current requirement to perform a Type A Integrated Containment Leak Rate Test once per 10 years. To support this request, it is intended to provide a risk-based analysis using PRA. This is being performed via calculation F-01-0001.

In order to estimate the effects on population dose, Calculation F-01-0001 uses the calculated population dose for containment leakage scenarios from the FTI report, BAW 2369, "Generic Level 3 PRA for Crystal River -3", dated May 2000. This FTI report was done as a pilot application of the MACCS2 code for the B&W owners. It was not intended to be used as the CR3 Level 3 PRA. The intent was to finalize the update to the CR3 Level 1 PRA, run a new Level 2 PRA and then feed the new Level 2 PRA results into a more formal MACCS2 analysis in 2001/2002. As such, the current MACCS2 analysis in the FTI report was not verified.

In order to verify the reasonableness of the FTI MACCS2 results for containment leakage scenarios, this EE will use a different method to estimate population dose.

#### b. Method

##### 1. General

The DBA LOCA analysis calculates doses to an individual at the Exclusion Area Boundary as a function of time. These base doses can be adjusted to determine a 50 mile population dose for the course of the accident. One difference between a DBA evaluation and a PRA evaluation is that the DBA evaluation uses 95% worst-case meteorology and the PRA MACCS2 code uses a probabilistic distribution over all meteorological conditions. Therefore, the first step will be to adjust the DBA doses based on average meteorology. The next step will be to determine doses as a function of distance out to the 50 mile radius that MACCS2 calculates a population dose. These doses will then be multiplied by the average number of people in the downwind direction in each distance ring. The population will be adjusted based on evacuation assumptions.

## 2. Individual Dose as a Function of Distance

The doses to be used as the base doses are the results of the RADTRAD run for containment leakage used in Calculation N-00-0002. This was the LOCA dose calculation for the Alternative Source Term License Amendment Request #262. Both N-00-0002 and the pilot MACCS2 run are based on the containment leaking at the Technical Specification limit of  $L_a$ . N-00-0002 calculated the dose at the Exclusion Area Boundary (EAB), which is 0.83 miles from the containment. The results were:

0-1.8 hrs – EAB TEDE dose – 4.97 REM  
0-8 hr – EAB TEDE Dose – 10.9 REM  
0-30 days - EAB TEDE Dose – 14.1 REM

A 2 hour EAB dose was not available from the N-00-0002 printouts, so it will be simply estimated as 2/1.8 times the above value for 1.8 hours. For this evaluation, the differential dose for each time step beyond 2 hours is required. Therefore, the dose from the subsequent time step will be subtracted.

This gives the following:

0-2 hr – EAB TEDE dose – 5.5 REM  
2-8 hr – EAB TEDE Dose – 5.4 REM  
8 hr-30 days - EAB TEDE Dose – 3.2 REM

(Note – although only a 2 hour EAB dose is necessary in the DBA calculations, the EAB dose was calculated for the entire 30 day time period in N-00-0002. The 95% maximum 0-2 hour X/Q was used for the entire 30 days.)

The above doses are based on 95% worst-case dispersion. This is typical of F stability with a low wind speed of approximately 2 m/sec. However, MACCS2 uses a probabilistic calculation over all meteorological conditions. An average meteorological condition would be represented by D stability and 5 m/sec wind speed (see Table 2-12 of the FSAR – considered both 33' and 175' data since a thermal release or vent release is likely to be captured in a mixed plume representative of both levels – D was the predominant stability class, the average wind speed of approximately 9 mph was rounded up to approximately 5 m/sec). Therefore, two

RADOSE IV dose calculations were performed using arbitrary, but consistent release information, and just varying the stability class and the wind speed. The two outputs are provided as Attachments 1 and 2. Attachment 1, the F stability case gives an EAB dose rate of  $3.5E4$  mrem/hr. The D stability case gives an EAB dose rate of  $4.4E3$  mrem/hr. Therefore, the ratio of the dose under the two meteorological conditions is  $4.4E3/3.5E4 = 0.13$ . This ratio will be used to adjust the above calculated EAB doses:

0-2 hr – EAB TEDE dose –  $5.5 \text{ REM} \times 0.13 = 0.7 \text{ REM}$

2-8 hr – EAB TEDE Dose –  $5.4 \text{ REM} \times 0.13 = 0.7 \text{ REM}$

8 hr-30 days - EAB TEDE Dose –  $3.2 \text{ REM} \times 0.13 = 0.4 \text{ REM}$

Similar to MACCS2, to calculate a population dose, it is important to estimate the dose out to 50 miles (although dose rates decrease significantly with distance, the population is much greater as distance increases). To extrapolate the EAB dose as a function of distance, the RADDose IV code was used. This calculates the dose at various increments out to 10 miles. An arbitrary release rate of 1000 Ci/sec of noble gas was used, since we are only interested in the ratio of the doses. A one hour core melt mix was used. A 0 hour mix would over-estimate the effects of decay during transit. A longer half life mix was not used as the mix should be fairly representative of the mix that exists when the major portion of the dose is received. For meteorology, an average condition of D stability and 5 m/sec wind speed was used as discussed above. Although this is the same case as used in Attachment 2, it had to be extended one time step to get the plume out 10 miles.

The RADDose IV output is attached as Attachment 3. The centerline dose rates were entered into an EXCEL spreadsheet, Attachment 4. From this data, a best fit curve was generated and extrapolated out to 50 miles. The equation for the curve was determined to be:

$$Y = 2925.6 X^{-1.4902}$$

Using this formula, the following ratios to the EAB dose can be determined:

X = 0.83 (EAB)	Y = 3862	
X = 1 mile	Y = 2926	Ratio 1/0.83 Doses = $2926/3862 = 0.76$
X = 2 miles	Y = 1041	Ratio 2/0.83 Doses = $1041/3862 = 0.27$
X = 3 miles	Y = 569	Ratio 3/0.83 Doses = $569/3862 = 0.15$
X = 4 miles	Y = 371	Ratio 4/0.83 Doses = $371/3862 = 0.096$
X = 5 miles	Y = 266	Ratio 5/0.83 Doses = $266/3862 = 0.069$
X = 10 miles	Y = 95	Ratio 10/0.83 Doses = $95/3862 = 0.025$
X = 20 miles	Y = 34	Ratio 20/0.83 Doses = $34/3862 = 0.0087$
X = 30 miles	Y = 18	Ratio 30/0.83 Doses = $18/3862 = 0.0048$
X = 40 miles	Y = 12	Ratio 40/0.83 Doses = $12/3862 = 0.0031$
X = 50 miles	Y = 9	Ratio 50/0.83 Doses = $9/3862 = 0.0022$

### 3. Population Information

MACCS2 does not use worst-case analyses. Rather it distributes the plume probabilistically based on meteorological data sampling. There are no predominant downwind sectors at CR3. The wind blows offshore at approximately the same frequency as onshore. (See Figure 2-10 of the FSAR) Therefore, to simulate the meteorological sampling, the population data entered into this analysis will be based on the total population within a distance ring, divided by 16 sectors. It is assumed that the dose in adjacent sectors from the downwind sector is insignificant compared to the downwind sector dose. (See Attachments 1 and 2 which show 0 dose in the adjacent sector for F stability and approximately 3% of the downwind sector dose in the adjacent sector for D stability.)

The 0-2 mile population is taken from the Radiological Emergency Response Plan – Page D-2. The 0-1 mile population is assumed to be 1100 people, which essentially is the assumed worker population at the Crystal River site. The 1-2 mile population is assumed to be 5. Dividing by 16 as noted above gives the following results for the average population affected:

0-1 mile – 69  
1-2 miles – 0.3

The population for distances beyond 2 miles is taken from FSAR Figure 2-6. The projected data for the year 2000 was used. The total ring population, and the results after dividing by 16 are as follows:

2-3 miles – 0	$0/16 = 0$
3-4 miles – 232	$232/16 = 15$
4-5 miles – 1743	$1743/16 = 109$
5-10 miles – 22,610	$22,610/16 = 1413$
10-20 miles – 60,866	$60,866/16 = 3804$
20-30 miles – 88,406	$88,406/16 = 5525$
30-40 miles – 160,474	$160,474/16 = 10,030$
40-50 miles – 291,942	$291,942/16 = 18,246$

Based on this scenario, a General Emergency would be declared and an evacuation to at least 5 miles would be implemented. (Zone 1, which is the 5 mile ring is the minimum evacuation for a General Emergency). Therefore, after the 0-2 hour time period, it was assumed that only 5% of the population within 5 miles remained. The 5% is consistent with the MACCS2 analysis assumption. Since the dose beyond 5 miles is well within EPA Protective Action Guides, no evacuation beyond 5 miles was assumed.

#### 4. Population Dose Estimate

The calculation of population dose based on the above method and assumptions was performed via an EXCEL spreadsheet (Attachment 5). Column A is the distance rings chosen. Column B is the distance adjustment factors as calculated above. To be conservative, the factor at the beginning ring distance was used for the whole ring. Column C is the 0-2 hour dose at each distance and is equal to the 0.7 REM dose at

the EAB as determined above times the distance adjustment factor in Column B. Column D is the assumed population affected in each distance ring as determined above. Column E is the population dose for the 0-2 hr period and is equal to Column C x Column D. Column F is the 2-8 hour dose at each distance and is equal to the 0.7 REM dose at the EAB as determined above times the distance adjustment factor in Column B. Column G is the assumed population affected in each distance ring and has been adjusted for the assumed evacuation within 5 miles as noted above. Column H is the population dose for the 2-8 hr period and is equal to Column F x Column G. Column I is the 8 hr to 30 day dose at each distance and is equal to the 0.4 REM dose at the EAB as determined above times the distance adjustment factor in Column B. Column J is the assumed population affected in each distance ring and has been adjusted for the assumed evacuation within 5 miles as noted above. Column K is the population dose for the 8 hr to 30 day period and is equal to Column I x Column J. Column L is the total 30 day population dose in each distance ring and is equal to Column E + Column H + Column K. The total for the 50 mile radius is calculated at the bottom of Column L and is 683 person-rem.

#### E. Conclusions/Recommendations

The calculated 50 mile population dose due to containment leakage at  $L_a$  is calculated to be 683 person-rem using the methods discussed in this EE. The calculated population dose for this release category in the CR3 pilot MACCS2 PRA Level 3 analysis was 987 person-rem. These values are within a factor of 2. This is very good agreement considering the numerous differences in the methodologies and assumptions. It is therefore concluded that the estimate of public dose from the FTI MACCS2 report for a containment leakage scenario is a reasonable estimate of the public risk. It is therefore acceptable for use in Calculation F-01-0001.

#### F. References

1. FTI Report BAW 2369, "Generic Level 3 PRA for Crystal River -3, dated May 2000
2. CR3 Calculation N-00-0002, Rev. 0 - Public and Control Room Dose from a LOCA Using the Alternative Source Term
3. CR3 FSAR - Rev. 26 - Chapter 2
4. CR3 Radiological Emergency Response Plan - Rev. 21
5. CR3 Calculation F-01-0001, Rev. 0 - "Evaluation of Risk Significance of ILRT Extension"
6. NUREG/CR-6613 - "Code Manual for MACCS2", April 1998

#### G. Effects on Programs/Procedures

None



H. Attachments

1. RADDOSE IV results – F stability
2. RADDOSE IV results – D stability
3. RADDOSE IV results – D stability – 10 miles
4. Dose Rate vs. Distance Adjustments
5. Population Dose Estimate Spreadsheet

Signatures

Preparer: R.A. CRANDALL

R A Crandall 4/10/01

Verification Engineer: KRCAMPBELL

KRC 4/11/01

Preparer's Supervisor:

[Signature] 4/11/01  
R.F. LATON

ATTACHMENT 1  
Pg 1 of 3

RADDOSE IV      VERSION RD4v2.0b  
CRYSTAL RIVER NUCLEAR GENERATING STATION  
COPYRIGHT 1996 EARTH TECH, INC.

PROJ NUMBER: 001  
PROJ DATE : 01/01/01  
PROJ TIME : 11:30

PRINT DATE: 04/09/01  
PRINT TIME: 13:23  
OPERATOR : RAC

ACCIDENT SCENARIO DEFINITION:

TRIP/DECAY START DATE: 01/01/01  
TRIP/DECAY START TIME: 10:00  
TIME STEP: 30

RELEASE DATE: 01/01/01  
RELEASE TIME: 11:00

SWITCHES SET AT PROGRAM START:

PUFF DECAY  
SOURCE DECAY  
PUFF DEPLETION

SEA BREEZE  
SEMI-INFINITE MODEL  
ACCUMULATE ISOTOPES

METEOROLOGICAL DATA:

WIND SPEED	:	2.0mps/ 4.5mph	STABILITY CLASS	:	F
WIND DIR. (FROM)	:	270 degrees	DELTA TEMPERATURE	:	1.80 degrees F
AIR TEMPERATURE	:	75 degrees F	SIGMA-THETA	:	N/A
PRECIPITATION RATE	:	0.00 in/15 mins	MIXING HEIGHT	:	150 m (TIBL Y)

SOURCE TERM DATA:

	PATHWAY 1	PATHWAY 2	PATHWAY 3
ACCIDENT TYPE	LOCAC	NONE	NONE
FLOWRATE (CFM)	++++++	*****	*****
NOBLE GAS METHOD	DIRECT	*****	*****
NOBLE GAS MONITOR	++++++	*****	*****
NOBLE GAS REL RATE	1.00E+03 Ci/s	*****	*****
IODINE METHOD	DIRECT	*****	*****
IODINE MONITOR	++++++	*****	*****
IODINE REL RATE	1.00E-20 Ci/s	*****	*****

TOTAL RELEASE RATES:

NOBLE GAS      1.00E+03 Ci/s  
IODINE        1.00E-20 Ci/s  
PARTICULATE   0.00E+00 Ci/s

CUMULATIVE RELEASE:

1.80E+06 Ci  
5.40E-17 Ci  
0.00E+00 Ci

CI/SEC RATIO (NOBLE GAS TO IODINE) = 1.00E+23  
% ABUNDANCE (Gases = 100%; Iodines = 100%; Particulates = 100%)

Kr-83m	:	0.00	I-131	:	15.18	Cs-134	:	0.00
Kr-85m	:	6.04	I-132	:	15.85	Cs-137	:	0.00
Kr-85	:	0.17	I-133	:	29.47	Te-132	:	0.00
Kr-87	:	8.03	I-134	:	15.28	Sr-89	:	0.00
Kr-88	:	15.66	I-135	:	24.22	Sr-90	:	0.00
Xe-131m	:	0.29				Ru-103	:	0.00
Xe-133m	:	1.76				Ru-106	:	0.00
Xe-133	:	50.01				Mo-99	:	0.00
Xe-135m	:	4.24						
Xe-135	:	11.00						
Xe-138	:	2.79						

```
PRINT DATE: 04/09/01
PRINT TIME: 13:23
OPERATOR   : RAC
```

[illegible]

CERT-01-003 REV 0  
ATTACHMENT 1  
Pg 3 of 3

RADDose IV                      VERSION RD4v2.0b  
CRYSTAL RIVER NUCLEAR GENERATING STATION  
COPYRIGHT 1996 EARTH TECH, INC.

PROJ NUMBER: 001  
PROJ DATE : 01/01/01  
PROJ TIME : 11:30

PRINT DATE: 04/09/01  
PRINT TIME: 13:23  
OPERATOR : RAC

CTOR	SECTOR MAXIMUM CDE-ADULT THYROID EXPOSURE				DOSE RATES (mrem/h-CDE)				ACCUMULATED DOSES (mrem-CDE)			
	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi
(A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(D)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(E)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(F)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(H)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(J)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW(K)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I(L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW(M)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N(N)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JW(P)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I(Q)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JW(R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AGs have been exceeded. Consider at least the minimum PAR.  
Exceeded: TEDEDose

ECTOR	SECTOR MAXIMUM TEDE EXPOSURE				DOSE RATES (mrem/h)				ACCUMULATED DOSES (mrem)			
	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi
(A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE(B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NE(D)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(E)	3.5E+04	1.1E+04	0.00	0.00	1.8E+04	2.9E+03	0.00	0.00	0.00	0.00	0.00	0.00
SE(F)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SE(H)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E(J)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW(K)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W(L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SW(M)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N(N)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW(P)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
W(Q)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NW(R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AGs have been exceeded. Consider at least the minimum PAR.  
Exceeded: TEDEDose

RADDOSE IV VERSION RD4v2.0b  
CRYSTAL RIVER NUCLEAR GENERATING STATION  
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Attachment 2

Pg 1 of 3

PROJ NUMBER: 001  
PROJ DATE : 01/01/01  
PROJ TIME : 11:30

PRINT DATE: 04/10/01  
PRINT TIME: 08:16  
OPERATOR : RAC

ACCIDENT SCENARIO DEFINITION:

TRIP/DECAY START DATE: 01/01/01  
TRIP/DECAY START TIME: 10:00  
TIME STEP: 30

RELEASE DATE: 01/01/01  
RELEASE TIME: 11:00

SWITCHES SET AT PROGRAM START:

PUFF DECAY  
SOURCE DECAY  
PUFF DEPLETION

SEA BREEZE  
SEMI-INFINITE MODEL  
ACCUMULATE ISOTOPES

METEOROLOGICAL DATA:

WIND SPEED : 5.0mps/ 11.2mph STABILITY CLASS : D  
WIND DIR.(FROM) : 270 degrees DELTA TEMPERATURE: -0.50 degrees F  
AIR TEMPERATURE : 75 degrees F SIGMA-THETA : N/A  
PRECIPITATION RATE: 0.00 in/15 mins MIXING HEIGHT : 98 m (TIBL Y)

SOURCE TERM DATA:

	PATHWAY 1	PATHWAY 2	PATHWAY 3
ACCIDENT TYPE	LOCAC	NONE	NONE
FLOWRATE (CFM)	+++++	*****	*****
NOBLE GAS METHOD	DRECT	*****	*****
NOBLE GAS MONITOR	+++++	*****	*****
NOBLE GAS REL RATE	1.00E+03 Ci/s	*****	*****
IODINE METHOD	DRECT	*****	*****
IODINE MONITOR	+++++	*****	*****
IODINE REL RATE	1.00E-20 Ci/s	*****	*****

TOTAL RELEASE RATES:

NOBLE GAS 1.00E+03 Ci/s  
IODINE 1.00E-20 Ci/s  
PARTICULATE 0.00E+00 Ci/s

CUMULATIVE RELEASE:

1.80E+06 Ci  
5.40E-17 Ci  
0.00E+00 Ci

CI/SEC RATIO (NOBLE GAS TO IODINE) = 1.00E+23  
% ABUNDANCE (Gases = 100%; Iodines = 100%; Particulates = 100%)

Kr-83m	: 0.00	I-131	: 15.18	Cs-134	: 0.00
Kr-85m	: 6.04	I-132	: 15.85	Cs-137	: 0.00
Kr-85	: 0.17	I-133	: 29.47	Te-132	: 0.00
Kr-87	: 8.03	I-134	: 15.28	Sr-89	: 0.00
Kr-88	: 15.66	I-135	: 24.22	Sr-90	: 0.00
Xe-131m	: 0.29			Ru-103	: 0.00
Xe-133m	: 1.76			Ru-106	: 0.00
Xe-133	: 50.01			Mo-99	: 0.00
Xe-135m	: 4.24				
Xe-135	: 11.00				
Xe-138	: 2.79				

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PRINT DATE: 04/10/01
PRINT TIME: 08:16
OPERATOR   : RAC
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AGs have been exceeded. Consider at least the minimum PAR.  
Exceeded: TEDEDose

[illegible]

RADDOSE IV VERSION RD4v2.0b  
CRYSTAL RIVER NUCLEAR GENERATING STATION  
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PROJ NUMBER: 001  
PROJ DATE : 01/01/01  
PROJ TIME : 11:30

PRINT DATE: 04/10/01  
PRINT TIME: 08:16  
OPERATOR : RAC

SECTOR	SECTOR MAXIMUM CDE-ADULT THYROID EXPOSURE				DOSE RATES (mrem/h-CDE)				ACCUMULATED DOSES (mrem-CDE)			
	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi
(A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(D)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(E)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(F)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(H)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(J)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(K)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(M)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(N)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(P)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(Q)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AGs have been exceeded. Consider at least the minimum PAR.  
Exceeded: TEDEDose

SECTOR	SECTOR MAXIMUM TEDE EXPOSURE				DOSE RATES (mrem/h)				ACCUMULATED DOSES (mrem)			
	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi
(A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(D)	144.01	17.89	1.82	0.00	72.01	8.95	0.46	0.00	0.00	0.00	0.00	0.00
(E)	4.4E+03	1.2E+03	294.21	0.00	2.2E+03	582.74	73.55	0.00	0.00	0.00	0.00	0.00
(F)	143.99	17.89	1.82	0.00	71.99	8.94	0.46	0.00	0.00	0.00	0.00	0.00
(G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(H)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(J)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(K)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(M)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(N)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(P)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(Q)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AGs have been exceeded. Consider at least the minimum PAR.  
Exceeded: TEDEDose

RADDOSE IV VERSION RD4v2.0b  
CRYSTAL RIVER NUCLEAR GENERATING STATION  
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Attachment 3  
Pg 1 of 3

PROJ NUMBER: 002  
PROJ DATE : 01/01/01  
PROJ TIME : 12:00

PRINT DATE: 04/09/01  
PRINT TIME: 10:43  
OPERATOR : RAC

ACCIDENT SCENARIO DEFINITION:

TRIP/DECAY START DATE: 01/01/01  
TRIP/DECAY START TIME: 10:00  
TIME STEP: 30

RELEASE DATE: 01/01/01  
RELEASE TIME: 11:00

SWITCHES SET AT PROGRAM START:

PUFF DECAY  
SOURCE DECAY  
PUFF DEPLETION

SEA BREEZE  
SEMI-INFINITE MODEL  
ACCUMULATE ISOTOPES

METEOROLOGICAL DATA:

WIND SPEED : 5.0mps/ 11.2mph STABILITY CLASS : D  
WIND DIR.(FROM) : 270 degrees DELTA TEMPERATURE: -0.50 degrees F  
AIR TEMPERATURE : 75 degrees F SIGMA-THETA : N/A  
PRECIPITATION RATE: 0.00 in/15 mins MIXING HEIGHT : 98 m (TIBL Y)

SOURCE TERM DATA:

	PATHWAY 1	PATHWAY 2	PATHWAY 3
ACCIDENT TYPE	LOCAC	NONE	NONE
FLOWRATE (CFM)	+++++++	*****	*****
NOBLE GAS METHOD	DRECT	*****	*****
NOBLE GAS MONITOR	+++++++	*****	*****
NOBLE GAS REL RATE	1.00E+03 Ci/s	*****	*****
IODINE METHOD	DRECT	*****	*****
IODINE MONITOR	+++++++	*****	*****
IODINE REL RATE	1.00E-20 Ci/s	*****	*****

TOTAL RELEASE RATES:

NOBLE GAS 1.00E+03 Ci/s  
IODINE 1.00E-20 Ci/s  
PARTICULATE 0.00E+00 Ci/s

CUMULATIVE RELEASE:

3.60E+06 Ci  
1.08E-16 Ci  
0.00E+00 Ci

CI/SEC RATIO (NOBLE GAS TO IODINE) = 1.00E+23  
% ABUNDANCE (Gases = 100%; Iodines = 100%; Particulates = 100%)

Kr-83m : 0.00	I-131 : 16.65	Cs-134 : 0.00
Kr-85m : 5.94	I-132 : 14.96	Cs-137 : 0.00
Kr-85 : 0.18	I-133 : 31.85	Te-132 : 0.00
Kr-87 : 6.50	I-134 : 11.27	Sr-89 : 0.00
Kr-88 : 14.71	I-135 : 25.27	Sr-90 : 0.00
Xe-131m : 0.31		Ru-103 : 0.00
Xe-133m : 1.87		Ru-106 : 0.00
Xe-133 : 53.13		Mo-99 : 0.00
Xe-135m : 4.54		
Xe-135 : 12.13		
Xe-138 : 0.70		





RADDOSE IV VERSION RD4v2.0b  
CRYSTAL RIVER NUCLEAR GENERATING STATION  
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ATTACHMENT 3

Pg 3 / 3

PROJ NUMBER: 002  
PROJ DATE : 01/01/01  
PROJ TIME : 12:00

PRINT DATE: 04/09/01  
PRINT TIME: 10:43  
OPERATOR : RAC

SECTOR	SECTOR MAXIMUM CDE-ADULT THYROID EXPOSURE				DOSE RATES (mrem/h-CDE)				ACCUMULATED DOSES (mrem-CDE)			
	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi
(A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(D)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(E)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(F)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(H)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(J)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(K)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(M)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(N)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(P)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(Q)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

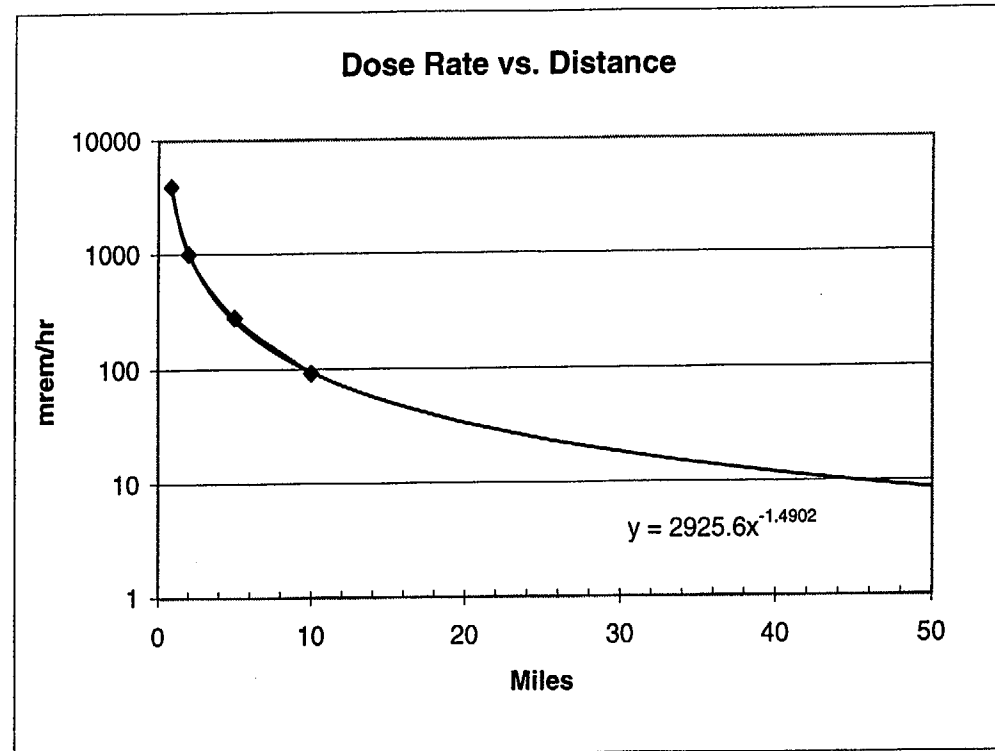
AGs have been exceeded. Consider at least the minimum PAR.  
Exceeded: TEDEDose

SECTOR	SECTOR MAXIMUM TEDE EXPOSURE				DOSE RATES (mrem/h)				ACCUMULATED DOSES (mrem)			
	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi	0.83mi	2.0 mi	5.0 mi	10.0 mi
(A)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(D)	128.90	16.01	1.79	0.28	136.46	16.95	1.39	0.07	136.43	16.95	1.39	0.07
(E)	3.9E+03	1.0E+03	281.69	92.06	4.1E+03	1.1E+03	220.64	23.05	4.1E+03	1.1E+03	220.64	23.05
(F)	128.88	16.01	1.79	0.28	136.43	16.95	1.39	0.07	136.43	16.95	1.39	0.07
(G)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(H)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(J)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(K)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(M)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(N)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(P)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(Q)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(R)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AGs have been exceeded. Consider at least the minimum PAR.  
Exceeded: TEDEDose

Distance Miles	Dose Rate mrem/hr
0.83	3900
2	1000
5	282
10	92

The above values are from a RADDose IV run with an arbitrary release rate of 1000 Ci/sec with a 1 hour post-LOCA, fuel melt mix. An average meteorological condition of D stability and 5 m/sec wind speed was used. The data was plotted and extrapolated out to 50 miles with a best fit curve. The ratio of the dose rate as a function of distance will be used to extrapolate the doses calculated in the DBA analysis at 0.83 miles.



Pg 1 of 1

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**FLORIDA POWER CORPORATION**

**CRYSTAL RIVER UNIT - 3**

**DOCKET NUMBER 50-302 / LICENSE NUMBER DPR-72**

**ATTACHMENT E**

**LICENSE AMENDMENT REQUEST #267, REVISION 1  
Containment Leakage Rate Testing Program**

**Adjusted Operational Type A Test Results for CR-3**

In Attachment A to Reference 1, a table of operational Type A test results was presented. These were the results using the Mass Point Test Method, which were submitted to the NRC after each operational Type A test. The Mass Point Test Method was used in each of the four (4) operational Type A tests while the Total Time Method was also used in the three (3) latest tests.

A subsequent letter to the NRC was determined to be applicable to these test results. FPC letter 3F0897-11, dated August 12, 1997, documented adjustments in the Type A test results for the 1987 and 1991 tests. The results of both test methods were reviewed and the adjustment was made only to the higher result. The table of operational Type A test results is updated as follows:

<u>Date of Type A test</u>	<u>Date of Report to NRC</u>	<u>FPC Letter Reference</u>	<b>Type A Test Results [%wt/day]</b>			
			<u>Total Time Method</u>	<u>Total Time Method Adjusted</u>	<u>Mass Point Method</u>	<u>Mass Point Method Adjusted</u>
06/80	10/24/80	3F1080-09	N / A		0.142	
07/83	10/11/83	3F1083-13	0.173		0.148	
11/87	03/21/88	3F0388-16	0.137	0.147	0.107	
11/91	01/29/92	3F0192-16	0.099		0.101	0.111

These changes do not impact the original conclusion that the previous operational Type A tests were all well under the acceptance criteria of 0.75 La or 0.187 %wt/day.

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**ATTACHMENT F**

**LICENSE AMENDMENT REQUEST #267, REVISION 1  
Containment Leakage Rate Testing Program**

**Proposed Revised Improved Technical Specifications Change Page**

**Strikeout / Shadowed Format**

<b><del>Strikeout Text</del></b>	<b>Indicates deleted text</b>
<b><u>Shadowed Text</u></b>	<b>Indicates added text</b>

## 5.6 Procedures, Programs and Manuals

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### 5.6.2.19 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

- c. The reactor vessel pressure and temperature limits, including those for heatup and cooldown rates, shall be determined so that all applicable limits (e.g., heatup limits, cooldown limits, and inservice leak and hydrostatic testing limits) of the analysis are met.
- d. The PTLR, including revisions or supplements thereto, shall be provided upon issuance for each reactor vessel fluency period.

### 5.6.2.20 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak Test Program," dated September 1995, as modified by the following exception:

1. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the November 7, 1991 Type A test shall be performed no later than November 6, 2007.

The peak calculated containment internal pressure for the design basis loss of coolant accident,  $P_a$ , is 54.2 psig. The containment design pressure is 55 psig.

The maximum allowable primary containment leakage rate,  $L_a$ , at  $P_a$ , shall be 0.25% of primary containment air weight per day.

Leakage Rate acceptance criteria are:

1. Containment leakage rate acceptance criterion is  $\leq 1.0 L_a$ . During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are  $\leq 0.60 L_a$  for the Type B and Type C Tests and  $\leq 0.75 L_a$  for Type A Tests.
2. Air lock testing acceptance criteria are:
  - a. Overall air lock leakage range is  $\leq 0.05 L_a$  when tested at  $\geq P_a$ .
  - b. For each door, leakage rate is  $\leq 0.01 L_a$  when tested at  $\geq 8.0$  psig.

The provisions of SR 3.0.2 do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.



**FLORIDA POWER CORPORATION**

**CRYSTAL RIVER UNIT - 3**

**DOCKET NUMBER 50-302 / LICENSE NUMBER DPR-72**

**ATTACHMENT G**

**LICENSE AMENDMENT REQUEST #267, REVISION 0**  
**Containment Leakage Rate Testing Program**

**Proposed Revised Improved Technical Specifications Change Page**

**Revision Bar Format**

## 5.7 Procedures, Programs and Manuals

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### 5.6.2.19 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR) (continued)

- e. The reactor vessel pressure and temperature limits, including those for heatup and cooldown rates, shall be determined so that all applicable limits (e.g., heatup limits, cooldown limits, and inservice leak and hydrostatic testing limits) of the analysis are met.
- f. The PTLR, including revisions or supplements thereto, shall be provided upon issuance for each reactor vessel fluency period.

### 5.6.2.20 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak Test Program," dated September 1995, as modified by the following exception:

- 1. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the November 7, 1991 Type A test shall be performed no later than November 6, 2007.

The peak calculated containment internal pressure for the design basis loss of coolant accident,  $P_a$ , is 54.2 psig. The containment design pressure is 55 psig.

The maximum allowable primary containment leakage rate,  $L_a$ , at  $P_a$ , shall be 0.25% of primary containment air weight per day.

Leakage Rate acceptance criteria are:

- 1. Containment leakage rate acceptance criterion is  $\leq 1.0 L_a$ . During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are  $\leq 0.60 L_a$  for the Type B and Type C Tests and  $\leq 0.75 L_a$  for Type A Tests.
- 2. Air lock testing acceptance criteria are:
  - a. Overall air lock leakage range is  $\leq 0.05 L_a$  when tested at  $\geq P_a$ .
  - b. For each door, leakage rate is  $\leq 0.01 L_a$  when tested at  $\geq 8.0$  psig.

The provisions of SR 3.0.2 do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.