NUCLEAR ENGINEERING CALCULATION COVER SHEET

NEPM-QA-0221-1

>2. TYPE: CALC >3. NUMBER: EC-RADN-1127 >4. REVISION: 0

*>5. UNIT 3 *>6. QUALITY CLASS: Q

>7. DESCRIPTION: Control Rod Drop Accident CRHE and Off Site Doses - AST

8. SUPERSEDED BY:

9. Alternate Number: 10. Cycle:

11. Computer Code/Model used: RADTRAD V 3.03 12. Discipline: R

>13. Are any results of this calculation described in the Licensing Documents?

☒ Yes, *Refer to NDAP-QA-0730 and NDAP-QA-0731* ☐ No

>14. Is this calculation changing any method of evaluation described in the FSAR and using the results to support or change the FSAR? (Refer to PPL Resource Manual for Definition of FSAR)

☒ Yes, *50.59 screen or evaluation required.* ☐ No

>15. Is this calculation Prepared by an External Organization?

☒ Yes ☐ No

EG771 Qualifications may not be required for individuals from external organizations (see Section 7.4.3).

>16. Prepared by:	K. Weise *Print Name(EG771 Qualification Required)*	*Signature*	8/16/05 *Date*
>17. Reviewed by:	M. M. Waselus *Print Name(EG771 Qualification Required)*	*Signature*	8/15/05 *Date*
>18. Verified by:	M. M. Waselus *Print Name(EG771 Qualification Required)*	*Signature*	8/15/05 *Date*
>19. Approved by:	M. G. Capiotis *Print Name(Qualified per NEPM-QA-0241 and comply with Section 7.8 of NEPM-QA-0221)*	*Signature*	8/15/05 *Date*
>20. Accepted by:	TERRENCE F. MACKAY *Print Name(EG771 Qualification Required) and comply with Section 7.9 of NEPM-QA-0221*	*Signature*	8/19/05 *Date*

TO BE COMPLETED BY DCS

DCS SIGNATURE/DATE

ADD A NEW COVER PAGE FOR EACH REVISION
FORM NEPM-QA-0221-1, Revision 8, Page 1 of 1, ELECTRONIC FORM

* Verified Fields
> REQUIRED FIELDS

ADD A NEW COVER PAGE FOR EACH REVISION
* Verified Fields

PP&L CALCULATION SHEET		
Dept. 0341 Rad & Eff Tech. Date August 15, 2005 Designed By K Weise Checked By M. M.Waselus	PROJECT: Control Rod Drop Accident CRHE and Offsite Doses - AST	Calc. No. EC-RADN-1127 Sh. No. 2

TABLE OF CONTENTS

1.0 PURPOSE 3
2.0 CONCLUSIONS and RECOMMENDATIONS 3
3.0 INPUT and ASSUMPTIONS 4
3.1 Reactor Core Sources 5
3.2 Fuel Damage from CRDA 7
3.3 Transport of Activity to the Environment 8
3.4 Control Room Habitability Design Parameters 8
3.5 Dose Parameters 9
3.6 Dispersion Parameters 9
4.0 METHOD 10
4.1 Applicability of Design Basis Analysis 10
4.2 Condenser Activities Available for Release to the Environment 11
4.3 Radiological and Transport Model 13
4.4 Releases from Mechanical Vacuum Pump at Low Power 14
5.0 RESULTS 15
6.0 REFERENCES 16
Attachment 1 RADTRAD Control File Release Fraction and Timing CRDA_SSES_AST_2000_melt.rft 18
Attachment 2 RADTRAD Control File Dose Conversion File CRDA_Expanded_Fgr11&12.inp 20
Attachment 3 RADTRAD Control File Inventory File CRDA_SSES_AST.nif 31
Attachment 4 RADTRAD Output CRDA_500cfm_2000_noCREOAS.out 40
Attachment 5 RADTRAD Output CRDA_500cfm_MVP_30_noCREOAS_AST.out 61

CONTROL ROD DROP ACCIDENT CRHE AND OFFSITE DOSES -AST

1.0 PURPOSE

This calculation documents the design basis evaluation of the Control Room Habitability Envelope (CRHE) and offsite radiological doses following a postulated control rod drop accident (CRDA) using the Alternate Source Term (AST) methodology described in USNRC Regulatory Guide 1.183 (Reference 1). The doses are calculated using the RADTRAD computer code (Reference 4).

The previous calculations EC-RADN-1073 (Reference 8) and EC-RADN-1111 (Reference 7) used the TID-14844 methodology described in NUREG-0800, SRP 15.4.9 (Reference 2).

2.0 CONCLUSIONS and RECOMMENDATIONS

The offsite dose acceptance criteria for the CRDA is provided in USNRC Regulatory Guide 1.183, Table 6. The CRHE dose acceptance criteria for the CRDA is provided in 10CFR50.67, Accident Source Term, subsection 10CRF50.67(b)(2)(iii). The offsite dose acceptance criteria is 6.3 Rem TEDE at the exclusion area boundary (EAB) and the low population zone (LPZ). The CRHE dose acceptance criteria is 5 Rem TEDE.

Two CRDA cases were analyzed. The first case adhered to the guidance in Regulatory Guide 1.183 and is applicable when the plant is at power. The results are based on a postulated 2000 rods failing in the core. The second case is during low power operation with the mechanical vacuum pump (MVP) running. At low power with fewer than 30 rods failing, main steam line dose rates may be too low to be reliably sensed by the MSLRMs to generate a trip signal for the mechanical vacuum pump. Failure to trip the vacuum pump would result in an unfiltered release of fission products to the environment from the turbine building vent stack. The reported doses for both cases are:

Dose Summary for Control Rod Drop Accident

	2000 Failed Rods with Condenser Leakage TEDE, rem	30 Failed Rods with MVP Running TEDE, rem
Acceptance Criterion - Offsite	6.3	6.3
EAB	0.19	2.3
LPZ	0.05	0.18
Acceptance Criterion - CRHE	5.0	5.0
CRHE	0.49	1.8
Acceptance Criterion -	5.0	5.0

3.0 INPUT and ASSUMPTIONS

The input data and assumptions used in this analysis are described in this section and summarized in Table 1.

Table 1
Control Rod Drop Analysis Input and Assumptions Summary

Description	Value	Source
Core Thermal Power	4032 MWt	Reference 5
Number of Fuel Bundles in Core	764	Reference 6
Number of ATRIUM-10 Rods per Bundle	87.8	See section 3.1
Core Inventory (Ci/MWt)	Table 2	Reference 13
Number of Fuel Rods Damaged by CRDA	2,000	See section 3.2
Fuel Melting in Damaged Rod	0.77%	See section 3.2
Core Radial Peaking Factor	1.6	Reference 14
Gap Activity Released to Reactor Coolant from Damaged Rods	10% noble gases and iodines 12% Cs and Rb	RG 1.183, Appendix C
Fraction of Fuel Activity Released to Reactor Coolant from Melted Regions	100% noble gases 50% iodines Table 3 - others	RG 1.183, Table 1 and Appendix C
Activity in Reactor Coolant Transported to Condenser	100% noble gases 10% iodine 1% others	RG 1.183, Appendix C
Activity in the Condenser Available for Release to Environment	100% noble gases 10% iodine 1% others	RG 1.183, Appendix C
Leak Rate from Condenser to Environment	1%/day	RG 1.183, Appendix C
Removal Rate from Condenser to Environment with MVP running	1212%/day	Reference 8
Number of Rods Damaged by CRDA Needed to Cause MVP Trip and Isolation	30	Reference 8
Radioiodine Species Released from Condenser	97% Elemental 3% Organic	RG 1.183, Appendix C
Holdup in Turbine Building	None	RG 1.183, Appendix C
Accident Duration	24 h	RG 1.183, Appendix C
CRHE Volume	518,000 ft^3	Reference 9

Accident Duration	24 h	RG 1.183, Appendix C

Table 1
Control Rod Drop Analysis Input and Assumptions Summary

Description	Value	Source
CRHE Isolation and CREOAS Start-up	None	See section 3.3
CRHE Air Intake Flow	6391 cfm (maximum)	Reference 20
CRHE Unfiltered Inleakage	500 cfm	See section 3.4
CRHE Ingress/egress Flow	10 cfm	
Operator and Offsite Breathing Rates	3.5E-04 m^3/s onsite and offsite 1.8E-04 m^3/s offsite 8 to 24 h	RG 1.183
Operator Occupancy Factors	1.0 for 24 h	RG 1.183
Offsite χ/Q	EAB: 8.3E-04 s/m^3, 0 to 2 h LPZ: 4.9E-05 s/m^3, 0 to 8 h 3.5E-05 s/m^3, 8 to 24 h	Reference 10
CRHE χ/Qs	Table 4	Reference 12

3.1 Reactor Core Sources

1. Core thermal power used for this accident is 4032 MWt per SSES EPUMELLA+ Design Report Request T0200, Core Design. (Reference 5). The thermal power is taken as 102% of the 3952 MWt uprate reactor power.
2. There are 764 ATRIUM-10 fuel bundles in the reactor core (EC-PUPC-1001, Tables A28-5 and A28-7, Reference 6).
3. There are 87.8 rods per ATRIUM-10 bundle averaged over the core. The total number of equivalent fuel rods per bundle is based on information in Reference 11 as follows:

Total # Rod Locations	91
# Full Length Rod Locations	83
# Part Length Fuel Rod Locations	8
Full Length Fuel Active Height, inch	149.45
Part Length Fuel Active Height, inch	90.0

From this data, the equivalent number of full length rods per bundle is:

No. Rods per bundle = [(83 x 149.45) + (8 x 90)] / 149.45 = 87.8

4. End of cycle reactor core inventories are given in Table 2. The AST nuclide activities are for a core with average burn up of 39 GWD/MTU using 4.25 wt% and 4.50 wt% enrichment ATRIUM-10 fuel (EC-FUEL-1615, Reference 13).

enrichment ATRIUM-10 fuel (EC-FUEL-1615, Reference 13).

PP&L CALCULATION SHEET		
Dept. 0341 Rad & Eff Tech. Date August 15, 2005 Designed By K Weise Checked By M. M.Waselus	PROJECT: Control Rod Drop Accident CRHE and Offsite Doses - AST	Calc. No. EC-RADN-1127 Sh. No. 6

Table 2
Core Activity at End of Cycle

Nuclide	Activity, Ci	Activity, Ci/MWt	Nuclide	Activity, Ci	Activity, Ci/MWt
Co-58	5.91E+05	1.47E+02	I-131	1.07E+08	2.65E+04
Co-60	3.19E+05	7.91E+01	I-132	1.57E+08	3.89E+04
Kr-83m	1.31E+07	3.25E+03	I-133	2.22E+08	5.51E+04
Kr-85	1.48E+06	3.67E+02	I-134	2.45E+08	6.08E+04
Kr-85m	2.68E+07	6.65E+03	I-135	2.11E+08	5.23E+04
Kr-87	5.37E+07	1.33E+04	Xe-131m	1.47E+06	3.60E+02
Kr-88	7.45E+07	1.85E+04	Xe-133m	6.99E+06	1.73E+03
Kr-89	9.24E+07	2.29E+04	Xe-133	2.12E+08	5.26E+04
Rb-86	2.17E+05	5.38E+01	Xe-135m	4.63E+07	1.15E+04
Sr-89	1.03E+08	2.55E+04	Xe-135	7.03E+07	1.74E+04
Sr-90	1.31E+07	3.25E+03	Xe-137	2.02E+08	5.01E+04
Sr-91	1.31E+08	3.25E+04	Xe-138	1.89E+08	4.69E+04
Sr-92	1.39E+08	3.45E+04	Cs-134	2.30E+07	5.70E+03
Y-90	1.36E+07	3.37E+03	Cs-136	7.34E+06	1.82E+03
Y-91	1.34E+08	3.32E+04	Cs-137	1.73E+07	4.29E+03
Y-92	1.40E+08	3.47E+04	Ba-139	1.95E+08	4.84E+04
Y-93	1.07E+08	2.65E+04	Ba-140	1.96E+08	4.86E+04
Zr-95	1.92E+08	4.76E+04	La-140	2.09E+08	5.18E+04
Zr-97	1.90E+08	4.71E+04	La-141	1.78E+08	4.41E+04
Nb-95	1.92E+08	4.76E+04	La-142	1.74E+08	4.32E+04
Mo-99	2.02E+08	5.01E+04	Ce-141	1.80E+08	4.46E+04
Tc-99m	1.79E+08	4.44E+04	Ce-143	1.67E+08	4.14E+04
Ru-103	1.72E+08	4.27E+04	Ce-144	1.51E+08	3.75E+04
Ru-105	1.19E+08	2.95E+04	Pr-143	1.61E+08	3.99E+04
Ru-106	6.85E+07	1.70E+04	Nd-147	7.24E+07	1.80E+04
Rh-105	1.11E+08	2.75E+04	Np-239	2.12E+09	5.26E+05
Sb-127	9.40E+06	2.33E+03	Pu-238	4.56E+05	1.13E+02
Sb-129	3.47E+07	8.61E+03	Pu-239	4.83E+04	1.20E+01
Te-127	9.32E+06	2.31E+03	Pu-240	7.79E+04	1.93E+01
Te-127m	1.59E+06	3.94E+02	Pu-241	1.92E+07	4.76E+03
Te-129	3.29E+07	8.16E+03	Am-241	2.54E+04	6.30E+00
Te-129m	6.66E+06	1.65E+03	Cm-242	6.67E+06	1.65E+03
Te-131m	2.15E+07	5.33E+03	Cm-244	3.90E+05	9.67E+01
Te-132	1.54E+08	3.82E+04			

Notes:
1. Core activity from EC-RADN-1615, Table 3.1
2. Core power at 4032 MWt
3. Kr-89, Xe-137 and Xe-138 neglected due to short half lives.
4. Xe-131m is neglected due to its small yield.

3.2 Fuel Damage from CRDA

1. 2000 fuel rods are assumed to experience cladding damage as the result of a CRDA. Currently, 1000 rods are assumed in the CRDA design basis accident for the pre-uprate core in accordance with EC-PUPC-1001 and EC-RADN-111 (References 6 and 7). Compliance check calculations are performed for each unit and cycle to verify that the number of rods is less than 1000. For these compliance checks, rods with 170 cal/gm or more energy deposited in the fuel are assumed to fail. It is expected that that the number of rods will not substantially change based on favorable results from compliance checking analyses and on scoping studies performed for extended power uprate. In order to establish a conservative bound for assessing accident doses, it is assumed that 2000 fuel rods fail.

2. No fuel melting is postulated for the CRDA (Reference 19). However, 0.77% of the fuel within a failed fuel rod is assumed to melt. This fuel melt assumption is intended to ensure compatibility with the same assumption made in GE's Topical Report NEDO-31400A, which evaluated the elimination of certain main steam radiation monitor (MSLRMs) safety functions (Reference 15).

   SSES's original design relied on the MSLRMs to provide early indications of gross fuel failures and input to the reactor protection system trip, MSIV trip closure, main steam line drain line valve closure, and mechanical vacuum pump trip. NEDO-31400A was a generic safety evaluation justifying the removal of some of the MSLRM functions in order to reduce inadvertent scram frequency. The NRC found the safety evaluation acceptable for use by licenses provided they complied with requirements identified by the NRC. The CRDA was the bounding accident impacted by the MSLRM change and addressed in NEDO-31400A.

   SSES relied on NEDO-31400A in its safety evaluation of the removal of the MSLRM input functions (50.59 Safety Evaluation E-01-1, MSLRM MSIV Closure and Scram Deletion, Reference 18). As part of SSES's evaluation, EC-RADN-1111 was performed in order to assess the impact of fuel melt relative to the licensing basis CRDA analysis[1]. EC-RADN-1111 neither used the AST methodology nor determined CRHE doses. Inclusion of fuel melt assumption here provides information on the potential impact of fuel melt and similarity to assumptions invoked in NEDO-31400A's generic analyses.

3. The activity release assumes the breached rods have operated with a radial peaking factor of 1.6. This factor corresponds to the worst case fuel bundle considered in SSES fuel handling accidents (Reference 14, Table 8.1).

4. The gap release is 10% of the core inventory noble gases and iodines, and 12% of the alkali metals (taken as Cs and Rb). These fractions are based on Regulatory Guide 1.183, Table 3, Note 11.

5. The release to the reactor coolant attributed to fuel melting consists of 100% of the noble gases and 50% of the iodines within the region that melts per Regulatory Guide

[1] NEDO-31400A and EC-RADN-1111 used the TID 14844 methodology.

noble gases and 50% of the iodines within the region that melts per Regulatory Guide

1.183, Appendix C.1. Solids released from the melted fuel are in accordance with the fractions shown in Regulatory Guide 1.183, Table 1.

6. Thirty fuel rods are required to reliably cause the MSLRMs to generate a high-high main steam radiation signal to initiate an automatic trip of the mechanical vacuum pump. This number was determined for a core with 79 rods per bundle, a radial peaking factor of 1.5, and power of 3616 MWt (EC-RADN-1073, Reference 8). With the uprate core with ATRIUM-10 fuel, the corresponding number of fuel rod perforations required to generate a high-high radiation signal is

$$\text{No. of Rods} = \frac{30 \text{ rods} * (87.8 \text{ rods per bundle} / 79 \text{ rods per bundle}) * (3616 \text{ MWt} * 1.5)}{(4032 \text{ MWt} * 1.6)}$$

or 28 rods. Therefore, 30 rod perforations will be retained in this calculation as the number needed to cause the mechanical vacuum pump to trip.

3.3 Transport of Activity to the Environment

The transport assumptions identified in this section are from Regulatory Guide 1.183, Appendix C. The assumptions are similar to NUREG-0800, SRP 15.49 guidance used in previous SSES licensing basis CRDA accident analyses[2].

1. Activity released from the fuel is assumed to instantaneously mix in the reactor coolant. Of this activity, 100% of the noble gases, 10% of the radioiodine, and 1% of the remaining nuclides are assumed to reach the condenser and turbine.
2. Of the activity reaching the condenser and turbine, 100% of the noble gases, 10% of the iodine, and 1% of the particulate nuclides are available for release to the environment.
3. The turbine and condenser leak to the atmosphere at 1% per day for 24 hours, after which time, the leakage is assumed to terminate.
4. If the mechanical vacuum pump is running, it removes activity from the main condenser at the rate of 1212%/day (Reference 8). The rate is based on a realistic condenser volume of 195,000 ft^3 and extraction of non-condensable gases at 75 cfm by the mechanical vacuum pump.
5. Radioiodine chemical species released from the main condenser/turbine is 97% elemental and 3% organic iodine.

3.4 Control Room Habitability Design Parameters

1. No credit is given for isolation or filtration of the CRHE's air supply. The control room emergency outside air filtration system (CREOAS) does not automatically start-up for

[2] SRP 15.4.9's activity transport considered noble gases and iodines. The AST methodology now also considers the alkali metals when no fuel melt occurs plus other core solids if fuel melt occurs.

this accident. Manual actuation by the control room operator is possible, but is not credited.

2. The CRHE's nominal CREOAS inlet air flow rate is 5810 cfm. This analysis uses 6391 cfm, the maximum value for which the system is in compliance with Technical Specification 5.5.7 (Reference 20). The use of the maximum flow rate results in the greatest uptake of activity during the accident.
3. Unfiltered inleakage is 500 cfm. This amount bounds the leakage and error band from the December 2004 CRHE tests. Unfiltered ingress/egress leakage through doors of 10 cfm is assumed based on NUREG-0800, SRP Section 6.4.
4. The control structure habitability envelope volume is 518,000 cu ft (EC-030-0502, Reference 9). The control room with volume of 110,000 ft^3 is located within this volume. The CRHE and control room are served by CREOAS.

3.5 Dose Parameters

1. Offsite breathing rates are 3.5E-04 m^3/s for the first 8 hours and 1.8E-04 m^3/s for 8 to 24 hours. The breathing rate for CRHE personnel is 3.5E-04 m^3/s These breathing rates are identified in Regulatory Guide 1.183.
2. Control room occupancy is based on a maximum exposed individual. This accident duration is 24 hours and the individual is assumed present in the control room 100% of the time during this period. The occupancy is consistent with the recommendations of Regulatory Guide 1.183 and NUREG-0800, SRP Section 6.4.
3. Doses are calculated in terms of the TEDE as required by Regulatory Guide 1.183. The dose conversion factors for the CEDE are based on Federal Guidance Report 11 and the EDE on Federal Guidance Report 12. The dose conversion factors adopted from FGR 11 and 12 are shown in Reference 4, Table 1.4.3.3-2. Three additional noble gas nuclides (Kr-83m, Xe-133m and Xe-135m) were added to the RADTRAD dose conversion library. The dose conversion factors have been recompiled into a RADTRAD file for this AST calculation and are included as Attachment 2.

3.6 Dispersion Parameters

1. χ/Q for the EAB is 8.3E-04 s/m^3 (0 to 2 h). χ/Q values for the LPZ are 4.9E-05 s/m^3 (0 to 8 h) and 3.5 E-05 s/m^3 (8 to 24 h) (EC-ENVR-1057, Tables 2.3-92 and 2.3-105, Reference 10).
2. Ground level releases are assumed from the turbine building vents via the turbine building's normal ventilation system. Two sets of CRHE χ/Qs are shown in Table 3. The sets correspond to the CRHE's new air intake (Unit 2 reactor building) location (EC-ENVR-1059, Reference 11).

Table 3
CRHE χ/Q Values Without Occupancy Correction

	RB Unit 2 CRHE Outside Air Intake Location		
Release Point	0 to 2 h χ/Q, s/m^3	2 to 8 h χ/Q, s/m^3	8 to 24 h χ/Q, s/m^3
TB Unit 1 Exhaust Vent	1.24E-03	9.55E-04	3.14E-04
TB Unit 2 Exhaust Vent	1.36E-03	1.03E-03	3.36E-04

Notes:
1. ARCON96 values from EC-ENVR-1059.

4.0 METHOD

The offsite and CRHE doses are calculated using the RADTRAD 3.03 computer program and the input and assumptions listed in Table 1. The RADTRAD control files used in the model are provided in Attachments 1, 2 and 3.

4.1 Applicability of Design Basis Analysis

The pre-AST design basis CRDA analysis for SSES follows the guidance in NUREG-0800, SRP Section 15.4.9. This guidance, like Regulatory Guide 1.183, Appendix C, presumed the instantaneous transport of radioactivity from failed fuel to the condenser/turbine, which then leaks to the environment at 1%/day from the isolated condenser. Regulatory Guide 1.183's methodology is also bounding although SSES's condenser is not initially isolated for a CRDA.

The MSIVs and main steam drain lines no longer automatically trip closed following a CRDA. The operators manually scram the reactor and close all MSIVs and drain line valves in the event of a main line steam radiation monitor (MSLRM) high radiation alarm in accordance with procedures ON-179-001 and ON-279-001 (Reference 27). The MSLRMs in the original SSES design provided input to automatically trip the MSIVs and drain line valves closed on a high-high radiation trip. These MSLRM trip functions were eliminated (as well as input to the RPS) as part of BWR generic efforts to reduce spurious reactor scrams and reactor vessel isolations (Reference 18).

A second flow path from the condenser is through the steam jet air ejectors (SJAEs). If the SJAEs are running, CRDA activity is transported from the condenser and processed in the offgas system. The SJAEs operate until manually shutdown in response to alarms from the pretreatment offgas system radiation monitor alarms (SSES Improved Technical Specification 3.7.5 and SSES Technical Requirements Manual 3.7.7, References 18, 21 and 23).

Justification for removal of the MSLRM functions and the acceptability of the offgas pathway including manual shutdown are based on the safety evaluations in NEDO-31400A (Reference 15) and 50.59 Safety Evaluation E-01-1, MSLRM MSIV Closure and Scram Deletion (Reference 18).

15) and 50.59 Safety Evaluation E-01-1, MSLRM MSIV Closure and Scram Deletion

Regulatory Guide 1.183, Appendix C's methodology remains bounding without automatic closure of the MSIVs or shutdown of the SJAEs. The assumption in Regulatory Guide 1.183 of the instantaneous release and transport of radioactivity to the condenser/turbine essentially gives no credit to the closure of the MSIVs. With sufficient steam available, the SJAEs operate and some of the activity in the condenser is transported to the augmented offgas system.

The dose resulting from radioactivity released through the augmented offgas system prior to its manual shutdown is small and can be neglected. Iodine releases are accepted as negligible in NEDO-31400A because of the retention of iodine in the offgas system's large charcoal beds. Similarly, NEDO-31400A demonstrates that hold-up of the noble gases by the offgas system can result in greatly reduced offsite doses. SSES's offgas system has activated charcoal hold-up times of 65 hours for kryptons and 39 days for xeons (Reference 18). With these hold-ups, the estimated dose at the SSES EAB due to noble gases is less than 0.09 rem (2000 rods with melt) assuming no shutdown of the SJAEs and offgas path[3]. The SJAE and offgas pathway's dose is small compared to the dose resulting from condenser/turbine leakage assumed in Regulatory Guide 1.183. In fact, processing some of the condensers activity would have a net beneficial effect since it becomes unavailable for leakage to the environment.

Certain other MSLRM isolation functions have been retained to control post-CRDA doses. A high-high radiation signal from MSLRM "A" or "B" shuts down the condenser's mechanical vacuum pump, if running, and closes its suction valves. This eliminates a potential unprocessed offgas release from the turbine building. (The vacuum pump is run at low loads prior to startup of the SJAEs, and then shutdown.) The MSLRM's trip output also closes the reactor recirculation sample valves, which isolates a potential path via the reactor building. These functions are covered in the Improved Technical Specifications (References 21, 22, 23).

4.2 Condenser Activities Available for Release to the Environment

Table 4 summarizes the release paths from the fuel to the main condenser. The fractions shown in the table are derived from Regulatory Guide 1.183 and are summarized in sections 3.2 and 3.3 above.

[3] The estimated dose follows directly from the evaluation in Reference 18, Table 2. Table 2 shows that SSES's EAB dose is only 8.9% of the generic 0.55 rem licensing basis dose determined in NEDO-31400A. Using 2000 failed rods (instead of 1000 failed rods assumed in Reference 18) and the updated site X/Qs (Reference 10), the EAB dose is less than 17.8% of the NEDO-31400A dose, or 0.09 rem .

[3] The estimated dose follows directly from the evaluation in Reference 18, Table 2. Table 2 shows that SSES's

Table 4
Release and Transport Pathway Fractions from Fuel to Environment

Nuclide Group	Failed Fuel Gap to Coolant f_g	Melted Fuel Core to Coolant f_m	Fraction Coolant to Condenser f_1	Fraction Condenser to Release f_2
Nobles	0.1	1	1	1
Iodines	0.1	0.5	0.1	0.1
Alkalis	0.12	0.25	0.01	0.01
Tellriums	0	0.05	0.01	0.01
Ba, Sr	0	0.02	0.01	0.01
Noble metals	0	0.0025	0.01	0.01
Lanthanides	0	0.0005	0.01	0.01
Ceriums	0	0.0002	0.01	0.01

Notes:
1. Release fractions from RG 1.183, Tables 1 and 3.
2. Transport fractions from RG 1.183, Appendix C.

The fraction $F_{c\text{-}i}$ of the core activity available for release from failed rods is

$$F_{c\text{-}i} = F_r * f_{g\text{-}i} * f_{1\text{-}i} * f_{2\text{-}i}$$

The fraction $F_{d\text{-}i}$ of the core inventory available for release from melted rods is

$$F_{d\text{-}i} = F_m * F_r * f_{m\text{-}i} * f_{1\text{-}i} * f_{2\text{-}i}$$

where -

F_r = fraction of failed rods in the reactor core

F_m = fraction of melted fuel in failed rods

$f_{g\text{-}i}$ = gap release fraction of activity from damaged rods for group i

$f_{m\text{-}i}$ = melt fraction of activity from damaged rods released to the coolant for group i

$f_{1\text{-}i}$ = fraction of activity in the coolant that reaches the condenser for group i

$f_{2\text{-}i}$ = fraction of activity in the condenser available for release to the environment for group i

for group i

The total available activity release by nuclide group F_{t-i} is the sum of the respective F_{c-i} and F_{d-i} values. The total release fractions are shown in Table 5. These values are used in the RADTRAD release fraction and timing (.rft) file to specify the activities available for release from the condenser.

Table 5
Fractions of Core Inventories
Available for Release from Condenser

Fuel bundles in core	764
Average no. rods per fuel bundle	87.8
Rods with failed clad	2000
Percent of failed rods in core, F_r	2.98%
Percent of failed rod melted, F_m	0.77%

Nuclide Group	Fuel Failure F_c	Fuel Melt F_d	Total F_t
Nobles	2.98E-03	2.30E-04	3.21E-03
Iodines	2.98E-05	1.15E-06	3.10E-05
Alkalis	3.58E-07	5.74E-09	3.64E-07
Tellriums	0	1.15E-09	1.15E-09
Ba, Sr	0	4.59E-10	4.59E-10
Noble metals	0	5.74E-11	5.74E-11
Lanthanides	0	1.15E-11	1.15E-11
Ceriums	0	4.59E-12	4.59E-12

4.3 Radiological and Transport Model

RADTRAD 3.03 is used for the dose models and calculations. The model consists of the main condenser/turbine, CRHE and environment compartments with four interconnecting transport pathways.

The activity is released immediately to the condenser/turbine compartment. Activity is then leaked from the compartment at the rate of 1%/day to the environment. The release is terminated at 24 h. Offsite and CRHE doses are calculated using the input parameters described in sections 3.4 to 3.6 above.

The worst case χ/Q corresponding to the unit 2 turbine building exhaust vents shown in Table 4 are used for the CRHE dose assessment. The total CRHE unfiltered inleakage is 510 cfm. The air intake is 6391 cfm throughout the accident with CREOAS not credited.

Nuclide release (.rft) and dose conversion factor (.inp) files are shown in Attachments 1 and 2. Nuclide inventories appear in the nuclear inventory (.nif) file in Attachment 3. These inventories are on a normalized Ci/MWt core basis. Observe that the radial peaking factor used in the calculation is applied as a source multiplier to the condenser/turbine compartment

Nuclide inventories appear in the nuclear inventory (.nif) file in Attachment 3. These

in the RADTRAD model. The physical and flow models are shown as part of the RADTRAD input in Attachment 4.

4.4 Releases from Mechanical Vacuum Pump at Low Power

The mechanical vacuum pump draws non-condensable gases from the main condenser and discharges to the turbine building vent stack. The vacuum pump's period of operation is relatively short, usually during start-up from criticality to a maximum of 5% reactor power. The MVP operates prior to start-up of the SJAEs.

A CRDA with limited rod damage could result in the MSLRM's high-high setpoint not being reached. The mechanical vacuum pump would not be automatically shutdown and isolated. In this case there is an unfiltered release path for fission product activity to the environment.[4]

Approximately 30 rods need to perforate in order for the high-high radiation setpoint to be reached. The number of rods corresponds to an analytical limit of 30X full power background main steam radiation without hydrogen injection (Reference 8). The nominal setpoint is ≤ 15X full power background per the Technical Requirements Manual, Table 2.2-1. item 2.2.10.1 (Reference 24).

Bounding calculations are performed for offsite and CRHE doses. The calculations are similar to the design basis CRDA analysis described above. 30 rods are assumed damaged and the mechanical vacuum pump continues to operate for 24 hours. No credit is taken for CRHE isolation.

The physical model is the same as Attachment 5 with the exceptions that the main condenser compartment source multiplier and leakage path are modified. The source multiplier is reduced to account for 30 rods instead of 2000 rods failing. The condenser leakage path is increased to 1212%/day to account for operation of the mechanical vacuum pump, see section 3.3, input #6.

The release fraction and timing file, dose conversion, and nuclide inventory files are the same as the design basis analysis. The output is in Attachment 5.

[4] Procedure ON-070-001 (Reference 28) for investigation of turbine building abnormal releases identifies the mechanical vacuum pump as a possible source. ON-070-001 advises shutting down the pump to determine if the condenser is the source of high radiation.

5.0 RESULTS

The reported offsite and CRHE doses based on the results of the RADTRAD computer runs are listed in Table 6.

Table 6
Offsite and CRHE Dose Results – Control Rod Drop Accident

	2000 Failed Rods with Condenser Leakage TEDE, rem	30 Failed Rods with MVP Running TEDE, rem
Acceptance Criterion - Offsite	6.3	6.3
EAB	0.19	2.3
LPZ	0.05	0.18
Acceptance Criterion - CRHE	5.0	5.0
CRHE	0.49	1.8

Notes:
1. RADTRAD output files are in Attachments 4 and 5.
2. CRHE doses do not credit operation of CREOAS.
3. Accident duration is 24 hours.

The EDE doses included in the TEDE are based on the CRHE volume of 518,000 ft^3 used in RADTRAD. No additional finite cloud reduction for the actual control room volume of 110,000 ft^3 is applied since the EDE contributions are small contributors (~6%) to the reported CRHE TEDE doses.

6.0 REFERENCES

1. USNRC Regulatory Guide 1.183, Alternative Radiological Source Terms For Evaluating Design Basis Accidents At Nuclear Power Reactors, July 2000.
2. NUREG-0800, USNRC Standard Review Plan Section 15.4.9, Radiological Consequences of a Control Rod Drop Accident, Revision 2.
3. NUREG-0800, USNRC Standard Review Plan Section 6.4, Control Room Habitability System, Revision 2.
4. NUREG/CR-6604 and Supplements, RADTRAD: A Simplified Model for RADionuclide Transport and Removal And Dose Estimation, 6/8/99.
5. EPUMELLLA+ Design Input Request T0200Core Design, Rev. 0.
6. Calculation EC-PUPC-1001, NEDC-32161P, General Electric Power Uprate Engineering Report for Susquehanna Steam Electric Station, Revision 6, 5/24/04.
7. Calculation EC-RADN-1111, DCP 294805 & 294809: Control Rod Drop Accident Offsite Doses (Design Basis Analysis), Revision 0, 11/19/02.
8. Calculation EC-RADN-1073, Updated Main Steam Line Radiation Monitor Setpoint Analysis – Radiological Evaluation, Revision 0, 2/25/98.
9. Calculation EC-030-0502, Control Structure Bldg. Volume, Revision 0, 12/17/93.
10. Calculation EC-ENVR-1057, Offsite χ/Q Values for the SSES Based on 1999-2003 Meteorological Data, Revision 0.
11. PPL Calculation EC-FUEL-1186, Fuel Component Weights, Revision 1.
12. Calculation EC-ENVR-1059, CRHE Accident Dispersion Factors (χ/Q) RB U2 Intake, Revision 0.
13. Calculation EC-FUEL-1615, AREVA Alternate Source Term (AST) Fission Product Inventory for Atrium-10 Fuel, Revision 1.
14. Calculation EMF-2851(P), Susquehanna Unit 2 Cycle 13 Reload Licensing Analysis Report, Supplemental 1 Workscope, Revision 0, January, 2004.
15. General Electric Topical Report, NEDO-31400A, "Safety Evaluation for Eliminating the Boiling Water Reactor Main Steam Isolation Valve Closure Function and Reactor Scram Function of the Main Steam Line Radiation Monitor", October 1992.
16. FGR 11 Federal Guidance Report No. 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion", 1988.
17. Federal Guidance Report No. 12, "External Exposures to Radionuclides in Air; Water; and Soil Based on the 1987 Federal Radiation Protection Guidance", 1993.
18. 50.59 Safety Evaluation E-01-1, MSLRM MSIV Closure and Scram Deletion, June 19, 2003.
19. PLI-93490, EPU Failed Fuel Pin Impacts for AST Events FEHA and CRDA, April 19, 2005.

19. PLI-93490, EPU Failed Fuel Pin Impacts for AST Events FEHA and CRDA, April 19,

20. SSES Improved Technical Specification 5.5.7, "Ventilation Filter Testing Program", Amendments 178 and 186.
21. SSES Improved Technical Specification 3.7.5, "Main Condenser Off Gas", Amendments 151 and 178. Bases for Improved Specification B 3.7.5.
22. SSES Technical Requirements Manual 3.3.11, "MVP Isolation Instrumentation", Rev. 1., and BASES 3.3.11, Rev 1.
23. SSES Technical Requirements Manual 3.7.7, "Main Condenser Offgas Pretreatment Logarithmic Radiation Monitoring Instrumentation", Rev. 1.
24. SSES Technical Requirements Manual 2.0, "Plant Programs and Setpoints", Table 2.2-1, Rev 4.
25. CH-ON-003, "Chemistry Requirements for Plant Events", Rev. 16.
26. ON-159-002 (Unit 1, Rev. 23) and ON-259-002 (Unit 2, Rev. 22), Containment Isolation.
27. ON-179-001 (Unit 1, Rev. 0) and ON-279-001 (Unit 2, Rev. 0), "Increasing Offgas/MSL Rad Levels".
28. ON-070-001 (Rev. 13), Abnormal Gaseous Radiation Release/CAM Alarms.

Attachment 1 RADTRAD Control File Release Fraction and Timing
CRDA_SSES_AST_2000_melt.rft

```
Release Fraction and Timing Name: CRDA-2000 rods w/melt Release Activity
      Instantaneously
BWR
Duration (h):   Design Basis Accident
 0.1000E-02  0.0000E+00  0.0000E+00  0.0000E+00
Noble Gases:
 0.3210E-02  0.0000E+00  0.0000E+00  0.0000E+00
Iodine:
 0.3100E-04  0.0000E+00  0.0000E+00  0.0000E+00
Cesium:
 0.3640E-06  0.0000E+00  0.0000E+00  0.0000E+00
Tellurium:
 0.1150E-08  0.0000E+00  0.0000E+00  0.0000E+00
Strontium:
 0.4590E-09  0.0000E+00  0.0000E+00  0.0000E-00
Barium:
 0.4590E-09  0.0000E+00  0.0000E+00  0.0000E+00
Ruthenium:
 0.5740E-10  0.0000E+00  0.0000E+00  0.0000E+00
Cerium:
 0.4590E-11  0.0000E+00  0.0000E+00  0.0000E+00
Lanthanum:
 0.1150E-10  0.0000E+00  0.0000E+00  0.0000E+00
Non-Radioactive Aerosols (kg):
 0.0000E+00  0.0000E+00  0.0000E+00  0.0000E-00
End of Release File
```

Attachment 2 RADTRAD Control File Dose Conversion File
CRDA_Expanded_Fgr11&12.inp

```
FGRDCF 10/24/95   03:24:50   beta-test version 1.10, minor FORTRAN fixes 5/4/95
Implicit daughter halflives (m) less than  90 and less than 0.100 of parent
        9 ORGANS DEFINED IN THIS FILE:
GONADS
BREAST
LUNGS
RED MARR
BONE SUR
THYROID
REMAINDER
EFFECTIVE
SKIN(FGR)
        63 NUCLIDES DEFINED IN THIS FILE:
Co-58     Y
Co-60     Y
Kr-85
Kr-85m
Kr-87
Kr-88
Rb-86     D
Sr-89     Y
Sr-90     Y
Sr-91     Y     Including:Y-91m
Sr-92     Y
Y-90      Y
Y-91      Y
Y-92      Y
Y-93      Y
Zr-95     D
Zr-97     Y     Including:Nb-97m , Including:Nb-97
Nb-95     Y
Mo-99     Y
Tc-99m    D
Ru-103    Y     Including:Rh-103m
Ru-105    Y
Ru-106    Y     Including:Rh-106
Rh-105    Y
Sb-127    W
Sb-129    W
Te-127    W
Te-127m   W
Te-129    W
Te-129m   W     Including:Te-129
Te-131m   W     Including:Te-131
Te-132    W
I-131     D
I-132     D
I-133     D
I-134     D
I-135     D     Including:Xe-135m
Xe-133
Xe-135
Cs-134    D
Cs-136    D
Cs-137    D     Including:Ba-137m
Ba-139    D
Ba-140    D
La-140    W
La-141    D
La-142    D
Ce-141    Y
Ce-143    Y
Ce-144    Y     Including:Pr-144m, Including:Pr-144
Pr-143    Y
Nd-147    Y
Np-239    W
Pu-238    Y
Pu-239    Y
Pu-240    Y
Pu-241    Y
Am-241    W
Cm-242    W
Cm-244    W
Kr-83m          Added
Xe-133m         Added
Xe-135m         Added
          CLOUDSHINE  GROUND    GROUND    GROUND    INHALED   INHALED  INGESTION
                      SHINE 8HR SHINE 7DAY SHINE RATE ACUTE    CHRONIC
Cm-244    W
Kr-83m          Added
```

Co-58						
GONADS	4.660E-14	2.867E-11	5.828E-10	9.970E-16-1.000E+00	6.170E-10	1.040E-09
BREAST	5.300E-14	2.737E-11	5.565E-10	9.520E-16-1.000E+00	9.370E-10	1.790E-10
LUNGS	4.640E-14	2.617E-11	5.319E-10	9.100E-16-1.000E+00	1.600E-08	8.530E-11
RED MARR	4.530E-14	2.671E-11	5.430E-10	9.290E-16-1.000E+00	9.230E-10	2.600E-10
BONE SUR	7.410E-14	3.795E-11	7.716E-10	1.320E-15-1.000E+00	6.930E-10	1.250E-10
THYROID	4.770E-14	2.720E-11	5.530E-10	9.460E-16-1.000E+00	8.720E-10	6.310E-11
REMAINDER	4.440E-14	2.585E-11	5.255E-10	8.990E-16-1.000E-00	1.890E-09	1.580E-09
EFFECTIVE	4.760E-14	2.732E-11	5.553E-10	9.500E-16-1.000E+00	2.940E-09	8.090E-10
SKIN(FGR)	5.580E-14	3.278E-11	6.664E-10	1.140E-15-1.000E+00	0.000E+00	0.000E+00
Co-60						
GONADS	1.230E-13	7.056E-11	1.480E-09	2.450E-15-1.000E-00	4.760E-09	3.190E-09
BREAST	1.390E-13	6.739E-11	1.413E-09	2.340E-15-1.000E+00	1.840E-08	1.100E-09
LUNGS	1.240E-13	6.537E-11	1.371E-09	2.270E-15-1.000E+00	3.450E-07	8.770E-10
RED MARR	1.230E-13	6.710E-11	1.407E-09	2.330E-15-1.000E+00	1.720E-08	1.320E-09
BONE SUR	1.780E-13	8.956E-11	1.879E-09	3.110E-15-1.000E+00	1.350E-08	9.390E-10
THYROID	1.270E-13	6.480E-11	1.359E-09	2.250E-15-1.000E+00	1.620E-08	7.880E-10
REMAINDER	1.200E-13	6.508E-11	1.365E-09	2.260E-15-1.000E+00	3.600E-08	4.970E-09
EFFECTIVE	1.260E-13	6.768E-11	1.419E-09	2.350E-15-1.000E+00	5.910E-08	2.770E-09
SKIN(FGR)	1.450E-13	7.948E-11	1.667E-09	2.760E-15-1.000E+00	0.000E+00	0.000E+00
Kr-85						
GONADS	1.170E-16	8.121E-14	1.704E-12	2.820E-18-1.000E+00	0.000E+00	0.000E+00
BREAST	1.340E-16	7.891E-14	1.656E-12	2.740E-18-1.000E+00	0.000E+00	0.000E+00
LUNGS	1.140E-16	7.056E-14	1.481E-12	2.450E-18-1.000E+00	0.000E+00	0.000E+00
RED MARR	1.090E-16	6.998E-14	1.469E-12	2.430E-18-1.000E+00	0.000E+00	0.000E+00
BONE SUR	2.200E-16	1.287E-13	2.702E-12	4.470E-18-1.000E+00	0.000E+00	0.000E+00
THYROID	1.180E-16	7.459E-14	1.565E-12	2.590E-18-1.000E+00	0.000E+00	0.000E-00
REMAINDER	1.090E-16	6.941E-14	1.457E-12	2.410E-18-1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	1.190E-16	7.603E-14	1.596E-12	2.640E-18-1.000E+00	0.000E+00	0.000E+00
SKIN(FGR)	1.320E-14	2.304E-11	4.835E-10	8.000E-16-1.000E-00	0.000E+00	0.000E+00
Kr-85m						
GONADS	7.310E-15	2.594E-12	3.653E-12	1.570E-16-1.000E+00	0.000E+00	0.000E+00
BREAST	8.410E-15	2.527E-12	3.560E-12	1.530E-16-1.000E+00	0.000E+00	0.000E+00
LUNGS	7.040E-15	2.379E-12	3.351E-12	1.440E-16-1.000E-00	0.000E+00	0.000E+00
RED MARR	6.430E-15	2.346E-12	3.304E-12	1.420E-16-1.000E+00	0.000E-00	0.000E+00
BONE SUR	1.880E-14	5.286E-12	7.446E-12	3.200E-16-1.000E+00	0.000E+00	0.000E+00
THYROID	7.330E-15	2.395E-12	3.374E-12	1.450E-16-1.000E-00	0.000E+00	0.000E+00
REMAINDER	6.640E-15	2.313E-12	3.257E-12	1.400E-16-1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	7.480E-15	2.511E-12	3.537E-12	1.520E-16-1.000E+00	0.000E+00	0.000E+00
SKIN(FGR)	2.240E-14	2.247E-11	3.164E-11	1.360E-15-1.000E+00	0.000E+00	0.000E+00
Kr-87						
GONADS	4.000E-14	4.962E-12	5.026E-12	7.610E-16-1.000E+00	0.000E+00	0.000E+00
BREAST	4.500E-14	4.740E-12	4.802E-12	7.270E-16-1.000E+00	0.000E+00	0.000E+00
LUNGS	4.040E-14	4.603E-12	4.663E-12	7.060E-16-1.000E+00	0.000E+00	0.000E+00
RED MARR	4.000E-14	4.708E-12	4.769E-12	7.220E-16-1.000E+00	0.000E+00	0.000E+00
BONE SUR	6.020E-14	6.514E-12	6.598E-12	9.990E-16-1.000E+00	0.000E+00	0.000E+00
THYROID	4.130E-14	4.473E-12	4.531E-12	6.860E-16-1.000E+00	0.000E+00	0.000E+00
REMAINDER	3.910E-14	4.590E-12	4.650E-12	7.040E-16-1.000E-00	0.000E+00	0.000E+00
EFFECTIVE	4.120E-14	4.773E-12	4.835E-12	7.320E-16-1.000E+00	0.000E+00	0.000E+00
SKIN(FGR)	1.370E-13	8.802E-11	8.916E-11	1.350E-14-1.000E+00	0.000E+00	0.000E+00
Kr-88						
GONADS	9.900E-14	2.278E-11	2.655E-11	1.800E-15-1.000E+00	0.000E+00	0.000E+00
BREAST	1.110E-13	2.177E-11	2.537E-11	1.720E-15-1.000E+00	0.000E+00	0.000E+00
LUNGS	1.010E-13	2.139E-11	2.493E-11	1.690E-15-1.000E+00	0.000E+00	0.000E+00
RED MARR	1.000E-13	2.190E-11	2.552E-11	1.730E-15-1.000E+00	0.000E+00	0.000E+00
BONE SUR	1.390E-13	2.886E-11	3.363E-11	2.280E-15-1.000E+00	0.000E+00	0.000E+00
THYROID	1.030E-13	2.012E-11	2.345E-11	1.590E-15-1.000E+00	0.000E+00	0.000E+00
REMAINDER	9.790E-14	2.139E-11	2.493E-11	1.690E-15-1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	1.020E-13	2.202E-11	2.567E-11	1.740E-15-1.000E+00	0.000E+00	0.000E+00
SKIN(FGR)	1.350E-13	5.607E-11	6.534E-11	4.430E-15-1.000E+00	0.000E+00	0.000E+00
Rb-86						
GONADS	4.710E-15	2.788E-12	5.187E-11	9.740E-17-1.000E-00	1.340E-09	2.150E-09
BREAST	5.340E-15	2.662E-12	4.953E-11	9.300E-17-1.000E+00	1.330E-09	2.140E-09
LUNGS	4.710E-15	2.553E-12	4.750E-11	8.920E-17-1.000E+00	3.300E-09	2.140E-09
RED MARR	4.640E-15	2.619E-12	4.873E-11	9.150E-17-1.000E+00	2.320E-09	3.720E-09
BONE SUR	7.050E-15	3.635E-12	6.764E-11	1.270E-16-1.000E-00	4.270E-09	6.860E-09
THYROID	4.840E-15	2.599E-12	4.836E-11	9.080E-17-1.000E+00	1.330E-09	2.140E-09
REMAINDER	4.520E-15	2.542E-12	4.729E-11	8.880E-17-1.000E+00	1.380E-09	2.330E-09
EFFECTIVE	4.810E-15	2.665E-12	4.958E-11	9.310E-17-1.000E+00	1.790E-09	2.530E-09
SKIN(FGR)	4.850E-14	2.210E-10	4.111E-09	7.720E-15-1.000E+00	0.000E+00	0.000E+00
Sr-89						
GONADS	7.730E-17	7.155E-14	1.436E-12	2.490E-18-1.000E+00	7.950E-12	8.050E-12
BREAST	9.080E-17	7.212E-14	1.447E-12	2.510E-18-1.000E+00	7.960E-12	7.980E-12
LUNGS	7.080E-17	5.689E-14	1.142E-12	1.980E-18-1.000E+00	8.350E-08	7.970E-12
RED MARR	6.390E-17	5.345E-14	1.073E-12	1.860E-18-1.000E+00	1.070E-10	1.080E-10
BONE SUR	1.940E-16	1.560E-13	3.131E-12	5.430E-18-1.000E+00	1.590E-10	1.610E-10
THYROID	7.600E-17	6.063E-14	1.217E-12	2.110E-18-1.000E-00	7.960E-12	7.970E-12
REMAINDER	6.710E-17	5.603E-14	1.124E-12	1.950E-18-1.000E+00	3.970E-09	8.250E-09
BREAST	9.080E-17	7.212E-14	1.447E-12	2.510E-18-1.000E+00	7.960E-12	7.980E-12
LUNGS	7.080E-17	5.689E-14	1.142E-12	1.980E-18-1.000E+00	9.350E-09	3.030E-12

EFFECTIVE	7.730E-17	6.523E-14	1.309E-12	2.270E-18	1.000E+00	1.120E-08	2.500E-09
SKIN(FGR)	3.690E-14	1.914E-10	3.841E-09	6.660E-15	1.000E+00	0.000E-00	0.000E+00
Sr-90							
GONADS	7.780E-18	9.590E-15	2.014E-13	3.330E-19	1.000E+00	2.690E-10	5.040E-11
BREAST	9.490E-18	1.008E-14	2.116E-13	3.500E-19	1.000E-00	2.690E-10	5.040E-11
LUNGS	6.440E-18	6.307E-15	1.324E-13	2.190E-19	1.000E-00	2.860E-06	5.040E-11
RED MARR	5.440E-18	5.558E-15	1.167E-13	1.930E-19	1.000E-00	3.280E-08	6.450E-09
BONE SUR	2.280E-17	2.393E-14	5.025E-13	8.310E-19	1.000E-00	7.090E-08	1.390E-08
THYROID	7.330E-18	7.171E-15	1.506E-13	2.490E-19	1.000E-00	2.690E-10	5.040E-11
REMAINDER	6.110E-18	6.422E-15	1.348E-13	2.230E-19	1.000E-00	5.730E-09	6.700E-09
EFFECTIVE	7.530E-18	8.179E-15	1.717E-13	2.840E-19	1.000E-00	3.510E-07	3.230E-09
SKIN(FGR)	9.200E-15	4.032E-12	8.465E-11	1.400E-16	1.000E-00	0.000E+00	0.000E+00
Sr-91							
GONADS	4.819E-14	2.155E-11	5.062E-11	1.026E-15	1.000E+00	5.669E-11	2.520E-10
BREAST	5.477E-14	2.059E-11	4.838E-11	9.806E-16	1.000E-00	1.775E-11	3.676E-11
LUNGS	4.803E-14	1.970E-11	4.626E-11	9.376E-16	1.000E-00	2.170E-09	1.055E-11
RED MARR	4.691E-14	2.011E-11	4.722E-11	9.570E-16	1.000E-00	2.275E-11	5.659E-11
BONE SUR	7.674E-14	2.852E-11	6.709E-11	1.360E-15	1.000E+00	1.306E-11	2.070E-11
THYROID	4.938E-14	2.035E-11	4.782E-11	9.693E-16	1.000E-00	9.930E-12	1.968E-12
REMAINDER	4.610E-14	1.948E-11	4.573E-11	9.268E-16	1.000E-00	5.802E-10	2.557E-09
EFFECTIVE	4.924E-14	2.057E-11	4.832E-11	9.793E-16	1.000E+00	4.547E-10	8.455E-10
SKIN(FGR)	9.938E-14	1.748E-10	3.987E-10	8.080E-15	1.000E+00	0.000E+00	0.000E+00
Sr-92							
GONADS	6.610E-14	1.593E-11	1.830E-11	1.300E-15	1.000E+00	1.020E-11	8.180E-11
BREAST	7.480E-14	1.520E-11	1.745E-11	1.240E-15	1.000E+00	6.490E-12	1.700E-11
LUNGS	6.670E-14	1.483E-11	1.703E-11	1.210E-15	1.000E+00	1.050E-09	7.220E-12
RED MARR	6.620E-14	1.520E-11	1.745E-11	1.240E-15	1.000E+00	6.980E-12	2.290E-11
BONE SUR	9.490E-14	2.010E-11	2.308E-11	1.640E-15	1.000E+00	4.360E-12	8.490E-12
THYROID	6.820E-14	1.446E-11	1.661E-11	1.180E-15	1.000E+00	3.920E-12	1.300E-12
REMAINDER	6.450E-14	1.471E-11	1.689E-11	1.200E-15	1.000E+00	2.900E-10	1.720E-09
EFFECTIVE	6.790E-14	1.532E-11	1.759E-11	1.250E-15	1.000E+00	2.180E-10	5.430E-10
SKIN(FGR)	8.560E-14	2.280E-11	2.618E-11	1.860E-15	1.000E+00	0.000E+00	0.000E+00
Y-90							
GONADS	1.890E-16	1.586E-13	1.601E-12	5.750E-18	1.000E+00	5.170E-13	1.430E-14
BREAST	2.200E-16	1.578E-13	1.593E-12	5.720E-18	1.000E+00	5.170E-13	1.270E-14
LUNGS	1.770E-16	1.313E-13	1.326E-12	4.760E-18	1.000E+00	9.310E-09	1.260E-14
RED MARR	1.620E-16	1.261E-13	1.273E-12	4.570E-18	1.000E+00	1.520E-11	3.700E-13
BONE SUR	4.440E-16	3.228E-13	3.259E-12	1.170E-17	1.000E+00	1.510E-11	3.670E-13
THYROID	1.670E-16	1.385E-13	1.398E-12	5.020E-18	1.000E+00	5.170E-13	1.260E-14
REMAINDER	1.680E-16	1.291E-13	1.303E-12	4.680E-18	1.000E+00	3.870E-09	9.680E-09
EFFECTIVE	1.900E-16	1.468E-13	1.482E-12	5.320E-18	1.000E+00	2.280E-09	2.910E-09
SKIN(FGR)	6.240E-14	2.897E-10	2.924E-09	1.050E-14	1.000E+00	0.000E-00	0.000E-00
Y-91							
GONADS	2.560E-16	1.756E-13	3.546E-12	6.110E-18	1.000E+00	8.200E-12	3.540E-12
BREAST	2.930E-16	1.713E-13	3.459E-12	5.960E-18	1.000E+00	8.920E-12	5.540E-13
LUNGS	2.500E-16	1.526E-13	3.082E-12	5.310E-18	1.000E+00	9.870E-08	2.020E-13
RED MARR	2.410E-16	1.521E-13	3.070E-12	5.290E-18	1.000E+00	3.190E-10	6.590E-12
BONE SUR	4.560E-16	2.903E-13	5.862E-12	1.010E-17	1.000E+00	3.180E-10	6.130E-12
THYROID	2.600E-16	1.564E-13	3.157E-12	5.440E-18	1.000E+00	8.500E-12	1.290E-13
REMAINDER	2.390E-16	1.509E-13	3.047E-12	5.250E-18	1.000E+00	4.200E-09	8.570E-09
EFFECTIVE	2.600E-16	1.650E-13	3.332E-12	5.740E-18	1.000E+00	1.320E-08	2.570E-09
SKIN(FGR)	3.850E-14	1.989E-10	4.016E-09	6.920E-15	1.000E+00	0.000E+00	0.000E+00
Y-92							
GONADS	1.270E-14	3.855E-12	4.872E-12	2.650E-16	1.000E+00	2.610E-12	1.960E-11
BREAST	1.440E-14	3.680E-12	4.652E-12	2.530E-16	1.000E+00	1.500E-12	3.550E-12
LUNGS	1.270E-14	3.535E-12	4.468E-12	2.430E-16	1.000E+00	1.240E-09	1.390E-12
RED MARR	1.250E-14	3.608E-12	4.560E-12	2.480E-16	1.000E+00	2.070E-12	4.910E-12
BONE SUR	1.950E-14	5.091E-12	6.435E-12	3.500E-16	1.000E+00	1.510E-12	1.750E-12
THYROID	1.300E-14	3.579E-12	4.523E-12	2.460E-16	1.000E+00	1.050E-12	1.770E-13
REMAINDER	1.220E-14	3.506E-12	4.431E-12	2.410E-16	1.000E+00	2.030E-10	1.700E-09
EFFECTIVE	1.300E-14	3.680E-12	4.652E-12	2.530E-16	1.000E+00	2.110E-10	5.150E-10
SKIN(FGR)	1.140E-13	2.022E-10	2.556E-10	1.390E-14	1.000E+00	0.000E+00	0.000E+00
Y-93							
GONADS	4.670E-15	2.108E-12	4.989E-12	9.510E-17	1.000E+00	5.310E-12	2.200E-11
BREAST	5.300E-15	2.026E-12	4.794E-12	9.140E-17	1.000E+00	1.740E-12	3.130E-12
LUNGS	4.680E-15	1.937E-12	4.585E-12	8.740E-17	1.000E+00	2.520E-09	8.670E-13
RED MARR	4.580E-15	1.972E-12	4.669E-12	8.900E-17	1.000E+00	4.040E-12	4.930E-12
BONE SUR	7.580E-15	2.948E-12	6.977E-12	1.330E-16	1.000E+00	3.140E-12	1.730E-12
THYROID	4.790E-15	1.908E-12	4.516E-12	8.610E-17	1.000E+00	9.260E-13	1.260E-13
REMAINDER	4.510E-15	1.919E-12	4.543E-12	8.660E-17	1.000E+00	9.250E-10	4.090E-09
EFFECTIVE	4.800E-15	2.021E-12	4.784E-12	9.120E-17	1.000E+00	5.820E-10	1.230E-09
SKIN(FGR)	8.500E-14	2.726E-10	6.452E-10	1.230E-14	1.000E+00	0.000E+00	0.000E+00
Zr-95							
GONADS	3.530E-14	2.182E-11	4.421E-10	7.590E-16	1.000E+00	1.880E-09	8.160E-10
BREAST	4.010E-14	2.084E-11	4.223E-10	7.250E-16	1.000E+00	1.910E-09	1.050E-10
LUNGS	3.510E-14	1.989E-11	4.030E-10	6.920E-16	1.000E+00	2.170E-09	2.340E-11
RED MARR	3.430E-14	2.030E-11	4.112E-10	7.060E-16	1.000E+00	1.300E-08	2.140E-10
BONE SUR	5.620E-14	2.875E-11	5.824E-10	1.000E-15	1.000E+00	1.030E-07	4.860E-10
Zr-95							
GONADS	3.530E-14	2.182E-11	4.421E-10	7.590E-16	1.000E+00	1.880E-09	8.160E-10

THYROID	3.610E-14	2.076E-11	4.205E-10	7.220E-16	1.000E+00	1.440E-09	8.270E-12
REMAINDER	3.360E-14	1.963E-11	3.978E-10	6.830E-16	1.000E+00	2.280E-09	2.530E-09
EFFECTIVE	3.600E-14	2.078E-11	4.211E-10	7.230E-16	1.000E+00	6.390E-09	1.020E-09
SKIN(FGR)	4.500E-14	2.561E-11	5.190E-10	8.910E-16	1.000E+00	0.000E+00	0.000E-00
Zr-97							
GONADS	4.331E-14	2.179E-11	7.799E-11	9.253E-16	1.000E+00	1.840E-10	6.228E-10
BREAST	4.928E-14	2.083E-11	7.455E-11	8.846E-16	1.000E+00	4.706E-11	8.137E-11
LUNGS	4.322E-14	1.992E-11	7.127E-11	8.456E-16	1.000E+00	4.108E-09	1.770E-11
RED MARR	4.224E-14	2.034E-11	7.279E-11	8.634E-16	1.000E+00	6.376E-11	1.302E-10
BONE SUR	6.897E-14	2.881E-11	1.031E-10	1.224E-15	1.000E+00	3.504E-11	4.558E-11
THYROID	4.443E-14	2.061E-11	7.377E-11	8.755E-16	1.000E+00	2.315E-11	2.671E-12
REMAINDER	4.139E-14	1.966E-11	7.035E-11	8.345E-16	1.000E+00	2.041E-09	6.990E-09
EFFECTIVE	4.432E-14	2.078E-11	7.438E-11	8.824E-16	1.000E+00	1.171E-09	2.293E-09
SKIN(FGR)	9.835E-14	2.281E-10	8.148E-10	9.587E-15	1.000E+00	0.000E+00	0.000E+00
Nb-95							
GONADS	3.660E-14	2.253E-11	4.435E-10	7.850E-16	1.000E+00	4.320E-10	8.050E-10
BREAST	4.160E-14	2.150E-11	4.231E-10	7.490E-16	1.000E+00	4.070E-10	1.070E-10
LUNGS	3.650E-14	2.055E-11	4.045E-10	7.160E-16	1.000E+00	8.320E-09	2.740E-11
RED MARR	3.560E-14	2.101E-11	4.135E-10	7.320E-16	1.000E+00	4.420E-10	1.990E-10
BONE SUR	5.790E-14	2.957E-11	5.819E-10	1.030E-15	1.000E+00	5.130E-10	2.940E-10
THYROID	3.750E-14	2.144E-11	4.220E-10	7.470E-16	1.000E+00	3.580E-10	1.180E-11
REMAINDER	3.490E-14	2.032E-11	4.000E-10	7.080E-16	1.000E+00	1.070E-09	1.470E-09
EFFECTIVE	3.740E-14	2.147E-11	4.226E-10	7.480E-16	1.000E+00	1.570E-09	6.950E-10
SKIN(FGR)	4.300E-14	2.598E-11	5.112E-10	9.050E-16	1.000E+00	0.000E+00	0.000E+00
Mo-99							
GONADS	7.130E-15	4.282E-12	4.403E-11	1.550E-16	1.000E+00	9.510E-11	2.180E-10
BREAST	8.130E-15	4.116E-12	4.233E-11	1.490E-16	1.000E+00	2.750E-11	3.430E-11
LUNGS	7.060E-15	3.867E-12	3.977E-11	1.400E-16	1.000E+00	4.290E-09	1.510E-11
RED MARR	6.820E-15	3.923E-12	4.034E-11	1.420E-16	1.000E+00	5.240E-11	8.320E-11
BONE SUR	1.240E-14	6.105E-12	6.278E-11	2.210E-16	1.000E+00	4.130E-11	6.320E-11
THYROID	7.270E-15	4.033E-12	4.147E-11	1.460E-16	1.000E+00	1.520E-11	1.030E-11
REMAINDER	6.740E-15	3.812E-12	3.920E-11	1.380E-16	1.000E+00	1.740E-09	4.280E-09
EFFECTIVE	7.280E-15	4.061E-12	4.176E-11	1.470E-16	1.000E+00	1.070E-09	1.360E-09
SKIN(FGR)	3.140E-14	1.039E-10	1.068E-09	3.760E-15	1.000E+00	0.000E+00	0.000E+00
Tc-99m							
GONADS	5.750E-15	2.334E-12	3.877E-12	1.240E-16	1.000E+00	2.770E-12	9.750E-12
BREAST	6.650E-15	2.258E-12	3.752E-12	1.200E-16	1.000E+00	2.150E-12	3.570E-12
LUNGS	5.490E-15	2.127E-12	3.533E-12	1.130E-16	1.000E+00	2.280E-11	3.140E-12
RED MARR	4.910E-15	2.070E-12	3.439E-12	1.100E-16	1.000E+00	3.360E-12	6.290E-12
BONE SUR	1.630E-14	5.383E-12	8.942E-12	2.860E-16	1.000E+00	2.620E-12	4.060E-12
THYROID	5.750E-15	2.145E-12	3.564E-12	1.140E-16	1.000E+00	5.010E-11	8.460E-11
REMAINDER	5.150E-15	2.070E-12	3.439E-12	1.100E-16	1.000E+00	1.020E-11	3.340E-11
EFFECTIVE	5.890E-15	2.277E-12	3.783E-12	1.210E-16	1.000E+00	8.800E-12	1.680E-11
SKIN(FGR)	7.140E-15	2.710E-12	4.502E-12	1.440E-16	1.000E+00	0.000E+00	0.000E+00
Ru-103							
GONADS	2.191E-14	1.404E-11	2.783E-10	4.892E-16	1.000E+00	3.070E-10	5.720E-10
BREAST	2.512E-14	1.350E-11	2.677E-10	4.705E-16	1.000E+00	3.110E-10	1.200E-10
LUNGS	2.180E-14	1.273E-11	2.522E-10	4.432E-16	1.000E+00	1.561E-08	7.310E-11
RED MARR	2.100E-14	1.287E-11	2.551E-10	4.483E-16	1.000E+00	3.190E-10	1.660E-10
BONE SUR	3.892E-14	1.958E-11	3.882E-10	6.823E-16	1.000E+00	2.370E-10	9.631E-11
THYROID	2.241E-14	1.331E-11	2.639E-10	4.638E-16	1.000E+00	2.570E-10	6.250E-11
REMAINDER	2.080E-14	1.248E-11	2.472E-10	4.346E-16	1.000E+00	1.250E-09	2.110E-09
EFFECTIVE	2.251E-14	1.332E-11	2.641E-10	4.642E-16	1.000E+00	2.421E-09	8.271E-10
SKIN(FGR)	2.774E-14	1.785E-11	3.543E-10	6.229E-16	1.000E+00	0.000E+00	0.000E+00
Ru-105							
GONADS	3.720E-14	1.327E-11	1.861E-11	8.070E-16	1.000E+00	1.590E-11	9.670E-11
BREAST	4.240E-14	1.271E-11	1.783E-11	7.730E-16	1.000E+00	6.610E-12	1.590E-11
LUNGS	3.700E-14	1.210E-11	1.697E-11	7.360E-16	1.000E+00	5.730E-10	6.210E-12
RED MARR	3.590E-14	1.230E-11	1.725E-11	7.480E-16	1.000E+00	7.700E-12	2.350E-11
BONE SUR	6.280E-14	1.809E-11	2.537E-11	1.100E-15	1.000E+00	4.620E-12	8.890E-12
THYROID	3.800E-14	1.260E-11	1.766E-11	7.660E-16	1.000E+00	4.150E-12	1.820E-12
REMAINDER	3.540E-14	1.189E-11	1.667E-11	7.230E-16	1.000E+00	1.610E-10	8.540E-10
EFFECTIVE	3.810E-14	1.265E-11	1.773E-11	7.690E-16	1.000E+00	1.230E-10	2.870E-10
SKIN(FGR)	6.730E-14	7.368E-11	1.033E-10	4.480E-15	1.000E+00	0.000E+00	0.000E+00
Ru-106							
GONADS	1.010E-14	6.411E-12	1.340E-10	2.230E-16	1.000E+00	1.300E-09	1.640E-09
BREAST	1.160E-14	6.152E-12	1.286E-10	2.140E-16	1.000E+00	1.780E-09	1.440E-09
LUNGS	1.010E-14	5.836E-12	1.220E-10	2.030E-16	1.000E+00	1.040E-06	1.420E-09
RED MARR	9.750E-15	5.893E-12	1.232E-10	2.050E-16	1.000E+00	1.760E-09	1.460E-09
BONE SUR	1.720E-14	8.883E-12	1.856E-10	3.090E-16	1.000E+00	1.610E-09	1.430E-09
THYROID	1.030E-14	6.066E-12	1.268E-10	2.110E-16	1.000E+00	1.720E-09	1.410E-09
REMAINDER	9.630E-15	5.721E-12	1.196E-10	1.990E-16	1.000E+00	1.200E-08	2.110E-08
EFFECTIVE	1.040E-14	6.095E-12	1.274E-10	2.120E-16	1.000E+00	1.290E-07	7.400E-09
SKIN(FGR)	1.090E-13	4.082E-10	8.531E-09	1.420E-14	1.000E+00	0.000E+00	0.000E+00
Rh-105							
GONADS	3.640E-15	2.127E-12	1.411E-11	7.980E-17	1.000E+00	2.110E-11	5.800E-11
BREAST	4.160E-15	2.063E-12	1.369E-11	7.740E-17	1.000E+00	5.610E-12	8.970E-12
LUNGS	3.630E-15	3.925E-12	1.296E-10	7.350E-18	1.000E+00	9.280E-30	2.960E-38
EFFECTIVE	1.040E-14	6.095E-12	1.274E-10	2.120E-16	1.000E+00	1.290E-07	7.400E-09
SKIN(FGR)	3.990E-13	1.990E-10	2.604E-09	1.400E-14	1.000E+00	0.000E+00	0.000E+00

RED MARR	3.380E-15	1.946E-12	1.291E-11	7.300E-17-1.000E+00	7.770E-12	1.470E-11
BONE SUR	7.530E-15	3.332E-12	2.210E-11	1.250E-16-1.000E+00	4.460E-12	6.750E-12
THYROID	3.680E-15	1.983E-12	1.316E-11	7.440E-17-1.000E+00	2.880E-12	2.910E-12
REMAINDER	3.390E-15	1.885E-12	1.250E-11	7.070E-17-1.000E-00	4.530E-10	1.270E-09
EFFECTIVE	3.720E-15	2.031E-12	1.347E-11	7.620E-17-1.000E+00	2.580E-10	3.990E-10
SKIN(FGR)	1.070E-14	4.691E-12	3.112E-11	1.760E-16-1.000E+00	0.000E+00	0.000E+00
Sb-127						
GONADS	3.260E-14	1.985E-11	2.441E-10	7.100E-16-1.000E+00	2.520E-10	6.140E-10
BREAST	3.720E-14	1.904E-11	2.341E-10	6.810E-16-1.000E-00	9.120E-11	7.600E-11
LUNGS	3.240E-14	1.809E-11	2.224E-10	6.470E-16-1.000E+00	6.940E-09	1.570E-11
RED MARR	3.140E-14	1.834E-11	2.255E-10	6.560E-16-1.000E+00	1.610E-10	1.330E-10
BONE SUR	5.520E-14	2.720E-11	3.345E-10	9.730E-16-1.000E+00	1.340E-10	5.240E-11
THYROID	3.330E-14	1.884E-11	2.317E-10	6.740E-16-1.000E+00	6.150E-11	4.640E-12
REMAINDER	3.090E-14	1.775E-11	2.183E-10	6.350E-16-1.000E-00	2.330E-09	5.870E-09
EFFECTIVE	3.330E-14	1.890E-11	2.324E-10	6.760E-16-1.000E+00	1.630E-09	1.950E-09
SKIN(FGR)	5.580E-14	7.967E-11	9.799E-10	2.850E-15-1.000E+00	0.000E-00	0.000E+00
Sb-129						
GONADS	6.970E-14	2.336E-11	3.231E-11	1.440E-15-1.000E+00	2.150E-11	1.510E-10
BREAST	7.910E-14	2.222E-11	3.074E-11	1.370E-15-1.000E+00	1.280E-11	2.560E-11
LUNGS	6.980E-14	2.141E-11	2.962E-11	1.320E-15-1.000E+00	8.980E-10	9.390E-12
RED MARR	6.860E-14	2.190E-11	3.029E-11	1.350E-15-1.000E-00	1.700E-11	3.670E-11
BONE SUR	1.070E-13	3.033E-11	4.196E-11	1.870E-15-1.000E+00	1.460E-11	1.340E-11
THYROID	7.160E-14	2.174E-11	3.007E-11	1.340E-15-1.000E+00	9.720E-12	1.470E-12
REMAINDER	6.710E-14	2.125E-11	2.939E-11	1.310E-15-1.000E+00	1.870E-10	1.450E-09
EFFECTIVE	7.140E-14	2.238E-11	3.096E-11	1.380E-15-1.000E+00	1.740E-10	4.840E-10
SKIN(FGR)	1.050E-13	8.273E-11	1.144E-10	5.100E-15-1.000E+00	0.000E+00	0.000E-00
Te-127						
GONADS	2.370E-16	1.191E-13	2.661E-13	5.480E-18-1.000E+00	2.020E-12	4.020E-12
BREAST	2.730E-16	1.158E-13	2.588E-13	5.330E-18-1.000E+00	1.880E-12	3.000E-12
LUNGS	2.320E-16	1.060E-13	2.370E-13	4.880E-18-1.000E+00	4.270E-10	2.890E-12
RED MARR	2.210E-16	1.058E-13	2.365E-13	4.870E-18-1.000E+00	4.090E-12	6.570E-12
BONE SUR	4.650E-16	1.862E-13	4.162E-13	8.570E-18-1.000E+00	4.090E-12	6.460E-12
THYROID	2.400E-16	1.106E-13	2.472E-13	5.090E-18-1.000E+00	1.840E-12	2.860E-12
REMAINDER	2.210E-16	1.036E-13	2.316E-13	4.770E-18-1.000E+00	1.110E-10	6.130E-10
EFFECTIVE	2.420E-16	1.125E-13	2.515E-13	5.180E-18-1.000E+00	8.600E-11	1.870E-10
SKIN(FGR)	1.140E-14	1.173E-11	2.622E-11	5.400E-16-1.000E-00	0.000E+00	0.000E+00
Te-127m						
GONADS	1.900E-16	4.689E-13	9.642E-12	1.630E-17-1.000E+00	1.100E-10	1.250E-10
BREAST	2.690E-16	5.150E-13	1.059E-11	1.790E-17-1.000E+00	1.100E-10	9.740E-11
LUNGS	7.620E-17	1.602E-13	3.295E-12	5.570E-18-1.000E+00	3.340E-08	9.620E-11
RED MARR	6.430E-17	1.249E-13	2.567E-12	4.340E-18-1.000E+00	5.360E-09	5.430E-09
BONE SUR	3.940E-16	9.005E-13	1.852E-11	3.130E-17-1.000E+00	2.040E-08	2.070E-08
THYROID	1.500E-16	2.779E-13	5.714E-12	9.660E-18-1.000E+00	9.660E-11	9.430E-11
REMAINDER	8.640E-17	1.999E-13	4.111E-12	6.950E-18-1.000E+00	1.660E-09	2.980E-09
EFFECTIVE	1.470E-16	3.251E-13	6.684E-12	1.130E-17-1.000E+00	5.810E-09	2.230E-09
SKIN(FGR)	8.490E-16	1.496E-12	3.076E-11	5.200E-17-1.000E+00	0.000E+00	0.000E-00
Te-129						
GONADS	2.710E-15	3.889E-13	3.922E-13	6.510E-17-1.000E+00	5.050E-13	1.590E-12
BREAST	3.120E-15	3.800E-13	3.832E-13	6.360E-17-1.000E+00	5.390E-13	6.050E-13
LUNGS	2.640E-15	3.298E-13	3.326E-13	5.520E-17-1.000E+00	1.530E-10	4.910E-13
RED MARR	2.540E-15	3.298E-13	3.326E-13	5.520E-17-1.000E+00	6.190E-13	7.640E-13
BONE SUR	4.880E-15	5.753E-13	5.802E-13	9.630E-17-1.000E+00	6.220E-13	5.400E-13
THYROID	2.740E-15	3.525E-13	3.555E-13	5.900E-17-1.000E+00	5.090E-13	3.360E-13
REMAINDER	2.520E-15	3.262E-13	3.289E-13	5.460E-17-1.000E+00	7.280E-12	1.790E-10
EFFECTIVE	2.750E-15	3.590E-13	3.621E-13	6.010E-17-1.000E+00	2.090E-11	5.450E-11
SKIN(FGR)	3.570E-14	3.429E-11	3.458E-11	5.740E-15-1.000E+00	0.000E+00	0.000E+00
Te-129m						
GONADS	3.321E-15	2.206E-12	4.799E-11	6.561E-17-1.000E-00	1.783E-10	2.420E-10
BREAST	3.838E-15	2.181E-12	4.739E-11	8.454E-17-1.000E+00	1.694E-10	1.664E-10
LUNGS	3.176E-15	1.741E-12	3.815E-11	6.808E-17-1.000E+00	4.040E-08	1.593E-10
RED MARR	3.071E-15	1.729E-12	3.793E-11	6.768E-17-1.000E+00	3.100E-09	3.500E-09
BONE SUR	5.772E-15	3.287E-12	7.147E-11	1.275E-16-1.000E+00	7.050E-09	7.990E-09
THYROID	3.341E-15	1.923E-12	4.201E-11	7.495E-17-1.000E-00	1.563E-10	1.572E-10
REMAINDER	3.048E-15	1.746E-12	3.822E-11	6.819E-17-1.000E+00	3.275E-09	7.196E-09
EFFECTIVE	3.337E-15	1.974E-12	4.308E-11	7.686E-17-1.000E+00	6.484E-09	2.925E-09
SKIN(FGR)	3.811E-14	1.501E-10	3.360E-09	6.001E-15-1.000E+00	0.000E+00	0.000E+00
Te-131m						
GONADS	7.292E-14	4.020E-11	2.343E-10	1.535E-15-1.000E+00	2.345E-10	7.415E-10
BREAST	8.286E-14	3.853E-11	2.246E-10	1.472E-15-1.000E+00	9.309E-11	1.361E-10
LUNGS	7.265E-14	3.657E-11	2.131E-10	1.397E-15-1.000E+00	2.296E-09	6.335E-11
RED MARR	7.097E-14	3.736E-11	2.178E-10	1.427E-15-1.000E-00	1.417E-10	2.435E-10
BONE SUR	1.174E-13	5.467E-11	3.189E-10	2.090E-15-1.000E+00	2.276E-10	3.248E-10
THYROID	7.471E-14	3.741E-11	2.181E-10	1.429E-15-1.000E+00	3.669E-08	4.383E-08
REMAINDER	6.965E-14	3.626E-11	2.113E-10	1.385E-15-1.000E+00	9.509E-10	3.153E-09
EFFECTIVE	7.463E-14	3.825E-11	2.229E-10	1.461E-15-1.000E+00	1.758E-09	2.514E-09
SKIN(FGR)	1.038E-13	1.033E-10	6.188E-10	4.056E-15-1.000E+00	0.000E+00	0.000E+00
Te-132						
BONE SUR	1.174E-13	5.467E-11	3.189E-10	2.090E-15-1.000E+00	2.276E-10	3.248E-10
THYROID	7.471E-14	3.741E-11	2.181E-10	1.429E-15-1.000E+00	3.669E-08	4.383E-08
GONADS	1.020E-14	8.612E-12	7.708E-11	2.450E-16-1.000E-00	4.150E-10	5.410E-10

BREAST	1.180E-14	6.756E-12	7.643E-11	2.430E-16	1.000E-00	3.630E-10	3.500E-10
LUNGS	9.650E-15	5.727E-12	6.479E-11	2.060E-16	1.000E+00	1.670E-09	3.300E-10
RED MARR	8.950E-15	5.588E-12	6.322E-11	2.010E-16	1.000E+00	4.270E-10	4.440E-10
BONE SUR	2.420E-14	1.273E-11	1.441E-10	4.580E-16	1.000E+00	7.120E-10	8.300E-10
THYROID	1.020E-14	5.978E-12	6.762E-11	2.150E-16	1.000E-00	6.280E-08	5.950E-08
REMAINDER	9.160E-15	5.644E-12	6.385E-11	2.030E-16	1.000E+00	7.890E-10	1.490E-09
EFFECTIVE	1.030E-14	6.339E-12	7.171E-11	2.280E-16	1.000E+00	2.550E-09	2.540E-09
SKIN(FGR)	1.390E-14	8.313E-12	9.405E-11	2.990E-16	1.000E+00	0.000E+00	0.000E+00
I-131							
GONADS	1.780E-14	1.119E-11	1.789E-10	3.940E-16	1.000E+00	2.530E-11	4.070E-11
BREAST	2.040E-14	1.082E-11	1.730E-10	3.810E-16	1.000E+00	7.880E-11	1.210E-10
LUNGS	1.760E-14	1.016E-11	1.626E-10	3.580E-16	1.000E+00	6.570E-10	1.020E-10
RED MARR	1.680E-14	1.022E-11	1.635E-10	3.600E-16	1.000E-00	6.260E-11	9.440E-11
BONE SUR	3.450E-14	1.675E-11	2.679E-10	5.900E-16	1.000E+00	5.730E-11	8.720E-11
THYROID	1.810E-14	1.053E-11	1.685E-10	3.710E-16	1.000E+00	2.920E-07	4.760E-07
REMAINDER	1.670E-14	9.908E-12	1.585E-10	3.490E-16	1.000E+00	8.030E-11	1.570E-10
EFFECTIVE	1.820E-14	1.067E-11	1.707E-10	3.760E-16	1.000E+00	8.890E-09	1.440E-08
SKIN(FGR)	2.980E-14	1.825E-11	2.920E-10	6.430E-16	1.000E+00	0.000E-00	0.000E+00
I-132							
GONADS	1.090E-13	2.523E-11	2.771E-11	2.320E-15	1.000E+00	9.950E-12	2.330E-11
BREAST	1.240E-13	2.414E-11	2.652E-11	2.220E-15	1.000E+00	1.410E-11	2.520E-11
LUNGS	1.090E-13	2.305E-11	2.532E-11	2.120E-15	1.000E+00	2.710E-10	2.640E-11
RED MARR	1.070E-13	2.360E-11	2.592E-11	2.170E-15	1.000E+00	1.400E-11	2.460E-11
BONE SUR	1.730E-13	3.327E-11	3.655E-11	3.060E-15	1.000E+00	1.240E-11	2.190E-11
THYROID	1.120E-13	2.381E-11	2.616E-11	2.190E-15	1.000E+00	1.740E-09	3.870E-09
REMAINDER	1.050E-13	2.283E-11	2.509E-11	2.100E-15	1.000E+00	3.780E-11	1.650E-10
EFFECTIVE	1.120E-13	2.403E-11	2.640E-11	2.210E-15	1.000E+00	1.030E-10	1.820E-10
SKIN(FGR)	1.580E-13	8.199E-11	9.007E-11	7.540E-15	1.000E+00	0.000E+00	0.000E+00
I-133							
GONADS	2.870E-14	1.585E-11	6.748E-11	6.270E-16	1.000E+00	1.950E-11	3.630E-11
BREAST	3.280E-14	1.519E-11	6.468E-11	6.010E-16	1.000E+00	2.940E-11	4.680E-11
LUNGS	2.860E-14	1.446E-11	6.156E-11	5.720E-16	1.000E+00	8.200E-10	4.530E-11
RED MARR	2.770E-14	1.466E-11	6.242E-11	5.800E-16	1.000E+00	2.720E-11	4.300E-11
BONE SUR	4.870E-14	2.161E-11	9.202E-11	8.550E-16	1.000E+00	2.520E-11	4.070E-11
THYROID	2.930E-14	1.502E-11	6.393E-11	5.940E-16	1.000E+00	4.860E-08	9.100E-08
REMAINDER	2.730E-14	1.418E-11	6.038E-11	5.610E-16	1.000E-00	5.000E-11	1.550E-10
EFFECTIVE	2.940E-14	1.509E-11	6.425E-11	5.970E-16	1.000E+00	1.580E-09	2.800E-09
SKIN(FGR)	5.830E-14	1.150E-10	4.897E-10	4.550E-15	1.000E+00	0.000E+00	0.000E+00
I-134							
GONADS	1.270E-13	1.200E-11	1.202E-11	2.640E-15	1.000E+00	4.250E-12	1.100E-11
BREAST	1.440E-13	1.145E-11	1.147E-11	2.520E-15	1.000E+00	6.170E-12	1.170E-11
LUNGS	1.270E-13	1.100E-11	1.102E-11	2.420E-15	1.000E+00	1.430E-10	1.260E-11
RED MARR	1.250E-13	1.127E-11	1.129E-11	2.480E-15	1.000E+00	6.080E-12	1.090E-11
BONE SUR	1.960E-13	1.568E-11	1.571E-11	3.450E-15	1.000E+00	5.310E-12	9.320E-12
THYROID	1.300E-13	1.127E-11	1.129E-11	2.480E-15	1.000E+00	2.880E-10	6.210E-10
REMAINDER	1.220E-13	1.091E-11	1.093E-11	2.400E-15	1.000E+00	2.270E-11	1.340E-10
EFFECTIVE	1.300E-13	1.150E-11	1.152E-11	2.530E-15	1.000E+00	3.550E-11	6.660E-11
SKIN(FGR)	1.870E-13	4.477E-11	4.485E-11	9.850E-15	1.000E-00	0.000E+00	0.000E-00
I-135							
GONADS	8.078E-14	3.113E-11	5.489E-11	1.599E-15	1.000E+00	1.700E-11	3.610E-11
BREAST	9.143E-14	2.971E-11	5.240E-11	1.526E-15	1.000E+00	2.340E-11	3.850E-11
LUNGS	8.145E-14	2.886E-11	5.089E-11	1.482E-15	1.000E+00	4.410E-10	3.750E-11
RED MARR	8.054E-14	2.965E-11	5.228E-11	1.523E-15	1.000E+00	2.240E-11	3.650E-11
BONE SUR	1.184E-13	3.983E-11	7.024E-11	2.046E-15	1.000E+00	2.010E-11	3.360E-11
THYROID	8.324E-14	2.852E-11	5.030E-11	1.465E-15	1.000E+00	8.460E-09	1.790E-08
REMAINDER	7.861E-14	2.883E-11	5.084E-11	1.481E-15	1.000E+00	4.700E-11	1.540E-10
EFFECTIVE	8.294E-14	2.989E-11	5.271E-11	1.535E-15	1.000E+00	3.320E-10	6.080E-10
SKIN(FGR)	1.156E-13	9.826E-11	1.733E-10	5.047E-15	1.000E+00	0.000E+00	0.000E+00
Xe-133							
GONADS	1.610E-15	1.465E-12	2.052E-11	5.200E-17	1.000E+00	0.000E+00	0.000E+00
BREAST	1.960E-15	1.505E-12	2.107E-11	5.340E-17	1.000E+00	0.000E+00	0.000E+00
LUNGS	1.320E-15	1.045E-12	1.464E-11	3.710E-17	1.000E+00	0.000E+00	0.000E+00
RED MARR	1.070E-15	8.791E-13	1.231E-11	3.120E-17	1.000E+00	0.000E+00	0.000E+00
BONE SUR	5.130E-15	4.254E-12	5.958E-11	1.510E-16	1.000E+00	0.000E+00	0.000E+00
THYROID	1.510E-15	1.181E-12	1.653E-11	4.190E-17	1.000E+00	0.000E+00	0.000E+00
REMAINDER	1.240E-15	1.042E-12	1.460E-11	3.700E-17	1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	1.560E-15	1.299E-12	1.819E-11	4.610E-17	1.000E+00	0.000E+00	0.000E+00
SKIN(FGR)	4.970E-15	1.953E-12	2.734E-11	6.930E-17	1.000E+00	0.000E+00	0.000E+00
Xe-135							
GONADS	1.170E-14	5.455E-12	1.194E-11	2.530E-16	1.000E+00	0.000E+00	0.000E+00
BREAST	1.330E-14	5.325E-12	1.166E-11	2.470E-16	1.000E+00	0.000E-00	0.000E+00
LUNGS	1.130E-14	4.959E-12	1.086E-11	2.300E-16	1.000E+00	0.000E+00	0.000E+00
RED MARR	1.070E-14	4.959E-12	1.086E-11	2.300E-16	1.000E+00	0.000E+00	0.000E+00
BONE SUR	2.570E-14	9.120E-12	1.997E-11	4.230E-16	1.000E+00	0.000E+00	0.000E+00
THYROID	1.180E-14	5.023E-12	1.100E-11	2.330E-16	1.000E+00	0.000E+00	0.000E+00
REMAINDER	1.080E-14	4.829E-12	1.058E-11	2.240E-16	1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	1.190E-14	5.217E-12	1.142E-11	2.420E-16	1.000E+00	0.000E+00	0.000E+00
SKIN(FGR)	2.120E-14	4.506E-11	9.862E-11	2.090E-15	1.000E+00	0.000E+00	0.000E+00
RED MARR	1.070E-14	4.959E-12	1.086E-11	2.300E-16	1.000E+00	0.000E+00	0.000E+00
BONE SUR	2.520E-14	9.330E-12	3.007E-11	4.930E-16	1.000E+00	0.000E+00	0.000E+00

Cs-134						
GONADS	7.400E-14	4.607E-11	9.646E-10	1.600E-15-1.000E+00	1.300E-08	2.060E-08
BREAST	8.430E-14	4.406E-11	9.224E-10	1.530E-15-1.000E+00	1.080E-08	1.720E-08
LUNGS	7.370E-14	4.204E-11	8.802E-10	1.460E-15-1.000E+00	1.180E-08	1.760E-08
RED MARR	7.190E-14	4.262E-11	8.922E-10	1.480E-15-1.000E+00	1.180E-08	1.870E-08
BONE SUR	1.200E-13	6.105E-11	1.278E-09	2.120E-15-1.000E+00	1.100E-08	1.740E-08
THYROID	7.570E-14	4.377E-11	9.163E-10	1.520E-15-1.000E+00	1.110E-08	1.760E-08
REMAINDER	7.060E-14	4.147E-11	8.681E-10	1.440E-15-1.000E+00	1.390E-08	2.210E-08
EFFECTIVE	7.570E-14	4.377E-11	9.163E-10	1.520E-15-1.000E+00	1.250E-08	1.980E-08
SKIN(FGR)	9.450E-14	6.249E-11	1.308E-09	2.170E-15-1.000E-00	0.000E+00	0.000E+00
Cs-136						
GONADS	1.040E-13	6.223E-11	1.102E-09	2.180E-15-1.000E+00	1.880E-09	3.040E-09
BREAST	1.180E-13	5.966E-11	1.056E-09	2.090E-15-1.000E+00	1.670E-09	2.650E-09
LUNGS	1.040E-13	5.710E-11	1.011E-09	2.000E-15-1.000E+00	2.320E-09	2.620E-09
RED MARR	1.010E-13	5.824E-11	1.031E-09	2.040E-15-1.000E-00	1.860E-09	2.950E-09
BONE SUR	1.660E-13	8.422E-11	1.491E-09	2.950E-15-1.000E+00	1.700E-09	2.710E-09
THYROID	1.070E-13	5.852E-11	1.036E-09	2.050E-15-1.000E+00	1.730E-09	2.740E-09
REMAINDER	9.950E-14	5.652E-11	1.001E-09	1.980E-15-1.000E+00	2.190E-09	3.520E-09
EFFECTIVE	1.060E-13	5.966E-11	1.056E-09	2.090E-15-1.000E+00	1.980E-09	3.040E-09
SKIN(FGR)	1.250E-13	7.251E-11	1.284E-09	2.540E-15-1.000E+00	0.000E+00	0.000E+00
Cs-137						
GONADS	2.669E-14	1.669E-11	3.530E-10	5.840E-16-1.000E+00	8.760E-09	1.390E-08
BREAST	3.047E-14	1.596E-11	3.376E-10	5.585E-16-1.000E+00	7.840E-09	1.240E-08
LUNGS	2.649E-14	1.517E-11	3.209E-10	5.309E-16-1.000E+00	8.820E-09	1.270E-08
RED MARR	2.583E-14	1.542E-11	3.260E-10	5.394E-16-1.000E+00	8.300E-09	1.320E-08
BONE SUR	4.382E-14	2.238E-11	4.734E-10	7.832E-16-1.000E+00	7.940E-09	1.260E-08
THYROID	2.725E-14	1.588E-11	3.358E-10	5.556E-16-1.000E+00	7.930E-09	1.260E-08
REMAINDER	2.536E-14	1.490E-11	3.152E-10	5.215E-16-1.000E+00	9.120E-09	1.450E-08
EFFECTIVE	2.725E-14	1.585E-11	3.353E-10	5.546E-16-1.000E+00	8.630E-09	1.350E-08
SKIN(FGR)	4.392E-14	5.253E-11	1.110E-09	1.836E-15-1.000E-00	0.000E+00	0.000E+00
Ba-139						
GONADS	2.130E-15	3.368E-13	3.429E-13	4.790E-17-1.000E+00	2.560E-12	1.560E-12
BREAST	2.450E-15	3.297E-13	3.357E-13	4.690E-17-1.000E+00	2.460E-12	5.170E-13
LUNGS	2.030E-15	3.002E-13	3.057E-13	4.270E-17-1.000E+00	2.530E-10	3.890E-13
RED MARR	1.870E-15	2.932E-13	2.985E-13	4.170E-17-1.000E+00	3.410E-12	8.590E-13
BONE SUR	5.290E-15	6.841E-13	6.965E-13	9.730E-17-1.000E-00	2.490E-12	4.380E-13
THYROID	2.130E-15	3.044E-13	3.100E-13	4.330E-17-1.000E+00	2.400E-12	2.660E-13
REMAINDER	1.920E-15	2.932E-13	2.985E-13	4.170E-17-1.000E+00	4.820E-11	3.570E-10
EFFECTIVE	2.170E-15	3.227E-13	3.286E-13	4.590E-17-1.000E+00	4.640E-11	1.080E-10
SKIN(FGR)	6.160E-14	7.241E-11	7.373E-11	1.030E-14-1.000E-00	0.000E+00	0.000E+00
Ba-140						
GONADS	8.410E-15	5.451E-12	9.607E-11	1.910E-16-1.000E+00	4.300E-10	9.960E-10
BREAST	9.640E-15	5.280E-12	9.305E-11	1.850E-16-1.000E+00	2.870E-10	1.590E-10
LUNGS	8.270E-15	4.852E-12	8.550E-11	1.700E-16-1.000E+00	1.660E-09	6.630E-11
RED MARR	7.930E-15	4.880E-12	8.601E-11	1.710E-16-1.000E+00	1.290E-09	4.390E-10
BONE SUR	1.550E-14	8.020E-12	1.413E-10	2.810E-16-1.000E+00	2.410E-09	5.530E-10
THYROID	8.530E-15	5.109E-12	9.003E-11	1.790E-16-1.000E+00	2.560E-10	5.250E-11
REMAINDER	7.890E-15	4.766E-12	8.399E-11	1.670E-16-1.000E+00	1.410E-09	7.370E-09
EFFECTIVE	8.580E-15	5.137E-12	9.053E-11	1.800E-16-1.000E+00	1.010E-09	2.560E-09
SKIN(FGR)	2.520E-14	5.565E-11	9.808E-10	1.950E-15-1.000E-00	0.000E-00	0.000E+00
La-140						
GONADS	1.140E-13	6.027E-11	4.425E-10	2.240E-15-1.000E+00	4.540E-10	1.340E-09
BREAST	1.290E-13	5.758E-11	4.228E-10	2.140E-15-1.000E+00	1.450E-10	1.800E-10
LUNGS	1.150E-13	5.596E-11	4.109E-10	2.080E-15-1.000E+00	4.210E-09	4.010E-11
RED MARR	1.140E-13	5.731E-11	4.208E-10	2.130E-15-1.000E+00	2.140E-10	2.810E-10
BONE SUR	1.690E-13	7.776E-11	5.709E-10	2.890E-15-1.000E-00	1.410E-10	9.770E-11
THYROID	1.180E-13	5.462E-11	4.010E-10	2.030E-15-1.000E+00	6.870E-11	6.400E-12
REMAINDER	1.110E-13	5.569E-11	4.089E-10	2.070E-15-1.000E+00	2.120E-09	6.260E-09
EFFECTIVE	1.170E-13	5.812E-11	4.267E-10	2.160E-15-1.000E+00	1.310E-09	2.280E-09
SKIN(FGR)	1.660E-13	2.217E-10	1.628E-09	8.240E-15-1.000E+00	0.000E-00	0.000E+00
La-141						
GONADS	2.330E-15	7.315E-13	9.675E-13	4.740E-17-1.000E+00	1.010E-11	3.770E-12
BREAST	2.640E-15	7.007E-13	9.267E-13	4.540E-17-1.000E+00	9.840E-12	7.070E-13
LUNGS	2.340E-15	6.713E-13	8.879E-13	4.350E-17-1.000E+00	6.460E-10	2.720E-13
RED MARR	2.310E-15	6.852E-13	9.063E-13	4.440E-17-1.000E+00	2.930E-11	1.070E-12
BONE SUR	3.490E-15	9.923E-13	1.312E-12	6.430E-17-1.000E+00	1.200E-10	6.060E-13
THYROID	2.390E-15	6.590E-13	8.716E-13	4.270E-17-1.000E+00	9.400E-12	5.290E-14
REMAINDER	2.260E-15	6.682E-13	8.838E-13	4.330E-17-1.000E+00	2.280E-10	1.240E-09
EFFECTIVE	2.390E-15	7.007E-13	9.267E-13	4.540E-17-1.000E+00	1.570E-10	3.740E-10
SKIN(FGR)	6.580E-14	1.667E-10	2.204E-10	1.080E-14-1.000E+00	0.000E+00	0.000E+00
La-142						
GONADS	1.400E-13	1.976E-11	2.034E-11	2.540E-15-1.000E+00	1.660E-11	6.990E-11
BREAST	1.570E-13	1.885E-11	1.938E-11	2.420E-15-1.000E+00	1.130E-11	1.540E-11
LUNGS	1.420E-13	1.846E-11	1.898E-11	2.370E-15-1.000E+00	3.010E-10	8.400E-12
RED MARR	1.420E-13	1.900E-11	1.954E-11	2.440E-15-1.000E+00	1.360E-11	1.930E-11
BONE SUR	1.950E-13	2.484E-11	2.554E-11	3.190E-15-1.000E+00	1.110E-11	7.400E-12
THYROID	1.450E-13	1.768E-11	1.818E-11	2.270E-15-1.000E-00	8.740E-12	1.160E-12
REMAINDER	1.380E-13	1.853E-11	1.906E-11	2.380E-15-1.000E+00	2.030E-11	5.300E-10
BREAST	1.570E-13	1.885E-11	1.938E-11	2.420E-15-1.000E+00	1.130E-11	1.540E-11
LUNGS	1.420E-13	1.846E-11	1.898E-11	2.330E-15-1.000E+00	3.010E-10	9.200E-10

EFFECTIVE	1.440E-13	1.916E-11	1.970E-11	2.460E-15	1.000E+00	6.840E-11	1.790E-10
SKIN(FGR)	2.160E-13	9.111E-11	9.368E-11	1.170E-14	1.000E+00	0.000E+00	0.000E+00
Ce-141							
GONADS	3.380E-15	2.213E-12	4.332E-11	7.710E-17	1.000E+00	5.540E-11	1.080E-10
BREAST	3.930E-15	2.170E-12	4.247E-11	7.560E-17	1.000E+00	4.460E-11	1.110E-11
LUNGS	3.170E-15	1.951E-12	3.820E-11	6.800E-17	1.000E+00	1.670E-08	1.430E-12
RED MARR	2.830E-15	1.860E-12	3.641E-11	6.480E-17	1.000E+00	8.960E-11	3.390E-11
BONE SUR	9.410E-15	5.166E-12	1.011E-10	1.800E-16	1.000E+00	2.540E-10	2.300E-11
THYROID	3.350E-15	2.003E-12	3.922E-11	6.980E-17	1.000E+00	2.550E-11	1.800E-13
REMAINDER	2.980E-15	1.894E-12	3.708E-11	6.600E-17	1.000E+00	1.260E-09	2.500E-09
EFFECTIVE	3.430E-15	2.118E-12	4.146E-11	7.380E-17	1.000E+00	2.420E-09	7.830E-10
SKIN(FGR)	1.020E-14	3.788E-12	7.416E-11	1.320E-16	1.000E+00	0.000E+00	0.000E+00
Ce-143							
GONADS	1.280E-14	7.900E-12	4.958E-11	2.980E-16	1.000E+00	7.530E-11	2.120E-10
BREAST	1.470E-14	7.688E-12	4.825E-11	2.900E-16	1.000E+00	1.660E-11	2.320E-11
LUNGS	1.230E-14	6.893E-12	4.325E-11	2.600E-16	1.000E+00	3.880E-09	3.820E-12
RED MARR	1.170E-14	6.787E-12	4.259E-11	2.560E-16	1.000E+00	2.960E-11	5.070E-11
BONE SUR	2.520E-14	1.323E-11	8.302E-11	4.990E-16	1.000E+00	1.640E-11	1.610E-11
THYROID	1.280E-14	7.211E-12	4.525E-11	2.720E-16	1.000E+00	6.230E-12	4.350E-13
REMAINDER	1.170E-14	6.734E-12	4.226E-11	2.540E-16	1.000E+00	1.420E-09	3.890E-09
EFFECTIVE	1.290E-14	7.396E-12	4.642E-11	2.790E-16	1.000E+00	9.160E-10	1.230E-09
SKIN(FGR)	3.960E-14	1.058E-10	6.638E-10	3.990E-15	1.000E+00	0.000E+00	0.000E+00
Ce-144							
GONADS	2.725E-15	6.328E-13	1.319E-11	6.088E-17	1.000E+00	2.390E-10	6.987E-11
BREAST	3.129E-15	6.274E-13	1.307E-11	5.922E-17	1.000E+00	3.480E-10	1.223E-11
LUNGS	2.639E-15	5.228E-13	1.089E-11	5.362E-17	1.000E+00	7.911E-07	6.551E-12
RED MARR	2.507E-15	4.755E-13	9.907E-12	5.247E-17	1.000E+00	2.880E-09	8.923E-11
BONE SUR	5.441E-15	1.646E-12	3.429E-11	1.127E-16	1.000E+00	4.720E-09	1.280E-10
THYROID	2.753E-15	5.529E-13	1.152E-11	5.418E-17	1.000E+00	2.920E-10	5.154E-12
REMAINDER	2.534E-15	5.086E-13	1.060E-11	5.283E-17	1.000E+00	1.910E-08	1.890E-08
EFFECTIVE	2.773E-15	5.909E-13	1.231E-11	5.766E-17	1.000E+00	1.010E-07	5.711E-09
SKIN(FGR)	8.574E-14	7.648E-13	1.594E-11	1.250E-14	1.000E+00	0.000E+00	0.000E+00
Pr-143							
GONADS	2.130E-17	2.264E-14	4.032E-13	7.930E-19	1.000E+00	4.370E-18	8.990E-18
BREAST	2.550E-17	2.330E-14	4.149E-13	8.160E-19	1.000E+00	2.220E-18	1.090E-18
LUNGS	1.860E-17	1.642E-14	2.923E-13	5.750E-19	1.000E+00	1.330E-08	1.910E-19
RED MARR	1.620E-17	1.493E-14	2.659E-13	5.230E-19	1.000E+00	1.480E-11	1.030E-12
BONE SUR	5.930E-17	5.454E-14	9.711E-13	1.910E-18	1.000E+00	1.490E-11	1.030E-12
THYROID	2.050E-17	1.802E-14	3.208E-13	6.310E-19	1.000E+00	1.680E-18	2.660E-20
REMAINDER	1.760E-17	1.642E-14	2.923E-13	5.750E-19	1.000E+00	1.970E-09	4.220E-09
EFFECTIVE	2.100E-17	2.002E-14	3.564E-13	7.010E-19	1.000E+00	2.190E-09	1.270E-09
SKIN(FGR)	1.760E-14	5.711E-11	1.017E-09	2.000E-15	1.000E+00	0.000E+00	0.000E+00
Nd-147							
GONADS	6.130E-15	4.218E-12	7.235E-11	1.480E-16	1.000E+00	8.410E-11	1.790E-10
BREAST	7.120E-15	4.132E-12	7.088E-11	1.450E-16	1.000E+00	3.450E-11	1.870E-11
LUNGS	5.820E-15	3.648E-12	6.257E-11	1.280E-16	1.000E+00	1.060E-08	2.440E-12
RED MARR	5.400E-15	3.505E-12	6.013E-11	1.230E-16	1.000E+00	9.190E-11	5.050E-11
BONE SUR	1.320E-14	8.265E-12	1.418E-10	2.900E-16	1.000E+00	3.260E-10	2.220E-11
THYROID	6.120E-15	3.876E-12	6.648E-11	1.360E-16	1.000E+00	1.820E-11	2.640E-13
REMAINDER	5.530E-15	3.562E-12	6.111E-11	1.250E-16	1.000E+00	1.760E-09	3.760E-09
EFFECTIVE	6.190E-15	3.961E-12	6.795E-11	1.390E-16	1.000E+00	1.850E-09	1.180E-09
SKIN(FGR)	1.950E-14	3.135E-11	5.377E-10	1.100E-15	1.000E+00	0.000E+00	0.000E+00
Np-239							
GONADS	7.530E-15	4.691E-12	4.380E-11	1.710E-16	1.000E+00	7.450E-11	1.620E-10
BREAST	8.730E-15	4.636E-12	4.329E-11	1.690E-16	1.000E+00	1.630E-11	1.720E-11
LUNGS	7.180E-15	4.115E-12	3.842E-11	1.500E-16	1.000E+00	2.360E-09	2.400E-12
RED MARR	6.500E-15	4.005E-12	3.740E-11	1.460E-16	1.000E+00	2.080E-10	4.660E-11
BONE SUR	2.000E-14	1.001E-11	9.349E-11	3.650E-16	1.000E+00	2.030E-09	3.590E-11
THYROID	7.520E-15	4.197E-12	3.919E-11	1.530E-16	1.000E+00	7.620E-12	2.070E-13
REMAINDER	6.760E-15	4.005E-12	3.740E-11	1.460E-16	1.000E+00	9.590E-10	2.770E-09
EFFECTIVE	7.690E-15	4.471E-12	4.175E-11	1.630E-16	1.000E+00	6.780E-10	8.820E-10
SKIN(FGR)	1.600E-14	7.215E-12	6.737E-11	2.630E-16	1.000E+00	0.000E+00	0.000E+00
Pu-238							
GONADS	6.560E-18	4.291E-14	9.011E-13	1.490E-18	1.000E+00	1.040E-05	2.330E-09
BREAST	1.270E-17	5.558E-14	1.167E-12	1.930E-18	1.000E+00	4.400E-10	1.800E-13
LUNGS	1.060E-18	2.267E-15	4.759E-14	7.870E-20	1.000E+00	3.200E-04	8.640E-14
RED MARR	1.680E-18	5.587E-15	1.173E-13	1.940E-19	1.000E+00	5.800E-05	1.270E-08
BONE SUR	9.300E-18	3.514E-14	7.378E-13	1.220E-18	1.000E+00	7.250E-04	1.580E-07
THYROID	4.010E-18	9.792E-15	2.056E-13	3.400E-19	1.000E+00	3.860E-10	7.990E-14
REMAINDER	1.990E-18	9.216E-15	1.935E-13	3.200E-19	1.000E+00	2.740E-05	2.180E-08
EFFECTIVE	4.880E-18	2.413E-14	5.068E-13	8.380E-19	1.000E+00	7.790E-05	1.340E-08
SKIN(FGR)	4.090E-17	2.776E-13	5.830E-12	9.640E-18	1.000E+00	0.000E+00	0.000E+00
Pu-239							
GONADS	4.840E-18	1.768E-14	3.713E-13	6.140E-19	1.000E+00	1.200E-05	2.640E-09
BREAST	7.550E-18	2.238E-14	4.699E-13	7.770E-19	1.000E+00	3.990E-10	1.210E-13
LUNGS	2.650E-18	2.267E-15	4.760E-14	7.870E-20	1.000E+00	3.230E-04	7.890E-14
RED MARR	2.670E-18	3.456E-15	7.258E-14	1.200E-19	1.000E+00	6.570E-05	1.410E-08
BONE SUR	9.470E-18	1.673E-14	3.514E-13	5.810E-19	1.000E+00	8.210E-04	1.760E-07
Pu-239							
GONADS	4.840E-18	1.768E-14	3.713E-13	6.140E-19	1.000E+00	1.200E-05	2.640E-09

THYROID	3.880E-18	5.126E-15	1.077E-13	1.780E-19-1.000E+00	3.750E-10	7.500E-14
REMAINDER	2.860E-18	4.838E-15	1.016E-13	1.680E-19-1.000E+00	3.020E-05	2.120E-08
EFFECTIVE	4.240E-18	1.057E-14	2.220E-13	3.670E-19-1.000E+00	8.330E-05	1.400E-08
SKIN(FGR)	1.860E-17	1.057E-13	2.220E-12	3.670E-18-1.000E+00	0.000E-00	0.000E+00
Pu-240						
GONADS	6.360E-18	4.118E-14	8.649E-13	1.430E-18-1.000E+00	1.200E-05	2.640E-09
BREAST	1.230E-17	5.328E-14	1.119E-12	1.850E-18-1.000E+00	4.330E-10	1.730E-13
LUNGS	1.090E-18	2.249E-15	4.723E-14	7.810E-20-1.000E+00	3.230E-04	8.220E-14
RED MARR	1.650E-18	5.386E-15	1.131E-13	1.870E-19-1.000E+00	6.570E-05	1.410E-08
BONE SUR	9.260E-18	3.398E-14	7.137E-13	1.180E-18-1.000E+00	8.210E-04	1.760E-07
THYROID	3.920E-18	9.446E-15	1.984E-13	3.280E-19-1.000E+00	3.760E-10	7.510E-14
REMAINDER	1.960E-18	8.870E-15	1.863E-13	3.080E-19-1.000E+00	3.020E-05	2.130E-08
EFFECTIVE	4.750E-18	2.313E-14	4.857E-13	8.030E-19-1.000E-00	8.330E-05	1.400E-08
SKIN(FGR)	3.920E-17	2.644E-13	5.552E-12	9.180E-18-1.000E+00	0.000E+00	0.000E+00
Pu-241						
GONADS	7.190E-20	6.653E-17	1.396E-15	2.310E-21-1.000E-00	2.760E-07	5.660E-11
BREAST	8.670E-20	7.229E-17	1.517E-15	2.510E-21-1.000E+00	2.140E-11	2.790E-15
LUNGS	6.480E-20	4.090E-17	8.584E-16	1.420E-21-1.000E+00	3.180E-06	4.480E-15
RED MARR	5.630E-20	4.003E-17	8.403E-16	1.390E-21-1.000E+00	1.430E-06	2.780E-10
BONE SUR	2.190E-19	1.385E-16	2.908E-15	4.810E-21-1.000E+00	1.780E-05	3.480E-09
THYROID	6.980E-20	4.522E-17	9.491E-16	1.570E-21-1.000E+00	9.150E-12	1.010E-15
REMAINDER	6.090E-20	4.291E-17	9.007E-16	1.490E-21-1.000E-00	6.020E-07	1.850E-10
EFFECTIVE	7.250E-20	5.558E-17	1.167E-15	1.930E-21-1.000E+00	1.340E-06	2.070E-10
SKIN(FGR)	1.170E-19	2.033E-16	4.268E-15	7.060E-21-1.000E+00	0.000E+00	0.000E+00
Am-241						
GONADS	8.580E-16	9.360E-13	1.966E-11	3.250E-17-1.000E+00	3.250E-05	2.700E-07
BREAST	1.070E-15	1.014E-12	2.129E-11	3.520E-17-1.000E+00	2.670E-09	2.620E-11
LUNGS	6.740E-16	5.789E-13	1.216E-11	2.010E-17-1.000E+00	1.840E-05	3.360E-11
RED MARR	5.210E-16	4.838E-13	1.016E-11	1.680E-17-1.000E+00	1.740E-04	1.450E-06
BONE SUR	2.870E-15	2.678E-12	5.625E-11	9.300E-17-1.000E+00	2.170E-03	1.810E-05
THYROID	7.830E-16	6.365E-13	1.337E-11	2.210E-17-1.000E+00	1.600E-09	1.320E-11
REMAINDER	6.340E-16	5.933E-13	1.246E-11	2.060E-17-1.000E+00	7.820E-05	6.660E-07
EFFECTIVE	8.180E-16	7.920E-13	1.663E-11	2.750E-17-1.000E-00	1.200E-04	9.840E-07
SKIN(FGR)	1.280E-15	2.396E-12	5.032E-11	8.320E-17-1.000E+00	0.000E+00	0.000E+00
Cm-242						
GONADS	7.830E-18	4.893E-14	1.013E-12	1.700E-18-1.000E+00	5.700E-07	5.200E-09
BREAST	1.480E-17	6.159E-14	1.275E-12	2.140E-18-1.000E+00	9.440E-10	8.950E-12
LUNGS	1.130E-18	3.022E-15	6.257E-14	1.050E-19-1.000E+00	1.550E-05	8.840E-12
RED MARR	1.890E-18	6.562E-15	1.359E-13	2.280E-19-1.000E-00	3.900E-06	3.570E-08
BONE SUR	1.060E-17	4.231E-14	8.759E-13	1.470E-18-1.000E+00	4.870E-05	4.460E-07
THYROID	4.910E-18	1.261E-14	2.610E-13	4.380E-19-1.000E+00	9.410E-10	8.820E-12
REMAINDER	2.270E-18	1.079E-14	2.235E-13	3.750E-19-1.000E+00	2.450E-06	4.020E-08
EFFECTIVE	5.690E-18	2.751E-14	5.697E-13	9.560E-19-1.000E+00	4.670E-06	3.100E-08
SKIN(FGR)	4.290E-17	2.700E-13	5.589E-12	9.380E-18-1.000E+00	0.000E+00	0.000E+00
Cm-244						
GONADS	6.900E-18	4.522E-14	9.492E-13	1.570E-18-1.000E+00	1.590E-05	1.330E-07
BREAST	1.330E-17	5.702E-14	1.197E-12	1.980E-18-1.000E+00	1.040E-09	8.820E-12
LUNGS	7.080E-19	2.592E-15	5.441E-14	9.000E-20-1.000E+00	1.930E-05	8.810E-12
RED MARR	1.460E-18	5.875E-15	1.233E-13	2.040E-19-1.000E+00	9.380E-05	7.820E-07
BONE SUR	8.820E-18	3.859E-14	8.101E-13	1.340E-18-1.000E+00	1.170E-03	9.770E-06
THYROID	4.190E-18	1.146E-14	2.406E-13	3.980E-19-1.000E+00	1.010E-09	8.440E-12
REMAINDER	1.810E-18	9.821E-15	2.062E-13	3.410E-19-1.000E+00	4.780E-05	4.150E-07
EFFECTIVE	4.910E-18	2.529E-14	5.308E-13	8.780E-19-1.000E+00	6.700E-05	5.450E-07
SKIN(FGR)	3.910E-17	2.506E-13	5.260E-12	8.700E-18-1.000E+00	0.000E+00	0.000E+00
Kr-83m						
GONADS	1.710E-18	5.572E-15	5.855E-15	6.160E-19-1.000E+00	0.000E+00	0.000E+00
BREAST	5.050E-18	9.498E-15	9.980E-15	1.050E-18-1.000E+00	0.000E+00	0.000E+00
LUNGS	1.640E-19	1.266E-16	1.331E-16	1.400E-20-1.000E+00	0.000E+00	0.000E+00
RED MARR	3.830E-19	5.617E-16	5.902E-16	6.210E-20-1.000E+00	0.000E+00	0.000E+00
BONE SUR	2.250E-18	3.437E-15	3.612E-15	3.800E-19-1.000E+00	0.000E-00	0.000E+00
THYROID	6.430E-19	7.698E-16	8.088E-16	8.510E-20-1.000E+00	0.000E+00	0.000E+00
REMAINDER	5.300E-19	1.393E-15	1.464E-15	1.540E-19-1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	1.500E-18	3.437E-15	3.612E-15	3.800E-19-1.000E+00	0.000E-00	0.000E+00
SKIN(FGR)	3.560E-17	1.167E-13	1.226E-13	1.290E-17-1.000E+00	0.000E+00	0.000E-00
Xe-133m						
GONADS	1.420E-15	1.337E-12	1.188E-11	4.890E-17-1.000E+00	0.000E+00	0.000E+00
BREAST	1.700E-15	1.383E-12	1.230E-11	5.060E-17-1.000E+00	0.000E+00	0.000E+00
LUNGS	1.190E-15	8.609E-13	7.656E-12	3.150E-17-1.000E+00	0.000E+00	0.000E+00
RED MARR	1.100E-15	7.844E-13	6.975E-12	2.870E-17-1.000E+00	0.000E-00	0.000E+00
BONE SUR	3.230E-15	2.599E-12	2.311E-11	9.510E-17-1.000E+00	0.000E+00	0.000E+00
THYROID	1.360E-15	1.028E-12	9.138E-12	3.760E-17-1.000E+00	0.000E+00	0.000E+00
REMAINDER	1.150E-15	8.855E-13	7.874E-12	3.240E-17-1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	1.370E-15	1.112E-12	9.892E-12	4.070E-17-1.000E-00	0.000E+00	0.000E+00
SKIN(FGR)	1.040E-14	1.894E-12	1.684E-11	6.930E-17-1.000E+00	0.000E+00	0.000E+00
Xe-135m						
GONADS	2.000E-14	5.929E-13	5.929E-13	4.480E-16-1.000E+00	0.000E+00	0.000E+00
BREAST	2.290E-14	5.691E-13	5.691E-13	4.300E-16-1.000E+00	0.000E-00	0.000E+00
LUNGS	1.980E-14	5.343E-13	5.347E-12	4.040E-16-1.000E+00	0.000E+00	0.000E-00
EFFECTIVE	1.370E-15	1.112E-12	9.892E-12	4.070E-17-1.000E-00	0.000E+00	0.000E+00
SKIN(FGR)	1.040E-14	1.894E-12	1.684E-11	6.930E-17-1.000E+00	0.000E+00	0.000E+00

RED MARR	1.910E-14	5.400E-13	5.400E-13	4.080E-16	1.000E+00	0.000E+00	0.000E-00
BONE SUR	3.500E-14	8.246E-13	8.246E-13	6.230E-16	1.000E+00	0.000E+00	0.000E-00
THYROID	2.040E-14	5.612E-13	5.612E-13	4.240E-16	1.000E-00	0.000E+00	0.000E+00
REMAINDER	1.890E-14	5.241E-13	5.241E-13	3.960E-16	1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	2.040E-14	5.612E-13	5.612E-13	4.240E-16	1.000E+00	0.000E-00	0.000E+00
SKIN(FGR)	2.970E-14	1.866E-12	1.866E-12	1.410E-15	1.000E+00	0.000E+00	0.000E+00

Attachment 3 RADTRAD Control File Inventory File CRDA_SSES_AST.nif

```
Nuclide Inventory Name: SSES_AST-LOCA.NIF + kr83m, xe 131m, 133m, 135m
 BWR Core Inventory Reference: EC-FUEL-1615 R1
 Power Level:
  0.1000E+01
 Nuclides:
  63
 Nuclide 001:
 Co-58
   7
  0.6117120000E+07
  0.5800E+02
  0.1470E+03
 none      0.0000E+00
 none      0.0000E+00
 none      0.0000E+00
 Nuclide 002:
 Co-60
   7
  0.1663401096E+09
  0.6000E+02
  0.7910E+02
 none      0.0000E+00
 none      0.0000E+00
 none      0.0000E+00
 Nuclide 003:
 Kr-85
   1
  0.3382974720E+09
  0.8500E+02
  0.3670E+03
 none      0.0000E+00
 none      0.0000E+00
 none      0.0000E+00
 Nuclide 004:
 Kr-85m
   1
  0.1612800000E+05
  0.8500E+02
  0.6650E+04
 Kr-85     0.2100E+00
 none      0.0000E+00
 none      0.0000E+00
 Nuclide 005:
 Kr-87
   1
  0.4578000000E+04
  0.8700E+02
  0.1330E+05
 Rb-87     0.1000E+01
 none      0.0000E+00
 none      0.0000E+00
 Nuclide 006:
 Kr-88
   1
  0.1022400000E+05
  0.8800E+02
  0.1850E+05
 Rb-88     0.1000E+01
 none      0.0000E+00
 none      0.0000E+00
 Nuclide 007:
 Rb-86
   3
  0.1612224000E+07
  0.8600E+02
  0.5380E+02
 none      0.0000E+00
 none      0.0000E+00
 none      0.0000E+00
 Nuclide 008:
 Sr-89
   5
  0.4363200000E+07
  0.8900E+02
  0.2550E+05
 none      0.0000E+00
 none      0.0000E+00
 none      0.0000E+00
  0.4363200000E+07
  0.8900E+02
```

```
Nuclide 009:
Sr-90
  5
 0.9189573120E-09
 0.9000E+02
 0.3250E+04
Y-90      0.1000E+01
none      0.0000E+00
none      0.0000E-00
Nuclide 010:
Sr-91
  5
 0.3420000000E+05
 0.9100E+02
 0.3250E+05
Y-91m     0.5800E+00
Y-91      0.4200E+00
none      0.0000E+00
Nuclide 011:
Sr-92
  5
 0.9756000000E+04
 0.9200E+02
 0.3450E+05
Y-92      0.1000E-01
none      0.0000E+00
none      0.0000E-00
Nuclide 012:
Y-90
  9
 0.2304000000E+06
 0.9000E+02
 0.3370E+04
none      0.0000E-00
none      0.0000E-00
none      0.0000E-00
Nuclide 013:
Y-91
  9
 0.5055264000E+07
 0.9100E+02
 0.3320E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 014:
Y-92
  9
 0.1274400000E+05
 0.9200E+02
 0.3470E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 015:
Y-93
  9
 0.3636000000E+05
 0.9300E+02
 0.2650E+05
Zr-93     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 016:
Zr-95
  9
 0.5527872000E-07
 0.9500E+02
 0.4760E+05
Nb-95m    0.7000E-02
Nb-95     0.9900E+00
none      0.0000E+00
Nuclide 017:
Zr-97
  9
 0.6084000000E+05
 0.9700E+02
 0.4710E+05
Nuclide 017:
Zr-97
```

```
Nb-97m    0.9500E+00
Nb-97     0.5300E-01
none      0.0000E+00
Nuclide 018:
Nb-95
  9
 0.3036960000E+07
 0.9500E+02
 0.4760E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E-00
Nuclide 019:
Mo-99
  7
 0.2376000000E+06
 0.9900E+02
 0.5010E+05
Tc-99m    0.8800E+00
Tc-99     0.1200E+00
none      0.0000E+00
Nuclide 020:
Tc-99m
  7
 0.2167200000E+05
 0.9900E+02
 0.4440E+05
Tc-99     0.1000E-01
none      0.0000E+00
none      0.0000E+00
Nuclide 021:
Ru-103
  7
 0.3393792000E+07
 0.1030E+03
 0.4270E+05
Rh-103m   0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 022:
Ru-105
  7
 0.1598400000E+05
 0.1050E+03
 0.2950E+05
Rh-105    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 023:
Ru-106
  7
 0.3181248000E+08
 0.1060E+03
 0.2700E+05
Rh-106    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 024:
Rh-105
  7
 0.1272960000E+06
 0.1050E+03
 0.2750E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 025:
Sb-127
  4
 0.3326400000E+06
 0.1270E+03
 0.2330E+04
Te-127m   0.1800E+00
Te-127    0.8200E+00
none      0.0000E+00
Nuclide 026:
Sb-129
  4
Te-127m   0.1800E+00
Te-127    0.8200E+00
```

```
 0.1555200000E+05
 0.1290E+03
 0.8610E+04
Te-129m  0.2200E-03
Te-129   0.7700E+00
none     0.0000E+00
Nuclide 027:
Te-127
  4
 0.3366000000E+05
 0.1270E+03
 0.2310E+04
none     0.0000E-00
none     0.0000E-00
none     0.0000E+00
Nuclide 028:
Te-127m
  4
 0.9417600000E+07
 0.1270E+03
 0.3940E+03
Te-127   0.9800E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 029:
Te-129
  4
 0.4176000000E+04
 0.1290E+03
 0.8160E+04
I-129    0.1000E+01
none     0.0000E+00
none     0.0000E+00
Nuclide 030:
Te-129m
  4
 0.2903040000E+07
 0.1290E+03
 0.1650E+04
Te-129   0.6500E+00
I-129    0.3500E+00
none     0.0000E+00
Nuclide 031:
Te-131m
  4
 0.1080000000E+06
 0.1310E+03
 0.5330E+04
Te-131   0.2200E+00
I-131    0.7800E+00
none     0.0000E+00
Nuclide 032:
Te-132
  4
 0.2815200000E+06
 0.1320E+03
 0.3620E+05
I-132    0.1000E+01
none     0.0000E+00
none     0.0000E+00
Nuclide 033:
I-131
  2
 0.6946560000E+06
 0.1310E+03
 0.2650E+05
Xe-131m  0.1100E-01
none     0.0000E+00
none     0.0000E+00
Nuclide 034:
I-132
  2
 0.8280000000E+04
 0.1320E+03
 0.3890E+05
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
 0.8280000000E+04
 0.1320E+03
```

```
Nuclide 035:
I-133
  2
 0.7486000000E+05
 0.1330E+03
 0.5510E-05
Xe-133m  0.2900E-01
Xe-133   0.9700E+00
none     0.0000E+00
Nuclide 036:
I-134
  2
 0.3156000000E-04
 0.1340E+03
 0.6080E+05
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 037:
I-135
  2
 0.2379600000E+05
 0.1350E+03
 0.5220E+05
Xe-135m  0.1500E+00
Xe-135   0.8500E+00
none     0.0000E+00
Nuclide 038:
Xe-133
  1
 0.4531680000E+06
 0.1330E+03
 0.5260E+05
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 039:
Xe-135
  1
 0.3272400000E+05
 0.1350E+03
 0.1740E-05
Cs-135   0.1000E+01
none     0.0000E+00
none     0.0000E+00
Nuclide 040:
Cs-134
  3
 0.6507177120E+08
 0.1340E+03
 0.5700E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 041:
Cs-136
  3
 0.1131840000E-07
 0.1360E+03
 0.1820E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 042:
Cs-137
  3
 0.9467280000E+09
 0.1370E+03
 0.4290E+04
Ba-137m  0.9500E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 043:
Ba-139
  6
 0.4962000000E+04
 0.1390E+03
 0.4840E+05
Nuclide 043:
Ba-139
```

```
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 044:
Ba-140
  6
 0.1100736000E+07
 0.1400E+03
 0.4860E+05
La-140    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 045:
La-140
  9
 0.1449792000E+06
 0.1400E+03
 0.5180E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 046:
La-141
  9
 0.1414800000E+05
 0.1410E+03
 0.4410E+05
Ce-141    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 047:
La-142
  9
 0.5550000000E+04
 0.1420E+03
 0.4320E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 048:
Ce-141
  8
 0.2808066400E-07
 0.1410E+03
 0.4460E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 049:
Ce-143
  8
 0.1188000000E+06
 0.1430E+03
 0.4140E+05
Pr-143    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 050:
Ce-144
  8
 0.2456352000E+08
 0.1440E+03
 0.3750E+05
Pr-144m   0.1800E-01
Pr-144    0.9800E+00
none      0.0000E+00
Nuclide 051:
Pr-143
  9
 0.1171584000E+07
 0.1430E+03
 0.3990E+05
none      0.0000E+00
none      0.0000E+00
none      0.0000E+00
Nuclide 052:
Nd-147
  9
none      0.0000E+00
none      0.0000E+00
```

```
 0.9486720000E+06
 0.1470E+03
 0.1800E+05
Pm-147    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 053:
Np-239
  8
 0.2034720000E+06
 0.2390E+03
 0.5260E+06
Pu-239    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 054:
Pu-238
  8
 0.2768863824E+10
 0.2380E+03
 0.1130E+03
U-234     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 055:
Pu-239
  8
 0.7594336440E+12
 0.2390E+03
 0.1200E+02
U-235     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 056:
Pu-240
  8
 0.2062920312E+12
 0.2400E+03
 0.1930E+02
U-236     0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 057:
Pu-241
  8
 0.4544294400E+09
 0.2410E+03
 0.4760E+04
U-237     0.2400E-04
Am-241    0.1000E+01
none      0.0000E+00
Nuclide 058:
Am-241
  9
 0.1363919472E+11
 0.2410E+03
 0.6300E-01
Np-237    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 059:
Cm-242
  9
 0.1406592000E-08
 0.2420E+03
 0.1650E+04
Pu-238    0.1000E+01
none      0.0000E+00
none      0.0000E+00
Nuclide 060:
Cm-244
  9
 0.5715081360E+09
 0.2440E+03
 0.9670E+02
Pu-240    0.1000E+01
none      0.0000E+00
none      0.0000E+00
 0.5715081360E+09
 0.2440E+03
```

```
 Nuclide 061:
 Kr-83m
   1
  0.6840000000E+04
  0.8300E+02
  0.3250E+04
 none      0.0000E+00
 none      0.0000E+00
 none      0.0000E+00
 Nuclide 062:
 Xe-133m
   1
  0.1987032000E+06
  0.1330E-03
  0.1730E+04
 Xe-133    0.1000E+01
 none      0.0000E-00
 none      0.0000E+00
Nuclide 063:
 Xe-135m
   1
  0.9360000000E+03
  0.1350E+03
  0.1500E+05
 Xe-135    0.1000E+01
 Cs-135    0.4500E-04
 none      0.0000E-00

 End of Nuclear Inventory File
```

Attachment 4 RADTRAD Output CRDA_500cfm_2000_noCREOAS.out

```
*****************************************************************
   RADTRAD Version 3.03 (Spring 2001) run on  8/15/2005  at 16:00:54
*****************************************************************

*****************************************************************
                    File information
*****************************************************************

Plant file           = C:\Program Files\radtrad3.03\PPL_AST_MSL\CRDA_500cfm_2000_noCREOAS.psf
Inventory file       = c:\program files\radtrad3.03\ppl_ast_msl\crda_sses_ast.nif
Release file         = c:\program files\radtrad3.03\ppl_ast_msl\crda_sses_ast_2000_melt.rft
Dose Conversion file = c:\program files\radtrad3.03\ppl_ast_msl\crda_expanded_fgr11&12.inp
```

```
Radtrad 3.03 4/15/2001
SSES
Nuclide Inventory File:
c:\program files\radtrad3.03\ppl_ast_msl\crda_sses_ast.nif
Plant Power Level:
 4.0320E+03
Compartments:
  3
Compartment 1:
SSES Condenser/Turbine
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 2:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 3:
Control Bldg
  1
 5.1800E-05
  0
  0
  0
  0
  0
Pathways:
  4
Pathway 1:
SSES Condenser/Turbine to Environs - 24 hr Release
  1
  2
  4
Pathway 2:
Environs to Control Bldg - 6391 cfm Air Intake
  2
  3
  2
Pathway 3:
Environs to Control Bldg - 510 cfm Inleakage
  2
  2
  3
```

```
  3
  2
Pathway 4:
Control Bldg to  Environs - Control Room Exhaust
  3
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.6000E-00
c:\program files\radtrad3.03\ppl_ast_msl\crda_expanded_fgr11&12.inp
c:\program files\radtrad3.03\ppl_ast_msl\crda_sses_ast_2000_melt.rft
  0.0000E-00
  1
  0.0000E-00   9.7000E-01   3.0000E-02   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  3
Compartment 1:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 2:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  4
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+00
  2.4000E+01   0.0000E+00
  7.2000E+02   0.0000E+00
  0
  1
  3
```

```
Pathway 2:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   6.3910E+03   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   6.3910E-03   0.0000E+00   0.0000E+00   0.0000E-00
  7.2000E+02   0.0000E-00   0.0000E+00   0.0000E-00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   5.1000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  7.2000E+02   0.0000E-00   0.0000E+00   0.0000E+00   0.0000E-00
  0
  0
  0
  0
  0
  0
Pathway 4:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   6.9010E+03   0.0000E+00   0.0000E-00   0.0000E+00
  2.4000E+01   6.9010E+03   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB - CRDA
  2
  1
  3
  0.0000E+00   8.3000E-04
  2.0000E+00   8.3000E-04
  7.2000E+02   0.0000E+00
  1
  4
  0.0000E+00   3.5000E-04
  6.0000E+00   1.8000E-04
  2.4000E+01   2.3000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ - CRDA
  2
  1
  5
  0.0000E+00   4.9000E-05
  8.0000E+00   3.5000E-05
  2.4000E+01   0.0000E+00
  9.6000E+01   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  6.[illegible]   [illegible]
  8.0000E+00   3.5000E-05
  9.6000E+01   0.0000E+00
```

```
  0.0000E+00    3.5000E-04
  8.0000E+00    1.8000E-04
  2.4000E+01    2.3000E-04
  7.2000E+02    0.0000E+00
  0
Location 3:
CRDA & CR
  3
  0
  1
  2
  0.0000E+00    3.5000E-04
  7.2000E+02    0.0000E+00
  1
  4
  0.0000E+00    1.0000E+00
  2.4000E-01    6.0000E-01
  9.6000E+01    4.0000E-01
  7.2000E+02    0.0000E+00
Effective Volume Location:
  1
  5
  0.0000E+00    1.3600E-03
  2.0000E+00    1.0300E-03
  8.0000E+00    3.3600E-04
  2.4000E+01    0.0000E+00
  7.2000E+02    0.0000E-00
Simulation Parameters:
  1
  0.0000E+00    0.0000E-00
Output Filename:
C:\Program Files\radtrad3.o40
  1
  1
  1
  0
  1
End of Scenario File
```

```
##################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  8/15/2005  at 16:00:54
##################################################################

##################################################################
                        Plant Description
##################################################################

Number of Nuclides =  63

Inventory Power =   1.0000E+00 MWth
Plant Power Level =   4.0320E+03 MWth

Number of compartments    =   3

Compartment information

Compartment number  1  (Source term fraction =   1.6000E+00
)
Name: SSES Condenser/Turbine
Compartment volume =   1.0000E+02 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  1
   Exit Pathway Number    1: SSES Condenser/Turbine to Environs - 24 hr Release

Compartment number  2
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  2
   Inlet Pathway Number   1: SSES Condenser/Turbine to Environs - 24 hr Release
   Inlet Pathway Number   4: Control Bldg to  Environs - Control Room Exhaust
   Exit Pathway Number    2: Environs to Control Bldg - 6391 cfm Air Intake
   Exit Pathway Number    3: Environs to Control Bldg - 510 cfm Inleakage

Compartment number  3
Name: Control Bldg
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Environs to Control Bldg - 6391 cfm Air Intake
   Inlet Pathway Number   3: Environs to Control Bldg - 510 cfm Inleakage
   Exit Pathway Number    4: Control Bldg to  Environs - Control Room Exhaust

Total number of pathways =   4
```

```
*****************************************************************
  RADTRAD Version 3.03 (Spring 2001) run on  8/15/2005  at 16:00:54
*****************************************************************

*****************************************************************
                    Scenario Description
*****************************************************************
```

Radioactive Decay is enabled
Calculation of Daughters is enabled

Release Fractions and Timings

	GAP	EARLY IN-VESSEL	LATE RELEASE	RELEASE MASS
	0.001000 hr	0.0000 hrs	0.0000 hrs	(gm)
NOBLES	3.2100E-03	0.0000E+00	0.0000E+00	1.592E-01
IODINE	3.1000E-05	0.0000E+00	0.0000E+00	3.541E-02
CESIUM	3.6400E-07	0.0000E+00	0.0000E+00	7.889E-02
TELLURIUM	1.1500E-09	0.0000E+00	0.0000E+00	1.115E-06
STRONTIUM	4.5900E-10	0.0000E+00	0.0000E+00	4.574E-05
BARIUM	4.5900E-10	0.0000E+00	0.0000E+00	1.234E-06
RUTHENIUM	5.7400E-11	0.0000E+00	0.0000E-00	1.534E-06
CERIUM	4.5900E-12	0.0000E+00	0.0000E+00	6.407E-06
LANTHANUM	1.1500E-11	0.0000E+00	0.0000E-00	4.302E-07

Inventory Power = 4032. MWt

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Co-58	7	1.470E+02	6.117E+06	4.760E-14	8.720E-10	2.940E-09
Co-60	7	7.910E+01	1.663E+08	1.260E-13	1.620E-08	5.910E-08
Kr-85	1	3.670E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	6.650E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.330E-04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	1.850E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
Rb-86	3	5.380E+01	1.612E-06	4.810E-15	1.330E-09	1.790E-09
Sr-89	5	2.550E-04	4.363E+06	7.730E-17	7.960E-12	1.120E-08
Sr-90	5	3.250E+03	9.190E-08	7.530E-18	2.690E-10	3.510E-07
Sr-91	5	3.250E+04	3.420E+04	4.924E-14	9.930E-12	4.547E-10
Sr-92	5	3.450E+04	9.756E+03	6.790E-14	3.920E-12	2.180E-10
Y-90	9	3.370E+03	2.304E+05	1.900E-16	5.170E-13	2.280E-09
Y-91	9	3.320E+04	5.055E+06	2.600E-16	8.500E-12	1.320E-08
Y-92	9	3.470E+04	1.274E+04	1.300E-14	1.050E-12	2.110E-10
Y-93	9	2.650E+04	3.636E+04	4.800E-15	9.260E-13	5.820E-10
Zr-95	9	4.760E+04	5.528E+06	3.600E-14	1.440E-09	6.390E-09
Zr-97	9	4.710E+04	6.084E+04	4.432E-14	2.315E-11	1.171E-09
Nb-95	9	4.760E+04	3.037E+06	3.740E-14	3.580E-10	1.570E-09
Mo-99	7	5.010E+04	2.376E+05	7.280E-15	1.520E-11	1.070E-09
Tc-99m	7	4.440E+04	2.167E+04	5.890E-15	5.010E-11	8.800E-12
Ru-103	7	4.270E+04	3.394E+06	2.251E-14	2.570E-10	2.421E-09
Ru-105	7	2.950E+04	1.598E+04	3.810E-14	4.150E-12	1.230E-10
Ru-106	7	1.700E+04	3.181E+07	1.040E-14	1.720E-09	1.290E-07
Rh-105	7	2.750E+04	1.273E+05	3.720E-15	2.880E-12	2.580E-10
Sb-127	4	2.330E+03	3.326E+05	3.330E-14	6.150E-11	1.630E-09
Sb-129	4	8.610E+03	1.555E+04	7.140E-14	9.720E-12	1.740E-10
Te-127	4	2.310E+03	3.366E+04	2.420E-16	1.840E-12	8.600E-11
Te-127m	4	3.940E+02	9.418E+06	1.470E-16	9.660E-11	5.810E-09
Te-129	4	8.160E+03	4.176E+03	2.750E-15	5.090E-13	2.090E-11
Te-129m	4	1.650E+03	2.903E+06	3.337E-15	1.563E-10	6.484E-09
Te-131m	4	5.330E+03	1.080E+05	7.463E-14	3.669E-08	1.758E-09
Te-132	4	3.820E+04	2.815E+05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.650E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.890E-04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.510E-04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.080E-04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.230E+04	2.380E-04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.260E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	1.740E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Cs-134	3	5.700E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.820E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.290E+03	9.467E+08	2.725E-14	7.930E-09	8.630E-09
Ba-139	6	4.840E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	4.860E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09
La-140	9	5.180E+04	1.450E+05	1.170E-13	6.870E-11	1.310E-09
La-141	9	4.410E+04	1.415E+04	2.390E-15	9.400E-12	1.570E-10
La-142	9	4.320E+04	5.550E+03	1.440E-13	8.740E-12	6.840E-11
Ce-141	8	4.460E+04	2.808E+06	3.430E-15	2.550E-11	2.420E-09
Ba-139	6	4.840E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	4.860E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09

Ce-143	8	4.140E+04	1.188E+05	1.290E-14	6.230E-12	9.160E-10
Ce-144	8	3.750E+04	2.456E+07	2.773E-15	2.920E-10	1.010E-07
Pr-143	9	3.990E+04	1.172E+06	2.100E-17	1.680E-18	2.190E-09
Nd-147	9	1.800E-04	9.467E-05	6.190E-15	1.820E-11	1.850E-09
Np-239	8	5.260E-05	2.035E+05	7.690E-15	7.620E-12	6.760E-10
Pu-238	8	1.130E-02	2.769E+09	4.880E-18	3.860E-10	7.790E-05
Pu-239	8	1.200E+01	7.594E+11	4.240E-18	3.750E-10	8.330E-05
Pu-240	8	1.930E+01	2.063E+11	4.750E-18	3.760E-10	8.330E-05
Pu-241	8	4.760E+03	4.544E+08	7.250E-20	9.150E-12	1.340E-06
Am-241	9	6.300E+00	1.364E+10	8.180E-16	1.600E-09	1.200E-04
Cm-242	9	1.650E+03	1.407E+07	5.690E-18	9.410E-10	4.670E-06
Cm-244	9	9.670E+01	5.715E+08	4.910E-18	1.010E-09	6.700E-05
Kr-83m	1	3.250E+03	6.840E+03	1.500E-18	0.000E+00	0.000E+00
Xe-133m	1	1.730E+03	1.987E+05	1.370E-15	0.000E+00	0.000E+00
Xe-135m	1	1.500E+04	9.360E+02	2.040E-14	0.000E+00	0.000E+00

Nuclide	Daughter	Fraction	Daughter	Fraction	Daughter	Fraction
Kr-85m	Kr-85	0.21	none	0.00	none	0.00
Kr-87	Rb-87	1.00	none	0.00	none	0.00
Kr-88	Rb-88	1.00	none	0.00	none	0.00
Sr-90	Y-90	1.00	none	0.00	none	0.00
Sr-91	Y-91m	0.58	Y-91	0.42	none	0.00
Sr-92	Y-92	1.00	none	0.00	none	0.00
Y-93	Zr-93	1.00	none	0.00	none	0.00
Zr-95	Nb-95m	0.01	Nb-95	0.99	none	0.00
Zr-97	Nb-97m	0.95	Nb-97	0.05	none	0.00
Mo-99	Tc-99m	0.88	Tc-99	0.12	none	0.00
Tc-99m	Tc-99	1.00	none	0.00	none	0.00
Ru-103	Rh-103m	1.00	none	0.00	none	0.00
Ru-105	Rh-105	1.00	none	0.00	none	0.00
Ru-106	Rh-106	1.00	none	0.00	none	0.00
Sb-127	Te-127m	0.18	Te-127	0.82	none	0.00
Sb-129	Te-129m	0.22	Te-129	0.77	none	0.00
Te-127m	Te-127	0.98	none	0.00	none	0.00
Te-129	I-129	1.00	none	0.00	none	0.00
Te-129m	Te-129	0.65	I-129	0.35	none	0.00
Te-131m	Te-131	0.22	I-131	0.78	none	0.00
Te-132	I-132	1.00	none	0.00	none	0.00
I-131	Xe-131m	0.01	none	0.00	none	0.00
I-133	Xe-133m	0.03	Xe-133	0.97	none	0.00
I-135	Xe-135m	0.15	Xe-135	0.85	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00
Xe-133m	Xe-133	1.00	none	0.00	none	0.00
Xe-135m	Xe-135	1.00	Cs-135	0.00	none	0.00

Iodine fractions

Aerosol = 0.0000E-00
Elemental = 9.7000E-01
Organic = 3.0000E-02

COMPARTMENT DATA

Compartment number 1: SSES Condenser/Turbine

Compartment number 2: Environment

Compartment number 3: Control Bldg

PATHWAY DATA

Pathway number 1: SSES Condenser/Turbine to Environs - 24 hr Release

Convection Data

Time (hr) Flow Rate (% / day)

PATHWAY DATA

Time (hr) Flow Rate (% / day)

0.0000E+00	1.0000E+00
2.4000E+01	0.0000E+00
7.2000E+02	0.0000E+00

Pathway number 2: Environs to Control Bldg - 6391 cfm Air Intake

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.3910E+03	0.0000E+00	0.0000E+00	0.0000E+00
1.0000E+00	6.3910E+03	0.0000E+00	0.0000E-00	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 3: Environs to Control Bldg - 510 cfm Inleakage

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E-00	0.0000E+00

Pathway number 4: Control Bldg to Environs - Control Room Exhaust

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.9010E+03	0.0000E+00	0.0000E+00	0.0000E-00
2.4000E+01	6.9010E+03	0.0000E+00	0.0000E+00	0.0000E-00

LOCATION DATA

Location EAB - CRDA is in compartment 2

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	8.3000E-04
2.0000E+00	8.3000E-04
7.2000E+02	0.0000E+00

Location Breathing Rate Data

Time (hr)	Breathing Rate (m^3 * sec^-1)
0.0000E-00	3.5000E-04
8.0000E+00	1.8000E-04
2.4000E+01	2.3000E-04
7.2000E+02	0.0000E+00

Location LPZ - CRDA is in compartment 2

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	4.9000E-05
8.0000E+00	3.5000E-05
2.4000E+01	0.0000E+00
9.6000E+01	0.0000E+00
7.2000E+02	0.0000E+00

Location Breathing Rate Data

Time (hr)	Breathing Rate (m^3 * sec^-1)
0.0000E+00	3.5000E-04
8.0000E+00	1.8000E-04
2.4000E+01	2.3000E-04
7.2000E+02	0.0000E+00

Location CRDA @ CR is in compartment 3

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	1.3600E-03
2.0000E+00	1.0300E-03
8.0000E+00	3.3600E-04
2.4000E+01	0.0000E+00
7.2000E+02	0.0000E+00

Location Breathing Rate Data

Time (hr)	Breathing Rate (m^3 * sec^-1)
0.0000E+00	3.5000E-04
7.2000E+02	0.0000E+00

.....

Location Breathing Rate Data

Location Occupancy Factor Data

Time (hr)	Occupancy Factor
0.0000E+00	1.0000E+00
2.4000E+01	6.0000E-01
5.6000E+01	4.0000E-01
7.2000E+02	0.0000E+00

USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS

Time	Time step
0.0000E+00	0.0000E+00

```
##################################################################
  RADTRAD Version 3.03 (Spring 2001) run on  8/15/2005  at 16:00:54
##################################################################
```

```
 ####   #    #  #####  #####   #    #  #####
#    #  #    #    #    #    #  #    #    #
#    #  #    #    #    #    #  #    #    #
#    #  #    #    #    #####   #    #    #
#    #  #    #    #    #       #    #    #
#    #  #    #    #    #       #    #    #
 ####    ####     #    #        ####     #
```

```
##################################################################
          Dose, Detailed model and Detailed Inventory Output
##################################################################
```

Detailed model information at time (H) = 0.0010

EAB - CRDA Doses:

Time (h) = 0.0010	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.3223E-05	4.9013E-04	5.8786E-05
Accumulated dose (rem)	4.3223E-05	4.9013E-04	5.8786E-05

LPZ - CRDA Doses:

Time (h) = 0.0010	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.5517E-06	2.8936E-05	3.4705E-06
Accumulated dose (rem)	2.5517E-06	2.8936E-05	3.4705E-06

CRDA @ CR Doses:

Time (h) = 0.0010	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5515E-09	2.4167E-07	9.2252E-09
Accumulated dose (rem)	1.5515E-09	2.4167E-07	9.2252E-09

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 0.0010	Ci	kg	Atoms	Decay
Co-58	5.4434E-05	1.7119E-12	1.7774E+13	5.4603E+06
Co-60	2.9291E-05	2.5912E-11	2.6008E-14	2.9382E+06
Kr-85	7.6000E+03	1.9371E-02	1.3724E+23	7.6236E+14
Kr-85m	1.3769E+05	1.6731E-05	1.1854E+20	1.3813E+16
Kr-87	2.7527E+05	9.7181E-06	6.7269E+19	2.7619E+16
Kr-88	3.8301E+05	3.0545E-05	2.0503E+20	3.8424E+16
Rb-86	1.2633E-01	1.5526E-09	1.0872E+16	1.2673E+10
Sr-89	7.5508E-02	2.5990E-09	1.7586E+16	7.5743E+09
Sr-90	9.6236E-03	7.0550E-08	4.7207E+17	9.6535E+08
Sr-91	9.6229E-02	2.6546E-11	1.7567E+14	9.6531E+09
Sr-92	1.0213E-01	8.1254E-12	5.3187E+13	1.0246E+10
Y-90	2.5009E-04	4.5968E-13	3.0758E+12	2.5081E+07
Y-91	2.4631E-03	1.0044E-10	6.6466E+14	2.4707E+08
Y-92	2.5890E-03	2.6906E-13	1.7612E+12	2.5858E-08
Y-93	1.9659E-03	5.8923E-13	3.8155E+12	1.9720E+08
Zr-95	3.5314E-03	1.6438E-10	1.0420E+15	3.5424E+08
Zr-97	3.4941E-03	1.8278E-12	1.1348E+13	3.5051E+08
Nb-95	3.5314E-03	9.0310E-11	5.7248E+14	3.5424E+08
Mo-99	1.8552E-02	3.8681E-11	2.3529E+14	1.8610E+09
Tc-99m	1.6441E-02	3.1268E-12	1.9020E+13	1.6492E+09
Ru-103	1.5812E-02	4.8992E-10	2.8645E+15	1.5861E+09
Ru-105	1.0922E-02	1.6248E-12	9.3190E+12	1.0957E+09
Ru-106	6.2951E-03	1.8816E-09	1.0690E+16	6.3147E+08
Rh-105	1.0183E-02	1.2065E-11	6.9195E+13	1.0215E+09
Sb-127	1.7286E-02	6.4728E-11	3.0693E+14	1.7340E+09
Sb-129	6.3866E-02	1.1357E-11	5.3019E+13	6.4069E+09
Te-127	1.7138E-02	6.4937E-12	3.0792E+13	1.7191E+09
Te-127m	2.9230E-03	3.0989E-10	1.4694E+15	2.9321E+08
Te-129	6.0536E-02	2.8906E-12	1.3494E+13	6.0717E+09
Te-129m	1.2241E-02	4.0634E-10	1.8969E+15	1.2279E+09
Te-131m	3.9542E-02	4.9588E-11	2.2796E+14	3.9665E+09
Te-132	2.8340E-01	9.3348E-10	4.2588E+15	2.8428E+10
Te-131	5.2996E+03	4.2749E-05	1.9651E+20	5.3161E+14
Te-127m	2.9230E-03	3.0989E-10	1.4694E+15	2.9321E+08
Te-129	6.0536E-03	2.8906E-13	1.3494E+13	6.0717E+09

I-132	7.7777E+03	7.5350E-07	3.4376E+18	7.8027E+14
I-133	1.1019E+04	9.7271E-06	4.4043E+19	1.1053E+15
I-134	1.2150E-04	4.5544E-07	2.0468E+18	1.2192E+15
I-135	1.0458E+04	2.9780E-06	1.3284E+19	1.0491E+15
Xe-133	1.0893E+06	5.8192E-03	2.6349E+22	1.0926E+17
Xe-135	3.6034E+05	1.4110E-04	6.2944E-20	3.6145E+16
Cs-134	1.3385E-01	1.0345E-05	4.6493E+19	1.3427E+12
Cs-136	4.2738E+00	5.8313E-08	2.5821E+17	4.2871E-11
Cs-137	1.0074E+01	1.1582E-04	5.0910E+20	1.0105E+12
Ba-139	1.4325E-01	8.7574E-12	3.7941E-13	1.4372E+10
Ba-140	1.4391E-01	1.9657E-09	8.4557E+15	1.4436E+10
La-140	3.8448E-03	6.9172E-12	2.9755E+13	3.8554E-08
La-141	3.2711E-03	5.7842E-13	2.4704E+12	3.2816E+08
La-142	3.2035E-03	2.2379E-13	9.4907E+11	3.2141E+08
Ce-141	1.3207E-03	4.6349E-11	1.9796E+14	1.3248E+08
Ce-143	1.2259E-03	1.8460E-12	7.7739E+12	1.2297E-08
Ce-144	1.1104E-03	3.4815E-10	1.4560E+15	1.1139E+08
Pr-143	2.9601E-03	4.3959E-11	1.8512E+14	2.9693E+08
Nd-147	1.3354E-03	1.6507E-11	6.7624E+13	1.3396E+08
Np-239	1.5575E-02	6.7137E-11	1.6917E+14	1.5624E+09
Pu-238	3.3460E-06	1.9545E-10	4.9455E+14	3.3565E+05
Pu-239	3.5533E-07	5.7167E-09	1.4405E+16	3.5644E+04
Pu-240	5.7149E-07	2.5020E-09	6.2932E+15	5.7327E+04
Pu-241	1.4095E-04	1.3683E-09	3.4190E+15	1.4139E+07
Am-241	4.6739E-07	1.3618E-10	3.4029E+14	4.6884E+04
Cm-242	1.2241E-04	3.6934E-11	9.1911E+13	1.2279E+07
Cm-244	7.1741E-06	8.8675E-11	2.1886E+14	7.1964E+05
Kr-83m	6.7278E+04	3.3856E-06	2.4564E+19	6.7497E+15
Xe-133m	3.5825E+04	8.3921E-05	3.7995E-20	3.5937E+15
Xe-135m	3.0991E+05	3.4711E-06	1.5484E+19	3.1118E+16

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 0.0010	Atmosphere	Sump	
Noble gases (atoms)	1.6504E+23	0.0000E+00	
Elemental I (atoms)	2.5155E+20	0.0000E+00	
Organic I (atoms)	7.7798E+18	0.0000E+00	
Aerosols (kg)	1.2631E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.6468E-03
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.3912E-03
Total I (Ci)			4.6704E+04

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:

Time (h) = 0.0010 Leakage Transport

Noble gases (atoms)	3.4382E+16
Elemental I (atoms)	5.2406E+13
Organic I (atoms)	1.6208E-12
Aerosols (kg)	2.6315E-11

Detailed model information at time (H) = 1.0000

EAB - CRDA Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.2436E-02	9.7141E-01	1.0321E-01
Accumulated dose (rem)	7.2479E-02	9.7190E-01	1.0326E-01

LPZ - CRDA Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.2764E-03	5.7348E-02	6.0928E-03
Accumulated dose (rem)	4.2789E-03	5.7377E-02	6.0963E-03

CRDA @ CR Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.5430E-03	4.9403E-01	1.8180E-02
Accumulated dose (rem)	2.5431E-03	4.9403E-01	1.8180E-02

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 1.0000	Ci	kg	Atoms	Decay
Co-58	5.4389E-05	1.7105E-12	1.7760E+13	7.2457E+09
Co-60	2.9278E-05	2.5901E-11	2.5996E+14	3.8996E+09
Kr-85	7.5969E+03	1.9363E-02	1.3719E+23	1.0118E+18
Kr-85m	1.1792E+05	1.4329E-05	1.0152E+20	1.6986E+19
Kr-87	1.5962E+05	5.6353E-06	3.9007E+19	2.8267E+19
Kr-88	[illegible]	[illegible]	[illegible]	[illegible]
Co-58	5.4389E-05	1.7105E-12	1.7760E+13	7.2457E+09
Co-60	3.0038E-05	2.5926E-05	2.6975E+20	9.5257E+19

Rb-86	1.2609E-01	1.5496E-09	1.0851E+16	1.6807E-13
Sr-89	7.5433E-02	2.5965E-09	1.7569E-16	1.0050E+13
Sr-90	9.6195E-03	7.0521E-08	4.7187E+17	1.2812E+12
Sr-91	8.9427E-02	2.4670E-11	1.6326E+14	1.2356E+13
Sr-92	7.9070E-02	6.2906E-12	4.1177E+13	1.2001E+13
Y-90	3.5087E-04	6.4491E-13	4.3153E+12	3.9329E-10
Y-91	2.4801E-03	1.0113E-10	6.6924E+14	3.2901E+11
Y-92	1.8225E-02	1.8940E-12	1.2398E+13	1.3512E+12
Y-93	1.8348E-03	5.4996E-13	3.5612E+12	2.5297E+11
Zr-95	3.5283E-03	1.6424E-10	1.0411E+15	4.7005E+11
Zr-97	3.3525E-03	1.7537E-12	1.0858E+13	4.5581E-11
Nb-95	3.5299E-03	9.0271E-11	5.7224E-14	4.7014E+11
Mo-99	1.8351E-02	3.8261E-11	2.3274E+14	2.4570E+12
Tc-99m	1.6423E-02	3.1232E-12	1.8998E+13	2.1759E+12
Ru-103	1.5794E-02	4.8936E-10	2.8612E+15	2.1044E+12
Ru-105	9.3410E-03	1.3896E-12	7.9700E+12	1.3465E+12
Ru-106	6.2920E-03	1.8807E-09	1.0685E+16	8.3807E+11
Rh-105	1.0178E-02	1.2058E-11	6.9158E+13	1.3547E+12
Sb-127	1.7150E-02	6.4218E-11	3.0451E+14	2.2928E+12
Sb-129	5.4385E-02	9.6712E-12	4.5148E+13	7.8570E+12
Te-127	1.7124E-02	6.4886E-12	3.0768E+13	2.2729E+12
Te-127m	2.9219E-03	3.0976E-10	1.4688E+15	3.8916E+11
Te-129	5.7860E-02	2.7629E-12	1.2898E+13	7.7004E-12
Te-129m	1.2237E-02	4.0619E-10	1.8962E+15	1.6297E+12
Te-131m	3.8623E-02	4.8436E-11	2.2266E+14	5.2042E+12
Te-132	2.8078E-01	9.2487E-10	4.2195E+15	3.7564E+13
I-131	5.2785E+03	4.2577E-05	1.9573E+20	7.0431E+17
I-132	5.7534E+03	5.5739E-07	2.5429E+18	8.9428E+17
I-133	1.0654E+04	9.4047E-06	4.2584E+19	1.4429E+18
I-134	5.5125E+03	2.0664E-07	9.2866E+17	1.1187E+18
I-135	9.4142E+03	2.6807E-06	1.1958E+19	1.3220E+18
Xe-133	1.0831E-06	5.7863E-03	2.6200E+22	1.4464E+20
Xe-135	3.4231E+05	1.3404E-04	5.9794E+20	4.6926E+19
Cs-134	1.3379E+01	1.0341E-05	4.6472E+19	1.7820E+15
Cs-136	4.2626E+00	5.8160E-08	2.5753E+17	5.6837E+14
Cs-137	1.0070E+01	1.1577E-04	5.0888E+20	1.3412E+15
Ba-139	8.6640E-02	5.2968E-12	2.2948E+13	1.4995E+13
Ba-140	1.4352E-01	1.9605E-09	8.4330E+15	1.9138E+13
La-140	6.2293E-03	1.1207E-11	4.8208E+13	6.5473E+11
La-141	2.7416E-03	4.8477E-13	2.0705E+12	3.9933E+11
La-142	2.0435E-03	1.4275E-13	6.0541E+11	3.4365E+11
Ce-141	1.3216E-03	4.6382E-11	1.9810E+14	1.7591E+11
Ce-143	1.1999E-03	1.8069E-12	7.6093E+12	1.6151E+11
Ce-144	1.1098E-03	3.4797E-10	1.4552E+15	1.4783E+11
Pr-143	2.9552E-03	4.3885E-11	1.8481E+14	3.9384E+11
Nd-147	1.3313E-03	1.6457E-11	6.7419E+13	1.7756E+11
Np-239	1.5379E-02	6.6292E-11	1.6704E+14	2.0610E+12
Pu-238	3.3448E-06	1.9537E-10	4.9436E+14	4.4549E+08
Pu-239	3.5523E-07	5.7152E-09	1.4401E+16	4.7311E+07
Pu-240	5.7125E-07	2.5070E-09	6.2905E+15	7.6087E+07
Pu-241	1.4089E-04	1.3677E-09	3.4176E+15	1.8765E+10
Am-241	4.6722E-07	1.3613E-10	3.4016E+14	6.2228E+07
Cm-242	1.2234E-04	3.6913E-11	9.1856E+13	1.6296E+10
Cm-244	7.1710E-06	8.8638E-11	2.1877E+14	9.5513E-08
Kr-83m	4.6710E+04	2.3506E-06	1.7055E+19	7.5076E+18
Xe-133m	3.5368E+04	8.2849E-05	3.7513E+20	4.7401E+18
Xe-135m	2.3142E+04	2.5920E-07	1.1563E-18	1.4554E+19

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 1.0000	Atmosphere	Sump	
Noble gases (atoms)	1.6468E+23	0.0000E+00	
Elemental I (atoms)	2.4613E+20	0.0000E+00	
Organic I (atoms)	7.6122E+18	0.0000E+00	
Aerosols (kg)	1.2626E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.6006E-03
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.2528E-03
Total I (Ci)			3.6612E+04

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:

Time (h) = 1.0000 Leakage Transport

Noble gases (atoms)	6.8662E+19
Elemental I (atoms)	1.0370E+17
Organic I (atoms)	3.2071E+15
Aerosols (kg)	5.2593E-08

Detailed model information at time (H) = 2.0000

Elemental I (atoms)	1.0370E+17
Organic I (atoms)	3.2071E+15

EAB - CRDA Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.3267E-02	9.5601E-01	8.3422E-02
Accumulated dose (rem)	1.2575E-01	1.9279E-00	1.8669E-01

LPZ - CRDA Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.1447E-03	5.6439E-02	4.9249E-03
Accumulated dose (rem)	7.4236E-03	1.1362E-01	1.1021E-02

CRDA @ CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.3518E-03	1.0808E+00	3.8441E-02
Accumulated dose (rem)	6.8949E-03	1.5749E+00	5.6620E-02

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
Co-58	5.4344E-05	1.7090E-12	1.7745E+13	1.4487E+10
Co-60	2.9265E-05	2.5890E-11	2.5985E+14	7.7985E+09
Kr-85	7.5939E+03	1.9356E-02	1.3713E+23	2.0235E+18
Kr-85m	1.0098E+05	1.2270E-05	8.6931E+19	3.1535E+19
Kr-87	9.2511E+04	3.2660E-06	2.2607E+19	4.4654E+19
Kr-88	2.3494E+05	1.8737E-05	1.2822E+20	8.0708E+19
Rb-86	1.2584E-01	1.5466E-09	1.0830E+16	3.3585E+13
Sr-89	7.5359E-02	2.5939E-09	1.7552E+16	2.0093E+13
Sr-90	9.6155E-03	7.0491E-08	4.7168E+17	2.5623E+12
Sr-91	8.3100E-02	2.2924E-11	1.5171E+14	2.3841E+13
Sr-92	6.1200E-02	4.8689E-12	3.1871E+13	2.1292E+13
Y-90	4.5058E-04	8.2818E-13	5.5416E+12	9.2024E+10
Y-91	2.4957E-03	1.0176E-10	6.7345E+14	6.6028E+11
Y-92	2.7449E-02	2.8526E-12	1.8673E+13	4.3606E+12
Y-93	1.7124E-03	5.1327E-13	3.3236E+12	4.8912E+11
Zr-95	3.5253E-03	1.6410E-10	1.0402E+15	9.3981E-11
Zr-97	3.2164E-03	1.6825E-12	1.0446E+13	8.9322E+11
Nb-95	3.5284E-03	9.0233E-11	5.7199E+14	9.4019E+11
Mo-99	1.8151E-02	3.7845E-11	2.3021E+14	4.8880E+12
Tc-99m	1.6387E-02	3.1164E-12	1.8957E+13	4.3488E+12
Ru-103	1.5775E-02	4.8880E-10	2.8579E+15	4.2068E+12
Ru-105	7.9875E-03	1.1883E-12	6.8151E+12	2.4982E+12
Ru-106	6.2889E-03	1.8798E-09	1.0679E+16	1.6759E+12
Rh-105	1.0144E-02	1.2018E-11	6.8929E+13	2.7073E+12
Sb-127	1.7014E-02	6.3712E-11	3.0211E+14	4.5681E+12
Sb-129	4.6304E-02	8.2341E-12	3.8439E+13	1.4548E+13
Te-127	1.7103E-02	6.4808E-12	3.0731E+13	4.5442E+12
Te-127m	2.9207E-03	3.0964E-10	1.4683E+15	7.7826E+11
Te-129	5.3285E-02	2.5444E-12	1.1878E+13	1.4927E+13
Te-129m	1.2231E-02	4.0599E-10	1.8953E+15	3.2592E+12
Te-131m	3.7726E-02	4.7310E-11	2.1749E+14	1.0289E+13
Te-132	2.7819E-01	9.1633E-10	4.1805E+15	7.4791E+13
I-131	5.2573E+03	4.2407E-05	1.9495E+20	1.4060E+18
I-132	4.2547E+03	4.1219E-07	1.8805E+18	1.5558E+18
I-133	1.0300E+04	9.0926E-06	4.1171E+19	2.8383E+18
I-134	2.4991E+03	9.3681E-08	4.2101E+17	1.6261E+18
I-135	8.4734E+03	2.4128E-06	1.0763E+19	2.5122E+18
Xe-133	1.0769E+06	5.7534E-03	2.6051E+22	2.8849E+20
Xe-135	3.1825E+05	1.2462E-04	5.5592E+20	9.0905E+19
Cs-134	1.3373E+01	1.0336E-05	4.6451E+19	3.5636E+15
Cs-136	4.2514E+00	5.8008E-08	2.5686E+17	1.1354E+15
Cs-137	1.0065E+01	1.1572E-04	5.0867E-20	2.6822E+15
Ba-139	5.2376E-02	3.2021E-12	1.3873E+13	2.4062E+13
Ba-140	1.4314E-01	1.9552E-09	8.4104E+15	3.8229E+13
La-140	8.5679E-03	1.5415E-11	6.6306E+13	1.6243E+12
La-141	2.2973E-03	4.0622E-13	1.7350E+12	7.3404E+11
La-142	1.3030E-03	9.1021E-14	3.8601E+11	5.6284E+11
Ce-141	1.3221E-03	4.6400E-11	1.9818E-14	3.5197E+11
Ce-143	1.1745E-03	1.7686E-12	7.4480E+12	3.1963E+11
Ce-144	1.1093E-03	3.4779E-10	1.4545E+15	2.9562E+11
Pr-143	2.9502E-03	4.3811E-11	1.8450E+14	7.8711E-11
Nd-147	1.3273E-03	1.6407E-11	6.7214E+13	3.5462E+11
Np-239	1.5185E-02	6.5457E-11	1.6493E+14	4.0965E+12
Pu-238	3.3435E-06	1.9530E-10	4.9417E+14	8.9091E+08
Pu-239	3.5514E-07	5.7136E-09	1.4397E+16	9.4620E+07
Pu-240	5.7102E-07	2.5059E-09	6.2879E+15	1.5216E+08
Pu-241	1.4083E-04	1.3671E-09	3.4161E+15	3.3527E-10
Nd-147	1.3273E-03	1.6407E-11	6.7214E+13	3.5462E+11
Np-239	1.5185E-02	6.5457E-11	1.6493E+14	4.0965E+12

Am-241	4.6705E-07	1.3608E-10	3.4004E+14	1.2445E-08
Cm-242	1.2227E-04	3.6891E-11	9.1802E+13	3.2586E+10
Cm-244	7.1680E-06	8.8601E-11	2.1867E+14	1.9101E+09
Kr-83m	3.2419E+04	1.6314E-06	1.1837E+19	1.2720E+19
Xe-133m	3.4916E+04	8.1790E-05	3.7034E+20	9.4208E-18
Xe-135m	2.9997E+03	3.3598E-08	1.4987E+17	1.5739E+19

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	1.6436E+23	0.0000E+00	
Elemental I (atoms)	2.4171E+20	0.0000E+00	
Organic I (atoms)	7.4754E+18	0.0000E+00	
Aerosols (kg)	1.2621E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.5586E-03
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.1470E-03
Total I (Ci)			3.0785E+04

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 2.0000 Leakage Transport

Noble gases (atoms)	1.3722E+20
Elemental I (atoms)	2.0539E+17
Organic I (atoms)	6.3524E+15
Aerosols (kg)	1.0519E-07

Detailed model information at time (H) = 8.0000

EAB - CRDA Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5621E-01	5.4504E+00	3.2694E-01
Accumulated dose (rem)	2.8195E-01	7.3783E+00	5.1362E-01

LPZ - CRDA Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.2218E-03	3.2177E-01	1.9301E-02
Accumulated dose (rem)	1.6645E-02	4.3559E-01	3.0322E-02

CRDA @ CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.4336E-02	6.8436E+00	2.2872E-01
Accumulated dose (rem)	2.1231E-02	8.4184E+00	2.8534E-01

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 8.0000	Ci	kg	Atoms	Decay
Co-58	5.4076E-05	1.7006E-12	1.7657E+13	5.7811E+10
Co-60	2.9190E-05	2.5823E-11	2.5918E+14	3.1157E+10
Kr-85	7.5752E+03	1.9308E-02	1.3679E+23	8.0850E+18
Kr-85m	3.9808E+04	4.8372E-06	3.4271E+19	8.4053E+19
Kr-87	3.5058E+03	1.2377E-07	8.5671E+17	6.6387E+19
Kr-88	5.4187E+04	4.3214E-06	2.9573E-19	1.7919E+20
Rb-86	1.2437E-01	1.5284E-09	1.0703E+16	1.3356E+14
Sr-89	7.4913E-02	2.5786E-09	1.7448E+16	8.0140E+13
Sr-90	9.5913E-03	7.0314E-08	4.7049E+17	1.0237E+13
Sr-91	5.3504E-02	1.4760E-11	9.7677E-13	7.7562E+13
Sr-92	1.3158E-02	1.0468E-12	6.8521E+12	4.6269E+13
Y-90	1.0250E-03	1.8839E-12	1.2606E+13	6.8017E+11
Y-91	2.5654E-03	1.0461E-10	6.9228E+14	2.6846E+12
Y-92	2.7245E-02	2.8315E-12	1.8534E+13	2.9423E+13
Y-93	1.1316E-03	3.3918E-13	2.1963E+12	1.6096E+12
Zr-95	3.5069E-03	1.6324E-10	1.0348E+15	3.7498E+12
Zr-97	2.5085E-03	1.3122E-12	8.1466E+12	3.1691E+12
Nb-95	3.5194E-03	9.0002E-11	5.7053E+14	3.7563E+12
Mo-99	1.7000E-02	3.5446E-11	2.1561E+14	1.8929E+13
Tc-99m	1.5911E-02	3.0260E-12	1.8407E+13	1.7208E+13
Ru-103	1.5667E-02	4.8543E-10	2.8382E+15	1.6771E+13
Ru-105	3.1227E-03	4.6455E-13	2.6644E+12	6.6379E+12
Ru-106	6.2702E-03	1.8742E-09	1.0648E+16	6.6944E+12
Rh-105	9.5652E-03	1.1332E-11	6.4596E+13	1.0612E+13
Sb-127	1.6225E-02	6.0756E-11	2.8809E+14	1.7848E+13
Sb-129	1.7637E-02	3.1364E-12	1.4642E+13	3.8284E+13
Te-127	1.6860E-02	6.3886E-12	3.0294E+13	1.8079E-13
Te-127m	2.9135E-03	3.0888E-10	1.4647E+15	3.1095E+12
Te-129	2.7142E-02	1.2961E-12	6.0504E+12	4.5348E+13
Te-129m	1.2171E-02	4.0601E-10	1.8860E+15	1.3012E+13
Sb-127	1.6225E-02	6.0756E-11	2.8809E+14	1.7848E+13
Sb-129	1.3637E-02	3.1364E-12	1.4642E+13	3.8284E+13

Te-131m	3.2760E-02	4.1083E-11	1.8886E-14	3.8407E+13
Te-132	2.6312E-01	8.6670E-10	3.9541E+15	2.9104E+14
I-131	5.1324E-03	4.1399E-05	1.9031E+20	5.5574E+18
I-132	6.9603E-02	6.7431E-08	3.0764E+17	3.1267E-18
I-133	8.4125E+03	7.4262E-06	3.3625E+19	1.0290E-19
I-134	2.1698E+01	8.1336E-10	3.6554E+15	2.0432E+18
I-135	4.5053E+03	1.2829E-06	5.7227E+18	7.5325E+18
Xe-133	1.0407E+06	5.5599E-03	2.5175E-22	1.1346E+21
Xe-135	2.0320E+05	7.9571E-05	3.5495E+20	2.9587E+20
Cs-134	1.3336E-01	1.0308E-05	4.6324E+19	1.4236E-16
Cs-136	4.1851E+00	5.7103E-08	2.5285E+17	4.5065E-15
Cs-137	1.0040E+01	1.1543E-04	5.0739E+20	1.0716E+16
Ba-139	2.5565E-03	1.5629E-13	6.7713E+11	3.7247E+13
Ba-140	1.4085E-01	1.9240E-09	8.2761E+15	1.5171E+14
La-140	2.1633E-02	3.8920E-11	1.6741E+14	1.3702E+13
La-141	7.9533E-04	1.4063E-13	6.0064E+11	1.8657E+12
La-142	8.7553E-05	6.1162E-15	2.5938E+10	9.2257E+11
Ce-141	1.3193E-03	4.6302E-11	1.9776E+14	1.4079E+12
Ce-143	1.0328E-03	1.5553E-12	6.5497E+12	1.2004E+12
Ce-144	1.1058E-03	3.4671E-10	1.4499E+15	1.1807E+12
Pr-143	2.9194E-03	4.3355E-11	1.8258E+14	3.1326E-12
Nd-147	1.3032E-03	1.6110E-11	6.5996E+13	1.4057E+12
Np-239	1.4073E-02	6.0661E-11	1.5285E+14	1.5782E+13
Pu-238	3.3358E-06	1.9485E-10	4.9303E+14	3.5599E+09
Pu-239	3.5454E-07	5.7040E-09	1.4372E+16	3.7820E+08
Pu-240	5.6959E-07	2.4997E-09	6.2722E+15	6.0794E+08
Pu-241	1.4047E-04	1.3636E-09	3.4075E+15	1.4993E+11
Am-241	4.6604E-07	1.3579E-10	3.3930E+14	4.9730E+08
Cm-242	1.2183E-04	3.6759E-11	9.1475E+13	1.3013E+11
Cm-244	7.1499E-06	8.8377E-11	2.1812E+14	7.6314E+09
Kr-83m	3.6232E+03	1.8233E-07	1.3229E+18	2.3221E+19
Xe-133m	3.2320E+04	7.5710E-05	3.4281E+20	3.6274E+19
Xe-135m	8.0158E+02	8.9781E-09	4.0050E+16	1.6602E+19

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 8.0000	Atmosphere	Sump	
Noble gases (atoms)	1.6273E-23	0.0000E+00	
Elemental I (atoms)	2.2307E+20	0.0000E+00	
Organic I (atoms)	6.8991E+18	0.0000E+00	
Aerosols (kg)	1.2588E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.3545E-03
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.7479E-03
Total I (Ci)			1.8768E+04

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 8.0000 Leakage Transport

Noble gases (atoms)	5.4603E+20
Elemental I (atoms)	7.8492E+17
Organic I (atoms)	2.4276E+16
Aerosols (kg)	4.2030E-07

Detailed model information at time (H) = 24.0000

EAB - CRDA Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0474E-01	6.6056E+00	3.0989E-01
Accumulated dose (rem)	3.8669E-01	1.3984E+01	8.2351E-01

LPZ - CRDA Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.4168E-03	2.7855E-01	1.3068E-02
Accumulated dose (rem)	2.1062E-02	7.1414E-01	4.3390E-02

CRDA @ CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.9913E-03	6.1044E+00	1.9368E-01
Accumulated dose (rem)	2.5222E-02	1.4523E+01	4.7902E-01

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
Co-58	5.3367E-05	1.6783E-12	1.7426E+13	1.7228E+11
Co-60	2.8989E-05	2.5645E-11	2.5740E+14	9.3142E+10
Kr-85	7.5243E+03	3.9178E-02	1.3588E+23	2.4172E+18

SSES Condenser/Turbine Compartment Nuclide Inventory:

Kr-85m	3.3263E+03	4.0419E-07	2.8637E+18	1.1537E-20
Kr-87	5.6801E-01	2.0053E-11	1.3881E+14	6.7243E+19
Kr-88	1.0841E+03	8.6455E-08	5.9164E+17	2.0812E+20
Rb-86	1.2052E-01	1.4811E-09	1.0372E+16	3.9445E+14
Sr-89	7.3738E-02	2.5381E-09	1.7174E+16	2.3852E+14
Sr-90	9.5272E-03	6.9844E-08	4.6734E+17	3.0607E+13
Sr-91	1.6539E-02	4.5624E-12	3.0193E+13	1.4465E+14
Sr-92	2.1826E-04	1.7365E-14	1.1367E+11	5.2996E+13
Y-90	2.3781E-03	4.3710E-12	2.9248E+13	4.2691E+12
Y-91	2.6319E-03	1.0732E-10	7.1021E+14	8.2392E+12
Y-92	2.4036E-03	2.4979E-13	1.6351E+12	5.2997E+13
Y-93	3.7491E-04	1.1237E-13	7.2765E+11	3.0692E+12
Zr-95	3.4586E-03	1.6099E-10	1.0205E+15	1.1171E+13
Zr-97	1.2929E-03	6.7625E-13	4.1984E+12	7.0771E+12
Nb-95	3.4952E-03	8.9385E-11	5.6662E+14	1.1228E+13
Mo-99	1.4275E-02	2.9764E-11	1.8105E+14	5.2167E+13
Tc-99m	1.4305E-02	2.7205E-12	1.6549E+13	4.8198E+13
Ru-103	1.5381E-02	4.7656E-10	2.7863E+15	4.9849E+13
Ru-105	2.5518E-04	3.7961E-14	2.1772E+11	9.0777E+12
Ru-106	6.2207E-03	1.8594E-09	1.0564E+16	2.0003E+13
Rh-105	7.2340E-03	8.5705E-12	4.9155E+13	2.8509E+13
Sb-127	1.4294E-02	5.3526E-11	2.5381E+14	5.0321E+13
Sb-129	1.3447E-03	2.3912E-13	1.1163E+12	5.1773E+13
Te-127	1.5959E-02	6.0471E-12	2.8675E+13	5.2192E+13
Te-127m	2.8935E-03	3.0675E-10	1.4546E+15	9.2962E+12
Te-129	1.2216E-02	5.8331E-13	2.7231E+12	7.5741E+13
Te-129m	1.1944E-02	3.9647E-10	1.8508E+15	3.8711E+13
Te-131m	2.2485E-02	2.8198E-11	1.2963E+14	9.6583E+13
Te-132	2.2681E-01	7.4710E-10	3.4084E+15	8.1208E+14
I-131	4.8135E+03	3.8827E-05	1.7849E+20	1.6151E+19
I-132	5.8341E+00	5.6521E-10	2.5786E+15	3.4318E+18
I-133	4.9031E+03	4.3282E-06	1.9598E+19	2.4143E+19
I-134	6.9094E-05	2.5900E-15	1.1640E+10	2.0469E+18
I-135	8.3592E+02	2.3803E-07	1.0618E+18	1.2174E+19
Xe-133	9.4960E+05	5.0732E-03	2.2971E+22	3.2536E+21
Xe-135	6.0926E+04	2.3858E-05	1.0643E+20	5.4766E+20
Cs-134	1.3240E+01	1.0233E-05	4.5988E+19	4.2551E+16
Cs-136	4.0132E+00	5.4757E-08	2.4247E+17	1.3240E+16
Cs-137	9.9731E+00	1.1466E-04	5.0400E+20	3.2039E+16
Ba-139	8.1343E-07	4.9730E-17	2.1545E+08	3.7923E+13
Ba-140	1.3493E-01	1.8431E-09	7.9282E+15	4.4550E+14
La-140	4.9580E-02	8.9200E-11	3.8369E+14	8.9365E+13
La-141	4.6998E-05	8.3104E-15	3.5494E+10	2.4294E+12
La-142	6.5339E-08	4.5644E-18	1.9357E+07	9.4847E+11
Ce-141	1.2957E-03	4.5475E-11	1.9422E+14	4.1956E+12
Ce-143	7.3313E-04	1.1040E-12	4.6491E+12	3.0638E+12
Ce-144	1.0967E-03	3.4384E-10	1.4380E+15	3.5274E+12
Pr-143	2.8321E-03	4.2057E-11	1.7711E+14	9.2602E+12
Nd-147	1.2412E-03	1.5343E-11	6.2856E+13	4.1162E+12
Np-239	1.1489E-02	4.9522E-11	1.2478E+14	4.2924E+13
Pu-238	3.3153E-06	1.9365E-10	4.9000E+14	1.0646E+10
Pu-239	3.5285E-07	5.6768E-09	1.4304E+16	1.1319E+09
Pu-240	5.6581E-07	2.4831E-09	6.2306E+15	1.8176E+09
Pu-241	1.3953E-04	1.3545E-09	3.3846E+15	4.4826E+11
Am-241	4.6335E-07	1.3500E-10	3.3734E+14	1.4875E+09
Cm-242	1.2068E-04	3.6412E-11	9.0610E+13	3.8850E+11
Cm-244	7.1019E-06	8.7784E-11	2.1666E+14	2.2616E+10
Kr-83m	1.0500E+01	5.2840E-10	3.8338E+15	2.4539E+19
Xe-133m	2.6295E+04	6.1597E-05	2.7891E+20	9.8506E+19
Xe-135m	3.8192E+02	4.2777E-09	1.9082E+16	1.7319E+19

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump	
Noble gases (atoms)	1.5924E+23	0.0000E+00	
Elemental I (atoms)	1.9318E+20	0.0000E+00	
Organic I (atoms)	5.9745E+18	0.0000E+00	
Aerosols (kg)	1.2504E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.9966E-03
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.1874E-03
Total I (Ci)			1.0558E+04

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:

Time (h) = 24.0000 Leakage Transport

Noble gases (atoms)	1.6192E+21
Elemental I (atoms)	2.1673E+18
Organic I (atoms)	6.7030E+16
Aerosols (kg)	1.2567E-06

Time (h) = 24.0000 Leakage Transport

Detailed model information at time (H) = 96.0000

EAB - CRDA Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	3.8669E-01	1.3984E+01	8.2351E-01

LPZ - CRDA Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E-00
Accumulated dose (rem)	2.1062E-02	7.1414E-01	4.3390E-02

CRDA @ CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.7919E-05	2.3511E-01	7.3501E-03
Accumulated dose (rem)	2.5300E-02	1.4758E+01	4.8637E-01

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 96.0000	Ci	kg	Atoms	Decay
Co-58	5.1823E-05	1.6297E-12	1.6922E+13	6.7665E+11
Co-60	2.8957E-05	2.5617E-11	2.5712E+14	3.7101E+11
Kr-85	7.5204E+03	1.9168E-02	1.3580E+23	9.6315E+19
Kr-85m	4.8304E-02	5.8696E-12	4.1585E+13	1.1824E+20
Kr-88	2.5311E-05	2.0186E-15	1.3814E+10	2.0871E+20
Rb-86	1.0781E-01	1.3250E-09	9.2780E+15	1.4882E+15
Sr-89	7.0763E-02	2.4357E-09	1.6481E+16	9.3133E+14
Sr-90	9.5253E-03	6.9830E-08	4.6725E+17	1.2197E+14
Sr-91	8.6498E-05	2.3862E-14	1.5791E+11	1.7469E+14
Y-90	6.2767E-03	1.1537E-11	7.7196E+13	4.7682E+13
Y-91	2.5854E-03	1.0543E-10	6.9767E+14	3.3394E-13
Y-92	2.3984E-09	2.4926E-19	1.6316E+06	5.4745E+13
Y-93	2.6790E-06	8.0297E-16	5.1996E-09	3.7917E+12
Zr-95	3.3480E-03	1.5584E-10	9.8791E+14	4.3807E+13
Zr-97	6.7456E-05	3.5287E-14	2.1907E+11	1.1056E+13
Nb-95	3.4880E-03	8.9200E-11	5.6545E+14	4.4705E+13
Mo-99	6.7017E-03	1.3973E-11	8.4998E+13	1.4822E+14
Tc-99m	6.8708E-03	1.3067E-12	7.9484E+12	1.4133E+14
Ru-103	1.4588E-02	4.5199E-10	2.6427E+15	1.9352E+14
Ru-105	3.3518E-09	4.9863E-19	2.8598E+06	9.2955E+12
Ru-106	6.1857E-03	1.8489E-09	1.0504E+16	7.9494E+13
Rh-105	1.7727E-03	2.1002E-12	1.2046E+13	6.5836E+13
Sb-127	8.3290E-03	3.1189E-11	1.4789E+14	1.5624E+14
Sb-129	1.2925E-08	2.2985E-18	1.0730E+07	5.2889E+13
Te-127	1.0811E-02	4.0963E-12	1.9424E+13	1.7542E+14
Te-127m	2.8763E-03	3.0494E-10	1.4460E-15	3.6977E+13
Te-129	9.7093E-03	4.6362E-13	2.1643E-12	1.4936E+14
Te-129m	1.1228E-02	3.7272E-10	1.7400E+15	1.4980E+14
Te-131m	4.2602E-03	5.3425E-12	2.4560E+13	2.0165E+14
Te-132	1.1981E-01	3.9465E-10	1.8005E+15	2.4200E+15
I-131	3.7165E+03	2.9978E-05	1.3781E+20	5.6828E+19
I-132	1.4301E-01	1.3855E-11	6.3208E+13	3.4359E+18
I-133	4.4508E+02	3.9290E-07	1.7790E+18	4.1961E+19
I-135	4.3971E-01	1.2521E-10	5.5853E+14	1.3236E+19
Xe-133	6.4487E+05	3.4451E-03	1.5599E+22	1.0809E+22
Xe-135	2.5991E+02	1.0178E-07	4.5401E+17	6.5471E+20
Cs-134	1.3203E+01	1.0205E-05	4.5861E+19	1.6935E-17
Cs-136	3.4242E-00	4.6720E-08	2.0688E+17	4.8829E+16
Cs-137	9.9712E+00	1.1464E-04	5.0390E+20	1.2768E+17
Ba-140	1.1461E-01	1.5656E-09	6.7343E+15	1.6395E+15
La-140	1.0210E-01	1.8369E-10	7.9017E+14	8.7686E+14
La-141	1.4356E-10	2.5385E-20	1.0842E-05	2.4649E+12
Ce-141	1.2157E-03	4.2664E-11	1.8222E+14	1.6235E+13
Ce-143	1.6158E-04	2.4331E-13	1.0247E+12	6.6883E+12
Ce-144	1.0887E-03	3.4134E-10	1.4275E+15	1.4007E+13
Pr-143	2.4822E-03	3.6862E-11	1.5523E+14	3.4764E+13
Nd-147	1.0271E-03	1.2696E-11	5.2011E+13	1.4961E+13
Np-239	4.7511E-03	2.0480E-11	5.1603E+13	1.1610E+14
Pu-238	3.3229E-06	1.9410E-10	4.9112E+14	4.2477E+10
Pu-239	3.5466E-07	5.7058E-09	1.4377E+16	4.5256E-09
Pu-240	5.6581E-07	2.4831E-09	6.2306E+15	7.2440E+09
Pu-241	1.3947E-04	1.3539E-09	3.3832E+15	1.7861E+12
Am-241	4.6518E-07	1.3554E-10	3.3868E+14	5.9399E+09
Cm-242	1.1915E-06	3.5949E-11	8.9460E-13	1.5385E+12
Pu-238	3.3229E-06	1.9410E-10	4.9112E+14	4.2477E+10
Pu-239	3.5466E-07	5.7058E-09	1.4377E+16	4.5256E-09

Cm-244	7.0997E-06	8.7756E-11	2.1659E+14	9.0916E+10
Kr-83m	4.1091E-11	2.0678E-21	1.5003E+04	2.4842E+19
Xe-133m	1.0673E+04	2.5003E-05	1.1321E+20	2.6472E+20
Xe-135m	2.0090E-01	2.2502E-12	1.0038E+13	1.7497E+19

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump	
Noble gases (atoms)	1.5152E+23	0.0000E+00	
Elemental I (atoms)	1.3540E+20	0.0000E+00	
Organic I (atoms)	4.1877E+18	0.0000E+00	
Aerosols (kg)	1.2498E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.3387E-03
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.3545E-03
Total I (Ci)			4.1622E+03

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 96.0000 Leakage Transport

Noble gases (atoms)	1.6192E+21
Elemental I (atoms)	2.1673E+18
Organic I (atoms)	6.7030E+16
Aerosols (kg)	1.2567E-06

Detailed model information at time (H) = 720.0000

EAB - CRDA Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	3.8669E-01	1.3984E+01	8.2351E-01

LPZ - CRDA Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	2.1062E-02	7.1414E-01	4.3390E-02

CRDA @ CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.2159E-30	1.0669E-26	3.2996E-28
Accumulated dose (rem)	2.5300E-02	1.4758E+01	4.8637E-01

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Co-58	4.0176E-05	1.2635E-12	1.3119E+13	4.4795E+12
Co-60	2.8688E-05	2.5379E-11	2.5472E+14	2.7666E-12
Kr-85	7.4858E+03	1.9080E-02	1.3518E+23	7.1995E+20
Rb-86	4.1040E-02	5.0438E-10	3.5319E+15	7.2342E+15
Sr-89	4.9525E-02	1.7047E-09	1.1535E+16	5.8779E+15
Sr-90	9.5092E-03	6.9712E-08	4.6646E+17	9.1301E+14
Y-90	9.5594E-03	1.7570E-11	1.1757E+14	7.9836E+14
Y-91	1.9002E-03	7.7485E-11	5.1277E+14	2.1836E+14
Zr-95	2.5261E-03	1.1759E-10	7.4539E+14	2.8632E+14
Nb-95	3.2342E-03	8.2710E-11	5.2430E+14	3.2594E+14
Mo-99	9.5518E-06	1.9915E-14	1.2115E+11	2.3310E+14
Tc-99m	9.7929E-06	1.8624E-15	1.1329E+10	2.2396E+14
Ru-103	9.2199E-03	2.8568E-10	1.6703E+15	1.1659E+15
Ru-106	5.8902E-03	1.7606E-09	1.0002E+16	5.8125E+14
Rh-105	8.6366E-09	1.0232E-17	5.8686E+07	7.7882E-13
Sb-127	7.7208E-05	2.8911E-13	1.3709E+12	3.0276E+14
Te-127	2.6078E-03	9.8814E-13	4.6856E+12	5.2943E+14
Te-127m	2.4840E-03	2.6335E-10	1.2487E+15	2.6057E+14
Te-129	5.6787E-03	2.7116E-13	1.2659E+12	6.1977E+14
Te-129m	6.5672E-03	2.1800E-10	1.0177E+15	8.7212E+14
Te-131m	2.3335E-09	2.9263E-18	1.3452E+07	2.2621E+14
Te-132	4.7471E-04	1.5636E-12	7.1337E+12	4.2134E+15
I-131	3.9506E+02	3.1866E-06	1.4649E+19	1.7999E+20
I-132	5.6661E-04	5.4893E-14	2.5043E+11	3.4378E+18
I-133	4.1452E-07	3.6592E-16	1.6569E+09	4.3741E+19
Xe-133	2.1029E+04	1.1235E-04	5.0869E+20	2.6014E+22
Cs-134	1.2891E+01	9.9634E-06	4.4777E+19	1.2537E+18
Cs-136	6.6514E-01	1.1804E-08	5.2270E+16	2.0344E+17
Cs-137	9.9548E+00	1.1445E-04	5.0308E+20	9.5577E-17
Ba-140	2.7854E-02	3.8047E-10	1.6366E+15	6.7371E+15
La-140	3.2355E-02	5.8211E-11	2.5040E+14	6.5143E+15
Ce-141	6.9822E-04	2.4505E-11	1.0466E-14	9.3796E+13
Cs-134	1.2891E+01	9.9634E-06	4.4777E+19	1.2537E+18
Cs-136	6.6514E-01	1.1804E-08	5.2270E+16	2.0344E+17

Ce-143	3.2823E-10	4.9427E-19	2.0815E+06	7.7129E+12
Ce-144	1.0218E-03	3.2037E-10	1.3398E-15	1.0169E+14
Pr-143	6.6195E-04	9.8302E-12	4.1398E-13	1.4963E+14
Nd-147	1.9897E-04	2.4595E-12	1.0076E+13	5.6896E+13
Np-239	2.2559E-06	9.7241E-15	2.4502E+10	1.6768E-14
Pu-238	3.3844E-06	1.9769E-10	5.0022E+14	3.2126E+11
Pu-239	3.5593E-07	5.7263E-09	1.4429E+16	3.4095E+10
Pu-240	5.6586E-07	2.4833E-09	6.2312E+15	5.4275E+10
Pu-241	1.3900E-04	1.3493E-09	3.3717E+15	1.3359E+13
Am-241	4.8102E-07	1.4015E-10	3.5021E-14	4.5262E+10
Cm-242	1.0666E-04	3.2182E-11	8.0085E+13	1.0913E-13
Cm-244	7.0804E-06	8.7517E-11	2.1600E+14	6.8022E+11
Xe-133m	4.2207E+00	9.8671E-09	4.4768E+16	3.7794E+20

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump	
Noble gases (atoms)	1.3569E+23	0.0000E+00	
Elemental I (atoms)	1.4209E-19	0.0000E+00	
Organic I (atoms)	4.3947E+17	0.0000E+00	
Aerosols (kg)	1.2451E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.3951E-04
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.3951E-04
Total I (Ci)			3.9506E+02

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 720.0000 Leakage Transport

Noble gases (atoms)	1.6192E+21
Elemental I (atoms)	2.1673E+18
Organic I (atoms)	6.7030E+16
Aerosols (kg)	1.2567E-06

837

###
I-131 Summary
###

Time (hr)	SSES Condenser/Turbin I-131 (Curies)	Environment I-131 (Curies)	Control Bldg I-131 (Curies)
0.000	2.9442E-03	3.4077E-04	1.5092E-06
0.001	5.2996E-03	1.1041E-03	4.8892E-06
0.401	5.2912E+03	8.8351E-01	3.3470E-03
0.701	5.2848E+03	1.5444E+00	5.2323E-03
1.000	5.2785E+03	2.2023E+00	6.7066E-03
1.300	5.2721E+03	2.8616E+00	7.8665E-03
1.600	5.2658E+03	3.5201E+00	8.7750E-03
1.900	5.2594E+03	4.1778E+00	9.4860E-03
2.000	5.2573E+03	4.3968E+00	9.6866E-03
2.300	5.2510E+03	5.0535E+00	9.5709E-03
2.600	5.2447E+03	5.7094E+00	9.4777E-03
2.900	5.2384E+03	6.3644E+00	9.4020E-03
3.200	5.2321E+03	7.0187E+00	9.3402E-03
3.500	5.2258E+03	7.6722E+00	9.2893E-03
3.800	5.2195E+03	8.3249E+00	9.2470E-03
4.100	5.2133E+03	8.9769E+00	9.2113E-03
4.400	5.2070E+03	9.6280E+00	9.1810E-03
4.700	5.2007E+03	1.0278E+01	9.1548E-03
5.000	5.1945E+03	1.0928E+01	9.1319E-03
5.300	5.1882E+03	1.1577E+01	9.1116E-03
5.600	5.1820E+03	1.2225E+01	9.0933E-03
5.900	5.1758E+03	1.2872E+01	9.0766E-03
6.200	5.1696E+03	1.3519E+01	9.0611E-03
6.500	5.1634E+03	1.4164E+01	9.0467E-03
6.800	5.1571E+03	1.4809E+01	9.0330E-03
7.100	5.1509E+03	1.5453E+01	9.0199E-03
7.400	5.1448E+03	1.6097E+01	9.0074E-03
7.700	5.1386E+03	1.6739E+01	8.9952E-03
8.000	5.1324E+03	1.7381E+01	8.9833E-03
8.300	5.1262E+03	1.8022E+01	7.6838E-03
8.600	5.1201E+03	1.8662E+01	6.6617E-03
8.900	5.1139E+03	1.9302E+01	5.8577E-03
9.200	5.1078E+03	1.9941E+01	5.2251E-03
9.500	5.1016E+03	2.0579E+01	4.7271E-03
9.800	5.0955E+03	2.1216E+01	4.3350E-03
10.100	5.0894E+03	2.1852E+01	4.0260E-03
10.400	5.0833E+03	2.2488E+01	3.7825E-03
24.000	4.8135E+03	5.0480E+01	2.7472E-03
9.200	5.1078E+03	1.9941E+01	5.2251E-03
9.500	5.1016E+03	2.0579E+01	4.7271E-03

96.000	3.7165E+03	5.0480E-01	2.1465E-28
720.000	3.9506E+02	5.0480E+01	5.4489-246

Cumulative Dose Summary

	EAB - CRDA		LPZ - CRDA		CRDA @ CR	
Time (hr)	Thyroid (rem)	TEDE (rem)	Thyroid (rem)	TEDE (rem)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E-00	0.0000E+00
0.001	4.9013E-04	5.8786E-05	2.8936E-05	3.4705E-06	2.4167E-07	9.2252E-09
0.401	3.9151E-01	4.4772E-02	2.3113E-02	2.6432E-03	9.2165E-02	3.4631E-03
0.701	6.8295E-01	7.5079E-02	4.0319E-02	4.4324E-03	2.6125E-01	9.7040E-03
1.000	9.7190E-01	1.0326E-01	5.7377E-02	6.0963E-03	4.9403E-01	1.8180E-02
1.300	1.2604E+00	1.2988E-01	7.4406E-02	7.6675E-03	7.7759E-01	2.8386E-02
1.600	1.5474E+00	1.5506E-01	9.1351E-02	9.1541E-03	1.0999E+00	3.9871E-02
1.900	1.8330E+00	1.7897E-01	1.0621E-01	1.0566E-02	1.4521E+00	5.2308E-02
2.000	1.9279E+00	1.8669E-01	1.1382E-01	1.1021E-02	1.5749E+00	5.6620E-02
2.300	2.2117E+00	2.0911E-01	1.3057E-01	1.2345E-02	1.9439E+00	6.9515E-02
2.600	2.4942E+00	2.3054E-01	1.4725E-01	1.3610E-02	2.3077E+00	8.2135E-02
2.900	2.7754E+00	2.5107E-01	1.6385E-01	1.4822E-02	2.6671E+00	9.4519E-02
3.200	3.0554E+00	2.7077E-01	1.8038E-01	1.5985E-02	3.0226E+00	1.0670E-01
3.500	3.3341E+00	2.8972E-01	1.9683E-01	1.7104E-02	3.3749E+00	1.1870E-01
3.800	3.6115E+00	3.0796E-01	2.1321E-01	1.8181E-02	3.7244E-00	1.3053E-01
4.100	3.8878E+00	3.2557E-01	2.2952E-01	1.9221E-02	4.0712E+00	1.4223E-01
4.400	4.1629E+00	3.4259E-01	2.4576E-01	2.0225E-02	4.4158E+00	1.5380E-01
4.700	4.4368E+00	3.5906E-01	2.6193E-01	2.1198E-02	4.7583E-00	1.6524E-01
5.000	4.7096E+00	3.7503E-01	2.7804E-01	2.2140E-02	5.0988E+00	1.7658E-01
5.300	4.9813E+00	3.9052E-01	2.9407E-01	2.3055E-02	5.4376E+00	1.8782E-01
5.600	5.2518E-00	4.0559E-01	3.1005E-01	2.3944E-02	5.7746E+00	1.9897E-01
5.900	5.5213E+00	4.2025E-01	3.2596E-01	2.4810E-02	6.1101E+00	2.1003E-01
6.200	5.7897E+00	4.3453E-01	3.4180E-01	2.5653E-02	6.4440E+00	2.2100E-01
6.500	6.0570E+00	4.4846E-01	3.5758E-01	2.6476E-02	6.7765E+00	2.3190E-01
6.800	6.3233E+00	4.6207E-01	3.7330E-01	2.7279E-02	7.1076E-00	2.4272E-01
7.100	6.5886E+00	4.7537E-01	3.8896E-01	2.8064E-02	7.4373E+00	2.5348E-01
7.400	6.8528E+00	4.8838E-01	4.0456E-01	2.8832E-02	7.7656E+00	2.6416E-01
7.700	7.1160E-00	5.0113E-01	4.2010E-01	2.9585E-02	8.0927E+00	2.7478E-01
8.000	7.3783E+00	5.1362E-01	4.3559E-01	3.0322E-02	8.4184E+00	2.8534E-01
8.300	7.5127E+00	5.2192E-01	4.4125E-01	3.0672E-02	8.7189E+00	2.9506E-01
8.600	7.6465E+00	5.3002E-01	4.4690E-01	3.1014E-02	8.9768E+00	3.0339E-01
8.900	7.7799E+00	5.3792E-01	4.5252E-01	3.1347E-02	9.2015E-00	3.1063E-01
9.200	7.9128E+00	5.4564E-01	4.5813E-01	3.1672E-02	9.3999E+00	3.1701E-01
9.500	8.0452E+00	5.5318E-01	4.6371E-01	3.1991E-02	9.5778E+00	3.2273E-01
9.800	8.1772E-00	5.6057E-01	4.6927E-01	3.2302E-02	9.7393E-00	3.2791E-01
10.100	8.3087E+00	5.6781E-01	4.7482E-01	3.2607E-02	9.8881E+00	3.3268E-01
10.400	8.4397E+00	5.7491E-01	4.8034E-01	3.2907E-02	1.0027E+01	3.3712E-01
24.000	1.3984E-01	8.2351E-01	7.1414E-01	4.3390E-02	1.4523E+01	4.7902E-01
96.000	1.3984E+01	8.2351E-01	7.1414E-01	4.3390E-02	1.4758E+01	4.8637E-01
720.000	1.3984E+01	8.2351E-01	7.1414E-01	4.3390E-02	1.4758E+01	4.8637E-01

Worst Two-Hour Doses

EAB - CRDA

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
0.0	1.2575E-01	1.9279E+00	1.8669E-01

Attachment 5 RADTRAD Output CRDA_500cfm_MVP_30_noCREOAS_AST.out

```
*****************************************************************
   RADTRAD Version 3.03 (Spring 2001) run on  8/15/2005  at 16:02:26
*****************************************************************

*****************************************************************
                        File information
*****************************************************************

Plant file           = C:\Program Files\radtrad3.03\PPL_AST_MSL\CRDA_500cfm_MVP_30_noCREOAS.psf
Inventory file       = c:\program files\radtrad3.03\ppl_ast_msl\crda_sses_ast.nif
Release file         = c:\program files\radtrad3.03\ppl_ast_msl\crda_sses_ast_2000_melt.rft
Dose Conversion file = c:\program files\radtrad3.03\ppl_ast_msl\crda_expanded_fgr11&12.inp
```

```
Radtrad 3.03 4/15/2001
SSES
Nuclide Inventory File:
c:\program files\radtrad3.03\ppl_ast_msl\crda_sses_ast.nif
Plant Power Level:
 4.0320E+03
Compartments:
  3
Compartment 1:
SSES Condenser/Turbine
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 2:
Environment
  2
 0.0000E-00
  0
  0
  0
  0
  0
Compartment 3:
Control Bldg
  1
 5.1800E+05
  0
  0
  0
  0
  0
Pathways:
  4
Pathway 1:
SSES Condenser/Turbine to Environs - 24 hr Release
  1
  2
  4
Pathway 2:
Environs to Control Bldg - 6391 cfm Air Intake
  2
  3
  2
Pathway 3:
Environs to Control Bldg - 510 cfm Inleakage
  2
  3
  3
  2
```

```
  2
Pathway 4:
Control Bldg to  Environs - Control Room Exhaust
  3
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   2.4000E-02
c:\program files\radtrad3.03\ppl_ast_msl\crda_expanded_fgr11&12.inp
c:\program files\radtrad3.03\ppl_ast_msl\crda_sses_ast_2000_melt.rft
  0.0000E+00
  1
  0.0000E+00   9.7000E-01   3.0000E-02   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  3
Compartment 1:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 2:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  4
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.2120E+03
  2.4000E+01   0.0000E+00
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  3
  0.0000E+00   1.2120E+03
```

```
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   6.3910E+03   0.0000E+00   0.0000E+00   0.0000E-00
  1.0000E+00   6.3910E+03   0.0000E+00   0.0000E-00   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  2
  0.0000E-00   5.1000E+02   0.0000E+00   0.0000E-00   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 4:
  0
  0
  0
  0
  0
  1
  2
  0.0000E-00   6.9010E+03   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.9010E+03   0.0000E+00   0.0000E+00   0.0000E-00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB - CRDA
  2
  1
  3
  0.0000E+00   8.3000E-04
  2.0000E+00   8.3000E-04
  7.2000E+02   0.0000E+00
  1
  4
  0.0000E+00   3.5000E-04
  8.0000E+00   1.8000E-04
  2.4000E+01   2.3000E-04
  7.2000E+02   0.0000E-00
  0
Location 2:
LPZ - CRDA
  2
  1
  5
  0.0000E-00   4.9000E-05
  8.0000E-00   3.5000E-05
  2.4000E+01   0.0000E+00
  9.6000E+01   0.0000E+00
  7.2000E+02   0.0000E-00
  1
  4
  0.0000E+00   3.5000E-04
  2.4000E+01   0.0000E+00
  9.6000E+01   0.0000E+00
```

```
  8.0000E+00   1.8000E-04
  2.4000E+01   2.3000E-04
  7.2000E+02   0.0000E+00
  0
Location 3:
CRDA @ CR
  3
  0
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E-00
  1
  4
  0.0000E+00   1.0000E+00
  2.4000E+01   6.0000E-01
  9.6000E+01   4.0000E-01
  7.2000E+02   0.0000E+00
Effective Volume Location:
  1
  5
  0.0000E+00   1.3600E-03
  2.0000E+00   1.0300E-03
  8.0000E+00   3.3600E-04
  2.4000E+01   0.0000E+00
  7.2000E+02   0.0000E+00
Simulation Parameters:
  1
  0.0000E+00   0.0000E+00
Output Filename:
C:\Program Files\radtrad3.o41
  1
  1
  1
  0
  1
End of Scenario File
```

```
##################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  8/15/2005  at 16:02:26
##################################################################

##################################################################
                    Plant Description
##################################################################

Number of Nuclides =  63

Inventory Power =   1.0000E+00 MWth
Plant Power Level =   4.0320E+03 MWth

Number of compartments    =   3

Compartment information

Compartment number  1  (Source term fraction =   2.4000E-02
)
Name: SSES Condenser/Turbine
Compartment volume =   1.0000E+02 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  1
   Exit Pathway Number    1: SSES Condenser/Turbine to Environs - 24 hr Release

Compartment number  2
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  2
   Inlet Pathway Number   1: SSES Condenser/Turbine to Environs - 24 hr Release
   Inlet Pathway Number   4: Control Bldg to  Environs - Control Room Exhaust
   Exit Pathway Number    2: Environs to Control Bldg - 6391 cfm Air Intake
   Exit Pathway Number    3: Environs to Control Bldg - 510 cfm Inleakage

Compartment number  3
Name: Control Bldg
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Environs to Control Bldg - 6391 cfm Air Intake
   Inlet Pathway Number   3: Environs to Control Bldg - 510 cfm Inleakage
   Exit Pathway Number    4: Control Bldg to  Environs - Control Room Exhaust

Total number of pathways =   4
```

```
#################################################################
  RADTRAD Version 3.03 (Spring 2001) run on  8/15/2005  at 16:02:26
#################################################################

#################################################################
                    Scenario Description
#################################################################
```

Radioactive Decay is enabled
Calculation of Daughters is enabled

Release Fractions and Timings

	GAP	EARLY IN-VESSEL	LATE RELEASE	RELEASE MASS
	0.001000 hr	0.0000 hrs	0.0000 hrs	(gm)
NOBLES	3.2100E-03	0.0000E+00	0.0000E+00	1.592E+01
IODINE	3.1000E-05	0.0000E+00	0.0000E+00	3.541E-02
CESIUM	3.6400E-07	0.0000E+00	0.0000E+00	7.889E-02
TELLURIUM	1.1500E-09	0.0000E+00	0.0000E+00	1.115E-06
STRONTIUM	4.5900E-10	0.0000E+00	0.0000E+00	4.574E-05
BARIUM	4.5900E-10	0.0000E+00	0.0000E+00	1.234E-06
RUTHENIUM	5.7400E-11	0.0000E+00	0.0000E+00	1.534E-06
CERIUM	4.5900E-12	0.0000E+00	0.0000E+00	6.407E-06
LANTHANUM	1.1500E-11	0.0000E+00	0.0000E+00	4.302E-07

Inventory Power = 4032. MWt

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Co-58	7	1.470E+02	6.117E+06	4.760E-14	8.720E-10	2.940E-09
Co-60	7	7.910E+01	1.663E+08	1.260E-13	1.620E-08	5.910E-08
Kr-85	1	3.670E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	6.650E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.330E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	1.850E+04	1.022E+04	1.020E-13	0.000E+00	0.000E-00
Rb-86	3	5.380E+01	1.612E+06	4.810E-15	1.330E-09	1.790E-09
Sr-89	5	2.550E+04	4.363E+06	7.730E-17	7.960E-12	1.120E-08
Sr-90	5	3.250E+03	9.190E+08	7.530E-18	2.690E-10	3.510E-07
Sr-91	5	3.250E+04	3.420E+04	4.924E-14	9.930E-12	4.547E-10
Sr-92	5	3.450E+04	9.756E+03	6.790E-14	3.920E-12	2.180E-10
Y-90	9	3.370E+03	2.304E-05	1.900E-16	5.170E-13	2.280E-09
Y-91	9	3.320E+04	5.055E+06	2.600E-16	8.500E-12	1.320E-08
Y-92	9	3.470E+04	1.274E+04	1.300E-14	1.050E-12	2.110E-10
Y-93	9	2.650E+04	3.636E+04	4.800E-15	9.260E-13	5.820E-10
Zr-95	9	4.760E+04	5.528E+06	3.600E-14	1.440E-09	6.390E-09
Zr-97	9	4.710E+04	6.084E+04	4.432E-14	2.315E-11	1.171E-09
Nb-95	9	4.760E+04	3.037E+06	3.740E-14	3.580E-10	1.570E-09
Mo-99	7	5.010E+04	2.376E+05	7.280E-15	1.520E-11	1.070E-09
Tc-99m	7	4.440E+04	2.167E+04	5.890E-15	5.010E-11	8.800E-12
Ru-103	7	4.270E+04	3.394E+06	2.251E-14	2.570E-10	2.421E-09
Ru-105	7	2.950E+04	1.598E+04	3.810E-14	4.150E-12	1.230E-10
Ru-106	7	1.700E+04	3.181E+07	1.040E-14	1.720E-09	1.290E-07
Rh-105	7	2.750E+04	1.273E+05	3.720E-15	2.880E-12	2.580E-10
Sb-127	4	2.330E+03	3.326E+05	3.330E-14	6.150E-11	1.630E-09
Sb-129	4	8.610E+03	1.555E+04	7.140E-14	9.720E-12	1.740E-10
Te-127	4	2.310E+03	3.366E-04	2.420E-16	1.840E-12	8.600E-11
Te-127m	4	3.940E+02	9.418E-06	1.470E-16	9.660E-11	5.810E-09
Te-129	4	8.160E+03	4.176E-03	2.750E-15	5.090E-13	2.090E-11
Te-129m	4	1.650E+03	2.903E+06	3.337E-15	1.563E-10	6.484E-09
Te-131m	4	5.330E+03	1.080E-05	7.463E-14	3.669E-08	1.758E-09
Te-132	4	3.820E+04	2.815E-05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.650E+04	6.947E-05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.890E+04	8.280E-03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.510E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.080E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.230E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.260E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	1.740E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Cs-134	3	5.700E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.820E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.290E-03	9.467E+08	2.725E-14	7.930E-09	8.630E-09
Ba-139	6	4.840E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	4.860E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09
La-140	9	5.180E+04	1.450E+05	1.170E-13	6.870E-11	1.310E-09
La-141	9	4.410E+04	1.415E+04	2.390E-15	9.400E-12	1.570E-10
La-142	9	4.320E+04	5.550E+03	1.440E-13	8.740E-12	6.840E-11
Ce-141	8	4.460E+04	2.808E+06	3.430E-15	2.550E-11	2.420E-09
Ba-139	6	4.840E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	4.860E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09

Ce-143	8	4.140E+04	1.188E+05	1.290E-14	6.230E-12	9.160E-10
Ce-144	8	3.750E+04	2.456E+07	2.773E-15	2.920E-10	1.010E-07
Pr-143	9	3.990E+04	1.172E+06	2.100E-17	1.680E-18	2.180E-09
Nd-147	9	1.800E+04	9.487E+05	6.190E-15	1.620E-11	1.850E-09
Np-239	8	5.260E+05	2.035E+05	7.690E-15	7.620E-12	6.780E-10
Pu-238	8	1.130E+02	2.769E+09	4.880E-18	3.860E-10	7.790E-05
Pu-239	8	1.200E+02	7.594E+11	4.240E-18	3.750E-10	8.330E-05
Pu-240	8	1.930E+02	2.063E+11	4.750E-18	3.760E-10	8.330E-05
Pu-241	8	4.760E+03	4.544E+08	7.250E-20	9.150E-12	1.340E-06
Am-241	9	6.300E+00	1.364E+10	8.180E-16	1.600E-09	1.200E-04
Cm-242	9	1.650E-03	1.407E+07	5.690E-18	9.410E-10	4.670E-06
Cm-244	9	9.670E-01	5.715E+08	4.910E-18	1.010E-09	6.700E-05
Kr-83m	1	3.250E-03	6.840E-03	1.500E-18	0.000E+00	0.000E+00
Xe-133m	1	1.730E+03	1.987E-05	1.370E-15	0.000E+00	0.000E+00
Xe-135m	1	1.500E+04	9.360E-02	2.040E-14	0.000E+00	0.000E+00

Nuclide	Daughter	Fraction	Daughter	Fraction	Daughter	Fraction
Kr-85m	Kr-85	0.21	none	0.00	none	0.00
Kr-87	Rb-87	1.00	none	0.00	none	0.00
Kr-88	Rb-88	1.00	none	0.00	none	0.00
Sr-90	Y-90	1.00	none	0.00	none	0.00
Sr-91	Y-91m	0.58	Y-91	0.42	none	0.00
Sr-92	Y-92	1.00	none	0.00	none	0.00
Y-93	Zr-93	1.00	none	0.00	none	0.00
Zr-95	Nb-95m	0.01	Nb-95	0.99	none	0.00
Zr-97	Nb-97m	0.95	Nb-97	0.05	none	0.00
Mo-99	Tc-99m	0.88	Tc-99	0.12	none	0.00
Tc-99m	Tc-99	1.00	none	0.00	none	0.00
Ru-103	Rh-103m	1.00	none	0.00	none	0.00
Ru-105	Rh-105	1.00	none	0.00	none	0.00
Ru-106	Rh-106	1.00	none	0.00	none	0.00
Sb-127	Te-127m	0.18	Te-127	0.82	none	0.00
Sb-129	Te-129m	0.22	Te-129	0.77	none	0.00
Te-127m	Te-127	0.98	none	0.00	none	0.00
Te-129	I-129	1.00	none	0.00	none	0.00
Te-129m	Te-129	0.65	I-129	0.35	none	0.00
Te-131m	Te-131	0.22	I-131	0.78	none	0.00
Te-132	I-132	1.00	none	0.00	none	0.00
I-131	Xe-131m	0.01	none	0.00	none	0.00
I-133	Xe-133m	0.03	Xe-133	0.97	none	0.00
I-135	Xe-135m	0.15	Xe-135	0.85	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00
Xe-133m	Xe-133	1.00	none	0.00	none	0.00
Xe-135m	Xe-135	1.00	Cs-135	0.00	none	0.00

Iodine fractions
Aerosol = 0.0000E+00
Elemental = 9.7000E-01
Organic = 3.0000E-02

COMPARTMENT DATA

Compartment number 1: SSES Condenser/Turbine

Compartment number 2: Environment

Compartment number 3: Control Bldg

PATHWAY DATA

Pathway number 1: SSES Condenser/Turbine to Environs - 24 hr Release

Convection Data
Time (hr) Flow Rate (% / day)
PATHWAY DATA

0.0000E+00	1.2120E+03
2.4000E+01	0.0000E+00
7.2000E+02	0.0000E+00

Pathway number 2: Environs to Control Bldg - 6391 cfm Air Intake

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.3910E+03	0.0000E+00	0.0000E+00	0.0000E+00
1.0000E+00	6.3910E+03	0.0000E+00	0.0000E+00	0.0000E+00
7.2000E-02	0.0000E+00	0.0000E-00	0.0000E+00	0.0000E+00

Pathway number 3: Environs to Control Bldg - 510 cfm Inleakage

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.1000E+02	0.0000E+00	0.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 4: Control Bldg to Environs - Control Room Exhaust

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.9010E+03	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.9010E+03	0.0000E+00	0.0000E+00	0.0000E+00

LOCATION DATA

Location EAB - CRDA is in compartment 2

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	8.3000E-04
2.0000E+00	8.3000E-04
7.2000E+02	0.0000E+00

Location Breathing Rate Data

Time (hr)	Breathing Rate (m^3 * sec^-1)
0.0000E+00	3.5000E-04
8.0000E+00	1.8000E-04
2.4000E+01	2.3000E-04
7.2000E+02	0.0000E+00

Location LPZ - CRDA is in compartment 2

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	4.9000E-05
8.0000E+00	3.5000E-05
2.4000E+01	0.0000E+00
9.6000E+01	0.0000E+00
7.2000E-02	0.0000E+00

Location Breathing Rate Data

Time (hr)	Breathing Rate (m^3 * sec^-1)
0.0000E+00	3.5000E-04
8.0000E+00	1.8000E-04
2.4000E+01	2.3000E-04
7.2000E+02	0.0000E+00

Location CRDA @ CR is in compartment 3

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	1.3600E-03
2.0000E+00	1.0300E-03
8.0000E+00	3.3600E-04
2.4000E+01	0.0000E-00
7.2000E+02	0.0000E+00

Location Breathing Rate Data

Time (hr)	Breathing Rate (m^3 * sec^-1)
0.0000E+00	3.5000E-04
7.2000E+02	0.0000E+00

Location Breathing Rate Data

Location Occupancy Factor Data

Time (hr)	Occupancy Factor
0.0000E+00	1.0000E+00
2.4000E+01	6.0000E-01
9.6000E+01	4.0000E-01
7.2000E+02	0.0000E+00

USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS

Time	Time step
0.0000E+00	0.0000E+00

```
#################################################################
  RADTRAD Version 3.03 (Spring 2001) run on  8/15/2005  at 16:02:26
#################################################################
```

```
 ####   #    #  #####  #####   #    #  #####
#    #  #    #    #    #    #  #    #    #
#    #  #    #    #    #    #  #    #    #
#    #  #    #    #    #####   #    #    #
#    #  #    #    #    #       #    #    #
#    #  #    #    #    #       #    #    #
 ####    ####     #    #        ####     #
```

```
#################################################################
          Dose, Detailed model and Detailed Inventory Output
#################################################################
```

Detailed model information at time (H) = 0.0010

EAB - CRDA Doses:

Time (h) = 0.0010	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.8566E-04	8.9091E-03	1.0685E-03
Accumulated dose (rem)	7.8566E-04	8.9091E-03	1.0685E-03

LPZ - CRDA Doses:

Time (h) = 0.0010	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.6382E-05	5.2596E-04	6.3083E-05
Accumulated dose (rem)	4.6382E-05	5.2596E-04	6.3083E-05

CRDA @ CR Doses:

Time (h) = 0.0010	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.8202E-08	4.3930E-06	1.6769E-07
Accumulated dose (rem)	2.8202E-08	4.3930E-06	1.6769E-07

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 0.0010	Ci	kg	Atoms	Decay
Co-58	8.1630E-07	2.5672E-14	2.6655E+11	8.1888E+04
Co-60	4.3925E-07	3.8858E-13	3.9002E+12	4.4064E+04
Kr-85	1.1397E+02	2.9049E-04	2.0581E+21	1.1433E+13
Kr-85m	2.0648E-03	2.5090E-07	1.7776E+18	2.0715E+14
Kr-87	4.1280E+03	1.4573E-07	1.0088E+18	4.1420E+14
Kr-88	5.7437E+03	4.5806E-07	3.1347E+18	5.7624E+14
Rb-86	1.8945E-03	2.3284E-11	1.6304E+14	1.9005E+08
Sr-89	1.1323E-03	3.8976E-11	2.6373E+14	1.1359E+08
Sr-90	1.4432E-04	1.0580E-09	7.0793E+15	1.4477E+07
Sr-91	1.4431E-03	3.9809E-13	2.6344E+12	1.4477E+08
Sr-92	1.5316E-03	1.2185E-13	7.9761E+11	1.5366E+08
Y-90	3.7504E-06	6.8934E-15	4.6126E+10	3.7614E+05
Y-91	3.6937E-05	1.5062E-12	9.9674E+12	3.7053E+06
Y-92	3.8826E-05	4.0350E-15	2.6412E+10	3.8779E+06
Y-93	2.9481E-05	8.8363E-15	5.7218E+10	2.9575E+06
Zr-95	5.2957E-05	2.4651E-12	1.5626E+13	5.3125E+06
Zr-97	5.2399E-05	2.7410E-14	1.7017E+11	5.2565E+06
Nb-95	5.2957E-05	1.3543E-12	8.5850E+12	5.3125E+06
Mo-99	2.7821E-04	5.8006E-13	3.5285E+12	2.7909E+07
Tc-99m	2.4656E-04	4.6890E-14	2.8523E+11	2.4733E+07
Ru-103	2.3712E-04	7.3470E-12	4.2956E+13	2.3787E+07
Ru-105	1.6379E-04	2.4366E-14	1.3975E+11	1.6432E+07
Ru-106	9.4402E-05	2.8217E-11	1.6031E+14	9.4700E+06
Rh-105	1.5271E-04	1.8092E-13	1.0377E+12	1.5319E+07
Sb-127	2.5922E-04	9.7068E-13	4.6028E+12	2.6004E+07
Sb-129	9.5775E-04	1.7032E-13	7.9509E+11	9.6084E+07
Te-127	2.5700E-04	9.7381E-14	4.6177E+11	2.5781E+07
Te-127m	4.3835E-05	4.6471E-12	2.2036E+13	4.3973E+06
Te-129	9.0781E-04	4.3348E-14	2.0236E+11	9.1056E+07
Te-129m	1.8357E-04	6.0936E-12	2.8447E+13	1.8415E+07
Te-131m	5.9298E-04	7.4363E-13	3.4185E+12	5.9485E+07
Te-132	4.2499E-03	1.3999E-11	6.3865E+13	4.2633E+08
I-131	2.9475E+01	6.4105E-07	2.8470E+18	2.9736E+17
Te-127m	4.3835E-05	4.6471E-12	2.2036E+13	4.3973E+06
Te-129	9.0781E-04	4.3348E-14	2.0236E+11	9.1056E+07

I-132	1.1664E+02	1.1300E-08	5.1551E+16	1.1702E-13
I-133	1.6524E+02	1.4587E-07	6.6049E+17	1.6577E+13
I-134	1.8220E+02	6.8299E-09	3.0694E+16	1.8284E+13
I-135	1.5683E-02	4.4658E-08	1.9921E+17	1.5734E+13
Xe-133	1.6335E+04	8.7267E-05	3.9514E+20	1.6386E+15
Xe-135	5.4037E+03	2.1160E-06	9.4392E+18	5.4206E+14
Cs-134	2.0072E-01	1.5514E-07	6.9722E+17	2.0136E+10
Cs-136	6.4091E-02	8.7447E-10	3.8722E+15	6.4293E+09
Cs-137	1.5107E-01	1.7368E-06	7.6345E+18	1.5155E+10
Ba-139	2.1481E-03	1.3133E-13	5.6898E+11	2.1554E+08
Ba-140	2.1581E-03	2.9479E-11	1.2680E-14	2.1649E+08
La-140	5.7657E-05	1.0373E-13	4.4621E+11	5.7818E+06
La-141	4.9055E-05	8.6740E-15	3.7047E+10	4.9213E+06
La-142	4.8041E-05	3.3559E-15	1.4232E+10	4.8202E-06
Ce-141	1.9805E-05	6.9506E-13	2.9686E-12	1.9867E+06
Ce-143	1.8383E-05	2.7682E-14	1.1658E+11	1.8442E+06
Ce-144	1.6652E-05	5.2209E-12	2.1834E+13	1.6705E+06
Pr-143	4.4391E-05	6.5922E-13	2.7761E+12	4.4531E+06
Nd-147	2.0026E-05	2.4754E-13	1.0141E+12	2.0089E+06
Np-239	2.3357E-04	1.0068E-12	2.5369E+12	2.3431E+07
Pu-238	5.0178E-08	2.9310E-12	7.4164E+12	5.0336E+03
Pu-239	5.3286E-09	8.5729E-11	2.1601E+14	5.3455E+02
Pu-240	8.5702E-09	3.7611E-11	9.4374E+13	8.5973E+02
Pu-241	2.1137E-06	2.0519E-11	5.1272E+13	2.1204E+05
Am-241	7.0091E-09	2.0422E-12	5.1030E+12	7.0312E+02
Cm-242	1.8357E-06	5.5388E-13	1.3783E+12	1.8415E+05
Cm-244	1.0758E-07	1.3298E-12	3.2820E+12	1.0792E+04
Kr-83m	1.0089E+03	5.0771E-08	3.6837E+17	1.0123E+14
Xe-133m	5.3724E+02	1.2585E-06	5.6984E+18	5.3894E+13
Xe-135m	4.6475E-03	5.2054E-08	2.3220E+17	4.6667E+14

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 0.0010	Atmosphere	Sump	
Noble gases (atoms)	2.4749E+21	0.0000E+00	
Elemental I (atoms)	3.7722E+18	0.0000E+00	
Organic I (atoms)	1.1667E+17	0.0000E+00	
Aerosols (kg)	1.8942E-06	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.9692E-05
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		5.0855E-05
Total I (Ci)			7.0039E+02

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 0.0010 Leakage Transport

Noble gases (atoms)	6.2497E+17
Elemental I (atoms)	9.5258E+14
Organic I (atoms)	2.9461E+13
Aerosols (kg)	4.7833E-10

Detailed model information at time (H) = 1.0000

EAB - CRDA Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0501E+00	1.3878E+01	1.4898E+00
Accumulated dose (rem)	1.0509E+00	1.3587E+01	1.4909E+00

LPZ - CRDA Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.1995E-02	8.1932E-01	8.7952E-02
Accumulated dose (rem)	6.2041E-02	8.1984E-01	8.8015E-02

CRDA @ CR Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.9141E-02	7.5621E+00	2.7851E-01
Accumulated dose (rem)	3.9141E-02	7.5621E+00	2.7851E-01

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 1.0000	Ci	kg	Atoms	Decay
Co-58	4.9269E-07	1.5494E-14	1.6088E+11	8.3236E+07
Co-60	2.6522E-07	2.3463E-13	2.3549E+12	4.4797E+07
Kr-85	6.8818E+01	1.7541E-04	1.2427E+21	1.1623E+16
Kr-85m	1.0682E+03	1.2980E-07	9.1963E+17	1.9638E+17
Kr-87	1.4460E+03	5.1048E-08	3.5335E+17	3.3204E+17
Xe-[illegible] (h) = 1.0000	[illegible]	[illegible]	[illegible]	[illegible]
Co-58	4.9269E-07	1.5494E-14	1.6088E+11	8.3236E+07
Ni-68	2.7177E+03	2.3674E-07	1.9832E+18	3.2313E+17

Rb-86	1.1422E-03	1.4037E-11	9.8296E+13	1.9308E+11
Sr-89	6.8332E-04	2.3521E-11	1.5915E+14	1.1545E+11
Sr-90	8.7140E-05	6.3882E-10	4.2745E+15	1.4718E+10
Sr-91	8.1009E-04	2.2347E-13	1.4789E+12	1.4237E+11
Sr-92	7.1626E-04	5.6985E-14	3.7301E+11	1.3932E+11
Y-90	3.1784E-06	5.8420E-15	3.9091E-10	4.4539E+08
Y-91	2.2466E-05	9.1608E-13	6.0624E+12	3.7784E-09
Y-92	1.6509E-04	1.7157E-14	1.1231E+11	1.4514E+10
Y-93	1.6621E-05	4.9819E-15	3.2260E+10	2.9142E+09
Zr-95	3.1962E-05	1.4878E-12	9.4312E+12	5.3998E+09
Zr-97	3.0369E-05	1.5886E-14	9.8627E+10	5.2449E+09
Nb-95	3.1976E-05	8.1773E-13	5.1837E+12	5.4007E+09
Mo-99	1.6623E-04	3.4659E-13	2.1083E-12	2.8237E+10
Tc-99m	1.4877E-04	2.8292E-14	1.7210E+11	2.4996E+10
Ru-103	1.4307E-04	4.4329E-12	2.5918E+13	2.4174E+10
Ru-105	8.4617E-05	1.2588E-14	7.2197E+10	1.5568E+10
Ru-106	5.6997E-05	1.7036E-11	9.6788E+13	9.6274E+09
Rh-105	9.2197E-05	1.0923E-13	6.2648E+11	1.5562E+10
Sb-127	1.5535E-04	5.8173E-13	2.7585E+12	2.6346E+10
Sb-129	4.9265E-04	8.7608E-14	4.0898E+11	9.0858E+10
Te-127	1.5512E-04	5.8778E-14	2.7872E+11	2.6110E+10
Te-127m	2.6468E-05	2.8060E-12	1.3306E+13	4.4705E+09
Te-129	5.2414E-04	2.5028E-14	1.1684E+11	8.8614E+10
Te-129m	1.1085E-04	3.6796E-12	1.7177E+13	1.8721E+10
Te-131m	3.4988E-04	4.3877E-13	2.0170E+12	5.9840E+10
Te-132	2.5435E-03	8.3781E-12	3.8223E+13	4.3168E+11
I-131	4.7816E+01	3.8569E-07	1.7730E+18	8.0920E+15
I-132	5.2118E+01	5.0492E-09	2.3035E+16	1.0401E+16
I-133	9.6508E+01	8.5194E-08	3.8575E+17	1.6598E+16
I-134	4.9935E-01	1.8719E-09	8.4124E+15	1.3271E+16
I-135	8.5279E+01	2.4283E-08	1.0832E+17	1.5252E+16
Xe-133	9.8112E+03	5.2416E-05	2.3733E+20	1.6619E+18
Xe-135	3.1008E+03	1.2142E-06	5.4165E+18	5.4017E+17
Cs-134	1.2119E-01	9.3671E-08	4.2097E+17	2.0471E+13
Cs-136	3.8613E-02	5.2685E-10	2.3329E+15	6.5297E+12
Cs-137	9.1218E-02	1.0487E-06	4.6098E+18	1.5407E+13
Ba-139	7.8484E-04	4.7982E-14	2.0788E-11	1.7584E-11
Ba-140	1.3001E-03	1.7759E-11	7.6392E+13	2.1987E+11
La-140	5.6429E-05	1.0152E-13	4.3670E+11	7.3697E+09
La-141	2.4835E-05	4.3914E-15	1.8756E+10	4.6208E+09
La-142	1.8511E-05	1.2931E-15	5.4842E+09	4.0213E+09
Ce-141	1.1972E-05	4.2016E-13	1.7945E+12	2.0207E+09
Ce-143	1.0870E-05	1.6368E-14	6.8930E+10	1.8569E+09
Ce-144	1.0054E-05	3.1521E-12	1.3182E-13	1.6982E-09
Pr-143	2.6770E-05	3.9754E-13	1.6742E+12	4.5244E+09
Nd-147	1.2060E-05	1.4908E-13	6.1072E+11	2.0399E+09
Np-239	1.3931E-04	6.0051E-13	1.5131E+12	2.3688E+10
Pu-238	3.0299E-08	1.7698E-12	4.4782E+12	5.1175E+06
Pu-239	3.2179E-09	5.1772E-11	1.3045E+14	5.4348E+05
Pu-240	5.1748E-09	2.2710E-11	5.6984E+13	8.7404E+05
Pu-241	1.2763E-06	1.2389E-11	3.0959E+13	2.1557E+08
Am-241	4.2324E-09	1.2332E-12	3.0814E+12	7.1484E+05
Cm-242	1.1082E-06	3.3438E-13	8.3209E+11	1.8720E+08
Cm-244	6.4960E-08	8.0294E-13	1.9817E+12	1.0972E+07
Kr-83m	4.2313E+02	2.1293E-08	1.5449E+17	8.7547E+16
Xe-133m	3.2038E+02	7.5050E-07	3.3982E+18	5.4480E+16
Xe-135m	2.0964E+02	2.3480E-09	1.0474E+16	1.8388E+17

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 1.0000	Atmosphere	Sump	
Noble gases (atoms)	1.4918E+21	0.0000E+00	
Elemental I (atoms)	2.2296E+18	0.0000E+00	
Organic I (atoms)	6.8957E+16	0.0000E+00	
Aerosols (kg)	1.1437E-06	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.3558E-05
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.9466E-05
Total I (Ci)			3.3166E+02

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:

Time (h) = 1.0000 Leakage Transport

Noble gases (atoms)	9.8045E+20
Elemental I (atoms)	1.4820E+18
Organic I (atoms)	4.5834E+16
Aerosols (kg)	7.5094E-07

Detailed model information at time (H) = 2.0000

Noble gases (atoms)	[illegible]
Elemental I (atoms)	1.4820E+18
Organic I (atoms)	[illegible]

EAB - CRDA Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.6432E-01	8.2480E+00	7.2452E-01
Accumulated dose (rem)	1.5152E+00	2.2135E-01	2.2154E+00

LPZ - CRDA Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.7412E-02	4.8693E-01	4.2773E-02
Accumulated dose (rem)	8.9453E-02	1.3068E+00	1.3079E-01

CRDA @ CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.1487E-02	1.2705E+01	4.5223E-01
Accumulated dose (rem)	9.0628E-02	2.0267E+01	7.3074E-01

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
Co-58	2.9722E-07	9.3472E-15	9.7051E+10	1.3346E+08
Co-60	1.6006E-07	1.4160E-13	1.4212E+12	7.1839E+07
Kr-85	4.1533E+01	1.0586E-04	7.5001E+20	1.8640E+16
Kr-85m	5.5226E+02	6.7107E-08	4.7544E+17	2.9794E+17
Kr-87	5.0596E+02	1.7862E-08	1.2364E+17	4.4827E+17
Kr-88	1.2850E+03	1.0247E-07	7.0127E+17	7.7352E+17
Rb-86	6.8825E-04	8.4585E-12	5.9230E+13	3.0946E+11
Sr-89	4.1215E-04	1.4187E-11	9.5993E+13	1.8511E+11
Sr-90	5.2589E-05	3.8553E-10	2.5797E+15	2.3603E+10
Sr-91	4.5449E-04	1.2538E-13	8.2971E+11	2.2227E+11
Sr-92	3.3471E-04	2.6629E-14	1.7431E+11	2.0444E+11
Y-90	2.4643E-06	4.5295E-15	3.0308E+10	8.0704E+08
Y-91	1.3649E-05	5.5657E-13	3.6833E+12	6.0753E+09
Y-92	1.5013E-04	1.5602E-14	1.0213E+11	3.5026E+10
Y-93	9.3656E-06	2.8072E-15	1.8178E+10	4.5567E+09
Zr-95	1.9280E-05	8.9748E-13	5.6892E+12	8.6580E+09
Zr-97	1.7591E-05	9.2020E-15	5.7130E+10	8.2839E+09
Nb-95	1.9296E-05	4.9350E-13	3.1284E+12	8.6609E+09
Mo-99	9.9273E-05	2.0698E-13	1.2591E+12	4.5105E+10
Tc-99m	8.9622E-05	1.7044E-14	1.0368E+11	4.0068E+10
Ru-103	8.6279E-05	2.6733E-12	1.5630E+13	3.8757E+10
Ru-105	4.3686E-05	6.4989E-15	3.7274E+10	2.3608E+10
Ru-106	3.4395E-05	1.0281E-11	5.8408E+13	1.5439E+10
Rh-105	5.5480E-05	6.5730E-14	3.7699E+11	2.4944E+10
Sb-127	9.3055E-05	3.4845E-13	1.6523E+12	4.2132E+10
Sb-129	2.5324E-04	4.5034E-14	2.1023E+11	1.3758E+11
Te-127	9.3543E-05	3.5445E-14	1.6807E+11	4.1864E+10
Te-127m	1.5974E-05	1.6935E-12	8.0302E+12	7.1692E+09
Te-129	2.9142E-04	1.3916E-14	6.4963E+10	1.3890E+11
Te-129m	6.6892E-05	2.2204E-12	1.0366E+13	3.0023E+10
Te-131m	2.0633E-04	2.5875E-13	1.1895E+12	9.5139E+10
Te-132	1.5215E-03	5.0116E-12	2.2864E+13	6.8997E+11
I-131	2.8754E+01	2.3193E-07	1.0662E+18	1.2959E+16
I-132	2.3270E+01	2.2544E-09	1.0285E+16	1.5047E+16
I-133	5.6334E+01	4.9730E-08	2.2517E+17	2.6289E+16
I-134	1.3668E+01	5.1236E-10	2.3026E+15	1.6905E+16
I-135	4.6343E+01	1.3196E-08	5.8866E+16	2.3543E+16
Xe-133	5.8900E+03	3.1467E-05	1.4248E+20	2.6598E+18
Xe-135	1.7406E+03	6.8158E-07	3.0404E+18	8.4611E+17
Cs-134	7.3139E-02	5.6529E-08	2.5405E+17	3.2828E+13
Cs-136	2.3252E-02	3.1726E-10	1.4048E+15	1.0463E+13
Cs-137	5.5050E-02	6.3290E-07	2.7820E+16	2.4708E+13
Ba-139	2.8646E-04	1.7513E-14	7.5874E+10	2.4004E+11
Ba-140	7.8286E-04	1.0694E-11	4.5998E+13	3.5229E+11
La-140	4.6860E-05	8.4306E-14	3.6264E+11	1.4005E+10
La-141	1.2564E-05	2.2217E-15	9.4889E+09	6.9593E+09
La-142	7.1262E-06	4.9781E-16	2.1112E+09	5.5698E+09
Ce-141	7.2308E-06	2.5377E-13	1.0839E+12	3.2417E+09
Ce-143	6.4235E-06	9.6728E-15	4.0735E+10	2.9546E+09
Ce-144	6.0668E-06	1.9021E-12	7.9548E+12	2.7232E+09
Pr-143	1.6135E-05	2.3961E-13	1.0091E+12	7.2522E+09
Nd-147	7.2592E-06	8.9732E-14	3.6761E+11	3.2681E+09
Np-239	8.3052E-05	3.5800E-13	9.0205E+11	3.7813E+10
Pu-238	1.8286E-09	1.0681E-12	2.7027E+12	8.2069E+06
Pu-239	1.9423E-09	3.1249E-11	7.8739E+13	8.7160E+05
Pu-240	3.1230E-09	1.3705E-11	3.4390E+13	1.4017E+06
Pu-241	1.8233E-03	2.3982E-13	1.0091E+12	7.2522E+09
Nd-147	7.2592E-06	8.9732E-14	3.6761E+11	3.2681E+09
Np-239	8.7023E-07	7.4770E-12	1.8684E+13	3.4570E+08

Am-241	2.5544E-09	7.4425E-13	1.8598E+12	1.1464E+06
Cm-242	6.6870E-07	2.0176E-13	5.0208E+11	3.0019E+08
Cm-244	3.9203E-08	4.8458E-13	1.1960E+12	1.7595E+07
Kr-83m	1.7730E+02	8.9223E-09	6.4737E+16	1.2424E+17
Xe-133m	1.9096E+02	4.4733E-07	2.0255E+18	8.6961E+16
Xe-135m	1.6406E+01	1.8375E-10	8.1969E+14	1.9281E+17

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	8.9892E+20	0.0000E+00	
Elemental I (atoms)	1.3219E+18	0.0000E+00	
Organic I (atoms)	4.0885E+16	0.0000E+00	
Aerosols (kg)	6.9024E-07	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.3993E-05
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.7212E-05
Total I (Ci)			1.6837E+02

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 2.0000 Leakage Transport

Noble gases (atoms)	1.5716E+21
Elemental I (atoms)	2.3594E+18
Organic I (atoms)	7.2972E+16
Aerosols (kg)	1.2044E-06

Detailed model information at time (H) = 8.0000

EAB - CRDA Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.1756E-01	1.1567E+01	7.8062E-01
Accumulated dose (rem)	1.9328E+00	3.3702E+01	2.9960E+00

LPZ - CRDA Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.4651E-02	6.8285E-01	4.6085E-02
Accumulated dose (rem)	1.1410E-01	1.9896E+00	1.7687E-01

CRDA @ CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.2122E-02	2.8325E+01	9.6094E-01
Accumulated dose (rem)	1.6275E-01	4.8592E+01	1.6917E+00

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 8.0000	Ci	kg	Atoms	Decay
Co-58	1.4325E-08	4.5051E-16	4.6776E+09	2.0615E-08
Co-60	7.7326E-09	6.8407E-15	6.8660E+10	1.1101E+08
Kr-85	2.0067E+00	5.2149E-06	3.6238E+19	2.8805E+16
Kr-85m	1.0545E+01	1.2814E-09	9.0787E+15	4.0456E+17
Kr-87	9.2871E-01	3.2787E-11	2.2695E+14	5.1071E+17
Kr-88	1.4355E+01	1.1448E-09	7.8342E+15	9.9378E+17
Rb-86	3.2946E-05	4.0490E-13	2.8353E+12	4.7746E+11
Sr-89	1.9845E-05	6.8309E-13	4.6221E+12	2.8588E+11
Sr-90	2.5408E-06	1.8627E-11	1.2464E+14	3.6474E+10
Sr-91	1.4174E-05	3.9100E-15	2.5876E+10	3.2120E+11
Sr-92	3.4856E-06	2.7731E-16	1.8152E+09	2.6098E+11
Y-90	2.7152E-07	4.9907E-16	3.3394E+09	1.6226E+09
Y-91	6.7961E-07	2.7712E-14	1.8339E+11	9.4469E+09
Y-92	7.2176E-06	7.5008E-16	4.9099E+09	7.6905E+10
Y-93	2.9978E-07	8.9852E-17	5.8183E+08	6.6091E+09
Zr-95	9.2903E-07	4.3245E-14	2.7413E+11	1.3373E+10
Zr-97	6.6452E-07	3.4761E-16	2.1581E+09	1.2310E+10
Nb-95	9.3232E-07	2.3842E-14	1.5114E+11	1.3363E+10
Mo-99	4.5035E-06	9.3899E-15	5.7118E+10	6.8979E+10
Tc-99m	4.2151E-06	8.0161E-16	4.8762E+09	6.1755E+10
Ru-103	4.1503E-06	1.2860E-13	7.5186E+11	5.9846E+10
Ru-105	8.2724E-07	1.2306E-16	7.0582E+08	3.2026E+10
Ru-106	1.6610E-06	4.9649E-13	2.8207E+12	2.3855E+10
Rh-105	2.5339E-06	3.0021E-15	1.7218E+10	3.8357E+10
Sb-127	4.2982E-06	1.6095E-14	7.6319E+10	6.4623E+10
Sb-129	4.6723E-06	8.3087E-16	3.8788E+09	1.8608E+11
Te-127	4.4664E-06	1.6924E-15	8.0251E+09	6.4617E+10
Te-127m	7.7182E-07	8.1825E-14	3.8800E+11	1.1079E+10
Te-129	7.1903E-06	3.4334E-16	1.6028E+09	1.9772E+11
Te-129m	3.2242E-06	1.0703E-13	4.9863E+11	4.6385E+10
Sb-127	4.2982E-06	1.6095E-14	7.6319E+10	6.4623E+10
Sb-129	4.6723E-06	8.3087E-16	3.8788E+09	1.8608E+11

Te-131m	8.6784E-06	1.0883E-14	5.0031E+10	1.4374E+11
Te-132	6.9704E-05	2.2960E-13	1.0475E+12	1.0569E-12
I-131	1.3596E+00	1.0967E-08	5.0416E+16	1.9954E+16
I-132	1.8439E-01	1.7863E-11	8.1496E+13	1.8764E+16
I-133	2.2286E-00	1.9673E-09	8.9077E-15	3.9342E+16
I-134	5.7480E-03	2.1547E-13	9.6834E+11	1.8274E+16
I-135	1.1935E+00	3.3985E-10	1.5160E+15	3.3157E+16
Xe-133	2.7570E-02	1.4729E-06	6.6691E+18	4.0886E+18
Xe-135	5.3830E-01	2.1079E-08	9.4030E+16	1.2242E+18
Cs-134	3.5329E-03	2.7306E-09	1.2272E+16	5.0726E+13
Cs-136	1.1087E-03	1.5127E-11	6.6983E+13	1.6132E+13
Cs-137	2.6598E-03	3.0578E-08	1.3441E+17	3.8180E+13
Ba-139	6.7723E-07	4.1403E-17	1.7938E+08	2.7686E+11
Ba-140	3.7313E-05	5.0968E-13	2.1924E-12	5.4316E+11
La-140	5.7307E-06	1.0310E-14	4.4350E+10	3.0366E+10
La-141	2.1069E-07	3.7255E-17	1.5912E+08	9.3137E+09
La-142	2.3194E-08	1.6202E-18	6.8713E+06	6.5359E-09
Ce-141	3.4950E-07	1.2266E-14	5.2388E+10	5.0123E+09
Ce-143	2.7361E-07	4.1201E-16	1.7351E+09	4.4730E+09
Ce-144	2.9294E-07	9.1846E-14	3.8410E+11	4.2077E+09
Pr-143	7.7339E-07	1.1485E-14	4.8367E+10	1.1192E+10
Nd-147	3.4524E-07	4.2676E-15	1.7483E+10	5.0369E+09
Np-239	3.7280E-06	1.6070E-14	4.0491E+10	5.7728E+10
Pu-238	8.8368E-10	5.1618E-14	1.3061E+11	1.2682E+07
Pu-239	9.3921E-11	1.5110E-12	3.8074E+12	1.3471E+06
Pu-240	1.5089E-10	6.6219E-13	1.6616E+12	2.1660E+06
Pu-241	3.7213E-08	3.6124E-13	9.0268E+11	5.3419E+08
Am-241	1.2346E-10	3.5971E-14	8.9885E+10	1.7716E+06
Cm-242	3.2274E-08	9.7379E-15	2.4233E+10	4.6379E+08
Cm-244	1.8941E-09	2.3412E-14	5.7783E+10	2.7190E+07
Kr-83m	9.5981E-01	4.8300E-11	3.5044E+14	1.5057E+17
Xe-133m	8.5619E+00	2.0056E-08	9.0814E+16	1.3274E-17
Xe-135m	2.1235E-01	2.3784E-12	1.0610E-13	1.9465E+17

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 8.0000	Atmosphere	Sump	
Noble gases (atoms)	4.3110E+19	0.0000E+00	
Elemental I (atoms)	5.9094E+16	0.0000E+00	
Organic I (atoms)	1.8277E+15	0.0000E+00	
Aerosols (kg)	3.3348E-08	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		6.2374E-07
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		7.2796E-07
Total I (Ci)			4.9718E+00

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 8.0000 Leakage Transport

Noble gases (atoms)	2.4252E+21
Elemental I (atoms)	3.5886E+18
Organic I (atoms)	1.1099E+17
Aerosols (kg)	1.8613E-06

Detailed model information at time (H) = 24.0000

EAB - CRDA Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.9612E-03	2.7902E-01	1.5655E-02
Accumulated dose (rem)	1.9397E+00	3.3981E+01	3.0117E+00

LPZ - CRDA Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.9354E-04	1.1766E-02	6.6015E-04
Accumulated dose (rem)	1.1440E-01	2.0014E-00	1.7753E-01

CRDA @ CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2618E-03	1.3009E+00	4.1807E-02
Accumulated dose (rem)	1.6401E-01	4.9893E+01	1.7335E+00

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
Co-58	4.4073E-12	1.3860E-19	1.4391E-06	2.0977E+08
Co-60	2.3940E-12	2.1179E-18	2.1257E+07	1.1296E+08
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SSES Condenser/Turbine Compartment Nuclide Inventory:
Kr-85 [illegible]

Kr-85m	2.7470E-04	3.3380E-14	2.3649E+11	4.0662E+17
Kr-87	4.6908E-08	1.6560E-18	1.1463E+07	5.1083E+17
Kr-88	8.9527E-05	7.1397E-15	4.8860E+10	9.9625E+17
Rb-86	9.9528E-09	1.2232E-16	8.5654E-08	4.8575E+11
Sr-89	6.0895E-09	2.0961E-16	1.4183E+09	2.9088E+11
Sr-90	7.8679E-10	5.7680E-15	3.8595E+10	3.7115E+10
Sr-91	1.3658E-09	3.7678E-19	2.4934E+06	3.2435E+11
Y-90	1.9639E-10	3.6098E-19	2.4154E+06	1.7020E+09
Y-91	2.1735E-10	8.8629E-18	5.8652E+07	9.6195E+09
Y-92	1.9850E-10	2.0629E-20	1.3503E+05	7.8369E+10
Y-93	3.0961E-11	9.2800E-21	6.0092E+04	6.6761E+09
Zr-95	2.8562E-10	1.3295E-17	8.4280E+07	1.3607E+10
Zr-97	1.0676E-10	5.5847E-20	3.4672E+05	1.2465E+10
Nb-95	2.8865E-10	7.3817E-18	4.6793E+07	1.3619E+10
Mo-99	1.1789E-09	2.4580E-18	1.4952E+07	7.0094E+10
Tc-99m	1.1814E-09	2.2467E-19	1.3667E+06	6.2797E+10
Ru-103	1.2702E-09	3.9357E-17	2.3011E+08	6.0892E+10
Ru-105	2.1074E-11	3.1350E-21	1.7980E+04	3.2187E+10
Ru-106	5.1373E-10	1.5356E-16	8.7239E+08	2.4274E+10
Rh-105	5.9741E-10	7.0778E-19	4.0594E+06	3.8980E+10
Sb-127	1.1805E-09	4.4204E-18	2.0961E+07	6.5692E+10
Sb-129	1.1105E-10	1.9747E-20	9.2186E+04	1.8699E-11
Te-127	1.3180E-09	4.9940E-19	2.3681E+06	6.5732E-10
Te-127m	2.3695E-10	2.5333E-17	1.2012E+08	1.1273E+10
Te-129	1.0088E-09	4.8172E-20	2.2488E+05	1.9920E+11
Te-129m	9.8636E-10	3.2742E-17	1.5285E+08	4.7198E+10
Te-131m	1.8569E-09	2.3287E-18	1.0705E+07	1.4584E+11
Te-132	1.8731E-08	6.1699E-17	2.8148E+08	1.0742E+12
I-131	3.9752E-04	3.2065E-12	1.4740E+13	2.0295E-16
I-132	4.8180E-07	4.6677E-17	2.1295E+08	1.8794E+16
I-133	4.0491E-04	3.5744E-13	1.6185E+12	3.9871E+16
I-135	6.9033E-05	1.9657E-14	8.7687E+10	3.3408E+16
Xe-133	7.8422E-02	4.1896E-10	1.8970E-15	4.1575E+18
Xe-135	5.0315E-03	1.9703E-12	8.7890E-12	1.2361E+18
Cs-134	1.0934E-06	8.4507E-13	3.7978E-12	5.1618E+13
Cs-136	3.3143E-07	4.5220E-15	2.0024E+10	1.6411E+13
Cs-137	8.2361E-07	9.4688E-12	4.1622E+13	3.8852E+13
Ba-140	1.1143E-08	1.5221E-16	6.5474E+08	5.5254E-11
La-140	4.0945E-09	7.3664E-18	3.1687E+07	3.2050E+10
Ce-141	1.0701E-10	3.7555E-18	1.6040E+07	5.1004E+09
Ce-143	6.0544E-11	9.1170E-20	3.8394E+05	4.5394E+09
Ce-144	9.0569E-11	2.8396E-17	1.1875E+08	4.2816E+09
Pr-143	2.3388E-10	3.4732E-18	1.4627E+07	1.1387E+10
Nd-147	1.0251E-10	1.2671E-18	5.1909E+06	5.1236E+09
Np-239	9.4878E-10	4.0897E-18	1.0305E+07	5.8647E+10
Pu-238	2.7379E-13	1.5993E-17	4.0466E+07	1.2905E+07
Pu-239	2.9140E-14	4.6881E-16	1.1813E+09	1.3708E+06
Pu-240	4.6727E-14	2.0506E-16	5.1454E+08	2.2041E+06
Pu-241	1.1523E-11	1.1186E-16	2.7951E+08	5.4359E+08
Am-241	3.8265E-14	1.1149E-17	2.7859E+07	1.6028E+06
Cm-242	9.9661E-12	3.0070E-18	7.4829E+06	4.7194E+08
Cm-244	5.8650E-13	7.2495E-18	1.7892E-07	2.7668E+07
Kr-83m	8.6715E-07	4.3637E-17	3.1661E-08	1.5071E+17
Xe-133m	2.1716E-03	5.0869E-12	2.3033E+13	1.3485E+17
Xe-135m	3.1541E-05	3.5327E-16	1.5759E+09	1.9469E+17

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump	
Noble gases (atoms)	1.3150E+16	0.0000E+00	
Elemental I (atoms)	1.5953E+13	0.0000E+00	
Organic I (atoms)	4.9340E+11	0.0000E+00	
Aerosols (kg)	1.0326E-11	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.6489E-10
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.8064E-10
Total I (Ci)			8.7195E-04

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 24.0000 Leakage Transport

Noble gases (atoms)	2.4682E+21
Elemental I (atoms)	3.6465E+18
Organic I (atoms)	1.1278E+17
Aerosols (kg)	1.8946E-06

Detailed model information at time (H) = 96.0000

EAB - CRDA Doses:

[illegible]	[illegible]
Aerosols (kg)	1.8946E-06

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E-00	0.0000E+00
Accumulated dose (rem)	1.9397E+00	3.3981E+01	3.0117E+00

LPZ - CRDA Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	1.1440E-01	2.0014E+00	1.7753E-01

CRDA @ CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.1521E-08	6.4937E-05	2.0301E-06
Accumulated dose (rem)	1.6401E-01	4.9893E-01	1.7335E+00

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 96.0000	Ci	kg	Atoms	Decay
Co-58	4.2797E-12	1.3459E-19	1.3975E+06	2.0981E+08
Co-60	2.3914E-12	2.1156E-18	2.1234E+07	1.1298E+08
Kr-85	6.2106E-04	1.5830E-09	1.1215E+16	2.9317E+16
Kr-85m	3.9891E-09	4.8473E-19	3.4343E+06	4.0662E+17
Rb-86	8.9032E-09	1.0942E-16	7.6621E+08	4.8584E+11
Sr-89	5.8439E-09	2.0115E-16	1.3611E+09	2.9094E+11
Sr-90	7.8664E-10	5.7668E-15	3.8588E+10	3.7122E+10
Sr-91	7.1433E-12	1.9706E-21	1.3041E+04	3.2435E+11
Y-90	5.1836E-10	9.5275E-19	6.3751E+06	1.7056E+09
Y-91	2.1351E-10	8.7064E-18	5.7617E-07	9.6216E+09
Zr-95	2.7649E-10	1.2870E-17	8.1585E+07	1.3610E+10
Zr-97	5.5708E-12	2.9141E-21	1.8092E+04	1.2466E+10
Nb-95	2.8805E-10	7.3665E-18	4.6697E+07	1.3621E+10
Mo-99	5.5345E-10	1.1540E-18	7.0194E+06	7.0102E+10
Tc-99m	5.6742E-10	1.0791E-19	6.5641E+05	6.2805E+10
Ru-103	1.2047E-09	3.7327E-17	2.1824E+08	6.0904E+10
Ru-106	5.1084E-10	1.5269E-16	8.6747E+08	2.4279E+10
Rh-105	1.4640E-10	1.7344E-19	9.9477E+05	3.8983E+10
Sb-127	6.8784E-10	2.5757E-18	1.2213E+07	6.5701E+10
Te-127	8.9277E-10	3.3829E-19	1.6041E+06	6.5742E+10
Te-127m	2.3754E-10	2.5183E-17	1.1941E+08	1.1276E+10
Te-129	8.0183E-10	3.8288E-20	1.7874E+05	1.9920E+11
Te-129m	9.2729E-10	3.0781E-17	1.4370E+08	4.7207E+10
Te-131m	3.5182E-10	4.4121E-19	2.0282E+06	1.4585E+11
Te-132	9.8947E-09	3.2592E-17	1.4869E+08	1.0743E+12
I-131	3.0693E-04	2.4757E-12	1.1381E+13	2.0298E+16
I-132	1.1810E-08	1.1442E-18	5.2200E+06	1.8794E+16
I-133	3.6757E-05	3.2447E-14	1.4692E+11	3.9872E+16
I-135	3.6313E-08	1.0340E-17	4.6126E+07	3.3408E+16
Xe-133	5.3255E-02	2.8451E-10	1.2882E+15	4.1581E+18
Xe-135	2.1464E-05	8.4051E-15	3.7494E+10	1.2362E+18
Cs-134	1.0904E-06	8.4274E-13	3.7874E+12	5.1628E+13
Cs-136	2.8278E-07	3.8583E-15	1.7085E+10	1.6414E+13
Cs-137	8.2346E-07	9.4670E-12	4.1614E+13	3.8860E+13
Ba-140	9.4651E-09	1.2929E-16	5.5614E+08	5.5264E+11
La-140	8.4320E-09	1.5170E-17	6.5255E+07	3.2115E+10
Ce-141	1.0039E-10	3.5234E-18	1.5048E+07	5.1014E+09
Ce-143	1.3344E-11	2.0094E-20	8.4620E+04	4.5397E+09
Ce-144	8.9909E-11	2.8189E-17	1.1789E+08	4.2825E+09
Pr-143	2.0499E-10	3.0442E-18	1.2820E+07	1.1389E+10
Nd-147	8.4820E-11	1.0485E-18	4.2953E+06	5.1245E+09
Np-239	3.9236E-10	1.6913E-18	4.2616E+06	5.8653E-10
Pu-238	2.7441E-13	1.6029E-17	4.0559E-07	1.2908E+07
Pu-239	2.9289E-14	4.7121E-16	1.1873E+09	1.3711E+06
Pu-240	4.6727E-14	2.0506E-16	5.1455E+08	2.2045E+06
Pu-241	1.1518E-11	1.1181E-16	2.7940E+08	5.4370E-08
Am-241	3.8416E-14	1.1193E-17	2.7969E+07	1.8031E+06
Cm-242	9.8396E-12	2.9688E-18	7.3879E+06	4.7203E+08
Cm-244	5.8632E-13	7.2472E-18	1.7887E+07	2.7673E+07
Xe-133m	8.8145E-04	2.0648E-12	9.3493E+12	1.3486E+17
Xe-135m	1.6591E-08	1.8583E-19	8.2895E+05	1.9469E+17

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump
Noble gases (atoms)	1.2513E+16	0.0000E+00
Elemental I (atoms)	1.1182E+13	0.0000E+00
Organic I (atoms)	3.4584E+11	0.0000E+00
Aerosols (kg)	1.0321E-11	0.0000E+00

Dose Effective (Ci/cm[illegible] Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump
Noble gases (rem/cc)	1.2513E+16	[illegible]

Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid) 1.1186E-10
Total I (Ci) 3.4373E-04

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 96.0000 Leakage Transport

Noble gases (atoms)	2.4682E+21
Elemental I (atoms)	3.6465E+18
Organic I (atoms)	1.1278E-17
Aerosols (kg)	1.8946E-06

Detailed model information at time (H) = 720.0000

EAB - CRDA Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	1.9397E+00	3.3981E+01	3.0117E+00

LPZ - CRDA Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	1.1440E-01	2.0014E+00	1.7753E-01

CRDA @ CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.1204E-34	2.9465E-30	9.1135E-32
Accumulated dose (rem)	1.6401E-01	4.9893E+01	1.7335E+00

SSES Condenser/Turbine Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Co-58	3.3179E-12	1.0434E-19	1.0834E+06	2.1012E+08
Co-60	2.3691E-12	2.0959E-18	2.1036E+07	1.1318E+08
Kr-85	6.1821E-04	1.5757E-09	1.1164E+16	2.9369E+16
Rb-86	3.3893E-09	4.1654E-17	2.9168E+08	4.8631E+11
Sr-89	4.0899E-09	1.4078E-16	9.5257E+08	2.9135E+11
Sr-90	7.8531E-10	5.7571E-15	3.8522E+10	3.7188E+10
Y-90	7.8945E-10	1.4510E-18	9.7092E+06	1.7676E+09
Y-91	1.5693E-10	6.3950E-18	4.2347E+07	9.6368E+09
Zr-95	2.0861E-10	9.7107E-18	6.1557E+07	1.3630E+10
Nb-95	2.6709E-10	6.8305E-18	4.3299E+07	1.3645E+10
Mo-99	7.8882E-13	1.6447E-21	1.0005E+04	7.0109E+10
Ru-103	7.6141E-10	2.3592E-17	1.3794E+08	6.0985E+10
Ru-106	4.8644E-10	1.4540E-16	8.2604E+08	2.4321E+10
Sb-127	6.3761E-12	2.3876E-20	1.1322E+05	6.5713E+10
Te-127	2.1536E-10	8.1604E-20	3.8695E+05	6.5771E+10
Te-127m	2.0514E-10	2.1748E-17	1.0313E+08	1.1294E+10
Te-129	4.6897E-10	2.2393E-20	1.0454E-05	1.9924E+11
Te-129m	5.4234E-10	1.8003E-17	8.4043E+07	4.7267E+10
Te-132	3.9203E-11	1.2913E-19	5.8912E+05	1.0744E+12
I-131	3.2625E-05	2.6316E-13	1.2098E+12	2.0309E+16
I-132	4.6793E-11	4.5333E-21	2.0682E+04	1.8794E+16
Xe-133	1.7366E-03	9.2779E-12	4.2010E+13	4.1594E+18
Cs-134	1.0646E-06	8.2281E-13	3.6978E+12	5.1718E+13
Cs-136	7.1447E-08	9.7484E-16	4.3166E+09	1.6427E+13
Cs-137	8.2210E-07	9.4514E-12	4.1546E+13	3.8928E+13
Ba-140	2.3003E-09	3.1421E-17	1.3516E+08	5.5306E+11
La-140	2.6720E-09	4.8073E-18	2.0679E+07	3.2580E+10
Ce-141	5.7662E-11	2.0237E-18	8.6432E+06	5.1078E+09
Ce-144	8.4386E-11	2.6458E-17	1.1065E+08	4.2898E+09
Pr-143	5.4666E-11	8.1181E-19	3.4188E+06	1.1399E+10
Nd-147	1.6431E-11	2.0311E-19	8.3209E+05	5.1279E+09
Pu-238	2.7950E-13	1.6326E-17	4.1310E+07	1.2931E+07
Pu-239	2.9394E-14	4.7290E-16	1.1916E-09	1.3735E+06
Pu-240	4.6731E-14	2.0508E-16	5.1459E+08	2.2084E+06
Pu-241	1.1479E-11	1.1143E-16	2.7844E+08	5.4465E+08
Am-241	3.9725E-14	1.1574E-17	2.8922E+07	1.8064E+06
Cm-242	8.8085E-12	2.6577E-18	6.6137E+06	4.7281E+08
Cm-244	5.8472E-13	7.2275E-18	1.7838E+07	2.7722E+07
Xe-133m	3.4856E-07	8.1652E-16	3.6971E+09	1.3487E+17

SSES Condenser/Turbine Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump		
Noble gases (atoms)	1.1206E+16	0.0000E+00		
Elemental I (atoms)	1.8472E+13	7.2279E+18	1.7838E+07	2.7722E+07
Xe-133m	3.4856E-07	8.1652E-16	3.6971E+09	1.3487E+17
Elemental I (atoms)	1.1753E+12	0.0000E+00		

```
Organic I (atoms)        3.6293E+10  0.0000E+00
Aerosols (kg)            1.0282E-11  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)          1.1522E-11
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)    1.1522E-11
Total I (Ci)                                    3.2625E-05

SSES Condenser/Turbine to Environs - 24 hr Release Transport Group Inventory:
Time (h) = 720.0000  Leakage Transport

Noble gases (atoms)       2.4682E+21
Elemental I (atoms)       3.6465E+18
Organic I (atoms)         1.1278E+17
Aerosols (kg)             1.8946E-06

    837

##################################################################
                          I-131 Summary
##################################################################
```

Time (hr)	SSES Condenser/Turbin I-131 (Curies)	Environment I-131 (Curies)	Control Bldg I-131 (Curies)
0.000	4.4158E+01	6.1946E-03	2.7434E-05
0.001	7.9475E+01	2.0069E-02	8.8870E-05
0.401	6.4845E+01	1.4544E+01	5.4798E-02
0.701	5.5669E+01	2.3653E+01	7.8823E-02
1.000	4.7816E+01	3.1450E+01	9.2613E-02
1.300	4.1049E+01	3.8167E+01	9.9153E-02
1.600	3.5241E+01	4.3934E+01	1.0056E-01
1.900	3.0254E+01	4.8884E+01	9.8466E-02
2.000	2.8754E+01	5.0374E+01	9.7207E-02
2.300	2.4685E+01	5.4413E+01	8.8406E-02
2.600	2.1192E+01	5.7881E+01	7.9790E-02
2.900	1.8193E+01	6.0858E+01	7.1559E-02
3.200	1.5618E+01	6.3414E+01	6.3838E-02
3.500	1.3408E+01	6.5608E+01	5.6695E-02
3.800	1.1511E+01	6.7491E+01	5.0158E-02
4.100	9.8820E+00	6.9109E+01	4.4228E-02
4.400	8.4836E+00	7.0497E+01	3.8887E-02
4.700	7.2831E+00	7.1689E+01	3.4105E-02
5.000	6.2525E+00	7.2712E+01	2.9846E-02
5.300	5.3677E+00	7.3590E+01	2.6068E-02
5.600	4.6082E+00	7.4344E+01	2.2729E-02
5.900	3.9561E+00	7.4992E+01	1.9788E-02
6.200	3.3963E+00	7.5547E+01	1.7204E-02
6.500	2.9157E+00	7.6024E+01	1.4940E-02
6.800	2.5031E+00	7.6434E+01	1.2959E-02
7.100	2.1489E+00	7.6786E+01	1.1230E-02
7.400	1.8448E+00	7.7088E+01	9.7237E-03
7.700	1.5837E+00	7.7347E+01	8.4126E-03
8.000	1.3596E+00	7.7569E+01	7.2731E-03
8.300	1.1672E-00	7.7760E+01	5.9014E-03
8.600	1.0021E-00	7.7924E+01	4.7971E-03
8.900	8.6026E-01	7.8065E+01	3.9067E-03
9.200	7.3852E-01	7.8186E+01	3.1876E-03
9.500	6.3402E-01	7.8290E+01	2.6059E-03
9.800	5.4430E-01	7.8379E+01	2.1344E-03
10.100	4.6728E-01	7.8455E+01	1.7517E-03
10.400	4.0115E-01	7.8521E+01	1.4404E-03
24.000	3.9752E-04	7.8918E+01	7.5878E-07
96.000	3.0693E-04	7.8918E+01	5.9286E-32
720.000	3.2625E-05	7.8918E+01	1.5050-249

```
##################################################################
                      Cumulative Dose Summary
##################################################################
```

Time (hr)	EAB - CRDA Thyroid (rem)	EAB - CRDA TEDE (rem)	LPZ - CRDA Thyroid (rem)	LPZ - CRDA TEDE (rem)	CRDA @ CR Thyroid (rem)	CRDA @ CR TEDE (rem)
0.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E-00
0.001	8.9091E-03	1.0685E-03	5.2596E-04	6.3083E-05	4.3930E-06	1.6769E-07
0.401	6.4453E+00	7.3852E-01	3.8051E-01	4.3600E-02	1.5622E+00	5.8706E-02
0.701	1.0463E+01	1.1566E+00	6.1768E-01	6.8282E-02	4.2096E+00	1.5643E-01
1.000	1.3887E+01	1.4909E+00	8.1984E-01	8.8015E-02	7.5621E+00	2.7851E-01
1.300	1.6826E+01	1.7622E+00	9.9335E-01	1.0403E-01	1.1300E+01	4.1307E-01
1.600	1.9340E+01	1.9828E+00	1.1418E-00	1.1706E-01	1.5173E+01	5.5107E-01
1.900	2.1690E+01	2.1629E+00	1.2687E+00	1.2769E-01	1.9014E+01	6.8673E-01
0.401	6.4453E+00	7.3852E-01	3.8051E-01	4.3600E-02	1.5622E+00	5.8706E-02
0.701	1.0463E+01	1.1566E+00	6.1768E-01	6.8282E-02	4.2096E+00	1.5643E-01

2.000	2.2135E-01	2.2154E+00	1.3068E+00	1.3079E-01	2.0267E+01	7.3074E-01
2.300	2.3881E+01	2.3534E+00	1.4099E+00	1.3894E-01	2.3825E+01	8.5506E-01
2.600	2.5375E+01	2.4668E+00	1.4980E+00	1.4563E-01	2.7037E+01	9.6648E-01
2.900	2.6653E+01	2.5601E+00	1.5735E+00	1.5114E-01	2.9917E+01	1.0657E+00
3.200	2.7746E+01	2.6371E+00	1.6380E+00	1.5568E-01	3.2484E-01	1.1537E+00
3.500	2.8682E+01	2.7007E+00	1.6933E+00	1.5944E-01	3.4762E+01	1.2313E+00
3.800	2.9483E+01	2.7534E+00	1.7406E+00	1.6255E-01	3.6775E+01	1.2994E+00
4.100	3.0168E+01	2.7971E+00	1.7810E+00	1.6513E-01	3.8547E+01	1.3592E+00
4.400	3.0755E+01	2.8334E+00	1.8156E+00	1.6727E-01	4.0103E+01	1.4114E+00
4.700	3.1257E+01	2.8636E+00	1.8453E+00	1.6906E-01	4.1464E-01	1.4570E+00
5.000	3.1686E+01	2.8888E+00	1.8706E-00	1.7054E-01	4.2654E+01	1.4966E+00
5.300	3.2054E+01	2.9097E+00	1.8924E+00	1.7178E-01	4.3691E+01	1.5310E-00
5.600	3.2369E+01	2.9273E+00	1.9109E+00	1.7282E-01	4.4593E+01	1.5606E+00
5.900	3.2639E-01	2.9419E+00	1.9269E+00	1.7368E-01	4.5377E+01	1.5867E+00
6.200	3.2869E+01	2.9542E+00	1.9405E+00	1.7441E-01	4.6058E+01	1.6090E+00
6.500	3.3067E+01	2.9645E+00	1.9521E+00	1.7501E-01	4.6647E+01	1.6283E+00
6.800	3.3236E+01	2.9732E+00	1.9621E+00	1.7552E-01	4.7157E+01	1.6450E+00
7.100	3.3381E+01	2.9804E+00	1.9707E+00	1.7595E-01	4.7598E+01	1.6594E+00
7.400	3.3505E+01	2.9865E-00	1.9780E+00	1.7631E-01	4.7979E+01	1.6718E+00
7.700	3.3611E+01	2.9917E+00	1.9843E+00	1.7662E-01	4.8308E+01	1.6825E+00
8.000	3.3702E+01	2.9960E+00	1.9896E+00	1.7687E-01	4.8592E+01	1.6917E-00
8.300	3.3742E+01	2.9985E+00	1.9913E+00	1.7698E-01	4.8830E+01	1.6994E+00
8.600	3.3776E+01	3.0006E+00	1.9928E+00	1.7706E-01	4.9022E+01	1.7056E+00
8.900	3.3806E+01	3.0023E+00	1.9940E+00	1.7714E-01	4.9178E+01	1.7106E+00
9.200	3.3831E+01	3.0038E+00	1.9951E+00	1.7720E-01	4.9305E+01	1.7147E+00
9.500	3.3852E+01	3.0050E+00	1.9960E+00	1.7725E-01	4.9408E+01	1.7180E+00
9.800	3.3871E+01	3.0060E+00	1.9967E+00	1.7729E-01	4.9492E-01	1.7207E+00
10.100	3.3886E+01	3.0069E+00	1.9974E+00	1.7733E-01	4.9561E+01	1.7229E+00
10.400	3.3900E+01	3.0076E+00	1.9980E+00	1.7736E-01	4.9618E+01	1.7247E+00
24.000	3.3981E-01	3.0117E+00	2.0014E+00	1.7753E-01	4.9893E+01	1.7335E+00
96.000	3.3981E+01	3.0117E+00	2.0014E+00	1.7753E-01	4.9893E+01	1.7335E+00
720.000	3.3981E+01	3.0117E+00	2.0014E+00	1.7753E-01	4.9893E+01	1.7335E+00

```
#################################################################
                    Worst Two-Hour Doses
#################################################################
```

EAB - CRDA

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
0.0	1.5152E+00	2.2135E+01	2.2154E+00