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10 CFR 50.90

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May 31, 2019

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Nine Mile Point Nuclear Station, Unit 2
Renewed Facility Operating License No. NPF-69
NRC Docket No. 50-410

Subject: License Amendment Request to Revise Technical Specifications Main Steam Isolation Valve Leak Rate

Pursuant to 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon) is requesting approval for proposed changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License No. NPF-69 for Nine Mile Point Nuclear Station, Unit 2 (NMP2).

The proposed change would revise TS Surveillance Requirement (SR) 3.6.1.3.11 to combine delayed drywell leakage from SR 3.6.1.3.11c with drywell leakage in SR 3.6.1.3.11a and delete SR 3.6.1.3.11c from the SR. The total drywell leakage in SR 3.6.1.3.11a and the wetwell leakage in SR 3.6.1.3.11b would also be revised to be consistent with the revised Alternative Source Term (AST) Loss-of-Coolant Accident (LOCA) radiological analysis. The proposed change would also revise TS SR 3.6.1.3.12 for Main Steam Isolation Valve (MSIV) leakage rate. The current leakage rate limit of less than or equal to 24 standard cubic feet per hour (scfh) for each MSIV would be revised to allow a leakage rate of less than or equal to 50 scfh for each MSIV.

Attachment 1 provides the Evaluation of Proposed Changes. Attachment 2 provides the Proposed TS Marked-Up Pages. Attachment 3 provides revised (clean) TS pages. Attachment 4 provides the Proposed Technical Specifications Bases Marked-Up Pages for information only.

These proposed changes have been reviewed and approved by the site's Plant Operations Review Committee in accordance with the requirements of the Exelon Quality Assurance Program.

Exelon requests approval of the proposed amendment by February 28, 2020. The amendment shall be implemented within 30 days following NRC approval, or prior to exiting Refueling Outage N2R17, whichever comes first.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (a)(1), the analysis about the issue of no significant hazards consideration using the standards in 10 CFR 50.92 is being provided to the Commission.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), Exelon is notifying the State of New York of this application for license amendment by transmitting a copy of this letter and its attachments to the designated State Official.

Should you have any questions concerning this submittal, please contact Ron Reynolds at (610) 765-5247.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 31st day of May 2019.

Respectfully,

James Barstow
Director - Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments:

1. Evaluation of Proposed Changes
2. Proposed Technical Specification Marked-Up Pages
3. Revised Technical Specification Pages (Clean Pages)
4. Proposed Technical Specification Bases Changes (Marked-Up Pages) (For Information Only)

Enclosure:

A. H21C-106, Revision 3, "Unit 2 LOCA w/LOOP, AST Methodology"

cc:	USNRC Region I, Regional Administrator	w/ attachments
	USNRC Project Manager, NMP	"
	USNRC Senior Resident Inspector, NMP	"
	A.L. Peterson, NYSERDA	"

ATTACHMENT 1

License Amendment Request

Nine Mile Point Nuclear Station Unit 2

Docket No. 50-410

Evaluation of Proposed Changes

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1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS) (Reference 7), Appendix A of Renewed Facility Operating License No. NPF-69 for Nine Mile Point Nuclear Station Unit 2 (NMP2).

The proposed change would revise TS Surveillance Requirement (SR) 3.6.1.3.11 to combine delayed drywell leakage from SR 3.6.1.3.11c with drywell leakage in SR 3.6.1.3.11a and delete SR 3.6.1.3.11c from the SR. The total drywell leakage in SR 3.6.1.3.11a and the wetwell leakage in SR 3.6.1.3.11b would also be revised to be consistent with the revised Alternative Source Term (AST) Loss of Coolant Accident (LOCA) radiological analysis. The proposed change would also revise TS SR 3.6.1.3.12 for Main Steam Isolation Valve (MSIV) leakage rate. The current leakage rate limit of less than or equal to 24 standard cubic feet per hour (scfh) for each MSIV would be revised to allow a leakage rate of less than or equal to 50 scfh for each MSIV.

The changes to the leakage rate limits are based on a revised radiological analysis of the design basis LOCA in accordance with the AST Methodology and revised radiological analyses for Environmental Qualification (EQ) and vital area access, which are based on the Technical Information Document (TID)-14844 source term methodology. Changes are made to inputs and elements of the methodology for the AST LOCA calculation, which are described in the Technical Evaluation.

2.0 DETAILED DESCRIPTION

2.1 Reason for the Proposed Change

Refurbishment of an MSIV to meet the current SR 3.6.1.3.12 leakage rate limit is a man-hour intensive effort which results in a cumulative worker radiation dose and expenditure of resources. Increasing the MSIV leakage rate limit would significantly reduce the amount of rework on the MSIVs. The change would lower personnel radiation exposure and improve the overall performance integrity of the MSIVs by reducing the number of maintenance activities associated with restoring the leakage to an overly strict lower limit. Approval of this proposed change would also be an economic benefit to Exelon in terms of direct costs and a reduction in outage activities.

2.2 Description of Proposed Changes

The following change to SR 3.6.1.3.12 is proposed:

Existing SR 3.6.1.3.12		Proposed SR 3.6.1.3.12	
SR 3.6.1.3.12	Verify leakage rate through each MSIV is ≤ 24 scfh when tested at ≥ 40 psig.	SR 3.6.1.3.12	Verify leakage rate through each MSIV is ≤ 50 scfh when tested at ≥ 40 psig.

The following change to SR 3.6.1.3.11 is also proposed:

Existing SR 3.6.1.3.11		Proposed SR 3.6.1.3.11	
SR 3.6.1.3.11	Verify the leakage rate for the secondary containment bypass leakage when pressurized to ≥ 40 psig is: a. Bypass (Drywell): ≤ 8.74 SCFH; and b. Bypass (Suppression Chamber): ≤ 1.67 SCFH; and c. Bypass (Drywell with delays): ≤ 28.17 SCFH	SR 3.6.1.3.11	Verify the leakage rate for the secondary containment bypass leakage when pressurized to ≥ 40 psig is: a. Bypass (Drywell): ≤ 36.88 SCFH; and b. Bypass (Suppression Chamber): ≤ 1.66 SCFH

For convenience, Attachment 2 contains a marked-up version of the TSs showing the proposed changes.

Attachment 3 provides the retyped version of NMP2 TS. These typed pages are to be used for issuance of the proposed amendment.

Exelon will make supporting change to the TS Bases in accordance with TS 5.5.10, "Technical Specifications (TS) Bases Control Program." Attachment 4 provides marked-up TS Bases pages. These pages are being submitted for information only and do not require issuance by the NRC.

3.0 TECHNICAL EVALUATION

On May 29, 2008 (Reference 1), the Nuclear Regulatory Commission (NRC) issued Amendment No. 125 to the Renewed Facility Operating Licenses for NMP2. This amendment adopts the full implementation of an Alternative Source Term (AST) Methodology in accordance with 10 CFR 50.67, "Accident Source Term."

Onsite and Offsite Atmospheric Dispersion Factors (χ/Q Values)

The NRC staff reviewed the regulatory and technical bases of design basis radiological analyses performed to support the AST license amendment (Reference 1). The NRC staff reviewed the assumptions, inputs, and methods used to assess the onsite and offsite χ/Q values and concluded that the resulting χ/Qs were acceptable for use in the analysis of the postulated Design Basis Accidents (DBA) including the LOCA, Fuel Handling Accident (FHA), Control Rod Drop Accident (CRDA), and Main Steam Line Break (MSLB) dose assessments at the NMP2 control room (CR), Technical Support Center (TSC), and NMP1 CR. These χ/Q values are unchanged in the revised AST LOCA analysis supporting the proposed change.

Revised LOCA Analysis

Among the AST analyses at NMP2, the proposed increase in allowable main steam line leakage rate affects only the LOCA analysis, which is summarized in Section 15.6.5.5 of the NMP2

Updated Safety Analysis Report (USAR) (Reference 6). The current LOCA analysis assumes a leakage rate of 24 scfh (the current TS limit) for each main steam line and assumes a holdup time in the MSIV and system bypass (SB) pathways. A description of the system bypass pathways in provided in Enclosure A.

The impact of the proposed change in the allowable MSIV leakage rate on the calculated radiological consequences of a LOCA for the control room and offsite receptors has been evaluated. The NMP2 LOCA radiological consequence analyses approved by the NRC in Reference 1 are based on AST characteristics. These characteristics include composition and magnitude of the radioactive material, its chemical and physical form, the timing of its release, pathways for transport of the activity released from the core to the environment, appropriate dilution, holdup, and radionuclide removal mechanisms, and shine dose pathways.

This proposed change is based on a revision to the radiological analysis of the design basis LOCA. The revised analysis of the LOCA radiological consequences performed to support this proposed license amendment is based on guidance provided in Regulatory Guide (RG) 1.183 (Reference 2) and RIS 2006-04 (Reference 9). The changes to the methodology and inputs of the revised LOCA analysis are provided in Table 1.

Table 1:

Design Input Parameter	Current Licensing Value	Revised Value
Settling Velocity for Aerosol Deposition in the MSIV and SB Leakage Pathways.	AEB 98-03 (Reference 3) 3rd percentile for MSIV and SB leakage pathways	3rd percentile settling velocity for SB leakage and 20-group probabilistic distribution of aerosol settling velocity for MSIV leakage based on AEB 98-03 (Reference 3) and including RIS 2006-04 (Reference 9) guidance
Aerosol Deposition in Horizontal Main Steam Lines (MSLs) and Drywell and Wetwell System Piping	Credited only between closed MSIVs and Primary Containment Isolation Valves (PCIVs). Not credited in MSL with one MSIV stuck open.	Credited only between closed PCIVs for SB leakage and between the reactor pressure vessel (RPV) nozzle and turbine stop valve (TSV) for MSIV leakage.
MSIV Leakage Rate	24 scfh @ 40 psig (Per MSL) 96 scfh @ 40 psig (Total through all four MSLs)	100 scfh @ 40 psig (Any one of the four MSLs) 200 scfh @ 40 psig (Total through all four MSLs)
Elemental Iodine Removal Rate	50% removal efficiency credited for accident duration	Time and temperature dependent removal efficiency based on J. E. Cline methodology (Reference 4)

Design Input Parameter	Current Licensing Value	Revised Value
Drywell Spray Aerosol Iodine Removal Elemental Iodine Removal	Credited based on Standard Review Plan Section 6.5.2 Credited for 6.0 hours Credited for 3.157 hours	Credited with adjustments based on Standard Review Plan Section 6.5.2 Credited for 2.25 hours Credited for 2.40 hours
Holdup Time for Activity Releases via MSLs and SB Lines from Drywell	Credited based on plug flow	Not credited (includes well-mixed volumes)
Standby Gas Treatment (SGT) System Exhaust Rate	4,000 (cubic feet per minute) cfm	4,000 ± 10% cfm – 4,400 cfm for airborne dose consequences and 3,600 cfm for Reactor Building (RB) shine dose
Control Room Envelope Filtration (CREF) System Actuation Delay	50 seconds	60 seconds
Control Room Intake Flow Rates	2,750 cfm unfiltered (between 0 and 50 seconds) 2,750 cfm filtered (between 50 seconds and 20 minutes) 1,650 cfm filtered (between 20 minutes and 720 hours based on operator action to secure one ventilation train)	750 cfm unfiltered (between 0 and 60 seconds) 1,350 cfm filtered (between 60 seconds and 720 hours)
Core Inventory	GNF2 core inventory	Based on modified fuel characteristics including increased core average exposure (CAVEX)
Dose Consequences Control Room Exclusion Area Boundary Low Population Zone	 1.65 rem TEDE 6.57E-01 rem TEDE 7.69E-01 rem TEDE	 2.37 rem TEDE 1.07 rem TEDE 9.13E-01 rem TEDE

Settling Velocity for Aerosol Deposition in the Main Steam Lines

The current licensing basis (CLB) analysis uses the conservative aerosol settling velocity of 3rd percentile for leakage past the MSIVs and leakage through other bypass leakage pathways. There are limitations to selecting a single value of aerosol settling velocity, which is appropriate for removal of the aerosol particles having a wide range of particle sizes and weights. This requires that a single value of settling velocity be selected such that it covers the settling velocity range of 0.00021 m/s (10th percentile) through 0.00148 m/s (60th percentile) given in AEB-98-03, Table A-1 (Reference 3).

The revised LOCA dose analysis implements a 20-group probabilistic settling velocity distribution for MSIV leakage rather than using the AEB-98-03 single, median value, model. The 20-group probabilistic distribution methodology has been previously approved at Clinton (Reference 10), Limerick (Reference 11), and LaSalle (Reference 12). The same settling velocity probability distribution function shown in Equation 5 of AEB-98-03 is used to conservatively calculate aerosol settling velocity as follows:

$$u_s = \frac{\rho * d_e^2 * g * C_s}{18 * \mu * k}$$

Where:

u_s = settling velocity (cm/sec)
ρ = particle density (g/cm^3)
d_e = particle diameter (cm)
g = gravitational acceleration (cm/sec^2)
C_s = Cunningham Slip Factor (dimensionless)
μ = viscosity (g/cm-sec)
k = shape factor (dimensionless)

As stated in AEB-98-03, this equation is conservative because it does not consider such phenomena as thermophoresis, diffusiophoresis, flow irregularities, and hygroscopicity, which would all serve to increase the rate of aerosol deposition. As applied in this analysis, the settling velocity distribution is a function of this equation evaluated over a randomly sampled range of the three critical aerosol parameters (i.e., density/weight (logarithmically distributed), diameter/size (uniformly distributed), and shape (uniformly distributed)); and three constants (i.e., gravitational acceleration, Cunningham slip factor, and viscosity). The range of each particle parameter is discussed and given in AEB-98-03. A settling velocity distribution was generated using 10,000 randomly generated histories. Each of the 10,000 calculated settling velocities was given a probability of 1/10,000th, thereby making the cumulative fraction total equal to 1. A conservative 20-group step function was developed to approximate the continuous settling velocity distribution function calculated from the 10,000 histories. To ensure conservatism, this step-wise representation of the maximum settling velocity of a group is never allowed to exceed the value that defines the continuous probability curve.

Using the following Equations 2 & 3 of AEB-98-03, settling velocity, settling area, volumetric flow rate, and the volume of the well-mixed region being modeled are used to calculate the aerosol particulate release fractions (RFs), based on initial activity concentration.

$$\eta_{filt} = 1 - \frac{C}{C_{in}} = 1 - \frac{1}{1 + \frac{\lambda_s * V}{Q}} = 1 - \frac{1}{1 + \frac{u_s * A}{Q}}$$

$$\lambda_s = \frac{u_s * A}{V}$$

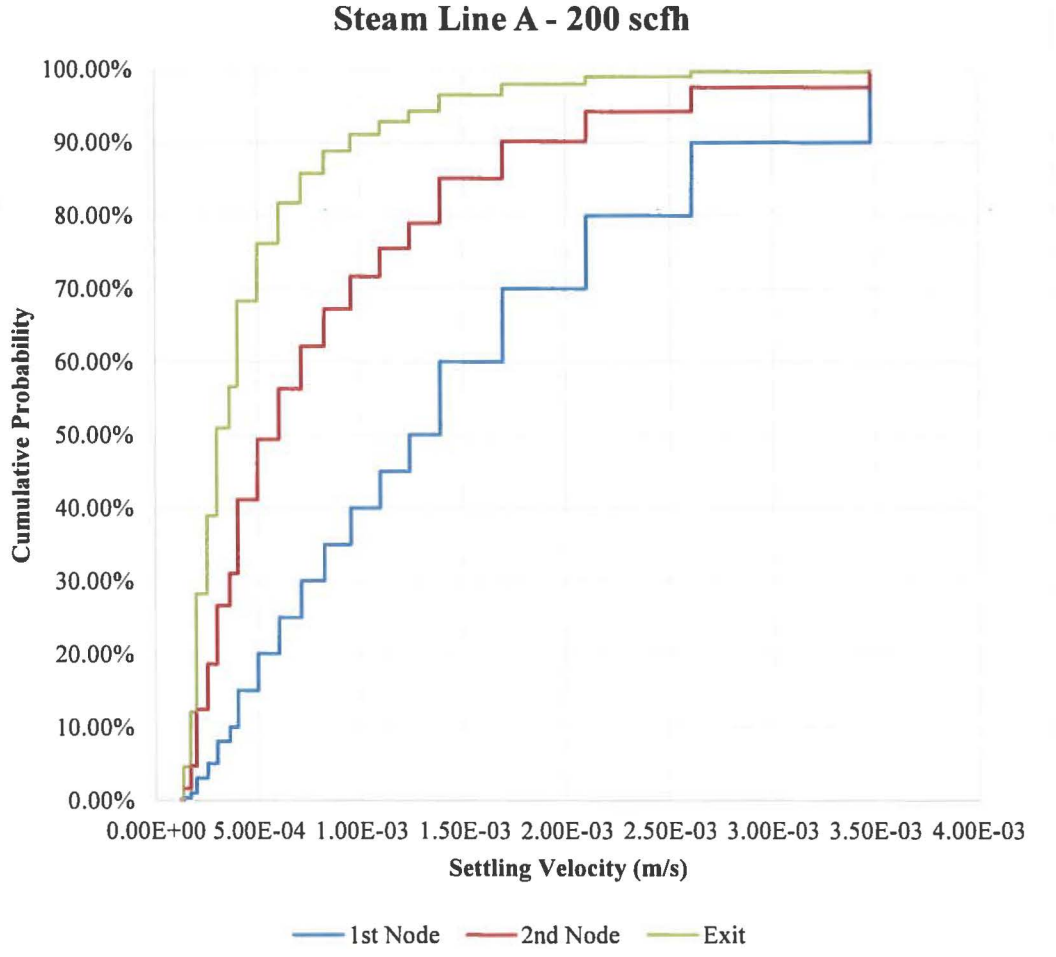
Where:

η_{filt} = filter efficiency
C = concentration of nuclides in well-mixed volume (cm^{-3})
C_{in} = initial concentration of nuclides in well-mixed volume (cm^{-3})
λ_s = settling rate constant (sec^{-1})
V = volume of well-mixed region (cm^3)
Q = volumetric flow rate into well-mixed volume (cm^3/sec)
u_s = settling velocity (cm/sec)
A = settling area (cm^2)

For each of the 20 groups, aerosol particulate RFs from each node or volume are calculated, as shown above, and then turned into removal efficiencies (REs) by subtracting them from 1. The set of 20 removal efficiencies, calculated for each volume, is combined to form a set of 20 Net Release Fractions (NRFs) for a given MSL. The NRF associated with a given group is the product of the RE for each volume, or node, and the probability associated with that specific settling velocity group. The set of 20 NRFs is summed, and again subtracted from 1, to calculate a total effective aerosol removal efficiency (TEARE). This process is performed for each MSL being modeled. Recalculating each distribution exiting a node or volume, then using that to calculate the distribution entering the next node or volume, yields the same TEARE. Therefore, one TEARE is applied to the entire MSIV release pathway.

By implementing a conservative, semi-continuous, probability-weighted 20-group step function to simulate the varied population of particulate in a given MSL volume, as opposed to a single median value, this model accounts for the uneven settling of "easier to remove particles" versus "difficult to remove particles". To transparently illustrate this, the settling velocity probability distribution exiting in each volume or node was re-calculated and compared to the initial distribution. The probability distribution successively shifts "weight" from the "easier to remove particles" when entering the piping, to the "difficult to remove particles" as flow moves through the MSL. When the activity finally exits the system, the re-calculated probability distribution indicates a much more likely chance of seeing "difficult to remove particles" than was the case when entering the system. An example of the changing particle velocity distribution is provided below in Figure 1 and further detailed in Enclosure A.

Figure 1 – Particle Settling Velocity Distribution



Aerosol Deposition Efficiency Modelling Approximation

The aerosol deposition is modelled using a filter efficiency in RADTRAD. As outlined in AEB 98-03, this approach is developed based on an assumption that the aerosol concentration is constant in the well-mixed volume. A changing aerosol concentration could therefore potentially cause an inaccurate filter efficiency.

To address this concern, the proposed analysis conservatively does not credit the 50% reduced flow rate at 24 hours in the calculation of the filter efficiency. A larger flow rate ensures a conservatively lower filter efficiency. To ensure this is reasonable, a sensitivity evaluation was included in the proposed analysis. This sensitivity analysis uses RADTRAD and evaluated the difference between the use of filter efficiencies and settling rate constants (lambdas). The

comparison in Enclosure A (page 17) shows that the resulting dose consequences using the aerosol removal efficiencies and lambdas are essentially the same as those in this analysis and their use results in inconsequential changes in dose consequences.

Aerosol Deposition in Horizontal Main Steam Lines

The "MSIV failed" line means that the inboard MSIV in one of the shortest MSLs fails to close and remains open during the accident, which instantly extends the well mixed volume boundary from the RPV nozzle to the outboard MSIV without breaching its structural integrity to perform its intended safety related function of maintaining the reactor pressure boundary during and following a LOCA. This MSIV failure complies with a single active component failure requirement that results in the most limiting radiological consequences (RG 1.183, Section 5.1.2). All MSLs in the MSIV leakage release pathways are seismically designed and supported to withstand the Safe Shutdown Earthquake (SSE) and thereby comply with RG 1.183, Appendix A, Section 6.5 requirement. The recirculation line break is the limiting event for fuel failure. It is not credible to assume two initiating limiting events, a recirculation line break and a break on the main steam line in a single design basis accident.

All four MSL headers are Seismic I and QA Cat I from the RPV nozzle to seismic boundary break at the TSV; therefore, they are qualified to withstand the SSE, and they comply with the RG 1.183, Appendix A, Section 6.5 requirement to be credited for aerosol deposition. Therefore, the MSIV leakage pathway boundary is extended up to the TSV. The post-LOCA MSIV failed and intact MSL MSIV leakage pathways from the CLB analysis are modified as described in the following section based on the increased MSIV leak rates. For the revised analysis, the activity available for release via MSIV leakage is assumed to be the activity released into the drywell for evaluating containment leakage (based on RG 1.183, Appendix A, Section 6.1).

The deposited aerosol on the inboard main steam line pipe surface may be subject to evaporation and could become airborne due to the thermal ripple effect. Therefore, the evaporation of CsI is qualitatively assessed because it represents 95% of the total core iodine release.

Table 5 of the LOCA analysis (Enclosure A) provides the steam line temperatures as a function of time used in the determination of elemental removal factors in the main steam line. These temperatures are derived from Reference A-9 of RG 1.183 by J.E. Cline on MSIV iodine transport (Reference 4). RG 1.183 Appendix A, Position 6.5, states that J.E. Cline provides guidance on acceptable models for steam line deposition. The maximum temperature used in the LOCA analysis, as derived from J.E. Cline, is 557.9°F. Therefore, it is reasonable to expect the main steam line maximum temperatures to be less than 600°F.

Metcalf (Reference 14) conservatively estimated the piping steel temperature rise due to fission product deposition to be 0.5°F /hr. Without considering radioactive decay and heat loss, a bounding temperature rise during the accident period of 720 hr would therefore be 360°F. Di Lemma et al (Reference 15) suggests the vaporization threshold is greater than 1,456°F for CsI. Given these considerations, it is very unlikely that temperatures in the main steam line will be sufficient to vaporize the deposited aerosols.

A total of 200 scfh MSIV leakage is assumed to occur in the following manner:

1. MSIV failed MSL:

    - MSIV leakage is increased from 24 scfh (CLB) to 100 scfh.
    - Horizontal piping surface area and volume of the MSL upstream of inboard MSIV are credited for aerosol deposition. A well-mixed volume in this line is between the RPV nozzle and outboard MSIV.
    - Horizontal piping surface area and volume of the MSL between the outboard MSIV and TSV are credited for aerosol deposition. A second well-mixed volume in this line is between the outboard MSIV and TSV.
    - The airborne elemental iodine in the MSIV release path is assumed to be adsorbed on the entire MSL piping volume surface area.
    - No credit is taken for an explicit holdup time in the MSIV failed MSL. Instead, two well-mixed volumes are modeled as described previously.

2. First shortest intact MSL:

    - MSIV leakage is increased from 72 scfh to 100 scfh.
    - Horizontal piping surface area and volume of the MSL between the RPV nozzle and inboard MSIV are credited for aerosol deposition. One well-mixed volume in this line is between the RPV nozzle and inboard MSIV.
    - Horizontal piping surface area and volume of the MSL between the inboard MSIV and TSV are credited for aerosol deposition. A second well-mixed volume in this line is between the inboard MSIV and TSV.
    - The airborne elemental iodine in the MSIV release path is assumed to be adsorbed on the entire MSL piping volume and surface area.
    - No credit is taken for an explicit holdup time in the intact MSLs. Instead, two well-mixed volumes are modeled as described previously.

3. Second shortest intact MSL:

    - 0 scfh through the third MSL is assumed.

4. Third shortest intact MSL:

    - 0 scfh through the fourth MSL is assumed.

<u>MSIV Leakage Rate in Various Main Steam Line Volumes</u>

The total MSIV leakage from all main steam lines is 200 scfh measured at 40 psig, which is modeled in the LOCA analysis as a maximum of 100 scfh from any one of the four main steam lines. Modeling the MSIV leakage as 100 scfh in the failed line and 200 scfh total is conservative relative to the proposed technical specification MSIV leakage of 50 scfh per line, while maintaining the same total leakage rate of 200 scfh.

Since the actual MSIV leak rate is reduced at the accident condition due to the combined effects of compression (due to the high pressure) and expansion (due to the high temperature), the increase in the MSIV leak rates to the environment from the outboard MSIVs are calculated using the Ideal Gas Law and drywell post-LOCA peak pressure and temperature. The MSIV leak rates are used in the analysis with the TEARE calculated based on the horizontal pipe surface areas and the 20-group probabilistic distribution of settling velocities.

A 50% reduction in the containment leakage and MSIV leakage 24 hours after the onset of a LOCA is credited in the analysis based on the reduction in pressure seen in the containment pressure response and the corresponding leakage flow rates at accident pressure (Reference 2, Appendix A, Section 6.2), but the leak rate reduction is conservatively not credited in the calculation of aerosol deposition removal rates. This is consistent with the assumption used in the evaluation that was approved in Reference 1.

Elemental Iodine Removal Rate

The NRC has consistently accepted the use of a 50% elemental iodine removal efficiency in the MSIV leakage release path for the entire duration of the accident based on the information used in AEB-98-03 (Reference 3) for AST license amendments. Consequently, the CLB analysis uses a 50% elemental iodine removal efficiency for the MSIV and system bypass release paths. In order to address the possibility of the elemental iodine removal efficiency being lower than 50% during the first 24 hours to 48 hours of the accident, time-dependent elemental iodine removal efficiencies are established and used in the revised LOCA analysis.

The gaseous iodine tends to deposit on the piping surface by chemical adsorption. The elemental iodine being the most reactive has the highest deposition rate. The iodine deposited on the surface undergoes both physical and chemical changes and can be re-emitted as an airborne gas (re-suspension) or permanently fixed to the surface (fixation). RG 1.183, Appendix A, Section 6.5, indicates that Reference 4 (J.E. Cline paper) provides acceptable models for deposition of iodine on the pipe surface. The J.E. Cline methodology is used to calculate the time-dependent deposition and resuspension rates of elemental iodine for the MSIV release paths (including the effects of decreasing temperature) in the revised LOCA analysis. The calculated removal efficiency for the MSIV release pathway is also applied to system bypass pathways. The bounding elemental iodine removal efficiency at the beginning of the time interval is used for the entire duration of the interval.

Drywell Spray Adjustment

RG 1.183, Appendix A, Section 3.3, allows licensees to take reduction in airborne radioactivity in the containment by containment spray systems that have been designed and are maintained in accordance with Chapter 6.5.2 of the SRP (Reference 5). RG 1.183, Section 5.1.2 advises that,

> "Credit may be taken for accident mitigation features that are classified as safety-related, are required to be operable by technical specifications, are powered by emergency power sources, and are either automatically actuated or, in limited cases, have actuation requirements explicitly addressed in emergency operating procedures."

Drywell sprays are credited in the CLB LOCA analysis as described in Reference 1. The minimum particulate aerosol removal coefficient is calculated to be 19.8 per hour, consistent with the CLB. In the revised analysis, the aerosol removal is conservatively not credited after the decontamination factor (DF) of 50 is reached. Although the elemental iodine removal coefficient is always considerably higher than the particulate aerosol removal coefficient, it is conservatively assumed to be the same as the particulate aerosol removal coefficient, which is 19.8 per hour. Natural deposition of aerosols in the Drywell is conservatively not credited, consistent with the CLB.

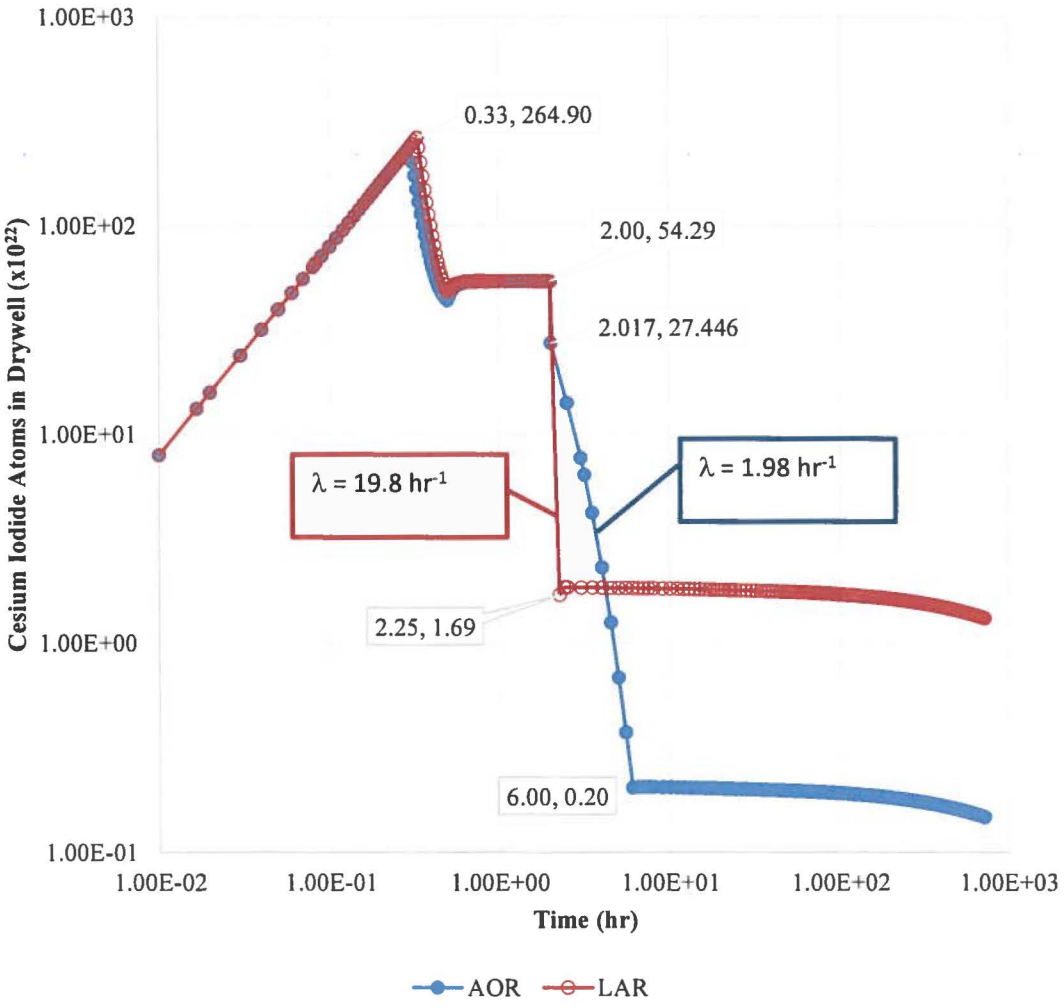
The iodine DF is defined as the maximum iodine concentration in the containment atmosphere divided by the concentration of iodine in the containment atmosphere at some time after decontamination (Reference 5, Section III.4.d). The effectiveness of the spray in removing elemental iodine is presumed to end when the maximum elemental iodine DF of 200 is reached. The post-LOCA maximum iodine concentration in the drywell occurs at the end of the Early-In-Vessel release phase, which is at 2.0 hours from the onset of a LOCA. The drywell spray is assumed to start at 0.333 hours (20 minutes) after the onset of a LOCA. The elemental iodine atoms and particulate iodine mass at 2.0 hours after the onset of a LOCA corresponds to the maximum concentrations of the elemental and particulate iodines in the drywell, which are divided by a factor 200 and 50 respectively, to determine the numbers of elemental iodine atoms and particulate mass and times when the corresponding DFs are reached. The revised LOCA analysis determines that the elemental iodine reaches a DF of 200 at 2.40 hours (CLB calculated 3.157 hours) and aerosol iodine mass reaches a DF of 50 at 2.25 hours (CLB calculated 2.017 hours).

Section J3.2.2 of NUREG-75/014 (Reference 13) provides the technical basis for the formula used in Section 6.5.2 of NUREG-0800 (Reference 5). NUREG-75/014 Section J3.2.2 also provides the correlation to determine spray lambdas. The spray lambda calculation assumes that diffusiophoresis is not a mechanism for spray removal. This is confirmed by Figure VII J-4 of NUREG-75/014. As previously discussed, the main steam line aerosol removal model does not include deposition by thermophoresis, diffusiophoresis, or flow irregularities. Therefore, it is reasonable to consider the use of aerosol removal by sprays and aerosol removal in the main steam lines as independent removal mechanisms because they rely on different physical mechanisms except for diffusiophoresis. However, neither the Drywell spray model nor the model for aerosol removal in the main steam lines consider removal by diffusiophoresis, which confirms the modeling is conservative with respect to the experimental data.

In the CLB the iodine removal efficiency of 19.8 per hour is reduced by a factor of ten at 2.017 hours. For elemental iodine the removal efficiency is terminated at 3.157 hours, while the aerosol removal efficiency is assumed to continue until 6.0 hours. In the revised LOCA analysis, the drywell spray removal of elemental iodine and aerosol is conservatively not credited after the respective DFs are reached. This change conservatively increases the drywell aerosol source term for MSIV leakage.

To assess the conservatism in the change in aerosol spray removal timing a sensitivity evaluation was performed as detailed in Enclosure A. An additional RADTRAD case was utilized with the CLB drywell spray removal timing to compare to the new proposed analysis. The models were adjusted to only model the CsI activity and the atoms present in the drywell were compared over time. The results are summarized in Figure 2 below and show the proposed analysis significantly increases the CsI activity in the drywell for most of the accident duration. The increased activity in the drywell due to the shorter spray duration is conservative for the MSIV dose. With a shorter spray duration, one can also expect a higher probability of larger particles remaining airborne because of the spray effectiveness of removing larger particles over smaller particles.

Figure 2 – Drywell CsI Activity Comparison



Holdup Time for Activity Releases via Main Steam Lines and System Bypass Lines from Drywell

The CLB LOCA analysis includes credit for holdup of activity releases via the main steam lines (based on MSIV leakage of 24 scfh per line) and system bypass lines from the drywell (feedwater, 14" containment purge, and reactor water cleanup). The delays credited in the CLB LOCA analysis are as follows:

- 5.26 hours for the steam line with one MSIV failed open
- 7.11 hours for the steam line with both MSIVs closed
- 2.45 hours for the bypass from the drywell

The revised LOCA analysis does not credit holdup of activity releases via the main steam lines and the bypass from the drywell. Instead, the MSLs are modeled using well-mixed volumes as described previously.

Standby Gas Treatment System Exhaust Rate

The reduction in containment leakage activity by dilution in 50% of the volume of the RB and removal by the SGT System filtration are credited consistent with the CLB. The SGT System engineered safety feature (ESF) grade charcoal and high efficiency particulate air (HEPA) filters are operable per TS 3.6.4.3, "Standby Gas Treatment (SGT) System," and tested per TS 5.5.7, "Ventilation Filter Testing Program (VFTP)," to maintain the filter integrity necessary to provide the desired performance during a radiological emergency to protect the health and safety of site personnel and that of the general public. The compliance to Generic Letter (GL) 99-02 (Reference 8) requires use of a safety factor of two (2) to calculate the filtration efficiency to be credited in the design basis analysis. The SGT System charcoal and HEPA filtration efficiencies are consistent with the CLB (i.e., 99%).

The SGT System exhaust flow rate varies from 3,600 cfm to 4,400 cfm, consistent with TS 5.5.7. The post-LOCA activity released via containment leakage from the drywell and wetwell and ESF leakage from the recirculation system in the RB leakage accumulates in the RB volume above the operating floor, which contributes to the direct shine dose to CR operators. An SGT System exhaust flow rate of 4,400 cfm (10% higher than the CLB value) is used in the LOCA revised dose analysis because it maximizes the CR and offsite doses.

This value of 4,400 cfm becomes non-conservative for the RB shine dose because it removes a larger amount of activity from the secondary containment volume leaving a lesser amount to contribute to the RB shine dose to CR personnel. Therefore, a value of 3,600 cfm (10% lower than the CLB value) is used in the RB shine analysis to maximize the post-LOCA activity confined above the RB operating floor, which conservatively increases the RB shine dose to the CR operators.

Control Room Envelope Filtration (CREF) System Actuation Delay

The CLB assumes a filtration initiation delay of 50 seconds. The revised LOCA dose analysis conservatively assumes a delay of 60 seconds prior to initiation of the CREF System.

Control Room Intake Flow Rates

The CLB dose analysis assumptions for the control room ventilation are summarized in Table 2.

Table 2 CLB CR Intake Flow and Timing:

Time	Intake Flow (cfm)	Recirculation Flow (cfm)	Unfiltered Inleakage (cfm)
0 to 50 seconds	2,750 unfiltered	0	250
50 seconds to 20 minutes	2,750 filtered	675 filtered	250
20 minutes to 720 hours	1,650 filtered	675 filtered	250

The control room operator dose is sensitive to control room ventilation flow rate and filter timing. A sensitivity analysis was performed to determine the appropriate and conservative flow rate and filter timing to use in the revised LOCA dose analysis.

The results of this sensitivity analysis concluded that the parameters in Table 3 result in the highest CR doses. Therefore, for conservatism, the flow rates and filter timings used in the revised LOCA analysis correspond to the Table 3 values. It is noted that this scenario does not require a flow rate reduction at 20 minutes post-LOCA and operator action to secure one ventilation train as the CLB assumes.

Table 3 Revised CR Intake Flow and Timing:

Time	Intake Flow (cfm)	Recirculation Flow (cfm)	Unfiltered Inleakage (cfm)
0 to 60 seconds	750 unfiltered	0	250
60 seconds to 720 hours	1,350 filtered	675 filtered	250

Core Inventory

The core inventory used as an input to the revised LOCA analysis increased the core average exposure envelope. In addition, a higher uranium core weight (149 MTU) was assumed. ORIGEN-ARP was used to analyze CAVEX of up to 37 GWD/MTU at 3.7 weight percent (wt%) U-235 and 41 GWD/MTU from 4 wt% to 4.5 wt%. The core inventory represents a conservative input change to the AST LOCA analysis. The core inventory change will allow margin for future core design optimization and flexibility.

Summary

The revised LOCA dose consequence analysis performed in support of this license amendment request is based on the analysis previously approved by the NRC in Reference 1. The revised analysis includes the changes listed in Table 1 and described in further detail above. The results of the revised LOCA analysis indicate that the total post-LOCA Exclusion Area Boundary (EAB), Low Population Zone (LPZ), and Control Room (CR) doses are within their allowable Total Effective Dose Equivalent (TEDE) limits (Table 4). The results are higher than the ones

approved in Reference 1; however, significant margin to the regulatory limits specified in 10 CFR 50.67 is still available.

Table 4: LOCA Radiological Consequences Results

Post-LOCA Activity Release Path	Post-LOCA TEDE Dose (Rem) Receptor Location		
	Control Room	EAB	LPZ
Containment Leakage	4.67E-01	3.12E-01 (occurs @ 0.0 hr)	3.63E-01
ESF Leakage	3.48E-01	1.85E-01 (occurs @ 16.1 hr)	1.79E-01
MSIV Bypass Leakage	6.35E-01	1.38E-01 (occurs @ 8.0 hr)	1.81E-01
Drywell Bypass Leakage	6.97E-01	4.11E-01 (occurs @ 0.8 hr)	1.79E-01
Wetwell Bypass Leakage	1.71E-02	2.49E-02 (occurs @ 2.0 hr)	1.18E-02
Containment Shine	6.73E-02	N/A	N/A
External Cloud Shine	1.42E-01	N/A	N/A
CR Filter Shine	Negligible	N/A	N/A
Total	**2.37E+00**	**1.07E+00**	**9.14E-01**
Allowable TEDE Limit	**5.00E+00**	**2.50E+01**	**2.50E+01**

The impact of the proposed amendment on habitability of the Technical Support Center (TSC) following a LOCA has also been evaluated. The TSC post-LOCA radiological consequence analysis is based on the AST methodology (Reference 1) and the models associated with the revised AST LOCA radiological analysis. The evaluation of the proposed activity concluded that the combined 30-day inhalation, immersion, and shine doses do not exceed 5 rem TEDE.

The impact of the increase in the MSIV leakage rate on compliance with 10 CFR 50.49, "Environmental qualification of electrical equipment important to safety for nuclear power plants," has been evaluated. The radiation dose source term basis for the EQ analyses is TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites," consistent with the CLB and Reference 1. Only areas outside of Secondary Containment (SC) are potentially impacted by increased MSIV leakage.

The evaluation of EQ impacts outside SC included updating the EQ dose analyses with revised airborne doses resulting from increased MSIV leakage. Revised total integrated doses (TID) for all EQ zones outside of SC were determined using updated post LOCA doses and 60-year normal doses. The revised EQ zone TIDs were compared to the current zone doses and the EQ zone classification thresholds [Mild: TID < 1.0E+3 rads; Mild Except for Electronics (ME): 1.0E+3 < TID < 1.0E+4 rads; Harsh: TID > 1.0E+4 rads]. The analyses and evaluation confirmed that no EQ zones transition from Mild to ME, and that no zones transition from ME to Harsh. Based on no zones transitioning there is no new equipment that needs to be evaluated for inclusion in the EQ Program.

For each EQ zone outside of SC that is currently classified as ME or Harsh based on the TID, all environmental qualification document packages (EQDP) containing equipment in those zones were identified and reviewed for impact. The ME and Harsh areas outside SC that contain EQ equipment are zones in the SGT Building in proximity to the SGT filters, in the Control Building (CB) near the emergency ventilation filters, in the Auxiliary Service Building (ASB), and in the Screenwell Area (SA). In the case of the zones in the SGT Building, the increased airborne dose from the change in MSIV leakage is negligible compared to the current TID, in which the dose primarily comes from filter shine. Regarding the CB zones, the equipment in question is a temperature indication controller that is installed in several other EQ zones, including some inside SC. The TID associated with the zones inside SC where these controllers are installed bounds the updated TID to the CB zones. For the ASB zones, the EQ equipment is a flow switch that is also installed in SC zones. The TID associated with the zones inside SC where these switches are installed bounds the updated TID to the ASB zones. Similarly, for the SA, the EQ equipment of interest (level switches), are also installed in zones inside containment, which have TIDs that bound the revised TID to the SA. As such, equipment already included in the EQ program continues to be qualified for the radiological environment resulting from the increased allowable MSIV leakage.

The impact of the increase in the MSIV leak rate limit on post-accident vital area access (NUREG-0737, Item II.B.2) has also been evaluated. The radiation dose source term basis for the vital area access analyses is TID-14844, consistent with the CLB and Reference 1. The main steam line leakage pathways have a relatively limited contribution to the NMP2 vital area dose rates and doses. The evaluation confirms that doses are less than the 10 CFR 50, Appendix A, General Design Criteria 19 limits and, therefore, vital area access is maintained.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 50.36(c)(3), "Surveillance requirements," states that SRs are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. The proposed changes to TS SR 3.6.1.3.11 and SR 3.6.1.3.12 continue to ensure that leakage through the bypass leakage pathways and the main steam lines is maintained within the values assumed in the LOCA radiological consequence analyses and, therefore, the limiting conditions for operation will be met.

10 CFR 50.49, "Environmental qualification of electric equipment important to safety for nuclear power plants," identifies requirements for establishing a program for qualifying electric equipment that is important to safety as defined in 10 CFR 50.49(b). The EQ dose analyses performed by NMP2 demonstrate that equipment in the EQ Program continues to be qualified for the updated radiation environment as a result of the proposed increased MSIV leakage. The analyses also demonstrate that no new equipment needs to be added to the EQ Program and no existing EQ zones change their current classification.

10 CFR 50.67, "Accident source term," establishes acceptable radiation dose limits resulting from design basis accidents for an individual located at the exclusion area boundary or low population zone, and for occupants of the control room. The analyses performed by NMP2 demonstrate that the calculated radiological consequences of a design basis LOCA with increased leakage through the main steam lines meet the radiation dose limits specified in 10 CFR 50.67.

10 CFR 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," describes test requirements that provide assurance that the primary containment, including those systems and components that penetrate the primary containment, do not exceed the allowable leakage rate values specified in the TS and their associated bases. The proposed amendment maintains compliance with the requirements of 10 CFR 50, Appendix J.

Regulatory Guide (RG) 1.183, dated July 2000, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," provides guidance for implementation of 10 CFR 50.67, including assumptions and methods that are acceptable to the NRC staff for performing design basis radiological analyses using an AST.

Regulatory Issue Summary (RIS) 2006-04, "Experience with Implementation of Alternative Source Terms," provides guidance to ensure that the appropriate level of technical detail is considered in AST analyses and included in AST submittals.

Standard Review Plan (SRP) 15.0.1, "Radiological Consequence Analyses Using Alternative Source Terms," describes the review plan for amendments implementing AST for radiological consequences.

The NMP2 radiological consequence analyses performed for design basis accidents have utilized the guidance in RG 1.183, RIS 2006-04, and in SRP 15.0.1. In Reference 1 the NRC concluded that the proposed implementation of AST at NMP2 was acceptable and that there was reasonable assurance that the radiation doses calculated by NMP2 complied with the requirements of 10 CFR 50.67 and the guidance of RG 1.183. The analyses performed for the proposed amendment continue to follow the guidance in RG 1.183 and use the same assumptions and methods approved by the NRC in Reference 1, with the exception of the changes provided in Table 1.

NUREG-0737, "Clarification of TMI Action Requirements," is a letter to licensees of operating power reactors and applicants for operating licenses containing post-Three Mile Island (TMI) requirements, which have been approved for implementation. Included in NUREG-0737 are requirements for providing for adequate access to vital areas throughout the facility. The requirements include dose rate criteria for personnel in vital areas requiring continuous occupancy post-accident and vital areas requiring infrequent access post-accident. The NMP2 vital area calculations confirm that vital area access is maintained consistent with NUREG-0737 when accounting for the proposed increase in MSIV leakage.

Based on the considerations discussed above, it is concluded that, (1) there is a reasonable assurance that the health and safety of the public will not be endangered by operating in the proposed manner, (2) activities will be conducted in compliance with NRC regulations, and (3) the approval and issuance of this proposed amendment will not be inimical to the common defense and security of the health and safety of the public.

4.2 No Significant Hazards Consideration Analysis

Exelon Generation Company, LLC (Exelon) is requesting an amendment to the Renewed Facility Operating License No. NPF-69 for Nine Mile Point Unit 2 (NMP2). The proposed amendment would revise Technical Specification (TS) Section 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," by revising Surveillance Requirement (SR) 3.6.1.3.12 for main steam

isolation valve (MSIV) leakage rate. The current leakage rate limit of less than or equal to 24 standard cubic feet per hour (scfh) for each MSIV would be revised to allow a leakage rate of less than or equal to 50 scfh for each MSIV. The total allowable main steam line leakage rate through all four steam lines would increase from 96 scfh to 200 scfh.

In addition, since the revised Loss of Coolant Accident (LOCA) analysis does not credit delays of activity releases via the bypass from the drywell (feedwater, 14" containment purge, and reactor water cleanup), SR 3.6.1.3.11 is revised by consolidating the total bypass from the drywell without accounting for delays. Small changes to the total drywell and wetwell bypass leakage rates in SR 3.6.1.3.11 are made to support the revised Alternative Source Term (AST) LOCA radiological analysis.

Exelon has evaluated the proposed change against the criteria of 10 CFR 50.92(c) to determine if the proposed change results in any significant hazards. The following is the evaluation of each of the 10 CFR 50.92(c) criteria:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The increase in the total MSIV leakage rate limit has been evaluated in a revision to the analysis of the LOCA radiological consequences. Based on the results of the analysis, it has been demonstrated that, with the requested change, the dose consequences of this limiting Design Basis Accident (DBA) are within the regulatory guidance provided by the NRC for use with the AST. This guidance is presented in 10 CFR 50.67, Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," Regulatory Issue Summary (RIS) 2006-04, and Standard Review Plan (SRP) Section 15.0.1.

   The proposed changes to the MSIV leakage limit and the consolidation of the bypass drywell leakage do not involve physical change to any plant structure, system, or component. As a result, no new failure modes of the MSIVs have been introduced.

   The proposed changes do not affect the normal design or operation of the facility before the accident; rather, it affects leakage limit assumptions that constitute inputs to the evaluation of the accident consequences. The radiological consequences of the analyzed LOCA have been evaluated using the plant licensing basis for this accident. The results conclude that the control room and offsite doses remain within applicable regulatory limits. The effect of the proposed changes on Environmental Qualification (EQ) and vital area access doses have also been evaluated. The proposed increase in MSIV leak rate does not require any new components to be evaluated for inclusion in the EQ program and all components currently in the program remain qualified for their environments. The dose rates and doses to personnel performing vital area tasks post-LOCA remain within acceptance criteria with the proposed change.

   Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   The change in the MSIV leakage rate limits and the consolidation of the drywell bypass leakage do not affect the design, functional performance or normal operation of the facility. Similarly, these changes do not affect the design or operation of any component in the facility such that new equipment failure modes are created. As such, the proposed changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No

   This proposed license amendment involves changes in the MSIV leakage rate limits and consolidation of the drywell bypass leakage. The revised leakage rate limits are used in the LOCA radiological analysis in conjunction with the revised inputs/methodologies described in Section 3.0 above. The delay in the drywell bypass leakage is not credited in the revised LOCA analysis. The analysis has been performed using conservative methodologies. Safety margins and analytical conservatisms have been evaluated and have been found acceptable. The analyzed LOCA event has been carefully selected and margin has been retained to ensure that the analysis adequately bounds the postulated event scenario. The dose consequences of this limiting event are within the acceptance criteria presented in 10 CFR 50.67, Regulatory Guide 1.183, and NRC SRP Section 15.0.1. The margin of safety is provided by meeting the applicable regulatory limits. The effect of the revision to the Technical Specification requirements has been analyzed and doses resulting from the pertinent design basis accident have been found to remain within the regulatory limits. The change continues to ensure that the doses at the exclusion area and low population zone boundaries, as well as the control room, are within the corresponding regulatory limits.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.

4.3 Conclusions

Based on the considerations discussed above: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

The proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. Letter from Richard V. Guzman (U.S. NRC) to Keith J. Polson, Nine Mile Point Nuclear Station, Unit 2 - Issuance of Amendment Re: Implementation of Alternative Radiological Source Term (TAC No. MD5758), dated May 29, 2008 (ADAMS Accession No. ML081230439)

2. Regulatory Guide 1.183, Alternative Radiological Source Terms for Evaluating design Basis Accidents at Nuclear Power Reactors, dated July 2000

3. AEB-98-03, Assessment of Radiological Consequences for the Perry Pilot Plant Application Using the Revised (NUREG-1465) Source Term.

4. J.E. Cline, MSIV Leakage Iodine Transport Analysis, Letter Report dated March 26, 1991 (ADAMS Accession Number ML003683718)

5. NUREG-0800, Standard Review Plan, "Containment Spray as a Fission Product Cleanup System," SRP 6.5.2, Revision 2, 1988

6. NMP2 USAR, Section 15.6.5, Revision 23, "Loss-of-Coolant Accidents (Resulting from Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary) Inside Primary Containment"

7. Nine Mile Point Unit 2, Technical Specifications

8. NRC Generic Letter 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," USNRC, dated June 3, 1999 (ADAMS Accession No. ML082350935)

9. NRC Regulatory Issue Summary 2006-04, "Experience with Implementation of Alternative Source Terms," March 7, 2006

10. Letter from Kahtan N. Jabbour (U.S. NRC) to Christopher M. Crane, Clinton Power Station, Unit 1 – Issuance of an Amendment Re: Application of Alternative Source Term Methodology (TAC No. MB8365), dated September 19, 2005 (ADAMS Accession No. ML052570461)

11. Letter from Richard V. Guzman (U.S. NRC) to Christopher M. Crane, Limerick Generating Station, Units 1 and 2 – Issuance of Amendments Re: Application of Alternative Source Term Methodology (TAC Nos. MC2295 and MC2296), dated August 23, 2006 (ADAMS Accession No. ML062210214)

12. Letter from Christopher Gratton (U.S. NRC) to Michael J. Pacilio, LaSalle County Station, Units 1 and 2 – Issuance of Amendments Re: Application of Alternative Source Term Methodology (TAC Nos. ME0068 and ME0069), dated September 6, 2010 (ADAMS Accession No. ML101750625)

13. WASH-1400 (NUREG-75/014), "Reactor Safety Study, An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants, Appendices VII, VIII, IX, and X," October 1975 (ADAMS Accession No. ML070600376)

14. International Society of Nuclear Air Treatment Technologies, 31st Nuclear Air Cleaning Conference, 19-21 July, 2010, "BWR Steam Line Radionuclide Concentration Distribution following a DBA LOCA," J.E. Metcalf & P.B. Perez (ADAMS Accession No. ML102380174)

15. Journal of Nuclear Materials, Volume 465, October 2015, Pages 127-134, "Fission Product Partitioning in Aerosol Release from Simulated Spent Nuclear Fuel," by F.G. Di Lemma, J.Y. Colle, G. Rasmussen, and R.J.M. Konings

ATTACHMENT 2

License Amendment Request

Nine Mile Point Nuclear Station Unit 2

Docket No. 50-410

Proposed Technical Specification Marked-Up Pages

3.6.1.3-12
3.6.1.3-13

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.6	Perform leakage rate testing for each primary containment purge valve with resilient seals.	In accordance with the Surveillance Frequency Control Program AND Once within 92 days after opening the valve
SR 3.6.1.3.7	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.6.1.3.8	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.9	Verify a representative sample of reactor instrumentation line EFCVs actuates to the isolation position on an actual or simulated instrument line break signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.10	Remove and test the explosive squib from each shear isolation valve of the TIP System.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.11	Verify the leakage rate for the secondary containment bypass leakage when pressurized to ≥ 40 psig is: a. Bypass (Drywell): ≤ ~~6.74~~ 36.88 SCFH; and b. Bypass (Suppression Chamber): ≤ ~~1.67~~ 1.66 SCFH; and ~~c. Bypass (Drywell with delays): ≤ 28.17 SCFH~~	In accordance with 10 CFR 50 Appendix J Testing Program Plan

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.12	Verify leakage rate through each MSIV is ≤ ~~24~~ scfh when tested at ≥ 40 psig. 50	In accordance with 10 CFR 50 Appendix J Testing Program Plan
SR 3.6.1.3.13	Verify combined leakage rate through hydrostatically tested lines that penetrate the primary containment is within limits.	In accordance with 10 CFR 50 Appendix J Testing Program Plan

ATTACHMENT 3

License Amendment Request

Nine Mile Point Nuclear Station Unit 2

Docket No. 50-410

Revised Technical Specification Pages (Clean Pages)

3.6.1.3-12
3.6.1.3-13

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.6	Perform leakage rate testing for each primary containment purge valve with resilient seals.	In accordance with the Surveillance Frequency Control Program AND Once within 92 days after opening the valve
SR 3.6.1.3.7	Verify the isolation time of each MSIV is ≥ 3 seconds and ≤ 5 seconds.	In accordance with the Inservice Testing Program
SR 3.6.1.3.8	Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.9	Verify a representative sample of reactor instrumentation line EFCVs actuates to the isolation position on an actual or simulated instrument line break signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.10	Remove and test the explosive squib from each shear isolation valve of the TIP System.	In accordance with the Surveillance Frequency Control Program
SR 3.6.1.3.11	Verify the leakage rate for the secondary containment bypass leakage when pressurized to ≥ 40 psig is: a. Bypass (Drywell): ≤ 36.88 SCFH; and b. Bypass (Suppression Chamber): ≤ 1.66 SCFH; and	In accordance with 10 CFR 50 Appendix J Testing Program Plan

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.1.3.12	Verify leakage rate through each MSIV is ≤ 50 scfh when tested at ≥ 40 psig.	In accordance with 10 CFR 50 Appendix J Testing Program Plan
SR 3.6.1.3.13	Verify combined leakage rate through hydrostatically tested lines that penetrate the primary containment is within limits.	In accordance with 10 CFR 50 Appendix J Testing Program Plan

ATTACHMENT 4

License Amendment Request

Nine Mile Point Nuclear Station Unit 2

Docket No. 50-410

Proposed Technical Specification Bases Changes (Marked-Up Pages)
(For Information Only)

B 3.6.1.3-19

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.1.3.12

The analyses in Reference ~~1~~ are based on leakage that is less than the specified leakage rate. Leakage through each MSIV must be ≤ ~~24~~ scfh when tested at 40 psig. ~~This ensures that MSIV leakage is properly accounted for in determining the overall primary containment leakage rate.~~ The Frequency is required by the 10 CFR 50 Appendix J Testing Program Plan.

~~MSIV leakage is considered part of L_a.~~

SR 3.6.1.3.13

Surveillance of hydrostatically tested lines provides assurance that the calculation assumptions of Reference 1 are met. The acceptance criteria for the combined leakage of all hydrostatically tested lines is 1 gpm times the total number of hydrostatically tested PCIVs when tested at ≥ 1.10 P_a (43.73 psig). The combined leakage rates must be demonstrated in accordance with the leakage test Frequency required by the 10 CFR 50 Appendix J Testing Program Plan.

REFERENCES

1. Technical Requirements Manual.
2. USAR, Section 15.6.5.
3. USAR, Section 15.6.4.
4. USAR, Section 15.2.4.
5. 10 CFR 50.36(c)(2)(ii).
6. USAR, Section 6.2.4.3.2.
7. 10 CFR 50, Appendix J Option B.
8. H21C-106, "Unit 2 LOCA w/LOOP AST Methodology"

ENCLOSURE A

License Amendment Request

Nine Mile Point Nuclear Station Unit 2

Docket No. 50-410

H21C-106, Revision 3, "Unit 2 LOCA w/LOOP, AST Methodology"

ATTACHMENT 1
Design Analysis Cover Sheet

Design Analysis		Last Page No. [6] 576	
Analysis No.: [1]	H21C-106	Revision: [2] 3 Major ☒	Minor ☐
Title: [3]	Unit 2 LOCA w/LOOP, AST Methodology		
ECP No.: [4]	ECP-18-000616	Revision: [5] 0	

Station(s): [7]	NMP	Component(s): [14]	
Unit No.: [8]	2		
Discipline: [9]	CR		
Descrip. Code/Keyword: [10]	AST		
Safety/QA Class: [11]	SR		
System Code: [12]	N/A		
Structure: [13]	N/A		

CONTROLLED DOCUMENT REFERENCES [15]

Document No.:	From/To	Document No.:	From/To
Refer to References in Section 9.0	From	H21C105	To
USAR Ch. 15.6	To		
PR-C-27-S	To		

Is this Design Analysis Safeguards Information? [16] Yes ☐ No ☒ If yes, see SY-AA-101-106

Does this Design Analysis contain Unverified Assumptions? [17] Yes ☐ No ☒ If yes, ATI/AR#:

This Design Analysis SUPERCEDES: [18] Revision 2 in its entirety.

Description of Revision (list changed pages when all pages of original analysis were not changed): [19] This revision evaluates the post-LOCA doses due to two levels of increased MSIV leak rate criteria of 400 scfh & 200 scfh using mainly CR dose margin, crediting the seismically supported inboard MSL piping and piping between the outboard MSIV and TSV, using a 20-group probabilistic distribution of settling velocity, and resulting total effective aerosol removal efficiency (TEARE). This is a major revision, which is completely re-written. See page 2.

Preparer: [20]	Gopal J. Patel (NUCORE)		05/29/2019
	Print Name	Sign Name	Date
Method of Review: [21]	Detailed Review ☒	Alternate Calculations (attached) ☐	Testing ☐
Reviewer: [22]	Thomas J. Mscisz (NUCORE)		05/29/2019
	Print Name	Sign Name	Date
Review Notes: [23]	Independent review ☒	Peer review ☐	
	The document has been reviewed in its entirety and found to be acceptable. All recommended changes were minor in nature, having been discussed, accepted, and incorporated into the final document.		
(For External Analyses Only) External Approver: [24]	N/A	N/A	N/A
	Print Name	Sign Name	Date
Exelon Reviewer: [25]	N/A	N/A	N/A
	Print Name	Sign Name	Date
Independent 3rd Party Review Reqd? [26]	Yes ☐	No ☒	
Exelon Approver: [27]	John Massari		5/30/2019
	Print Name	Sign Name	Date

CALCULATION NO. H21C-106	REV. No. 3	PAGE NO. 2

REVISION HISTORY

Revision	Revision Description
0	Original Issue
1	Revision to add Appendix J
2	Revision to Appendix J and adds Appendices K, L and M
3	This revision evaluates the post-LOCA doses due to two increased MSIV leak rate criteria of 400 scfh & 200 scfh by: 1. Using additional CR dose margin. 2. Crediting the seismically supported inboard MSL piping and piping between outboard MSIV and TSV. 3. Using a 20-group probabilistic distribution of settling velocity, and total effective aerosol removal efficiency (TEARE). 4. Eliminating the holdup times in the MSIV & system bypass leakage pathways. 5. Limiting the DW spray operation up to DF cutoff times of elemental & aerosol iodine. 6. Using the time-dependent elemental iodine removal efficiency. 7. Using two nodes of well mixed volumes in both MSIV leakage pathways - MSIV failed and intact MSLs. This is a major revision, which is completely re-written.

CALCULATION NO. H21C-106	REV. No. 3	PAGE NO. 3

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1.0 PURPOSE

The purpose of this calculation is to evaluate the post-LOCA Exclusion Area Boundary (EAB), Low Population Zone (LPZ), and Control Room (CR) doses for the Nine Mile Point Unit 2 (NMP2) using the increased Core Average Exposure (CAVEX) inventory, as-built reasonably conservative design inputs and assumptions, the optimized MSIV leak rate criteria of either 400 scfh or 200 scfh, the Alternative Source Term (AST), the guidance in Regulatory Guide (RG) 1.183 and Regulatory Issue Summary 2006-04, and Total Effective Dose Equivalent (TEDE) dose criteria.

This calculation is performed in a reasonably conservative manner for the following design basis post-LOCA release paths:

1. Containment Leakage + Traversing In-core Probe (TIP) Leakage (included as 0.12 volume % per day, based on the drywell free air volume)
2. Engineered Safety Feature (ESF) Leakage
3. Main Steam Isolation Valve (MSIV) & System Bypass Leakages

NMP2 received a NRC Safety Evaluation Report (SER) for license amendment 125 (Ref. 9.26.1) approving the adoption of Alternative Source Term (AST) methodology to be used for design basis accidents and implemented an Extended Power Uprate (Ref. 9.26.2). The AST LOCA analysis that supported the AST license amendment was performed in a very conservative manner with a large CR dose margin of 3.35 rem TEDE. Exelon learned that the excessive conservatisms in the analyses need to be reduced to a reasonably acceptable level and the excessive CR dose margin needs to be prudently utilized to improve the plant operational flexibility and simultaneously reduce the expensive maintenance costs of repairing the MSIVs during a refueling outage. The conservatisms in the design inputs are either added, multiplied, or compounded based on their interactions with each other within a given time domain to render the given CR dose margin. Therefore the CLB analysis is revised to effectively allocate the CR dose margin and reduce excessive conservatism to optimize the MSIV leak rates to reduce MSIV repair costs to operate the plant safely and economically while still maintaining the adequate CR dose margin to comply with the underlying regulations. There are two proposed MSIV leak rate criteria (400 scfh total and 200 scfh total), which are conservatively analyzed in the following sections. The total MSIV leak rate criterion of 200 scfh and resulting dose consequences in Section 8.2 will support the current NMP2 MSIV leak rate Technical specification (TS) amendment. The total MSIV leak rate criterion of 400 scfh and resulting dose consequences in Section 8.1 will be used if Exelon decides to increase the MSIV leak rate TS limit greater than 200 scfh in the future. The analysis in the following sections is performed for the bounding MSIV leak rate of 400 scfh and then revised by modifying it for the total MSIV leak rate of 200 scfh by further revising the MSIV leak rate in Table 3A, the TEARE efficiency in Table 4C and rerunning the RADTRAD run only for MSIV leakage release pathways 7 & 8 (Figure 1) using the MSIV leak rate and TEARE information in Tables 3A & 4C. The CR doses due to the containment & ESF leakage and reactor building (RB) shine are expected to be the same for both MSIV leak rates because they are independent of the MSIV leak rates, which bypass the RB. The external cloud dose for the MSIV leak rate of 400 scfh remains bounding for the MSIV leakage of 200 scfh. In essence, going from the MSIV leakage of 400 scfh to 200 scfh, other post-LOCA dose contributions either remain the same or are bounding for 200 scfh except the dose contribution from the MSIV leakage of 200 scfh, which was revised and resulting doses are listed in the results summary in Section 8.2.

The maintenance costs to repair the MSIVs are increasing from outage to outage. Therefore, the allowable MSIV leak rates established in the CLB analysis are optimized safely and prudently adopting the following changes:

1. Optimizing and effectively utilizing the CR dose margin of 3.35 rem TEDE in the CLB LOCA analysis.

2. Crediting QA Category 1 main steam piping (MSP) seismically designed and supported to withstand safe shutdown earthquake (SSE) that qualified them to be used for aerosol removal per RG 1.183, Appendix A, Section 6.5. The inboard MSP segments and those between the outboard and turbine stop valve (TSV) are credited for aerosol deposition (see Figure 3).

3. Using the 20-Group probabilistic distributions of settling velocities and total effective aerosol removal efficiencies (TEARE) for the MSIV leakage pathways to address the NRC potential concern about the use of the higher settling velocity for a large range of aerosol particle size that over estimates aerosol deposition. The CLB uses 3rd percentile aerosol settling velocity.

4. Using two (2) nodes of well mixed volumes in both MSIV leakage pathways eliminated the multiple in-series node configuration, which predicted to over-estimate the removal of aerosols in bypass leakage pathways. Instead, the CLB analysis uses no aerosol deposition in the MSIV failed line and aerosol deposition in main steam line (MSL) between the MSIVs for intact line.

5. Using the lessons learned from the NRC acceptance of the Exelon BWR fleet and Industry's other BWR AST license amendments.

This analysis continued maintaining the following existing conservatisms and regulatory compliance in the CLB analysis:

1. The containment and MSIV leakages are reduced after 24 hrs but conservatively the flow rate reduction is not credited for aerosol deposition.

2. The aerosol natural deposition in the drywell is conservatively not credited in this analysis.

3. Although the tracer gas test measures near zero unfiltered inleakage, 250 cfm unfiltered inleakage is used in this analysis.

4. Although, four (4) seismically supported MSLs are available for the MSIV leakage pathways, the MSIV leakage is distributed among two MSLs.

5. The system bypass leakages only credit the piping between the containment isolation valves (CIVs) for aerosol deposition. This is conservative, since the bypass pathway could be extended to the next seismic boundary.

The following additional conservatisms are added in this analysis:

1. The holdup times in the MSIV leakage and system bypass leakage are not credited in this analysis. *This change is conservative and will considerably increase the CR dose due to MSIV & system bypass releases.*

2. The drywell spray is not credited beyond the respective aerosol & elemental iodine cutoff times of 2.25 hrs and 2.40 hrs. The CLB analysis credited the spray for 6.0 hrs. *This change makes a larger portion of aerosol & elemental iodine available for the bypass leakage pathways.*

3. The use of 20-Group probabilistic distributions of settling velocities and total effective aerosol removal efficiencies provide a conservative treatment to removal of the aerosols having a wide

range of particle sizes (smaller to larger) and weight (heavier to lighter) in the MSIV & system bypass releases.

4. The use a 10% higher SGTS exhaust rate maximizes the doses from the containment and ESF leakages by releasing a larger amount of activity to the environment.

5. The use of a 10% lower SGTS exhaust rate maximizes the post-LOCA activity confined above the RB operating floor that increases the RB shine dose to the CR operator.

6. The use of time-dependent elemental iodine removal efficiencies using J.E. Cline methodology is conservative with respect to the 50% removal efficiency used in the CLB analysis (Table 5G).

7. The CREF is conservatively assumed to be initiated at 60 sec instead of 50 sec and lower intake and recirculation flow rates are used to increase the CR dose.

Consequently, this calculation radiologically balances the conservatisms in the analysis by appropriately allocating the CR dose margin and providing the appropriate treatment to removal of the aerosols having a wide range of particle sizes (smaller to larger) and weight (heavier to lighter). This analysis is more conservative than the previous analysis reviewed by the NRC.

2.0 METHODOLOGY AND ACCEPTANCE CRITERIA

The design basis loss of coolant accident is analyzed using a reasonably conservative set of assumptions and as-built design inputs parameters proven compatible for the AST and TEDE dose criteria. The numeric values of the critical design inputs are selected in a reasonably conservative manner to assure an appropriate and prudent safety margin to protect against unpredicted events in the course of an accident and to compensate for large uncertainties in facility parameters, accident progression, radioactive material transport, and atmospheric dispersion.

2.1 Post-LOCA Containment Leakage

2.1.1 Source Term

The composite model for all post-LOCA release pathways including the containment leakage release pathways is shown in Figure 1. The BWR core inventory fractions listed in Regulatory Guide 1.183, Table 1 are postulated to be released into the containment at the release timing shown in RG 1.183, Table 4 (Ref. 9.1, Sections 3.2 & 3.3). Since the post-LOCA minimum suppression chamber water pH is maintained greater than 7.0 (Ref. 9.12, Section 6.2), the chemical form of radioiodine released into the containment is assumed to be 95% cesium iodide (CsI), 4.85 percent elemental iodine, and 0.15 percent organic iodide (Ref. 9.1, Section A.2). With the exception of elemental and organic iodine and noble gases, the remaining fission products are assumed to be in particulate form (Ref. 9.1, Section 3.5). The fission product isotopic inventory for the increased Core Average Exposure (CAVEX) is obtained from Reference 9.6 and listed in Table 1 and in Design Input (DI) 5.3.1.3. The RADTRAD Nuclide Inventory File (NIF) is developed using the core isotopic activities from Table 1 and core thermal power level of 4,067 MWt (= 102% of 3,988 MWt Rated Thermal Power [RTP]). The NIF is used as a source term input for the RADTRAD3.03 computer code (Reference 9.2). The RADTRAD3.03 computer code is used to develop the post-LOCA radioactive release models. The validation & verification (V&V) of the RADTRAD3.03 code is documented in Reference 9.21. The RADTRAD NIF nmp2.nif (Attachment 13.14) is developed and used in this analysis. The source term design inputs are shown in Sections

5.3.1.1 through 5.3.1.7. The Release Fraction and Timing (RFT) File "bwr_dba.rft" (Attachment 13.15) is used in the analysis.

2.1.2 Transport In Primary Containment

The radioactivity released from the fuel is assumed to mix instantaneously and homogeneously throughout the free air volume of the primary containment as it is released as discussed below. The radioactivity release into the containment is assumed to terminate at the end of the Early In-Vessel phase, which occurs at the end of 2 hrs after the onset of a LOCA (Ref. 9.1, Table 4). The design inputs for the transport in the primary containment are shown in Sections 5.3.2.1 through 5.3.2.12.

The radioactivity released from the core is initially confined in the drywell volume of 3.062E+05 ft^3 during the first 2 hours of the LOCA, and then it gets distributed between the drywell and suppression chamber (wetwell) air volume of 1.908E+05 ft^3 after 2 hours, at which time the total volume of 4.97E+05 ft^3 is expected to become one well mixed volume following the restoration of core cooling system. The thermal-hydraulic conditions in the primary containment are expected to be quite active due to a very high flow established between the drywell and wetwell (pathways 1 & 2 in Figure 1) as a result of steaming and condensing phenomenon (Ref. 9.5, Table 2). The high flow between the drywell & wetwell is credited after two hours for the remaining duration of the accident to maintain the homogeneous distribution of activity in one well mixed volume. The containment and drywell represent the same compartment.

2.1.3 Reduction In Airborne Activity Inside Containment

2.1.3.1 Elemental Iodine & Aerosol Activity Removal in Containment

There are two independent mechanisms working simultaneously in the drywell for removal of airborne iodine activities, namely the natural deposition of aerosols by gravitation and removal of elemental and aerosol iodine activities by drywell spray. In accordance with Section 3.2 of Appendix A to RG 1.183 (Ref. 9.1), reduction in drywell airborne radioactivity by natural gravitational deposition within containment may be credited using the models described in NUREG/CR-6189 ("A Simplified Model of Aerosol Removal by Natural Processes in Reactor Containments") (Ref. 9.32), which is incorporated in the RADTRAD code. *However, the gravitational deposition of drywell airborne aerosols is conservatively not credited in the analysis.*

2.1.3.2 Iodine Removal by RHR Drywell Spray

RG 1.183, Appendix A, Section 3.3, allows licensees to take reduction in airborne radioactivity in the containment by containment spray systems that have been designed and are maintained in accordance with Chapter 6.5.2 of the SRP (Ref. 9.9). RG 1.183, Section 5.1.2 requires that credit may be taken for accident mitigation features that are classified as *safety-related*, are required to be *operable by technical specifications*, are *powered by emergency power sources*, and are *either automatically actuated or, in limited cases, have actuation requirements explicitly addressed in emergency operating procedures.* The drywell spray, alternatively called containment spray, is qualified to meet the above RG 1.183 requirement as follows:

1. The containment spray system is safety related (Ref. 9.30, Section 6.2.2.3.1.2).
2. Operable by TS 3.6.1.6, "Two RHR drywell spray subsystems shall be OPERABLE." (Ref. 9.17.1).

3. In case of LOOP, supplied with a redundant onsite standby power source (Ref. 9.30, Section 6.2.2.3.1.2).
4. The containment spray isolation valves are electrically interlocked to allow actuation of the drywell spray only when: 1) there is a LOCA signal or a system-level LPCI manual initiation signal, and 2) there is a high drywell pressure signal present. A second electrical interlock prevents actuation of either the drywell or suppression chamber spray lines until the corresponding LPCI injection valve is shut (Ref. 9.30, Section 6.2.2.3.1.2).
5. Containment spray cannot be initiated below 2 psig due to a pressure interlock permissive in the Unit 2 RHR control logic (Ref. 9.30, Appendix C, Section 8.2).

The drywell spray is manually started 20 minutes after onset of a LOCA (Section 5.8.4).

The first order removal coefficient for drywell spray for particulate aerosols can be determined by the following equation from Standard Review Plan 6.5.2 (Reference 9.9, Section III.4.C.4, page 6.5.2-11):
$\lambda_{S,Partic} = (3 \times h \times F \times E) / (2 \times V \times D)$
$\lambda_{S,Partic} = (3 \times h \times F) \times (E/D) / (2 \times V)$
where,
$\lambda_{S,Partic}$ = particulate aerosol removal coefficient by spray wash-out
h = spray drop fall height
F = spray flow
E/D = ratio of a dimensionless collection efficiency (E) to the average spray drop diameter (D)
V = containment building net free volume

The minimum particulate aerosol removal coefficient is calculated to be 19.8 hr^{-1} in Section 7.9. The aerosol removal is not credited after the DF of 50 is reached. Although, the elemental iodine removal coefficient is always considerably higher than the particulate aerosol removal coefficient, it is conservatively assumed to be the same as the particulate aerosol removal coefficient, which is 19.8 hr^{-1}.

Justification for Operation of Drywell Spray

As a result of a large break LOCA, the containment pressure will reach a maximum very early in the event sequence. Emergency Operating Procedures (EOPs) will be entered to start carrying out actions to protect the reactor core. At the same time, the AST accident sequence begins with fuel cladding failure starting at 2 minutes. In the AST scenario, fuel damage progressively worsens due the assumed inability to cool the reactor core, which is beyond the design basis requirements for the Emergency Core Cooling System (ECCS). As such, it is assumed that the operators will quickly transition to the Severe Operating Procedures (SAPs) and enter N2-SAP-1 (Ref. 9.25).

Following the symptoms-based procedure in N2-SAP-1, it is assumed that operators will enter No. 4, “Core debris cannot be retained in the RPV”. This is because the previous paths are not applicable because the RPV has not been breached and the ability to inject to the reactor core is not applicable at this stage in the assumed AST scenario.

Under the AST accident scenario, release associated with fuel melting starts at the start of the early-in-vessel stage at 30 minutes post-LOCA. N2-SAP-1 directs operators to use drywell and suppression chamber sprays by N2-SAP-2 (Ref. 9.34) for drywell temperature, primary containment pressure, radiation or hydrogen/oxygen control if the entry conditions are satisfied, including drywell/suppression pool chamber pressure greater than 0 psig. The entry conditions to spray via N2-SAP-2 will be satisfied within minutes of this event. Both the pressure and radiation will exceed SAP thresholds within minutes.

The radiation based entry condition for drywell spray is 6.0E+4 R/hr in the drywell (Ref. 9.34). The radiation level is based on minor revision 009718 (Ref. 9.35.1) to design analysis PR-C-24-O (Ref. 9.35) and corresponds to the General Emergency (GE) Emergency Action Level (EAL) for containment radiation monitors. The drywell source term for the GE EAL corresponds to gap release of 20% of the core noble gases (3% gap release) and halogens (2% gap release). The GE EAL is approximately 10% of the total AST gap inventory, which is released linearly from t=0 to 30 minutes. Thus, the GE EAL in the AST scenario will be exceeded at approximately 1/10th of the release duration or 3 minutes post-LOCA, which is comparable to the timeframe when the peak pressure will be reached. Once the radiation exceeds the GE EAL, it will take many hours to come back down due to the more substantial release that occurs from the fuel melting. Therefore, drywell spray entry conditions will be met for pressure and radiation within minutes of the LOCA, however it is conservatively assumed that the drywell spray is manually started 20 minutes after onset of a LOCA (Section 5.8.4).

After sprays are manually initiated, N2-SAP-2 spray criterion on radiation will require spray operation for an extended period of time, well after the fuel release is terminated. However, the sprays may require termination due to low drywell pressure. The termination criteria for sprays are specified in both N2-SAP-1 and N2-SAP-2 “before drywell pressure drops to 0 psig.”

The containment pressure is anticipated to remain above zero based on USAR containment analyses combined with the AST scenario which postulates significant fuel damage, including clad-water reaction, cladding perforation. Containment evaluations and combustible gas evaluations indicate a minimum pressure above zero will be reached within 10 minutes of the initial spray with containment pressure stabilizing above zero and then slowly increasing as the containment heats up and with the postulated hydrogen release associated with the fuel damage including the non-condensable gas buildup. Because the radiation levels will exceed the action level to spray the drywell based on the radiation criteria within the assumed 10 minute spray period where containment is depressurized, it can be assumed the operators will not secure the sprays. It is noted that the NMP2 containment spray system has an interlock that will prevent the operators from manually starting the sprays if the containment pressure is below 2 psig and therefore a precaution is appropriate to ensure operators continue to spray if in the N2-SAP-2 spray criterion on radiation and only secure sprays if pressure continue to trend to zero.

In summary, the above description provides adequate justification for the assumed operation of drywell spray from 20 minutes with the sprays continuing for at least 2.40 hours after the radiation levels exceed the N2-SAP-2 action level.

The iodine decontamination factor, DF, is defined as the maximum iodine concentration in the containment atmosphere divided by the concentration of iodine in the containment atmosphere at some time after decontamination (Ref. 9.9, Section III.4.d). The effectiveness of the spray in removing elemental iodine is presumed to end when the maximum elemental iodine DF of 200 is reached.

The post-LOCA maximum iodine concentration in the drywell occurs at the end of the Early-In-Vessel release phase, which is at 2.0 hrs from the onset of a LOCA. The isotopic elemental iodine atoms in the drywell represent the elemental iodine isotopic activities. Therefore, the containment leakage RADTRAD run NP2CL400.psf is modified simply by continuing the drywell spray elemental and particulate removal coefficients for the entire duration accident for 720 hrs in RADTRAD run NP2CL11.o0 to determine the time-dependent reduction in the drywell airborne elemental iodine atoms and aerosol (particulate) mass, which are listed in Table 1A. The DW spray is assumed to start at 0.333 hr (20 minutes) after the onset of a LOCA. The elemental iodine atoms and particulate iodine mass at 2.00 hrs after the onset of a LOCA corresponds to the maximum concentrations of the elemental and

particulate iodines in the drywell, which are divided by a factor 200 and 50 respectively, to determine the numbers of elemental iodine atoms & particulate mass and times when the corresponding DFs are reached. The review of Table 1A indicates the elemental iodine reaches a DF of 200 at 2.40 hrs and aerosol iodine mass reaches to a DF of 50 at 2.25 hrs. At these times, SRP 6.5.2 requires the spray removal of iodine to be terminated and the spray removal of aerosol be reduced by the factor of 10. The DW spray removal of elemental iodine and aerosol is conservatively not credited after the respective DFs are reached.

The containment leakage RADTRAD input file of NP2CL400.psf is developed using the cutoff time information in Table 1A and the elemental & aerosol removal coefficient of 19.8 hr^{-1}.

For the six MSIV leakage and system bypass leakage models, the elemental removal rate for the time interval of 2.25 hrs to 2.40 hrs is conservatively modeled at the rate of 1.98 hr^{-1} even though the rate of 19.8 hr^{-1} described above is acceptable. This is an artifact of early model development and was retained through finalization of the model and results. Rather than change the six RADTRAD models it was justified this minor difference was acceptable as it is conservative. The effect of this modelling choice has virtually no impact on the results.

ADC-11-000648-CN-001 (Ref. 9.29.1) identifies an increase in valve leakage during the first few minutes after a LOCA event due to a lengthening of the closure time for certain isolation valves. The ECP identifies the leakage of 100 cfm during the first 5 minutes after onset of a LOCA.

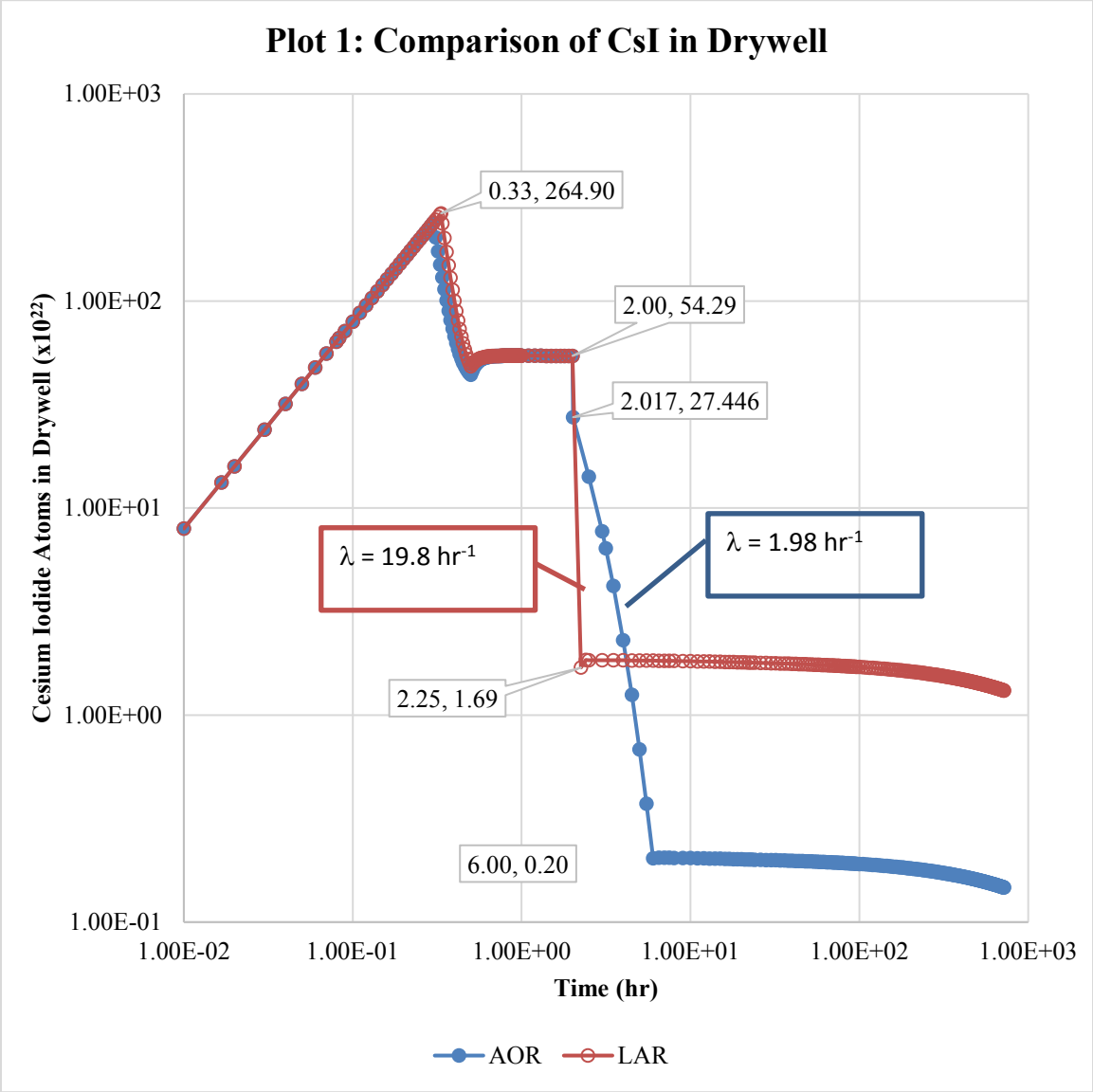
The release from the valves in question is from the WW, which does not contain the accident source until 2 hours into the accident. The above changes affect the containment leakage model only. This additional leakage from the isolation valve is expected to leak to the reactor building (RB) during the first few minutes when the RB is drawn down to establish sub-atmospheric pressure. Conservatively, the DW is postulated to leak to the RB (instead of WW) at a rate of 102.75 cfm (= 100 cfm valve leakage + 2.75 cfm DW leakage) for a duration of 5 minutes to leak additional core gap activity into RB volume, which is directly released to the atmosphere from the RB at the ground level release during the drawdown time at a rate of 2,670 cfm (Ref. 9.17.5). Note that this is conservative because the AST methodology in Regulatory Guide 1.183 (Reference 9.1) allows a 2 minute delay before the onset of the gap release phase, which is not credited and the release from the valves in question is from the wetwell, which does not contain the accident source (in the model) until 2 hours into the accident.

Aerosol Distribution in Drywell

The aerosol distribution in the drywell is evaluated for the analysis of record (AOR) case and the License Amendment Request (LAR) case in this analysis. To compare the aerosol distribution in the drywell, the MSIV leakage release models in both cases are made consistent with respect to the drywell and MSL nodal configurations with the case-specific design input parameters including the drywell spray cutoff times and aerosol removal filter efficiency in the MSL nodes. Release is only CsI per RG 1.183. The Cs is modeled as 7.2% of the total Cs activity based on use of molar fractions. The AOR case is developed by modifying the LAR MSIV leakage RADTRAD file NMP2MS201.psf by using the following: 1) Aerosol drywell spray model from the AOR is inserted and 2) main steam line aerosol deposition is recalculated using a 3rd percentile settling velocity using the MSL parameters. The newly developed RADTRAD file NMP2MSAOR.psf is used for the drywell aerosol distribution plot.

The 95% of 30% of the core iodine released during a LOCA is in the form of CsI, therefore, the CsI distribution in the drywell is evaluated for the LAR and OAR cases and compared to demonstrate that the LAR case is relatively bounding and provides a larger amount of aerosol in the drywell volume,

which is available for release to the MSIV leakage pathways. The aerosol distribution in the drywell for both cases is plotted in the following Plot 1.



2.1.4 Reduction In Airborne Activity Inside Secondary Containment

The reduction in containment leakage activity by dilution in 50% of the volume of the RB and removal by the SGTS filtration are credited. The SC and SGTS ESF grade charcoal and HEPA filters are operable per TS 3.6.4.1 and 3.6.4.3 (Ref. 9.17.2 & 9.17.3, respectively) and tested per NMP2 TS 5.5.7 (Ref, 9.17.4) to maintain the filter integrity necessary to provide the desired performance during the radiological emergency to protect the health & safety of site personnel and that of the general public. The compliance to Generic Letter (GL) 99-02 (Reference 9.13) requires use of a safety factor of 2 to calculate the filtration efficiency to be credited in the design basis analysis. The SGTS charcoal and HEPA filtration efficiencies of 99% are calculated in Section 7.8 and credited in this analysis. The SGTS exhaust flow rate varies 3,600 cfm to 4,400 cfm (Ref. 9.17.4). The larger SGTS flow rate of 4,400 cfm is used in the analysis to maximize CR & offsite doses but a lower SGTS flow rate of 3,600 cfm is conservatively used to maximize RB shine dose to CR.

2.1.5 Dual Containment

Leakage from the primary containment is assumed to mix in 50% of the reactor building (RB) free air volume. The 50% mixing effectively reduces the RB net free volume by 50% from when modeled for the containment & ESF leakage releases.

2.1.6 Containment Purging

2.1.6.1 Normal Containment Purging (NCP)

Per NMP2 Technical Specification (TS) Basis B3.6.1.6 (Ref. 9.17.6), the 12" and 14" primary containment purge (CP) valves are PCIVs that are qualified for use during all operational conditions. The 12 and 14 inch primary containment purge valves are normally maintained closed in MODES 1, 2, and 3 to ensure the primary containment boundary is maintained. However, the purge valves may be open when being used for pressure control, inerting, de-inerting, ALARA, or air quality considerations since they are fully qualified. These PC valves are required to open less than 5 seconds (Section 5.3.2.4 & Ref. 9.29.2, Attachment 5) and release the total containment air volume of 247.4 ft^3 (Section 5.3.2.4 & Ref. 9.29.2, Item 3.18). Traditionally, the NCP doses are negligible because:

1. The duration of purge is less than 5 seconds.
2. The contaminated air released during the NCP is 247.4 ft^3.
3. The reactor coolant activity is expected to be released during the NCP, which is multiple magnitudes smaller than the core activity.

The most conservative scenario is the occurrence of a LOCA while the NCP is in progress. This event would not last more than 5 seconds and during this time there will be no core activity available for release until 2 minutes after the onset of a LOCA (Ref. 9.1, Table 4). Therefore, this event is considered inconsequential.

2.1.6.2 Post-LOCA Containment Purging

Section 7 of Appendix A to R.G. 1.183 states that if post LOCA primary containment purging is performed as a combustible gas or pressure control measure or if primary containment purging is required within 30 days following a LOCA, then radiological consequences should be analyzed. It further states that if the containment purging capabilities are maintained for purposes of severe accident management and are not credited in any design basis analysis, then radiological consequences need not be evaluated. The NRC SER for TS improvement to eliminate requirements for hydrogen recombiners

and hydrogen/oxygen monitors using the consolidated line item improvement process TSTF-447 (Ref. 9.24), indicates that the revised 10 CFR 50.44 no longer defines a design-basis LOCA hydrogen release, and eliminates requirements for hydrogen control systems to mitigate such a release. The installation of hydrogen recombiners and/or vent and purge systems required by 10 CFR 50.44(b) (3) was intended to address the limited quantity and rate of hydrogen generation that was postulated from a design-basis LOCA. The Commission has found that this hydrogen release is not risk-significant because the design-basis LOCA hydrogen release does not contribute to the conditional probability of a large release up to approximately 24 hours after the onset of core damage. In addition, these systems were ineffective at mitigating hydrogen releases from risk-significant beyond design-basis accidents. Therefore, the Commission eliminated the hydrogen release associated with a design-basis LOCA from 10 CFR 50.44 and the associated requirements that necessitated the need for the hydrogen recombiners and *the backup hydrogen vent and purge systems*. Therefore, the post-LOCA containment purging is not a credible event that needs to be analyzed.

2.2 Post-LOCA ESF Leakage

The post-LOCA ESF leakage release model is shown in Figure 1. The ESF systems that recirculate suppression pool water outside of the primary containment are assumed to leak during their intended operation. This release source includes, but is not limited to, leakage through valve packing glands; pump shaft seals, flanged connections, and other similar components. The radiological consequences from this postulated leakage are analyzed in the following section and combined with the radiological consequences from other fission product release paths to determine the total calculated radiological consequences from the LOCA (see Section 8.1 of this calc). The ESF components are located in the RB.

2.2.1 Source Term

With the exception of noble gases, all the fission products released from the core to the containment (as defined in Sections 5.3.1.3 & 5.3.1.5) are assumed to instantaneously and homogeneously mix in the suppression pool water at the time of release from the core. The total ESF leakage from all components in the ESF systems is assumed to be 62 gpm or 8.29 cfm (Section 7.4) that includes 60 gpm of leakage associated with valves - 2RHS*MOV142, 2RHS*S0V35A, 2RHS*S0V36A, 2RHS*MOV149, 2RHS*S0V35B, & 2RHS*S0V36B (Ref. 9.4, Item 3.16) and l gpm of the system leakage, which was doubled per RG 1.183, Appendix A, section A.5.2 and assumed to start at time t = 0.0 minutes after the onset of a LOCA. With the exception of iodine, all remaining fission products in the recirculating liquid are assumed to be retained in the liquid phase. As such, ESF leakage is modeled as release of only iodine isotopes. Since the maximum suppression pool water temperature of 202^0F is less than 212ºF, 10% iodine activity in the ESF is assumed to become airborne (Ref. 9.1, Section A.5.5). 10% of iodine activity in the ESF leakage that becomes airborne (flashed in to the air) is modeled as a filter with a 90% of iodine removal efficiency in RADTRAD files NP2ES400.psf for elemental and organic iodine. The design inputs for the ESF leakage are shown in Section 5.4. The ESF leakage activity is assumed to mix in 50% of the RB volume and filtered by the SGTS filtration system.

2.2.2 Chemical Form

The radioiodine that is postulated to be available for release to the environment is assumed to be 97% elemental and 3% organic (Ref. 9.1, Section A.5.6).

2.3 Post-LOCA Bypass Leakages

2.3.1 MSIV Bypass Leakage

The MSL piping schematic is shown in Figure 2. The four main steam lines, which penetrate the primary containment, are automatically isolated by the MSIVs in the event of a LOCA. There are two MSIVs on each steam line, one inside containment is called an Inboard MSIV and one outside containment is called an Outboard MSIV. The MSIVs are functionally part of the primary containment boundary and design leakage through these valves provides release pathways for fission products that bypass the secondary containment and enter the environment as a ground-level release. The MSIVs are postulated to leak at a total design leak rate of either 400 scfh or 200 scfh. The radiological dose consequences from postulated MSIV leakage are analyzed and combined with dose consequences from other post-LOCA sources to determine the total post-LOCA dose (see Section 8.1 of this calc).

As stated in Section 1.0, the MSIV leak rate criteria are optimized prudently allocating the CR dose margin and reducing excessive conservatism in the design inputs.

The following CLB NMP2 plant-specific design inputs are modified in a reasonably conservative manner for the MSIV leakage path:

1. Using the 20-Group Probabilistic Distribution of Aerosol Settling Velocity
2. Crediting Aerosol Deposition in MSL Upstream of Inboard MSIV
3. Crediting Aerosol Deposition in MSLs Beyond the Outboard MSIVs
4. Crediting Time-dependent Elemental Iodine Removal

2.3.1.1 Using the 20-Group Probabilistic Distribution of Aerosol Settling Velocity

The review of various NRC AST Safety Evaluation Reports (SERs) addressed the following common concerns about the aerosol deposition in the MSLs:

1. Knowing characteristics used in AEB-98-03 (Ref. 9.5) and lack of further information, the NRC staff is concerned with how much deposition (i.e., what settling velocity value) is appropriate. The use of AEB-98-03 is acceptable to the NRC in accordance with RIS 2006-04 (Ref. 9.19), provided these concerns are addressed.

2. The settling would be expected to be at a lesser rate for the later sections of piping and at a later time considering that the larger and heavier aerosols would have already settled out of the main steam line atmosphere in upstream sections of piping.

The NRC concern is about the selection of a value of aerosol settling velocity, which is appropriate for removal of the aerosol particles having a wide range of particle sizes and weights. It means that a single value of settling velocity needs to be selected such that it covers the settling velocity range of 0.00021 m/s (10^{th} percentile) through 0.00148 m/s (60^{th} percentile) given AEB 98-03, Table A-1.

In response to these NRC concerns, this analysis implements a 20-group probabilistic settling velocity distribution rather than using a single median value from AEB-98-03, Table A-1. The same settling velocity probability distribution function shown in Equation (5) of AEB 98-03 is used to conservatively calculate aerosol settling velocity as follows:

$$u_s = \frac{\rho \cdot d_e^2 \cdot g \cdot C_s}{18 \cdot \mu \cdot k}$$

where:
u_s = settling velocity (cm/sec)
ρ = particle density (g/cm^3)
d_e = particle diameter (cm)
g = gravitational acceleration (cm/sec^2)
C_s = Cunningham Slip Factor (dimensionless)
μ = viscosity (g/cm-sec)
k = shape factor (dimensionless)

As stated in AEB-98-03 and discussed above, this equation is conservative because it does not consider such phenomena as thermophoresis, diffusiophoresis, flow irregularities, and hygroscopicity, which would all serve to increase the rate of aerosol deposition and reduce the settling velocity. As applied in this analysis, the settling velocity distribution in this equation is a function of a randomly sampled range of the three (3) critical aerosol parameters, density/weight (logarithmically distributed), diameter/size (uniformly distributed), and shape (uniformly distributed); and three (3) constants, gravitational acceleration, Cunningham slip factor, and viscosity. The range of each particle parameter is discussed and given in AEB-98-03. A spreadsheet was developed to perform this random sampling, using 10,000 randomly generated histories to ultimately generate a settling velocity distribution. Each of the 10,000 calculated settling velocities was given a probability of 1/10,000th, thereby making the cumulative fraction total to 1. A conservative 20-group step function was developed to approximate the continuous settling velocity distribution function calculated from the 10,000 histories. To ensure conservatism, this step-wise representation of the maximum settling velocity of a group is never allowed to exceed the value that defines the continuous probability curve.

Using the following equations (2) & (3) of AEB-98-03, settling velocity, settling area, volumetric flow rate, and the volume of the well-mixed region being modeled are used to calculate the aerosol particulate release fractions (RFs), based on initial activity concentration.

$$\eta_{filt} = 1 - \frac{C}{C_{in}} = 1 - \frac{1}{1 + \frac{\lambda_s * V}{Q}} = 1 - \frac{1}{1 + \frac{\mu_s * A}{Q}} \qquad \lambda_s = \frac{\mu_s * A}{V} = Q/V\,((1 / (1 - \eta) - 1))$$

where:
u_s = settling velocity (cm/sec)
A = settling area (cm^2)
V = volume of well-mixed region (cm^3)
C = concentration of nuclides in well-mixed volume (cm^{-3})
C_{in} = initial concentration of nuclides in well-mixed volume (cm^{-3})
λ_s = settling rate constant (sec^{-1})
Q = volumetric flow rate into well-mixed volume (cm^3/sec)
η_{filt} = filter efficiency

For each of the 20 groups, aerosol particulate RFs from each node or volume are calculated, as shown above, and then turned into removal efficiencies (REs) by subtracting them from 1. The set of 20 removal efficiencies, calculated for each volume, is combined to form a set of 20 Net Release Fractions (NRFs) for a given MSL. The NRF associated with a given group is the product of the RE for each volume, or node, and the probability associated with that specific settling velocity group. The set of 20 NRFs is summed, and again subtracted from 1, to calculate a total effective aerosol removal efficiency (TEARE) as shown in Table 4 for the MSIV leakage of 400 scfh and Table 4B for the MSIV leakage of 200 scfh for input to the RADTRAD code. This is performed for each MSL being modeled.

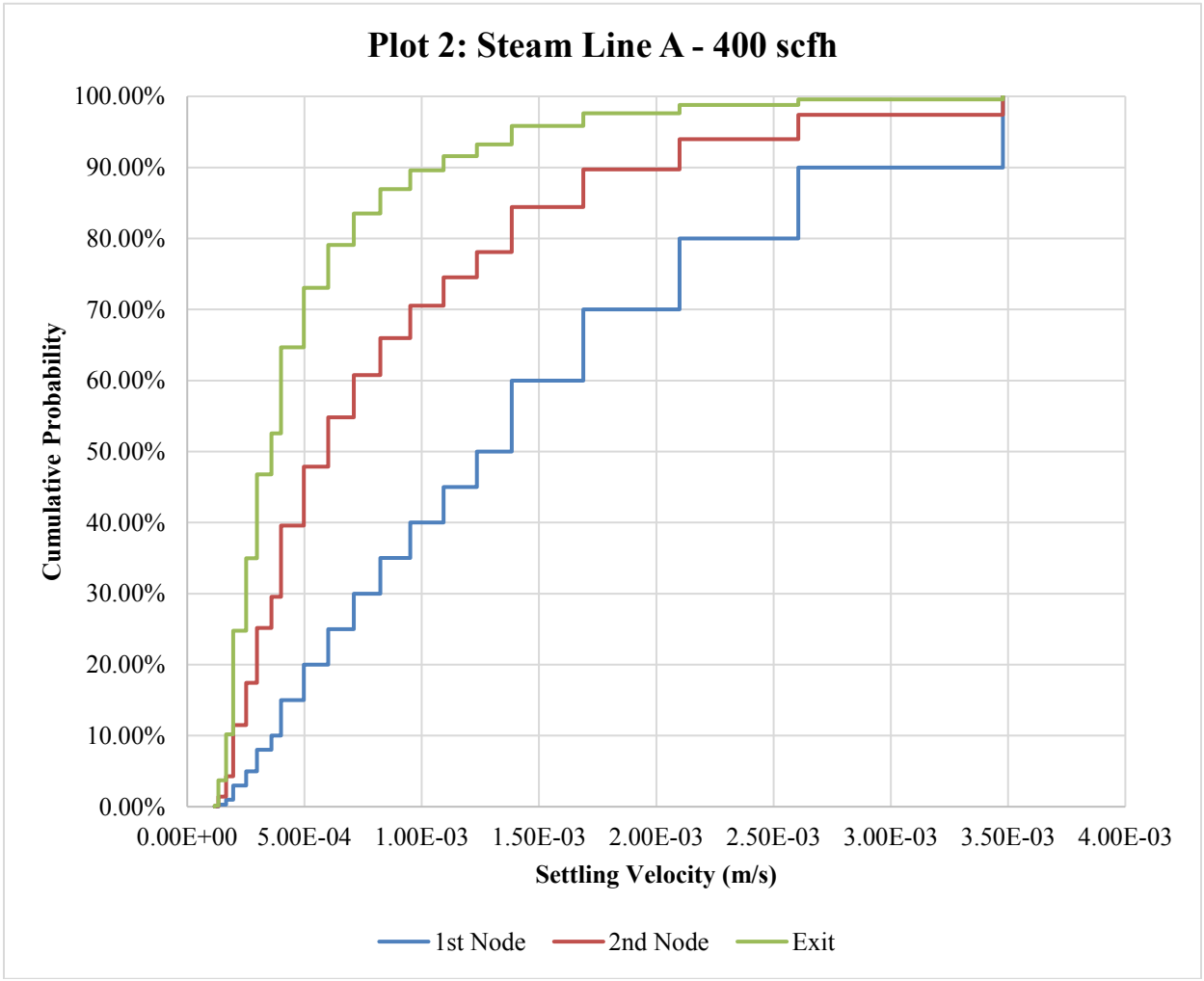
By implementing a conservative, semi-continuous, probability-weighted 20-group step function to simulate the varied population of particulate in a given MSL volume, as opposed to a single median value, this model accounts for the uneven settling of "easier to remove particles" versus "difficult to remove particles". To transparently illustrate this, the settling velocity probability distribution exiting in each volume or node can be re-calculated and compared to the initial distribution. The probability distribution successively shifts "weight" from the "easier to remove particles" when entering the piping, to the "difficult to remove particles" as flow moves through the MSL. When the activity finally exits the system, the re-calculated probability distribution indicates a much more likely chance of seeing "difficult to remove particles" than was the case when entering the system. As shown in Table 4A (MSIV leakage of 400 scfh) and Table 4C (MSIV leakage of 200 scfh), the spreadsheet individually re-calculates the probability distribution exiting MSL A & MSL D for illustration purposes. Because multiplication is the only affected mathematical operation in this model, and considering that multiplication is commutative and distributive, it is not necessary to individually re-calculate the distribution after each node or volume; by applying just the initial probability distribution to the calculation of the NRF, the changing distribution through the system is accounted for. *Recalculating each distribution exiting a node or volume, then using that to calculate the distribution entering the next node or volume, yields the same TEARE as that calculated in Tables 4 & 4B . Therefore, one TEARE is applied to the entire MSIV release pathway. Each MSIV release path consists of two MSL segments, the inboard and outboard MSL segments. Therefore, the TEARE is also applied to the outboard MSL segment in each MSIV release path exiting the environment.*

In addition to the conservative implementation of the 20-group settling velocity distribution discussed above, the analysis added a large amount of conservatism in the analysis as discussed in Section 1.0. This conservative aerosol deposition treatment and the significant residual conservatism associated with and mentioned in the AEB-98-03 conclusions and discussed above, account for uncertainty associated with the aerosol settling velocity and deposition model in AEB-98-03.

The total effective aerosol removal efficiency (TEARE) in Tables 4 & 4B is calculated using the MSL horizontal projected area in Table 2 and the MSIV leak rates in Tables 3 & 3A, respectively. The MSIV leak rate reduction after 24 hrs is credited for the release pathways but not credited for calculating the TEARE. The new RADTRAD input files NMP2MS00.psf, NMP2MS01.psf, and NMP2MS201.psf are generated for the MSIV leakage pathways using the well-mixed volumes information from Table 2, leak rate information from Tables 3 & 3A, and TEARE from Tables 4 & 4B. The new RADTRAD input files NMP2MS02.psf, and NMP2MS03.psf for the System Bypass leakage are generated using the leak rate and aerosol removal efficiency information from Table 9 and adjusted site boundary χ/Q information from Table 10A.

The effective aerosol removal efficiencies and aerosol removal rate constants, the lambdas (λ_s), are calculated in Tables 4A-1 and 4C-1 for the MSL A & D inboard and outboard piping segments for MSIV leak rates of 400 scfh and 200 scfh, respectively. The RADTRAD Files NMP2MS01.psf (400 scfh) and NMP2MS201.psf (200 scfh) are modified using the effective aerosol removal efficiencies and lambdas from Table 4A-1 and 4C-1 to calculate the resulting dose consequences listed in Table 4D and compared them with those in this revised analysis that uses the 20-group TEARE. The comparison in Table 4D shows that the resulting dose consequences using the aerosol removal efficiencies and lambdas are essentially the same as those in this analysis and their use results in inconsequential changes in dose consequences.

The 20-group step function simulates a varied population of aerosols having uneven settling of the heavier & larger particles versus the lighter & smaller particles. The settling velocity probability distribution shifts from the "heavier & larger particles" when entering the MSL piping to the "lighter & smaller particles" when moving through the MSL. The settling velocity probabilistic distributions are calculated in Tables 4A-2 & 4C-2 for MSLs A & D for Node 1 (entry node), Node 2 (piping node) and exit for the MSIV leak rates of 400 scfh and 200 scfh, respectively and plotted in Plots 2 through 5, which show that the settling velocity probability distribution shifts from the "heavier & larger particles" when entering the entry node (Node 1) to the "lighter & smaller particles" when exiting from the MSL.



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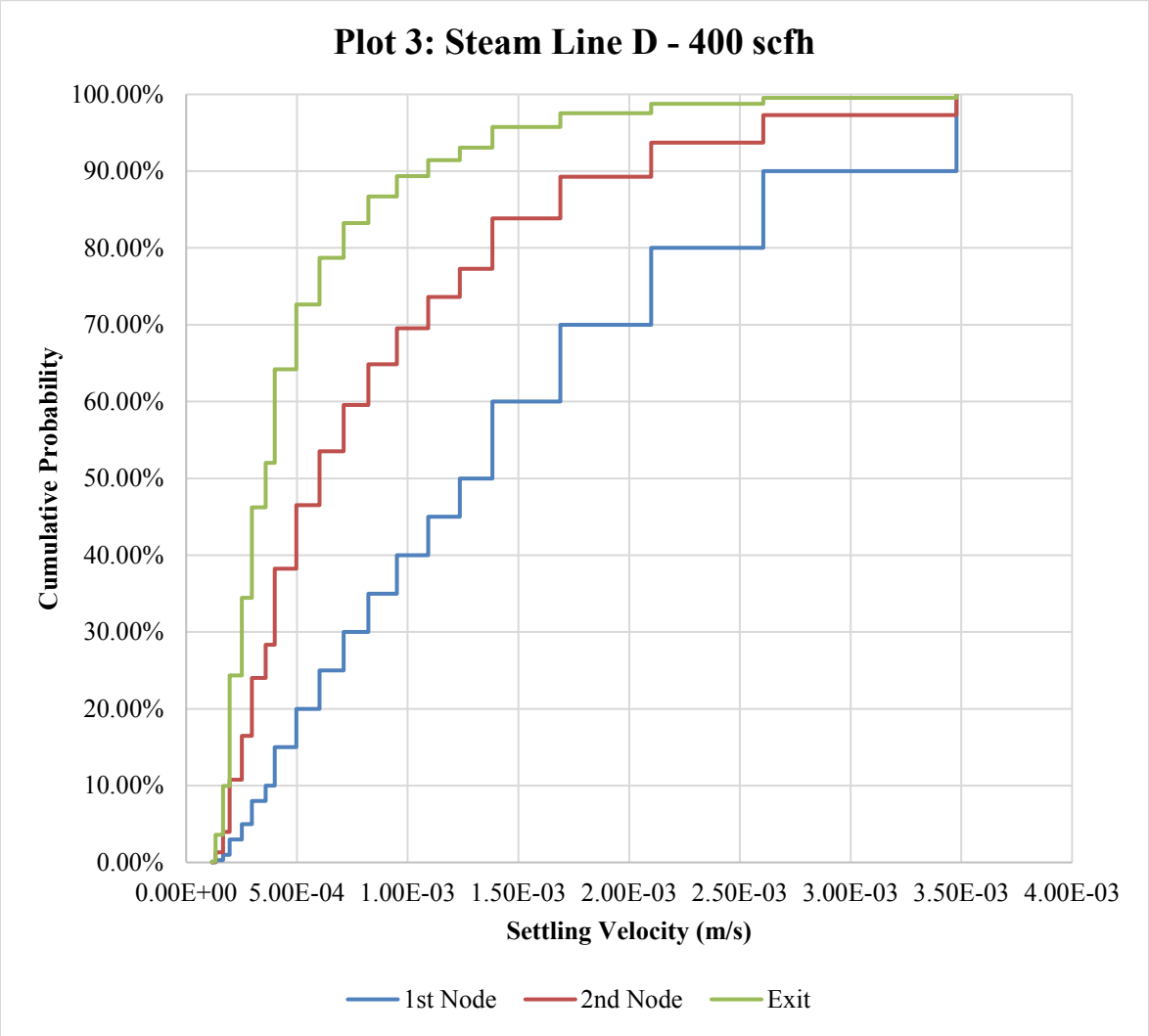

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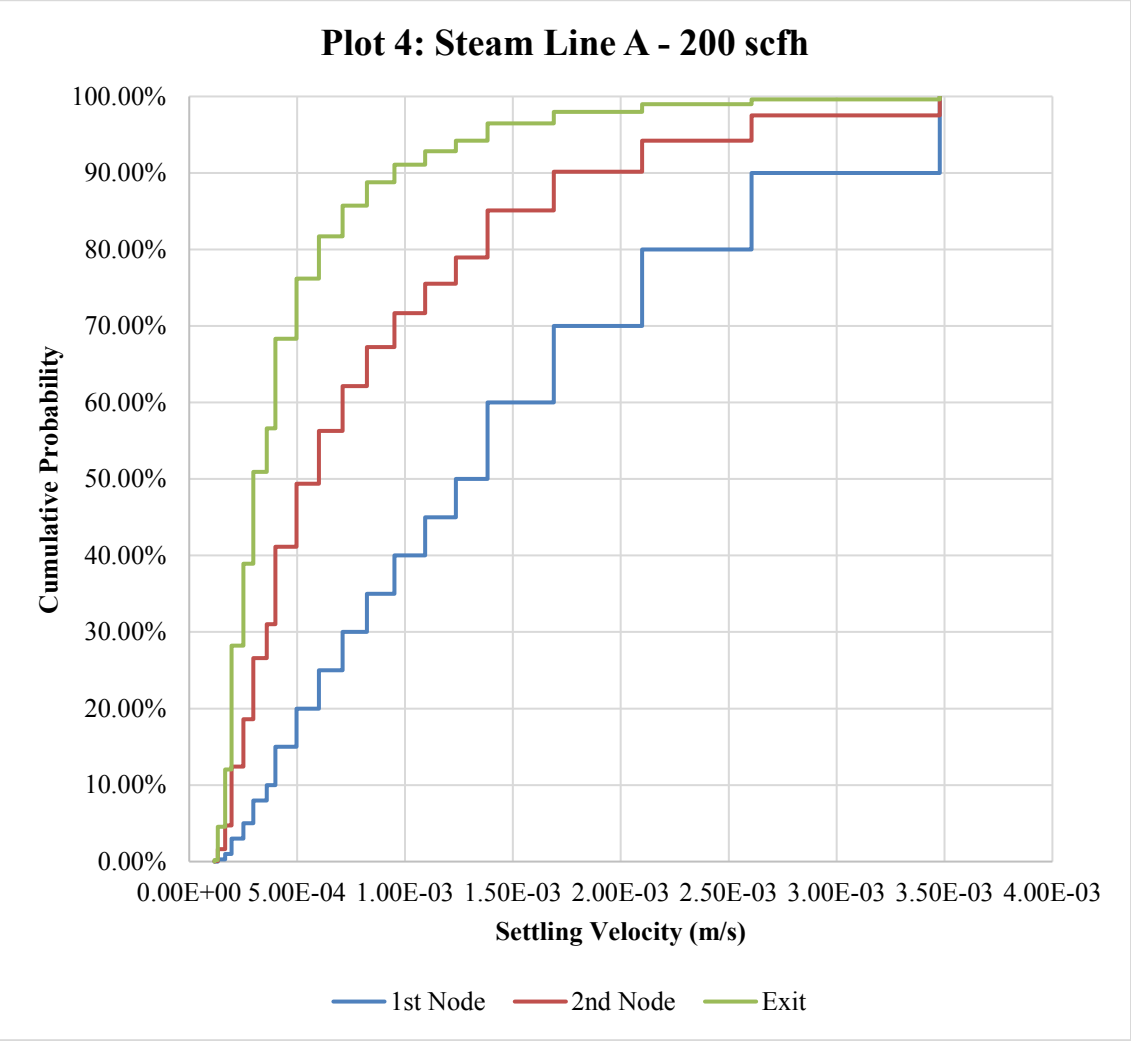

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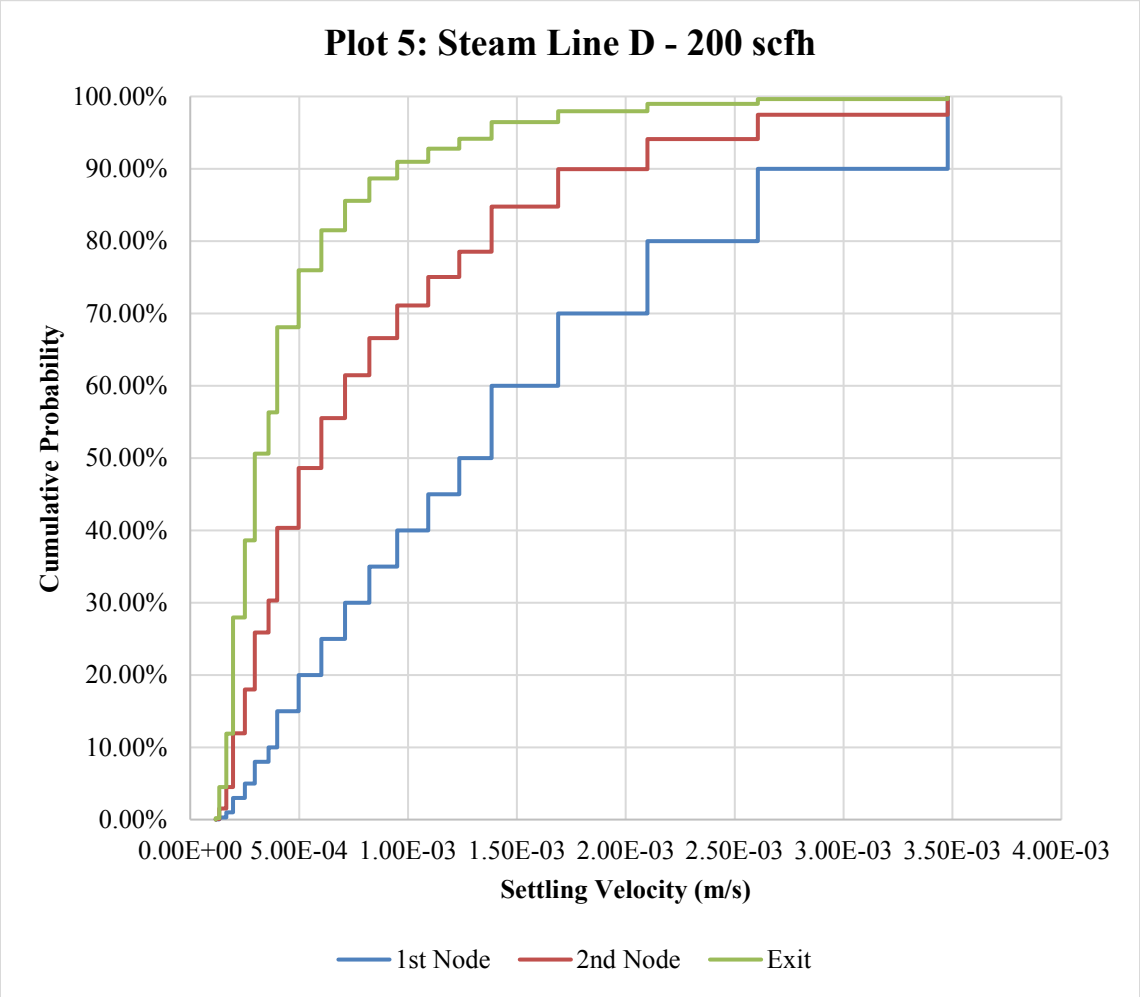

2.3.1.2 Crediting Deposition in MSL Upstream of Failed Inboard MSIV

The "MSIV failed" line means that the inboard MSIV in one of the shortest MSLs fails to close and remains open during the accident, which instantly extends the well mixed volume boundary from the RPV nozzle to the outboard MSIV without breaching its structural integrity to perform its intended safety related function of maintaining the reactor pressure boundary during and following a LOCA. This MSIV failure complies with a single active component failure requirement that results in the most limiting radiological consequences (RG 1.183, Section 5.1.2). All MSLs in the MSIV leakage release pathways are seismically designed and supported to withstand the Safe Shutdown Earthquake (SSE) (Figure 2) and thereby it complies with RG 1.183, Appendix A, Section 6.5 requirement. Therefore, the horizontal pipe surface area is credited for the aerosol deposition and volume for dilution in the MSL upstream of the inboard MSIV that failed to close. Postulating the MSL break upstream of the inboard MSIV during a LOCA is considered another DBA event of a main steam line break inside the containment, which is neither credible nor feasible based on the qualification of the MSLs.

The information in Table 2 is modified to include the inboard MSL area and volume and is used to calculate the TEARE in Table 4. The CLB aerosol deposition model is modified to include the inboard MSL piping surface area and volume to calculate the aerosol removal efficiency in one well-mixed volume of the MSIV failed MSL A (Figure 3). The new RADTRAD input files for the MSIV leakage pathways NMP2MS00.psf, NMP2MS01.psf, NMP2MS02.psf, NMP2MS03.psf, and NMP2MS201.psf are established using the well-mixed volumes information from Table 2, leak rate information from Tables 3 & 3A, and TEARE from Tables 4 & 4B.

Evaporation of Aerosols Deposited In Inboard MSL Piping:

The inboard piping is connected to the RPV and subjected to achieve the temperature the same as the RPV dome prior to water being restored around 1 hr. Preliminary results using MAAP for Quad Cities indicates that the temperatures in the RPV head may briefly spike over 700^0F but then fall below 600F. The temperature in the first MSL node also exceeds 600F in a few cases for short duration, but generally stays below *600^0F*. In the worst case the temperature transient in the inboard piping may last less than an hour that may potentially impact the aerosol physics and platout mechanism, which may affect the aerosol removal credited in the analysis.

The plated out aerosol on the inboard MSL pipe surface may be subject to be evaporated and become airborne due to thermal ripple effect. Therefore, the evaporation of CsI is qualitatively assessed because it represents 95% of the total core iodine release.

MAAP preliminary results & J.E. Cline support max steam line temperature $\leq 600^0$F.
Metcalf conservatively estimated the piping steel temperature rise = 0.5^0F/hr (Ref. 9.37, Section 3.3.2)
Di Lemma et al suggests the vaporization threshold is >$1{,}100^0$K for CsI > $1{,}456^0$F (Ref. 9.36, Section 4.2). A bounding temperature rise during the accident period of 720 hr would be 720 hrs* 0.5^0 F/hr = 360^0F.

The highest temperature of CsI = $600^0F+360^0F = 960^0F$, which is considerably less than $1{,}100^0K$ or $1{,}456^0F$.

It is to be noted here that the high temperature that potentially evaporates the aerosol potentially exists prior to flooding of the core in less than an hour but the piping temperature increase is calculated for 720 hrs.

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The above qualitative conservative assessment indicates that the temperature in the inboard MSL piping may not reach to the threshold temperature of evaporation for the most critical CsI. The post-LOCA condition in the inboard MSL piping does not support the evaporation of the aerosols plated out on the piping surface. Therefore, the aerosol removal in the inboard MSL piping is credited in the analysis.

2.3.1.3 Crediting Deposition in MSLs beyond the Outboard MSVs

As can be seen from Figure 2 obtained from Reference 9.10 that all four MSL headers are seismic I and QA Cat I from the RPV Nozzle to the seismic boundary break at the Turbine Stop Valve (TSV), therefore, they are qualified to withstand the SSE and thereby they comply with the RG 1.183, Appendix A, Section 6.5 requirement to be credited for aerosol deposition. Therefore, the MSIV leakage pathway boundary is extended up to the TSV. The post-LOCA MSIV leakage pathway boundaries from the CLB analysis are modified in the following section for increased MSIV leak rates. For the purpose of this analysis, the activity available for release via MSIV leakage is assumed to be that activity released into the drywell for evaluating containment leakage.

A total of 400 scfh or 200 scfh MSIV leakage is assumed to occur in the following manner:

1. MSIV Failed MSL (Pathway 7 in Figure 1):

   - MSIV leakage is increased from 24 scfh to 200 or 100 scfh.
   - Horizontal piping surface area and volume of the MSL upstream of inboard MSIV are credited for aerosol deposition. One well-mixed volume (V_1) is between the RPV Nozzle and outboard MSIV.
   - Horizontal piping surface area and volume of the MSL between the outboard MSIV and TSV are credited for aerosol deposition. A second well-mixed volume (V_2) is between the outboard MSIV and TSV.
   - The airborne elemental iodine in this release path is assumed to be adsorbed on the entire MSL piping volume surface area.
   - No credit is taken for a holdup time in the MSIV failed MSL.

2. First Shortest Intact MSL (Pathway 8 in Figure 1):

   - MSIV leakage is increased from 72 scfh to 200 or 100 scfh
   - Horizontal piping surface area and volume of the MSL between the RPV Nozzle and inboard MSIV are credited for aerosol deposition. One well-mixed volume (V_3) is between the RPV Nozzle and inboard MSIV.
   - Horizontal piping surface area and volume of the MSL between the inboard MSIVs and TSV are credited for aerosol deposition. A second well-mixed (V_4) between the inboard MSIV and TSV.
   - The airborne elemental iodine in this release path is assumed to be adsorbed on the entire MSL piping volume surface area.
   - No credit is taken for a holdup time in the intact MSLs.

3. Second Shortest Intact MSL
   - 0 scfh through the third MSL is assumed.
4. Third Shortest Intact MSL
   - 0 scfh through the fourth MSL is assumed.

2.3.1.4 Crediting Time-dependent Elemental Iodine Removal

The NRC has consistently accepted the use of a 50% elemental iodine removal efficiency in the MSIV leakage release path for the entire duration of the accident based on the information used in AEB 98-03 (Ref. 9.5) for AST license amendments. Consequently, the CLB analysis uses a 50% elemental iodine removal efficiency for the MSIV release paths. The industry experience with other AST license amendments indicates that elemental iodine removal is considerably lower than 50% during the first 24 hrs to 48 hrs of the accident that underestimates the CR dose. Therefore, time-dependent elemental iodine removal efficiencies are established and used in this analysis.

The gaseous iodine tends to accumulate on the piping surface by chemical adsorption. The elemental iodine being the most reactive has the highest deposition rate. The iodine deposited on the surface undergoes both physical and chemical changes and can be re-emitted as an airborne gas (re-suspension) or permanently fixed to the surface (fixation). RG-1.183, Appendix A, Section 6.5, indicates that Reference 9.16 (J.E. Cline paper) provides acceptable models for deposition of iodine on the pipe surface. The J.E. Cline methodology is used to calculate the time-dependent deposition and resuspension rates of elemental iodine in Section 7.12. The RADTRAD input files for the MSIV bypass leakage pathways NMP2MS00.psf, NMP2MS01.psf, and NMP2MS201.psf and system bypass leakage pathways NMP2MS02.psf & NMP2MS03.psf are modified using the elemental iodine removal efficiencies in Table 5M. The bounding elemental iodine removal efficiency at the beginning of the time interval is used for the entire duration of the interval. No specific time-dependent elemental iodine removal efficiencies are calculated for the system bypass leakage pathways 5 (NMP2MS02.psf) & 6 (NMP2MS03.psf). The time-dependent elemental iodine removal efficiencies for Volume 4 are arbitrararily selected from Table 5M for system bypass leakage pathways, which is more conservative than the 50% elemental iodine removal efficiency used for these pathways for the entire duration of the accident in the CLB analysis and accepted by the NRC.

2.3.1.5 Determination of MSIV Leak Rates in Various Main Steam Line Volumes

The total MSIV leakage from all main steam lines is either 400 scfh or 200 scfh measured at 40 psig, allowing a maximum of 200 scfh or 100 scfh from any one of the 4 main steam lines. The total MSIV leak of 400 scfh is converted using the Ideal Gas Law to determine the actual leakage (cfh) using post-LOCA peak temperature and pressure in Section 7.2. Since the actual MSIV leak rate is reduced at the accident condition due to the combined effects of compression (due to the high pressure) and expansion (due to the high temperature), the increase in the MSIV leak rates to the environment from the outboard MSIVs are conservatively calculated in Section 7.2 using the Ideal Gas Law and drywell post-LOCA peak pressure and temperature and listed in Table 3. The corresponding time-dependent leak rate information for the MSIV leakage of 200 scfh is calculated in Table 3A by dividing the leak rate values in Table 3 by a factor of 2. The MSIV leak rates in Tables 3 & 3A are used in this analysis with the total effective aerosol removal efficiency (TEARE) calculated in Tables 4 & 4B based on the horizontal pipe surface areas calculated in Table 2 and the 20-group probabilistic distribution of settling velocities. The reduction in the containment leakage and MSIV leakage 24 hours after the onset of a LOCA is credited in the analysis (Ref. 9.1, RG 1.183 Appendix A, Section 6.2) but the leak rate reduction is conservatively not credited in the aerosol deposition calculation (Tables 4 & 4B).

2.3.2 System Bypass Leakages

The aerosol deposition depends on three variables namely the aerosol settling velocity, the horizontal projected pipe surface area (the horizontal length times the diameter), and volumetric flow rate of system bypass leakage. Also, only the portion of the line between the containment isolation valves (CIVs) is credited for aerosol deposition. This is conservative, since the bypass pathway could be

extended to the next seismic boundary.

Unlike the MSIV leakage pathways having the same size of MSLs in two release pathways, the 25 system bypass leakage pathways have different sizes of pipes that require determination of the piping size-specific aerosol removal efficiencies using the 20-group probabilistic distribution of settling velocities. This makes it difficult to calculate TEARE for each release path. Therefore, the procedure for aerosol deposition for each system bypass pathway is developed using a spreadsheet methodology as shown in Table 6 using the CLB 3rd percentile aerosol settling velocity, which remains bounding for the aerosol particle range discussed in Section 2.3.1.1. and discussed in the following section.

1. The system bypass leakage pathway conservatively credits only the piping between CIVs to be a well-mixed volume.
2. The CLB aerosol settling velocity of 3rd percentile is used, which continues to bound the range of aerosol particles described in AEB 98-03.
3. The tested system bypass leakage in scfh is listed in Column A of Table 6.
4. The internal piping areas (πDL) for the bypass leakage pathways are obtained from Reference 9.10, Table 6.11-2 and are listed in Column B of Table 6 of this calculation.
5. The projected horizontal piping surface area [$(\pi DL)/\pi$] is calculated in Column C of Table 6.
6. The aerosol settling velocity of 0.777 ft/hr is calculated based on the 3rd percentile settling velocity and listed in Column D of Table 6.
7. The product of projected surface area times settling velocity ($\mu * A$) is calculated in Column E of Table 6.
8. A factor to convert the flow rate scfh at the testing condition to actual flow rate cfh @ accident condition is calculated to be 0.4056 as follows:

   Actual cfh @ accident condition = scfh x [14.7 psia / (40 psig + 14.7 psia)] x [800R / 530R] = scfh x 0.4056 cfh/scfh = cfh
   The actual flow rate cfh = scfh (Column A) x 0.4056 and is listed in Column F of Table 6.
9. The aerosol removal efficiency is calculated in Column G of Table 6 using the following Equation (3) from Section 2.3.2:

$$\eta_{filt} = 1 - \frac{C}{C_{in}} = 1 - \frac{1}{1 + \frac{\mu_s * A}{Q}} = 1 - (1 + E/F)^{-1}$$

The ratio of accident volumetric flow (cfh) to tested mass flow (scfh) under these conditions is 0.4056. This ratio holds for all bypass pathways because all are tested under the same conditions and exposed to the same accident conditions (pressure and temperature).

For the MSL as an example for MSIV leak rate of 200 scfh:

The volumetric flow rate under accident conditions cfh = 200 scfh x 0.4056 = 81.12 cfh as shown in Table 3.

As shown above, the volumetric flow rates under test conditions (a pressure of 40 psig and temperature of 70F) are converted to accident volumetric flow rates for a pressure of 40 psig and maximum temperature of 800 R (340 F drywell design temperature per Item 6.4 of Reference 9.4). The resultant conversion factor of 0.4056 is applied uniformly to all the bypass leakage rates. Therefore, the as-modeled accident volumetric flow rates can be converted to test conditions by dividing by 1/0.4056. This provides a basis for establishing combined leakage limits at test conditions. This conversion also applies to the calculated MSIV leakage as shown above (Ref. 9.29.3, Insert 3).

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2.3.3 Grouping System Bypass Leakages

There are 25 other bypass leakages from various systems excluding the MSIV bypass leakages discussed in Section 2.3.2 and are listed in Section 5.5.6. These system bypass leakages are grouped together based on their release locations and origin of the radioactive sources. These system bypass leakages originate either from drywell or wetwell and get released to the environment via four (4) release locations, namely the main steam tunnel, combined radwaste & reactor building vent, standby gas treatment system building, and PASS panel. *No credit is taken for any holdup time in the system bypass pathways.* The time-dependent χ/Q values are shown in the following table obtained from Table 7:

Time (hr)	Control Room χ/Q Values for Various NMP2 Release Points				
	Combined Radwaste & Reactor Bldg Vent (s/m^3) A	Post Accident Sampling System Panel (PASS) (s/m^3) B	Standby Gas Treatment Sys Building (SGTS) (s/m^3) C	Main Steam Tunnel (s/m^3) D	Main Stack (s/m^3) E
0-2	1.09E-03	3.84E-04	5.33E-04	1.47E-03	8.03E-05
2-8	7.23E-04	2.28E-04	3.72E-04	9.74E-04	4.48E-05
8-24	2.50E-04	8.23E-05	1.36E-04	3.63E-04	1.68E-05
24-96	1.92E-04	6.28E-05	9.17E-05	2.45E-04	1.20E-05
96-720	1.47E-04	4.57E-05	6.72E-05	1.90E-04	8.83E-06

Theses system bypass pathways are divided into two release categories, namely the drywell system bypass pathway 5 (Figure 1) and wetwell system bypass pathway 6 (Figure 1) based on their origins.

For the given source term, the system leak rate determines the activity release rate ($Ci/m^3 * m^3/s = Ci/s$). For the given system activity release rate, the location of the release point produces the activity concentration ($Ci/s * s/m^3 = Ci/m^3$), which is multiplied by the dose conversion factor yielding the dose at the given receptor location. As discussed in the preceding section, there are two system sources, the drywell and wetwell, and four release locations. First of all, the most limiting release point location is determined where the highest bypass leak rate occurs. The Main Steam Tunnel (MST) is considered to be the most limiting release location because the MSIV bypass leakage of 400 scfh and other largest system bypass leakages of Feedwater and RWCU systems are released at the MST location (Section 2.3.2 & Table 9). Additionally, the MST has the largest set of χ/Q values that favors the MST as the correct location for normalization (Table 7). All system bypass leakages occurring at the different release point locations can be transposed to the MST release point to provide both system bypass release categories (drywell & wetwell) a consistent basis for using one set of main steam tunnel χ/Qs to minimize the number of computer runs without compromising accuracy. The MST χ/Q values are used to normalize other system bypass leakages to transpose them to the MST location. Each location-specific time dependent χ/Q value is divided by the corresponding MST χ/Q value to determine a set of multipliers for each release point location as shown in Table 8 and listed below.

Time (hr)	NMP2 Release Point Normalization Factors			
	Combined Radwaste & Reactor Bldg Vent	Post Accident Sampling System Panel (PASS)	Standby Gas Treatment Sys Building (SGTS)	Main Steam Tunnel
0-2	0.74	0.26	0.36	1.00
2-8	0.74	0.23	**0.38**	1.00
8-24	0.69	0.23	0.37	1.00
24-96	**0.78**	**0.26**	0.37	1.00
96-720	0.77	0.24	0.35	1.00

Choosing the largest calculated value from each set from above table, the following multiplier values are selected:

- U2 Combined Radwaste & Reactor Vent: Multiplier = 0.78
- U2 Post Accident Sampling Sys. Panel (PASS)**:** Multiplier = 0.26
- U2 Standby Gas Treatment Sys. Building (SGTS): Multiplier = 0.38
- U2 Main Steam Tunnel**:** Multiplier = 1.00

The multiplier factor varies from 0.26 for the PASS system release point to 1.0 for the MST release point. The adjusted system bypass leak rate at the MST release point can be determined by multiplying the system leak rate by the applicable multiplier for the release point location. The normalized system bypass leak rate is substantially reduced for the PASS system due to having the lowest multiplier value. The aerosol removal (deposition) efficiency is inversely proportional to the system bypass leak rate. The reduction in the system bypass leak rate is appropriate for its normalized location to the MST release point but it proportionately increases the aerosol removal efficiency, which is adverse and non-conservative. Therefore, the combined aerosol removal efficiencies in Table 9, Columns D & J and penetration in Column E are calculated using the actual flow rates instead of the adjusted flow rates. (Table 9, Columns E and Note J).

The same following equation is used to calculate the aerosol removal efficiencies as used in Tables 4 and 4B for the MSIV bypass leakage and Table 6 for the other system bypass leakages.

$$\eta_{filt} = 1 - \frac{C}{C_{in}} = 1 - \frac{1}{1 + \frac{\mu_s * A}{Q}}$$

Table 9 was developed to calculate the composite leak rates and aerosol removal efficiencies for two categories (drywell and wetwell) of system bypass pathways. The actual system bypass leak rates are appropriately adjusted (normalized) using the applicable largest multipliers from Table 8 in Column C. The aerosol penetration in Column E is conservatively calculated using the actual system bypass leak rate from Column B, which is used to calculate the combined aerosol removal efficiency in Column J. The composite adjusted flow rates and combined aerosol removal efficiencies are used for the drywell system bypass leakage pathway 5 (Figure 1) and wetwell system bypass leakage pathway 6 (Figure 1) respectively, in Figure 1 and RADTRAD bypass release modeling. The corresponding drywell and wetwell system bypass leak rates at testing condition are calculated in Table 9A.

The CR air intake χ/Q values are developed using site-specific release point locations. Unlike the CR χ/Q values, the offsite χ/Q values for EAB & LPZ are determined for the worst-case release/receptor geometry in the PAVAN code to provide with the bounding sets of the χ/Q values for the overall site release points (ground or stack release). Therefore, the offsite dose χ/Q values need to be corrected using the ratios of actual bypass leak rate to effective bypass leak rate for the drywell system bypass

pathway 5 (Figure 1) and wetwell system bypass leakage pathway 6 (Figure 1) as shown in Table 10A and listed below.

Time Interval (hr)	Offsite Receptor	Actual Value A	System Bypass Pathway	
			Drywell B=A*(1)	Wetwell C=A*(2)
Ratio	EAB / LPZ	-	1.22E+00	2.63E+00
Worst 2-hr (Ground-level)	EAB	1.19E-04	1.46E-04	3.13E-04
0-8 hr	LPZ	1.62E-05	1.98E-05	4.26E-05
8-24 hr		1.09E-05	1.33E-05	2.87E-05
24-96 hr		4.59E-06	5.61E-06	1.21E-05
96-720 hr		1.33E-06	1.63E-06	3.50E-06

A From Sections 5.7.2 & 5.7.5
(1) The ratio of G/I from Table 9 DW Bypass
(2) The ratio of G/I from Table 9 DW Bypass

The modified offsite χ/Q values are used in RADTRAD files NMP2MS02.psf & NMP2MS03.psf for the DW& WW system bypass leakage pathways to calculate the EAB and LPZ doses.

The RADTRAD files for the containment leakage (NP2CL400.psf), MSIV leakage (NMP2MS00.psf & NMP2MS01.psf), and system bypass leakage (NMP2MS02.psf & NMP2MS03.psf) have all of these release pathways. These pathways, including release rate, can be turned on by releasing it to the environment with the associated removal efficiencies if any or turned off by directing it to the Dummy node depending on the specific release pathway being analyzed. For example, for the containment leakage pathway, RADTRAD File NMP2CL400.psf turns on the pathways from DW & WW to RB and RB to environment and turns off the MSIV leakage pathways 7 & 8 and system bypass leakage pathways 5 & 6 by directing releases from the source nodes to the Dummy node by just providing leak rate from each node to balance activity in the drywell. No other inputs are required for these passive pathways not released to the environment. Similarly, for the MSIV and system leakage bypass pathways, the applicable pathway is postulated to be released to the environment directing the remaining passive pathways to the Dummy node. Other RADTRAD files NP2CL22.psf, NP2CL00.psf, and NP2MS22psf are treated in a similar manner. *A minor leak rate change in the passive pathways associated with the release to the environment will not impact the resulting dose consequences.*

2.3.4 Outstanding Changes Posted to Bypass Leakage

The various changes are posted to or affecting calculation H21C-106, Rev 2 to bypass leakage pathways are listed in Table 1B (Refs 9.29.1, 9.29.2 & 9.29.3) and appropriately incorporated in the applicable sections of this calculation.

2.4 Control Room Model

The analysis for CR operator radiation exposure from various sources is performed in the following sections using the information from supporting drawings and documents referenced in this section.

The post-LOCA control room RADTRAD nodalization is shown in Figure 4 with the design input parameter values. The post-LOCA radioactive releases that contribute to the CR TEDE dose are as follows:

- Post-LOCA Containment + TIP Leakage (included as 0.12 volume % per day, based on the drywell free air volume)
- Post-LOCA ESF Leakage

- Post-LOCA MSIV & System Bypass Leakages

The radioactivity from the above sources is assumed to be released into the atmosphere and transported to the CR air intake, where it may leak into the CR envelope unfiltered and be filtered by the CR intake filtration system prior to being distributed in the CR envelope. The five major radioactive sources which contribute to the CR TEDE dose are:

- Post-LOCA airborne activity inside the CR through filtered intake and unfiltered inleakage
- Post-LOCA airborne cloud external to CR
- Post-LOCA RB shine to CR
- Post-LOCA Control Room Envelope Filtration (CREF) filter shine

2.4.1 Post-LOCA Airborne Activity inside CR through filtered intake & unfiltered inleakage

The post-LOCA radioactive release pathways from various sources are shown in Figures 1 and 4. The activities released from the various sources are diluted by atmospheric dispersion and carried over to the CR air intake. The atmospheric dispersion factors are shown in Sections 5.6.8 through 5.6.12 for the containment, ESF, and bypass leakages. The containment and ESF leakages have the same release point and χ/Qs. The RADTRAD release models are developed for each release pathway using appropriate design inputs from Sections 5.3 through 5.8. The CR dose model is developed using the design input parameters in Section 5.6. The CR TEDE dose contributions from the airborne post-LOCA activities available inside the CR envelope via filtered intake and unfiltered inleakage are calculated and tabulated in Sections 8.1 & 8.2.

2.4.2 Post-LOCA Airborne Cloud External to CR

The post-LOCA radioactive plume contains the radioactive sources from the containment, ESF, and Bypass leakages. The CR whole body gamma dose from the radioactive external cloud shine will be attenuated by the 2 feet minimum concrete east wall and roof shielding (Ref. 9.28, page 71). The RADTRAD3.03 code calculates the whole body gamma dose based on the semi-infinite cloud submergence at the site boundary location (Ref. 9.2, Section 2.3.1 and Ref. 9.1, Section 4.1.4). Therefore, the χ/Q values for the LPZ receptor locations in RADTRAD file NP2CL400.psf, NP2ES400.psf, and NMP2MS00.psf are modified in the newly developed RADTRAD files NP2CL22.psf, NP2ES22.psf, and NP2MS22.psf by replacing the LPZ χ/Q values with the corresponding CR air intake χ/Q values. The resulting WB dose at the CR air intake would be due to the semi-infinite cloud submergence of the CR envelope. This WB gamma submergence dose is reduced based on the minimum CR concrete shielding and occupancy factor to calculate the CR dose from the post-LOCA external cloud. The post-LOCA time-dependent WB gamma doses at the CR intake are listed in Table 10 without & with the CR occupancy factors from Section 5.6.13 for all three (3) post-LOCA release pathways. The total post-LOCA external cloud unshielded WB gamma dose in the CR is calculated to be 33.22 rem (Table 10). The 2 feet concrete shielding gamma attenuation factor is calculated to be 0.00427 in Section 7.5 for a 1 MeV gamma emission. This attenuation factor includes the buildup due to multiple scattering. The resulting CR gamma dose from the external cloud shine would be 0.1418 rem (33.22 rem x 0.00427 = 0.1418 rem), which is added with the dose contribution from other post-LOCA sources in Sections 8.1 & 8.2.

2.4.3 Post-LOCA RB Shine to CR

Reactor Building Activities

The post-LOCA activity released from the containment leakage from the drywell & wetwell and ESF leakage from recirculation system in the RB leakage accumulates in the RB volume above the operating floor, which contributes the direct shine dose to CR operators (Figure 5). The activity release from these leakages get homogeneously distributed in 50% of the well-mixed air volume of the RB. 10% higher SGTS exhaust flow rate 4,400 cfm (=1.10 x 4,000) is used in RADTRAD runs NP2CL400.psf and NP2ES400.psf because it maximize the CR and offsite doses but it becomes non-conservative for the RB shine dose because it removes a larger amount of activity from the containment volume leaving a lesser amount to contribute the RB shine dose to CR operator. The RADTRAD files NP2CL400.psf and NP2ES400.psf are revised using the SGTS flow rate of 3,600 cfm (= 0.90 x 4,000 cfm) NP2CL00.psf (Attachment 13.12) and NP2ES00.psf (Attachment 13.4). The post-LOCA time-dependent isotopic activity from the containment and ESF leakages are listed in Tables 11 & 12 respectively and are combined in Table 13 and further sorted for MicroShield input in Table 14. The containment and CR shielding geometry parameters are calculated in Section 7.6 based on the information obtained from Reference 9.28, pages 71 through 76 and shown in Figure 5.

Reactor Building:

The post-LOCA airborne activity is expected to be confined in the volume above the operating floor area between ELs 386'-10" and 426'-3". The RB cylindrical wall located above EL 386' -10" elevation at radius of 88.0’is a sheet metal wall and is assumed to provide no shielding. The secondary containment airborne source term located above 386' -10" is modeled as a right circular cylinder - MicroShield Geometry (Cylinder Volume - Side Shields). The previous QADMOD shielding model shown in Figure 5 was developed based on the shielding associated with CR and the distance associated with the RB radioactive source volume (Ref. 9.28, Figure 1). The QADMOD code models three dimensional shielding geometry and accurately calculates the direct shine dose. MicroShield is one dimension models one dimensional shielding geometry, which does not accurately model the precision of QADMOD. Therefore, the three dimensional shielding geometry associated with the RB shine QADMOD shielding model is conservatively translated in to one dimensional MicroShield geometry by conservatively translating the source/dose point distance and source volume contributing dose with the fraction shielded by the RB concrete structure. The three dimensional source/ receptor line-of-sight distance is translated into a straight line distance in Section 7.6 including the shielded and directly contributing source volumes. A simplified MicroShield geometric model is developed in Figure 6 that conservatively calculates the RB shine dose to the CR operator. The dose point is placed in the north-east corner of the CR 1 foot from the north & east walls (see Figure 5). The horizontal line-of-sight distance is calculated in Section 7.6 based on the plan view of the shielding geometry in Figure 5, which is then used to account for vertical elevation difference to calculate the three-dimensional line-of-sight distance for the MicroShield input with the CR concrete wall shielding to determine the CR dose rate as shown in Figure 6. The CR operator is postulated to stand 6 feet tall above the CR floor at EL 306’-0” to calculate the minimum vertical elevation difference between the source and the dose point. The MicroShield model places the CR dose point relative to the center of the cylindrical source.

The shielding geometry dimensions and distances are calculated in Section 7.6 and are used to develop the MicroShield geometric model in Figure 6. The time dependent CR RB shine dose rates are listed in Table 15 and integrated to obtain the 720-day cumulative dose, which is appropriately reduced to compensate for the source volume (Section 7.6.3) in Section 7.7 and added to the dose contribution from other post-LOCA sources in Sections 8.1 & 8.2.

2.4.4 Post-LOCA CREF Filter Shine

The NMP2 CR is located at the south-west of the RB (Ref. 9.28, page 75). Actually, the same charcoal filter and HEPA filter serve both the intake and recirculation filtration (Figure 4). The CREF intake & Recirculation charcoal filters remove both the elemental & organic iodines and CREF HEPA filter removes the aerosol (particulates). There are two CR filter assemblies (2HVC*FLT2A & 2B). FLT2A is located on EL 288'-6". FLT2B is located on EL 306'-0" almost directly above FLT2A (Ref. 9.28, page 95). Also, it is conservatively assumed that all iodine and particulate activity removed from the CR intake and recirculated air is built up on filter 2HVC*FL T2B, which is on the same elevation as the CR (Ref. 9.28, page 95). The RADTRAD3.03 code calculates the 720-hr cumulative elemental and organic iodine atoms and the aerosol mass accumulated on the CR intake and recirculation filters separately in the RADTRAD output files .

2.4.4.1 Post-LOCA Iodine Activity on CREF Charcoal Filter – Post-LOCA Releases

The total number of elemental iodine and organic iodine atoms accumulated on the CREF charcoal filter and aerosol mass collected on the CREF HEPA filter are listed and summed in Table 16 from the RADTRAD output files NP2CL400.o0 (Attachment 13.2), NP2ES400.o0 (Attachment 13.3), and NMP2MS00.o0 (Attachment 13.4) for the intake and recirculation charcoal filters. The isotopic iodine atom/curie relationship is established in Table 17 using the containment leakage RADTRAD file NP2CL400.o0, which is used to convert the total number of iodine atoms on the charcoal filter (Table 16) into isotopic iodine activity in Table 18. Table 18 calculates the total iodine activity of 3.695 Ci on the CREF charcoal. There is 2 feet of concrete shielding between the filter and CR operator (Ref. 9.28, page 97), which will reduce the CR operator dose to an insignificant level. This is expected as indicated in the previous analysis. This is as expected, because 99.5% of the elemental iodine is removed by drywell spray and a good amount of the remaining elemental iodine is adsorbed in the main steam piping volume before it gets released to the environment where it is further diluted by the air dispersion and filtered by the CR intake and recirculation filter. The post-LOCA iodine loading on the CREF charcoal filters is provided in Table 18. Only iodine activity on the CREF charcoal bed is required to calculate heat load per RG 1.52, Section C.3.k (Ref. 9.33). Therefore, the CREF time-dependent iodine activity loading is provided in Table 18.

2.4.4.2 Post-LOCA Aerosol Activity On CREF HEPA Filter – Post-LOCA Releases

The total aerosol mass deposited on the CREF HEPA filter due to the Containment, ESF, & MSIV leakage pathways are obtained from the RADTRAD output files NP2CL400.o0 (Attachment 13.2), NP2ES400.o0 (Attachment 13.3), & NMP2MS00.o0, (Attachment 13.4) listed and summed in Table 16. The resulting aerosol mass is calculated to be 2.93E-07 kg or 0.293 milligram, which is negligibly small and becomes inconsequential for the filter shine dose. This is as expected, because most of the aerosols get removed by drywell spray and the remaining aerosol further deposited on the horizontal surface areas of MSL piping in the bypass pathways. Therefore, the CREF filter shine dose is considered inconsequential and not added with the dose contribution from other post-LOCA sources in Section 8.1.

2.5 Post-LOCA Iodine Loading on SGTS Filter

Per RG 1.52, Section C.3.k (Ref. 9.33), only iodine activity on the SGTS charcoal bed is required to calculate heat load, therefore, the iodine loading on the SGTS filter is calculated in this section. The time dependent SGTS filter iodine loading is determined in a manner similar to the CREF filter loading as discussed in Section 2.4.4.1. The time-dependent elemental & organic iodine atoms accumulated on the SGTS are listed in Tables 19 & 20 for the containment leakage and ESF leakage, respectively from the

RADTRAD output files NP2CL400.o0 (Attachment 13.2) and NP2ES400.o0 (Attachment 13.3). It is to be noted here that the MSIV & system leakages bypass the RB and do not contribute to SGTS activity loading. The time-dependent isotopic iodine atom/curie relationships are established in Tables 17 through 17I. These relationships are used to convert the total number of iodine atoms on the charcoal filter (Table 19) into iodine isotopic activities in Table 23.

2.6 Updating UFSAR Section 15.6.5 Tables

The revision of this calculation requires revision of the information in various sections of NMP2 UFSAR Chapter 15.6.5 as noted in Section 12.0 of this calculation. The information for release of post-LOCA activity to the primary containment at the end of the vessel release listed in Table 15.6-14 and the subsequent release of a portion of that activity to the environment in Table 15.6-15b are revised and listed in Tables 25 & 26, respectively,

3.0 ACCEPTANCE CRITERIA

The following NRC regulatory requirement and guidance documents are applicable to this NMP2 Alternative Source Term LOCA Calculation:

- Regulatory Guide 1.183 (Ref. 9.1)
- 10CFR50.67 (Ref. 9.3)
- Standard Review Plan section 15.0.1 (Ref. 9.15)

Dose Acceptance Criteria are:

	Regulatory Dose Limits		
Dose Type	Control Room (30 days) (rem TEDE)	EAB (Max 2 hours) (rem TEDE)	LPZ (30 days) (rem TEDE)
TEDE Dose	5	25	25

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4.0 ASSUMPTIONS

The following assumptions used in evaluating the offsite and control room doses resulting from a LOCA are based on the requirements in the Regulatory Guide 1.183 (Ref. 9.1). These assumptions become the design inputs in Sections 5.3 through 5.7 and are incorporated in the analyses.

4.1 Source Term Assumptions

Acceptable assumptions regarding core inventory and the release of radionuclides from the fuel are provided in Sections 3.1 through 3.4 of Reference 9.1 as follows:

4.2 Equilibrium Core Inventory

The assumed increased CAVEX inventory of fission products in the reactor core and available for release to the containment is based on the maximum power level of 4,067 MWt, which represents the maximum full power operation of the core at a power level equal to the Extended Power Uprate (EPU) thermal power level of 3,988 MWt plus a 2% margin for instrument uncertainty (Section 5.3.1.1). The equilibrium core inventory is described in Design Input 5.3.1.3.

4.3 Release Fractions and Timing

The core inventory release fractions, by radionuclide group, for the gap release and early in-vessel damage phases for a Design Basis Accident (DBA) LOCA are listed in Design Input 5.3.1.5. These fractions are applied to the equilibrium core inventory (Ref. 9.1, Tables 1 & 4). The release fractions are acceptable for use given that the peak fuel burnup meets the 62,000 MWD/MTU requirement specified in Regulatory Guide 1.183 (Ref. 9.1, Note 10) as shown in Design Input 5.3.1.2.

4.4 Radionuclide Composition

The elements in each radionuclide group to be considered in design basis analyses are shown in Design Input 5.3.1.4 (Ref. 9.1, Section 3.4).

4.5 Chemical Form

The long-term suppression pool water pH is greater than 7 during a LOCA (9.12, Section 6.0) with credit taken for sodium pentaborate in the Standby Liquid Control System. Consequently, the chemical forms of radioiodine released to the containment can be assumed to be 95% cesium iodide (CsI), 4.85 percent elemental iodine, and 0.15 percent organic iodide (Ref. 9.1, Sections 3.5 and A.2). These are shown in Design Input 5.3.1.7. With the exception of elemental and organic iodine and noble gases, fission products are assumed to be in particulate form (Ref. 9.1, Sections 3.5 and A.2).

4.6 Assumptions on Activity Transport in Primary Containment

4.6.1 The radioactivity released from the fuel is assumed to mix instantaneously and homogeneously throughout the free air volume of the primary containment. The radioactivity released from the fuel doesn't mix with the suppression pool air space until after two hours, as previously discussed in Section 2.1.2.

4.6.2 Reduction in airborne radioactivity in the containment is credited by the following means:

- Removal of the containment airborne elemental and aerosol iodine by drywell spray (Ref. 9.1, Section A.3.3 and Section 2.1.3.2) using applicable lambdas calculated per guidance in the SRP 6.5.2 (Ref. 9.9). Conservatively, the aerosol lambda is used for elemental iodine removal.

4.6.3 The primary containment and the MSIVs are assumed to leak at the allowable Technical Specification peak pressure leak rate for the event duration (Ref. 9.1, Section A.3.7).

- Primary containment and MSIV leakage rates are assumed to reduce by 50% after 24 hrs (Ref. 9.1, Section A.3.7; and Ref. 9.29.2 Item 6.5). This is supported by secondary containment bypass leakage analysis (Ref. 9.29.4), which calculates for 50 scfh MSIV leakage at test conditions and 1 MSIV closed, the initial leakage (39.75 psig drywell pressure) is 61.7 scfh. At 24 hours the drywell pressure is reduced to 15.2 psig, and the corresponding leakage is 29.7 scfh. This supports a 50% reduction in containment leakage at 24 hours.

4.6.4 NMP2 does not purge containment to relieve containment pressure or to reduce containment hydrogen concentration (Section 2.1.6.2). Therefore, the release from containment purging is not analyzed.

4.6.5 The MSIV leakage rate through each MSIV leakage path is assumed to be either 200 scfh or 100 scfh at 40 psig and the combined leakage rate for all leakage paths is either 400 scfh or 200 scfh at 40 psig. This assumption converts MSIV leak rates in scfh to actual testing conditions in cfh using the Ideal Gas Law, using the post-LOCA peak pressure of 40.0 psig and a temperature of 340^0 F (Section 5.3.2.10). The MSIV leakage rates modeled in this analysis appropriately implement the allowable Technical Specification MSIV leakage limits.

4.7 Offsite Dose Consequences

The following assumptions are used in determining the TEDE for a maximum exposed individual at EAB and LPZ locations:

4.7.1 The offsite dose is determined as a TEDE, which is the sum of the committed effective dose equivalent (CEDE) from inhalation and the deep dose equivalent (DDE) from external exposure from all radionuclides that are significant with regard to dose consequences and the released radioactivity (Ref. 9.1, Section 4.1.1; and Refs. 9.7 & 9.8). The RADTRAD3.03 computer code (Ref. 9.2) performs this summation to calculate the TEDE.

4.7.2 The offsite dose analysis uses the Committed Effective Dose Equivalent (CEDE) Dose Conversion Factors (DCFs) for inhalation exposure. (Ref. 9.1, Section 4.1.2; and Ref. 9.7).

4.7.3 Since RADTRAD3.03 calculates Deep Dose Equivalent (DDE) using whole body submergence in a semi-infinite cloud with appropriate credit for attenuation by body tissue, the DDE can be assumed nominally equivalent to the Effective Dose Equivalent (EDE) from external exposure. Therefore, the offsite dose analysis uses EDE in lieu of DDE Dose Conversion Factors in determining external exposure (Ref. 9.1, Section 4.1.4; and Ref. 9.8).

4.7.4 The maximum EAB TEDE for any two-hour period following the start of the radioactivity release is determined and used in determining compliance with the dose acceptance criteria in 10 CFR 50.67 (Ref. 9.1, Section 4.1.5 & Section 4.4; and Ref. 9.3).

EAB Dose Acceptance Criteria: 25 Rem TEDE (50.67(b)(2)(i)) (Ref. 9.3)

4.7.5 TEDE is determined for the most limiting receptor at the outer boundary of the low population zone (LPZ) and is used in determining compliance with the dose criteria in 10 CFR 50.67 (Ref. 9.1, Sections 4.1.6 and 4.4; and Ref. 9.3).

LPZ Dose Acceptance Criteria: 25 Rem TEDE (50.67(b)(2)(ii)) (Ref. 9.3)

4.7.6 No correction is made for depletion of the effluent plume by deposition on the ground (Ref. 9.1, Section 4.1.7).

4.7.7 The breathing rates used for persons at offsite locations are given in Reference 9.1, Sections 4.1.3 & 4.4. These rates are incorporated in Design Inputs 5.7.3 & 5.7.6.

4.8 Control Room Dose Consequences

The following guidance is used in determining the TEDE for maximum exposed individuals located in the control room:

4.8.1 The CR TEDE analysis considers the following sources of radiation that will cause exposure to control room personnel (Ref. 9.1, Section 4.2.1). See applicable Design Inputs 5.6.1 through 5.6.13.

- Contamination of the control room atmosphere by the intake or infiltration of the radioactive material contained in the post-accident radioactive plume released from the facility (via CR filtered air intake) (Section 2.4.1),
- Contamination of the control room atmosphere by the intake or infiltration of airborne radioactive material from areas and structures adjacent to the control room envelope (via CR unfiltered inleakage) (Section 2.4.1),
- Radiation shine from the external radioactive plume released from the facility (external airborne cloud) (Section 2.4.2) ,
- Radiation RB shine from radioactive material in the reactor containment (Section 2.4.3) ,
- Radiation shine from radioactive material in systems and components inside or external to the control room envelope, e.g., radioactive material buildup in recirculation filters (CR filter shine dose) (Section 2.4.4).

4.8.2 The radioactivity releases and radiation levels used for the control room dose are determined using the same source term, transport, and release assumptions used for determining the exclusion area boundary (EAB) and the low population zone (LPZ) TEDE values (Ref. 9.1, Section 4.2.2).

4.8.3 The occupancy and breathing rate of the maximum exposed individual present in the control room are incorporated in Design Inputs 5.6.13 & 5.6.5 (Ref. 9.1, Section 4.2.6).

4.8.4 10 CFR 50.67 (Ref. 9.3) establishes the following radiological criterion for the control room. This criterion is stated for evaluating reactor accidents of exceedingly low probability of

occurrence and low risk of public exposure to radiation, e.g., a large-break LOCA (Ref. 9.1, Section 4.4).

CR Dose Acceptance Criteria: 5 Rem TEDE (50.67(b)(2)(iii)) (Ref. 9.3)

4.8.5 Credit for engineered safety features that mitigate airborne activity within the control room is taken for control room isolation/pressurization and intake and recirculation filtration (Ref. 9.1, Section 4.2.4). The CR emergency filtration system is conservatively assumed to be initiated at 60 seconds (Design Input 5.6.2) due to loss-of-offsite-power (LOOP) and system constraints after onset of a LOCA (refer to Figure 4).

4.8.6 The CR unfiltered inleakage is conservatively assumed to be 250 cfm during emergency mode of CREF operation (Design Input 5.6.6).

4.8.7 No credits for KI pills or respirators are taken (Ref. 9.1, Section 4.2.5).

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5.0 DESIGN INPUTS

5.1 General Considerations

5.1.1 Applicability of Prior Licensing Basis

NMP2 is licensed to use the AST and TEDE methodology (Ref. 9.26.1). The NMP2 specific design inputs and assumptions used in the CLB analysis are validated to represent the as-built condition of the plant and further evaluated to make them reasonably conservative with respect to the underlying regulatory requirements and to create dose margin for operational flexibility as discussed in Section 1.0.

5.1.2 Credit for Engineered Safety Features

Credit is taken only for those accident mitigation features that are classified as safety-related, are required to be operable by technical specifications, are powered by emergency power sources, and are either automatically actuated or, in limited cases, have actuation requirements explicitly addressed in emergency operating procedures (Ref. 9.1, Section 5.1.2). The single active component failure that results in the most limiting radiological consequences is assumed. The single active failures considered in this calculation are the MSIV in one main steam line failing to close and the operation of the CREF system failing to start due to a LOOP and a loss of a division of emergency power for Control Room modelling assumptions. The single active component failure that results in the most limiting radiological consequence is assumed (Ref. 9.1, Section 5.1.2).

5.1.3 Assignment of Numeric Input Values

The numeric values that are chosen as inputs to analyses required by 10 CFR 50.67 are compatible with AST and TEDE dose criteria and selected with the objective of to be reasonably conservative. As a conservative alternative, the limiting value applicable to each portion of the analysis is used in the evaluation of that portion. The use of 10% lower flow rates for the CREF intake & recirculation, assuming single failure of the dose mitigating active component (failure of one CREF & SGTS filtration train and failure of one drywell spray pump), not crediting the drywell spray beyond the DF cutoff times, not crediting the inboard piping for aerosol deposition in the system bypass leakage pathways, and use of ground level release χ/Qs demonstrate the inherent conservatisms in the plant design and post-accident response.

5.1.4 Meteorology Considerations

Atmospheric dispersion factors (χ/Qs) for the onsite and offsite release points are developed (Ref. 9.11) using the NRC sponsored ARCON96 and PAVAN computer codes. These χ/Q values are developed using the NMP2 plant-specific meteorological hourly data and appropriate regulatory guidance (Ref. 9.11).

5.2 Accident-Specific Design Inputs/Assumptions

The design inputs/assumptions utilized in the EAB, LPZ, and CR habitability analyses are listed in the following sections. The design inputs are compatible with the requirements of the AST and TEDE dose criteria and the assumptions are consistent with those identified in Regulatory Position 1.1.3 and Appendix A of RG 1.183 (Ref. 9.1). The design inputs and assumptions in the following sections represent the as-built design of the plant.

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Design Input Parameter	Value Assigned	Reference
5.3 Containment Leakage Model Parameters		
5.3.1 Source Term		
5.3.1.1 Thermal Power Level	4,067 MWt (includes 2% margin over 3,988 MWt)	9.17.7
5.3.1.2 Peak Fuel Burnup	62,000 MWD/MTU	9.1, Section 3.2, Note 10

5.3.1.3 CAVEX Isotopic Core Inventory (Ci/MWt) (Table 1)

Isotope	Ci/MW$_t$	Isotope	Ci/MW$_t$	Isotope	Ci/MW$_t$
Kr-83m	4.05E+03	Ru-105	3.17E+04	Cs-134	6.26E+03
Kr-85m	9.12E+03	Ru-106	1.85E+04	Cs-136	1.91E+03
Kr-85	4.61E+02	Rh-105	2.95E+04	Cs-137	4.86E+03
Kr-87	1.84E+04	Sb-127	2.56E+03	Ba-139	5.20E+04
Kr-88	2.50E+04	Sb-129	7.91E+03	Ba-140	5.06E+04
Rb-86	6.26E+01	Te-127	2.53E+03	La-140	5.11E+04
Rb-88	2.52E+04	Te-127m	4.33E+02	La-141	4.75E+04
Sr-89	3.44E+04	Te-129	7.41E+03	La-142	4.66E+04
Sr-90	3.68E+03	Te-129m	1.42E+03	Ce-141	4.78E+04
Sr-91	4.24E+04	Te-131m	5.38E+03	Ce-143	4.66E+04
Sr-92	4.39E+04	Te-132	3.86E+04	Ce-144	3.83E+04
Y-90	3.81E+03	I-131	2.72E+04	Pr-143	4.56E+04
Y-91	4.31E+04	I-132	3.96E+04	Nd-147	1.86E+04
Y-92	4.44E+04	I-133	5.64E+04	Np-239	5.45E+05
Y-93	4.81E+04	I-134	6.47E+04	Pu-238	1.19E+02
Zr-95	5.09E+04	I-135	5.33E+04	Pu-239	1.20E+01
Zr-97	4.91E+04	Xe-133	5.64E+04	Pu-240	2.12E+01
Nb-95	5.02E+04	Xe-133m	1.73E+03	Pu-241	4.71E+03
Mo-99	5.14E+04	Xe-135	2.37E+04	Am-241	6.66E+00
Tc-99m	4.53E+04	Xe-135m	1.17E+04	Cm-242	1.83E+03
Ru-103	4.45E+04	Xe-138	5.06E+04	Cm-244	1.21E+02

5.3.1.4 Radionuclide Composition

Group	Elements	
Noble Gases	Xe, Kr	9.1, Section 3.4, Table 5
Halogens	I, Br	
Alkali Metals	Cs, Rb	
Tellurium Group	Te, Sb, Se	
Barium, Strontium	Ba, Sr	
Noble Metals	Ru, Rh, Pd, Mo, Tc, Co	
Lanthanides	La, Zr, Nd, Eu, Nb, Pm, Pr, Sm, Y, Cm, Am	
Cerium	Ce, Pu, Np	

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Design Input Parameter	Value Assigned	Reference
5.3.1.5 Release Fraction (Ref 9.1, Table 1)		
BWR Core Inventory Fraction Released Into Containment		
Group	**Gap Release Phase**	**Early In-Vessel Release Phase**
Noble Gases	0.05	0.95
Halogens	0.05	0.25
Alkali Metals	0.05	0.20
Tellurium Metals	0.00	0.05
Ba, Sr	0.00	0.02
Noble Metals	0.00	0.0025
Cerium Group	0.00	0.0005
Lanthanides	0.00	0.0002
5.3.1.6 Timing of Release Phase (Ref. 9.1, Table 4)		
Phase	**Onset**	**Duration**
Gap Release	2 min	0.5 hr
Early In-Vessel Release	0.5 hr	1.5 hr
5.3.1.7 Iodine Chemical Form		
Aerosol (CsI)	95%	9.1, Section 3.5
Elemental	4.85%	
Organic	0.15%	
5.3.2 Activity Transport in Primary Containment		
5.3.2.1 Minimum Drywell Air Volume	3.062E+05 ft^3	9.4, Item 3.8.1
5.3.2.2 Minimum Wetwell Air Volume	1.098E+05 ft^3	9.4, Item 3.8.2
5.3.2.3 Drywell plus Wetwell Volume	4.97E+05 ft^3 (=1.908E+05 ft^3 + 3.062E+05)	9.4, Item 3.8
5.3.2.4 Containment Normal Purge Release Time Volume	 < 5 sec 247.4 ft^3	 9.29.2, Attachment 5 9.29.2, Item 3.18
5.3.2.5 Reactor Building Free Volume	3.88E+06 ft^3 1.94E+06 Credited for Mixing	9.4, Item 3.17
5.3.2.6 Containment Leak Rate Drywell Wetwell	1.22 v%/day (= 4.21 cfm Total) 102.75 cfm (0-5 minutes) 2.75 cfm (5 min to 24 hrs) 1.375 cfm (> 24 hrs) 1.46 cfm (< 24 hrs) 0.73 cfm (> 24 hrs)	 9.29.1, Section 2 9.4, Items 3.10 9.4,Item 3.11
5.3.2.7 Fraction of Reactor Building Available for Mixing	50%	9.4, Item 3.17
5.3.2.8 SGTS Exhaust Rate	3,600 to 4,400 cfm 4,400 cfm used in the analysis to maximize CR & O/S doses; 3,600 cfm used to maximize RB shine dose to CR	9.17.4

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Design Input Parameter	Value Assigned	Reference
5.3.2.9 RB Drawdown Time Leakage during drawdown	 1 hr 2670 cfm	9.17.5 9.4, Item 6.6
5.3.2.10 Post-LOCA Drywell Pressure Temperature	 40.0 psig 340^{0}F	9.4, Item 6.4
5.3.2.11 SGTS Exhaust Charcoal and HEPA Filter Efficiencies		
Elemental Iodine	99%	Section 7.8 9.29.2, Item 4.1
Organic Iodide	99%	
Particulate Aerosols	99%	
5.3.2.12 Mixing Flow Rates: DW to WW WW to DW	 8.971E+04 %/day 1.440E+05 %/day	Section 7.11
5.4 ESF Leakage Model Parameters		
5.4.1 Suppression Pool Minimum Water Volume	1.45E+05 ft^3	9.4, Item 3.9
5.4.2 Suppression Pool Water Activity (Ref. 9.1, Tables 1 & 4)		
Group	Gap Release Phase	Early In-Vessel Release Phase
Timing Duration (Hrs)	2 min – 0.50 hr	0.50 – 2.0 Hr
Halogen	0.05 hr	0.25
5.4.3 ESF Leakage Rate	60 gpm (failure of six valves) + 2 gpm operational leakage (doubled)	9.4, Item 3.16 & 9.1, Section A5.2
5.4.4 ESF Leakage Duration Time	0 to 30 days	Assumed
5.4.5 Maximum Suppression Pool Water Temperature	202^{0}F	9.4, Item 6.7
5.4.6 Long-Term Suppression Pool Water pH	> 7.0	9.12, Section 6.2, 9.1, Section A.2 9.29.2, Item 7.6
5.4.7 Fraction of Iodine in ESF Leakage that becomes Airborne	0.10	9.1, Section A.5.5
5.4.8 Chemical Form of Iodine in ESF Leakage		
Elemental	97%	9.1, Section A.5.6
Organic	3%	
5.4.9 Fraction of RB Volume for ESF Leakage Mixing	50%	9.4, Item 3.17
5.5 MSIV Leakage Model Parameters		
5.5.1 Total MSIV Leak Rate Through All Four Lines	400 scfh @ 40.0 psig & 340^{0}F or 200 scfh @ 40.0 psig & 340^{0}F	Assumed, Section 2.3.1.3
5.5.2 MSIV Leak Rate Through One Line With MSIV Failed	200 scfh @ 40.0 psig & 340^{0}F or 100 scfh @ 40.0 psig & 340^{0}F	Assumed - Section 2.3.1.3
5.5.3 MSIV Leak Rate Through Three Intact Lines		
First Intact Line	200 scfh @ 40.0 psig & 340^{0}F or 100 scfh @ 40.0 psig & 340^{0}F	Assumed - Section 2.3.1.3
Second Intact Line	0.0	
Third Intact Line	0.0	

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Design Input Parameter	Value Assigned	Reference
5.5.4 MSL Data Internal Area & Volume	Table 2	9.10, Tables 6.1-1, 6.1-2, & 6.1-4
5.5.5 Maximum Steam Line Temperature	558^0F	9.4, Item 6.3
5.5.6 System Bypass Leakages		
Bypass Pathway	**Leakage (scfh)**	
MSL lnboard Drains	1.875	9.29.2, Item 3.19 * EC/ECR No. ECP-18-000616-CN-002, "This line was removed by ECP-13-000087, however it is retained in the analysis, however it is most limiting line with regards to fission product deposition in the group of six lines shown." (Refs. 9.29.2 & 9.29.3, Insert 1)
MSL Outboard Drains	0.625	
Drywell Floor Drain	1.875	
Drywell Floor Drain Tank Vent	0.9375	
Drywell Equip Drain	1.25	
Drywell Equip Drain Tank Vent	0.625	
2in. CPS Line in Drywell	0.625	
PASS Sample A	0.2344	
PASS Sample B	0.2344	
PASS Return A	0.2344	
PASS Return B	0.2344	
lAS Line l	0.9375	
lAS Line 2	0.9375	
IAS Line 3	3.6	
lAS Line 4		
lAS Line 5		
GSN		
1in. CPS Line 1		
1in. CPS Line 2*		
12in.CPS Line in Wetwell	3.75	
2in.CPS Line in Wetwell	0.625	
Feedwater Line A	12	
Feedwater Line B	12	
RWCU	2.5	
14 in. CPS Line in Drywell	4.38	
5.6 Control Room Model Parameters		
5.6.1 CR Envelope Pressure Boundary Free Volume	3.81E+05 ft^3	9.4, Item 3.2
5.6.2 CREF Flow Rates 0 to 60 sec > 60 sec	 750 cfm (unfiltered) 1,350 cfm (filtered)	9.29.2, Items 3.12, 3.13, 3.14 and Attachment 10
5.6.3 CREF & Recirculation Actuation Time	60 seconds	
5.6.4 CREF Recirculation Rate	675 cfm (> 60 seconds, filtered)	
5.6.5 CR Breathing Rate	3.5E-04 m^3/sec	9.1, Section 4.2.6

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Design Input Parameter	Value Assigned	Reference
5.6.6 CREF Unfiltered Inleakage (includes ingress/egress inleakage of 10 cfm)	0 cfm measured 250 cfm used in analysis	9.29.2, Item 3.15 & Attachment 11 9.4, Item 3.15
5.6.7 CR Emergency Ventilation Mode Intake Charcoal and HEPA Filter Efficiencies		
Elemental Iodine	99%	Section 7.8 9.29.2, Item 4.2
Organic Iodide	99%	
Particulate Aerosols	99%	
5.6.8 CR χ/Qs For Containment & ESF Leakage Release Via SGTS Stack (Station Chimney)		
Time	**X/Q (sec/m^3)**	
0-2	8.03E-05	9.11, Table 7.3.4 (Worst case value of CR intake) 9.4, Section 5
0-8	4.48E-05	
8-24	1.68E-05	
24-96	1.20E-05	
96-720	8.83E-06	
5.6.9 CR X/Qs For Bypass Leakage Release Via Main Steam Tunnel		
Time	**X/Q (sec/m^3)**	
0-2	1.47E-03	9.11, Table 7.3.4 (Worst case value of CR intake) 9.4, Section 5
0-8	9.74E-04	
8-24	3.63E-04	
24-96	2.45E-04	
96-720	1.90E-04	
5.6.10 CR X/Qs For Bypass Leakage Release Via Combined Radwaste &Reactor Bldg Vent		
Time	**X/Q (sec/m^3)**	
0-2	1.09E-03	9.11, Table 7.3.4 (Worst case value of CR intake) 9.4, Section 5
0-8	7.23E-04	
8-24	2.50E-04	
24-96	1.92E-04	
96-720	1.47E-04	
5.6.11 CR X/Qs For Bypass Leakage Release Via Post Accident Sampling System Panel (PASS)		
Time	**X/Q (sec/m^3)**	
0-2	3.84E-04	9.11, Table 7.3.4 (Worst case value of CR intake) 9.4, Section 5
0-8	2.28E-04	
8-24	8.23E-05	
24-96	6.28E-05	
96-720	4.57E-05	
5.6.12 CR X/Qs For Bypass Leakage Release Via Standby Gas Treatment System Building		
Time	**X/Q (sec/m^3)**	
0-2	5.33E-04	9.11, Table 7.3.4 (Worst case value of CR intake) 9.4, Section 5
0-8	3.72E-04	
8-24	1.36E-05	
24-96	9.17E-05	
96-720	6.72E-05	

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Design Input Parameter	Value Assigned	Reference
5.6.13 CR Occupancy Factors		
Time (Hr)	**%**	
0-24	100	9.1, Section 4.2.6 9.4, Section 5
24-96	60	
96-720	40	
5.7 Offsite Dose Receptor Release Model Parameters		
5.7.1 EAB X/Qs For Containment & ESF Leakage Release Via SGTS Stack (Station Chimney)		
Time (hrs)	**X/Q (sec/m^3)**	
0-2 (Stack Fumigation)	2.96E-05	9.11, Table 7.2; 9.4, Section 5
5.7.2 EAB X/Q For MSIV Leakage Release Via Main Steam Tunnel		
Time (hrs)	**X/Q (sec/m^3)**	9.11, Table 7.1; 9.4, Section 5
0-720	1.19E-04	
5.7.3 EAB Breathing Rate	3.5E-04 m^3/sec	9.1, Section 4.1.3, 9.4, Section 5
5.7.4 LPZ X/Qs For Containment & ESF Leakage Release Via SGTS Stack		
Time (hrs)	**X/Q (sec/m^3)**	
0-2 (Stack Fumigation)	1.42E-05	9.11, Table 7.2, 9.4, Section 5
0-8	1.42E-05	
8-24	5.41E-07	
24-96	2.31E-07	
96-720	7.65E-08	
5.7.5 LPZ X/Qs For Ground Level Release		
Time (hrs)	**X/Q (sec/m^3)**	
0-8	1.62E-05	9.11, Table 7.1, 9.4, Section 5
8-24	1.09E-05	
24-96	4.59E-06	
96-720	1.33E-06	
5.7.6 LPZ Breathing Rates (BR)		
Time (hrs)	**BR (m^3/sec)**	
0-8	3.5E-04	9.1, Section 4.1.3, 9.4, Section 5
8-24	1.8E-04	
24-720	2.3E-04	
5.8 Drywell Spray Parameters		
5.8.1 Spray Average Height	31.5 ft	Section 7.9
5.8.2 Spray Average Flow Rate	5,237.49 gpm	Attachment 13.1
5.8.3 Spray Aerosol & Elemental Removal Rate Constant	19.8 hr^{-1}	Section 7.9
5.8.4 Spray Initiation Time	20 minutes (manually initiated)	9.30, page 6.2-11
5.9 Shielding Inputs		
5.9.1 CR Roof & East wall Concrete Shielding	2 feet	Ref. 9.28, Page 71
5.9.2 RB/CR Shielding Geometry	See Sections 2.4.3, 2.4.4 & 7.6	Ref. 9.28, Pages 71 through 76
5.9.3 CR Filter Elevations	288'-6" / 306'-0"	Ref. 9.28, Page 95

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5.9.4 CR Concrete Shielding Between Filter & Operator	2 feet	Ref. 9.28, Page 97
5.9.5 Inner Radius of RB Concrete Wall	83'	Ref. 9.28, Page 72
5.9.6 Outer Radius of RB Concrete Wall	83 + 2.5' = 85'-6"	
5.9.7 Radius of RB sheet metal wall	88'	
5.9.8 Concrete Density	2.16 g/cc	Ref. 9.28, Page 22

6.0 COMPUTER CODES & COMPLIANCE WITH REGULATORY REQUIREMENTS

6.1 Computer Codes

All computer codes used in this calculation have been approved for use with appropriate Verification and Validation (V&V) documentation. Computer codes used in this analysis include:

- **RADTRAD** (Ref. 9.2): This is an NRC-sponsored code approved for use in determining control room and offsite doses from releases due to reactor accidents. EXELON performed an in-house V&V of the RADTRAD3.03 code (Ref. 9.21). Therefore, the code is considered acceptable to be used for the EXELON AST analyses.

- **MicroShield** (Ref. 9.20): A commercially available and accepted code used to determine dose rates at various source-receptor combinations. Several runs were made at various times during the LOCA since the source strength varies over time. EXELON performed an in-house V&V of the MicroShield 5.05 code (Ref. 9.22). Therefore, the code is considered acceptable to be used for the EXELON AST analyses.

6.2 Compliance With Regulatory Requirements

As discussed in Section 4.0, Assumptions, the analysis in this calculation complies with line-by-line requirements in Regulatory Guide 1.183.

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7.0 CALCULATIONS

7.1 NMP2 Plant Specific Nuclide Inventory File (NIF) For RADTRAD3.03 Input

The RADTRAD nuclide inventory nmp2.inp (Attachment 13.14) is a radionuclide power density in Ci/MW_t established using the EPU core inventory listed in Table 1 and used for RADTRAD release models for the containment, ESF, and MSIV /other system bypass leakages.

7.2 Determination of MSIV Leak Rates

7.2.1 Design Basis Case

The total leakage from all main steam lines is 400 scfh at 40 psig, allowing a maximum of 200 scfh at 40 psig from any one of the 4 main steam lines. The design basis leakage is converted to LOCA conditions using the Ideal Gas Law at 40.0 psig and 340^0 F.

7.2.2 MSIV Leakage During 0-24 hrs

Drywell volume = 3.062E+05 ft^3
Total MSIV leakage measured @ 40.0 psig = 400 scfh (assumed)
Per the ideal gas law, PV= nRT or PV/T = nR. Given that nR is a constant for the air leakage, PV/T at post-LOCA conditions is equal to PV/T at STP conditions.
P @LOCA = Drywell peak pressure = 40.0 psig
T @LOCA = Drywell peak temperature = 340^oF= $340^0F + 460 = 800^0R$
P @STP = Standard pressure = 14.7 psia
T @STP = Standard temperature = $70^0F = 70^0F + 460 = 530^0R$
V @STP = MSIV leakage based @ 40.0 psig = 400 scfh

V @LOCA = (PV/T @ STP) x (T/P @ LOCA)
0-2 hrs MSIV leakage @ drywell peak pressure of 40 psig and temperature of 340^0F
= 400 scfh x [14.7 psia / (40 psig + 14.7 psia)] x [800^0R / 530^0R]
= 400 scfh x 0.4056 = 162.24 cfh

The 0-24 hrs 400 scfh MSIV leakage is released via four Main Steam Lines (MSLs). A maximum allowable leak rate of 200 scfh is postulated to leak in the shortest MSL with its failed MSIV to close. The balance of allowable leak rate of 200 scfh is postulated to leak in the second shortest intact MSL. The MSIV leakage of 0 scfh is postulated in the remaining intact MSLs 3 & 4.

0-24 hrs allowable leakage from MSL with failed MSIV (at maximum 200 scfh leak rate)
= (200 scfh / 400 scfh total) x 162.24 cfh = 81.12 cfh = 1.352 cfm
0-24 hrs allowable leakage from intact MSL (at maximum 200 scfh leak rate)
= (200 scfh / 400 scfh total) x 162.24 cfh = 81.12 cfh = 1.352 cfm

7.2.3 MSIV Leakage During 24-720 hrs

Per RG 1.183, Appendix A, Section 6.2, the postulated MSIV leakage is reduced to 50% of the maximum leak rate after the first 24 hours.

0-24 hrs MSIV leak rate = 81.12 cfh = 1.352 cfm from MSL with failed MSIV (Section 7.2.2)

24-720 hrs allowable leakage from MSL with failed MSIV
= 81.12 cfh / 2 = 40.56 cfh = 0.676 cfm
24-720 hrs allowable leakage from intact MSL
= 81.12 cfh / 2 = 40.56 cfh = 0.676 cfm

7.2.4 MSIV Leakage To Environment

0-24 hrs MSIV Leakage to Environment

It is assumed that the post-LOCA activity released in the MSL with the failed inboard MSIV is instantaneously and homogeneously distributed in the single well-mixed volumes of MSL segments between the RPV nozzle and outboard MSIV and the outboard MSIV and Turbine Stop Valve (TSV). The MSIV leakage from the TSV expands to the atmospheric condition as follows:

0-24 hrs Upstream of TSV in MSIV Failed MSL (Section 7.2.2):
V1 = 81.12 cfh P1 = 40.0 psig + 14.7 = 54.7 psia T1 = (340^0F + 460) = 800^0R

0-24 hrs Downstream of TSV in MSIV Failed MSL (Atmospheric Condition):
V2 = TBD P2 = 14.7 psia T2 = (70^0F + 460) = 530^0R

0-24 hrs MSIV Leakage to Environment From MSIV Failed MSL:
V2 = (PV/T @ 1) x (T/P @ 2)
= (54.7 psia x 81.12 cfh / 800^0R) x (530^0R / 14.7 psia)
= 200.0 cfh = 3.333 cfm

This is as expected, given that the 81.12 cfh leakage rate is equivalent to 200 scfh upstream of the outboard MSIV, and therefore it is equivalent to 200 cfh downstream of the outboard MSIV in the presence of standard pressure and temperature atmospheric conditions.

0-24 hr Upstream of TSV in Intact MSL (Section 7.2.2):
V1 = 81.12 cfh P1 = 40.0 psig + 14.7 = 54.7 psia T1 = (340^0F + 460) = 800^0R

0-24 hrs Downstream of TSV in Intact MSL (Atmospheric Condition):
V2 = TBD P2 = 14.7 psia T2 = (70^0F + 460) = 530^0R

0-24 hrs MSIV Leakage to Environment From Intact MSL:
V2 = (PV/T @ 1) x (T/P @ 2)
= (54.7 psia x 81.12 cfh / 800^0R) x (530^0R / 14.7 psia)
= 200 cfh = 3.333 cfm

24-720 hr MSIV leakages to Environment

The MSIV leakage is reduced by 50% after 24 hours, therefore, the MSIV leakage during 0-24 hrs is reduced by a factor of 2 as follows:

24-720 hrs Upstream of TSV in MSIV Failed MSL (Section 7.2.3):
V1 = 40.56 cfh P1 = 40.0 psig + 14.7 = 54.7 psia T1 = (340^0F + 460) = 800^0R

24-720 hrs Downstream of TSV in MSIV Failed MSL (Atmospheric Condition):
V2 = TBD P2 = 14.7 psia T2 = (70^0F + 460) = 530^0R

24-720 hrs MSIV Leakage to Environment from MSIV Failed MSL:
V2 = (PV/T @ 1) x (T/P @ 2)
= (54.7 psia x 40.56 cfh / 800^0R) x (530^0R / 14.7 psia)
= 100.0 cfh = 1.667 cfm

24-720 hrs Upstream of TSV in Intact MSL (Section 7.2.3):
V1 = 40.56 cfh P1 = 40.0 psig + 14.7 = 54.7 psia T1 = (340^0F + 460) = 800^0R

24-720 hrs Downstream of TSV in Intact MSL (Atmospheric Condition):
V2 = TBD P2 = 14.7 psia T2 = (70^0F + 460) = 530^0R

24-720 hrs MSIV Leakage to Environment from MSIV Failed Line (MS Line 1):
V2 = (PV/T @ 1) x (T/P @ 2)
= (54.7 psia x 40.56 cfh / 800^0R) x (530^0R / 14.7 psia)
= 100.0 cfh = 1.667 cfm

The MSIV leak rate information in Section 7.2 above is listed in Table 3 for the total MSIV leakage of 400 scfh. The MSIV leakage values in Table 3 is divided by a factor of 2 to calculate corresponding values for MSIV leakage value of 200 scfh in Table 3A. Theses time dependent MSIV leakage values are used in the RADTRAD runs NMP2MS00.psf, NMP2MS01.psf, and NMP2MS201.psf.

7.3 MSIV Bypass Leakage – MSL Volumes & Surface Area For Plateout of Activity

Calculation H21C-093 (Ref. 9.10) provides the piping data for bypass release pathways. The calculation documents the piping lengths, internal areas, and volumes. The horizontal piping projected areas and horizontal piping volume are calculated for the MSIV bypass and other system bypass leakages in the following sections. Reference 9.10 calculates internal horizontal piping area, which is a product of π D L. The projected area can be obtained by dividing the internal area by π in the following sections.

7.3.1 Main Steam Header A

7.3.1.1 Control Volume V_1 for MSIV Failed MSL Between RPV Nozzle & Outboard MSIV (200 scfh)

Horizontal Pipe Volume
= MSL segment between RPV and inboard MSIV + Interstitial volume between inboard & outboard MSIVs
= 119.82 ft^3 + 59.39 ft^3 = 179.21 ft^3 (Ref. 9.10, Table 6.1-1)

Total Pipe Volume V_1
= Horizontal Pipe Volume + Vertical Pipe Volume
= 179.21 ft^3 + 211.47 ft^3 = 390.68 ft^3

Horizontal Pipe Surface Area
= (244.93 ft^2) / π + (121.41 ft^2) / π = 77.96 ft^2 + 38.65 ft^2 = 116.61 ft^2 (Ref. 9.10, Table 6.1-1)

7.3.1.2 Control Volume V_2 for MSIV Failed MSL Between Outboard MSIV & TSV (200 scfh)

Horizontal Pipe Volume
= 271.38 ft^3 (Ref. 9.10, Table 6.1-1)

Total Pipe Volume V_2
= Horizontal Pipe Volume + Vertical Pipe Volume
= 271.38 ft^3 + 157.03 ft^3 = 428.41 ft^3 (Ref. 9.10, Table 6.1-1)

Horizontal Pipe Surface Area
= (516.31 ft^2) / π = 164.35 ft^2 (Ref. 9.10, Table 6.1-1)

7.3.2 Main Steam Header D

7.3.2.1 Control Volume V_3 for MSIV Intact MSL Between RPV Nozzle & Inboard MSIV (200 scfh)

Horizontal Pipe Volume
= MSL segment between RPV and inboard MSIV
= 119.99 ft^3 (Ref. 9.10, Table 6.1-4)

Total Pipe Volume V_3
= Horizontal Pipe Volume + Vertical Pipe Volume
= 119.99 ft^3 + 211.82 ft^3 = 331.81 ft^3 (Ref. 9.10, Table 6.1-4)

Horizontal Pipe Surface Area
= (245.28 ft^2) / π = 78.07 ft^2 (Ref. 9.10, Table 6.1-4)

7.3.2.2 Control Volume V_4 for MSIV Intact MSL Between Inboard MSIV & TSV (200 scfh)

Horizontal Pipe Volume
= 59.27 ft^3 + 271.31 ft^3 = 330.58 ft^3 (Ref. 9.10, Table 6.1-4)

Total Pipe Volume V_4
= Horizontal Pipe Volume + Vertical Pipe Volume
= 330.58 ft^3 + 156.45 ft^3 = 487.03 ft^3 (Ref. 9.10, Table 6.1-4)

Horizontal Pipe Surface Area
= (121.15 ft^2) / π + (516.17 ft^2) / π = 202.86 ft^2

These MSIV bypass leakage piping parameters calculated in the above section are listed in Table 2 and used in Tables 4 & 4B to calculate the TEAREs.

7.4 ESF Leak Rates

As stated in Section 2.2.1, the total ESF leakage from all components in the ESF systems is assumed to be 62 gpm that includes 60 gpm of six assumed failure of valves (Ref. 9.4, Item 3.16)- 2RHS*MOV142, 2RHS*S0V35A, 2RHS*S0V36A, 2RHS*MOV149, 2RHS*S0V35B, & 2RHS*S0V36B and l gpm of the system leakage, which was doubled (Ref. 9.1, Section A.5.2).

62 gallon/min × 1/7.4805 ft^3/gallon = 8.29 cfm, which is used in RADTRAD files NP2ES400.psf, NP2ES00.psf, and NP2ES22.psf.

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7.5 External Cloud Gamma Dose Attenuation Factor

The gamma attenuation for concrete shielding for an external cloud dose is conservatively calculated for an average gamma energy of 1 MeV.

The gamma radiation external radioactive plume shine to the CR personnel is attenuated by the 2'-0" minimum concrete wall shielding (Ref. 9.28, page 71). Gamma dose attenuation for 1'-6" concrete shielding is calculated as follows:
Mass attenuation coefficient for concrete at 1 MeV $\mu/\rho = 0.0635$ cm^2/g (Ref. 9.14, Table 3.7)
Density of concrete $\rho = 2.16$ g/cm^3 (Section 5.9.8)
Linear attenuation coefficient μ in concrete = $\mu/\rho \times \rho = 0.0635$ cm^2/g x 2.16 g/cm^3 = 0.137 cm^{-1}
Shielding thickness r = 24 inch x 2.54 cm/inch = 60.96 cm
μr in concrete shielding = 0.137 cm^{-1} x 60.96 cm = 8.35 mean free paths
Exposure buildup factor for isotropic point source at disintegration energy of 1 MeV and 8.35 mean free paths of the 1 MeV gammas

$B_p(\mu r) = A_1 e^{-\alpha_1 \mu r} + A_2 e^{-\alpha_2 \mu r}$ (Ref. 9.14, page 556)

Where A_1, A_2, α_1, and α_2 are functions of energy, and
$A_1 + A_2 = 1$

Values of these parameters are obtained from Table 10.3 of Reference 9.14 for 1 MeV gamma in concrete shielding as follows:
$A_1 = 25.507$ $\alpha_1 = -0.07230$ $\alpha_2 = -0.01843$ $A_2 = 1 - A_1 = 1 - 25.507 = -24.507$ $\mu r = 8.35$

Substituting these values in the above equation yields:

$B_p(\mu r) = 46.65 - 28.58 = 18.07$

Direct Shield Attenuation $I/I_0 = B_p(\mu r)\, e^{-\mu r}$
Where
I = shielded gamma dose rate
I_0 = unshielded gamma dose rate
$B_p(\mu r)$ = Exposure buildup factor

Substituting the values of parameters into the above attenuation Equation (1) yields a direct shield attenuation factor of

$I/I_0 = B_p(\mu r)\, e^{-\mu r} = 18.07\, e^{-(8.35)} = 18.07 \times 2.364\text{E-}04 = 0.00427$

7.6 Containment/CR Shielding Geometry

7.6.1 Dimensions:

The dimensions shown below are taken from Reference 9.28, pages 71 through 74. These dimensions are used in determining the boundaries that define the geometry model for MicroShield.

Horizontal distances from the center line of RB - Figure 5 (Plan View)
CR East Wall = 63' -0"

North Wall = 97'-6"

Vertical Elevations - Figure 5 (Plan View):
RB Roof EL 426'-3"
RB Operating Floor EL 386' -10"
CR Roof EL 328' -0"
CR Floor EL 306'-0"

Control Room wall thicknesses (Ref. 9.28, page 71):
North wall 24" concrete
East Wall 24" concrete
South Wall 24" concrete
West wall 24" concrete
Roof 24" concrete

RB Dimensions (Ref. 9.28, page 72)
Inner Radius of RB Concrete Wall = 83' -0"
Outer radius of RB concrete wall= (83' -0") + (2' -6") = 85' -6"
Radius of RB sheet metal wall = 88' -0"
Source Volume:
Radioactive source volume is calculated as follows:
Radius of RB sheet metal wall= R = 88' -0"
Height of source= H = (426'-3") - (386'-10") = 39'-5" = 39.42'
Volume = $\pi R^2 H = \pi * (88')^2 * 39.42' = 959{,}029.21\ ft^3$

7.6.2 Slant Distance Through 2' CR Concrete Roof

The location of CR is such that the line-of-sight with RB source passes through the CR roof having a thickness of 2 feet (Figure 5)

The slant distance is calculated just above the CR dose point at the bottom of the roof at EL 326'-0"
Minimum vertical elevation difference with the bottom of the RB source
= 386'-10" – 326'-0" = 60'-10" = 60.83'
Horizontal distance at CR dose point = 66.0'
Tan θ = 60.83' / 66.0' = 0.922
$\theta = 42.68^0$

Sin 42.68^0 = 0.678 = 2' (CR roof thickness) / Slant Distance
Minimum slant distance through CR concrete roof = 2' / 0.678 = 2.95' credited in MicroShield shielding model

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7.6.3 QADMOD Parameters (Figure 5):

Contact dose point (DP) location = 1' from east CR wall
CR wall thickness = 2'
Horizontal east-west distance of CR DP = 63'-0" + 2.0' + 1.0' = 66.0'
Horizontal north-south distance of CR DP = 97.5'+ 2.0' + 1.0' = 100.5'
Horizontal line-of-sight distance of CR DP = $[(66')^2 + (100.5')^2]^{-2}$ = 120.23'
Elevation difference between CR operator and RB source = 386'-10" – (306' + 6') = 74.83'
Slant line-of-sight distance of CR DP = $[(120.23')^2 + (74.83')^2]^{-2}$ = 141.61'≅ 141'

MicroShield Parameters (Figure 6):

Cylindrical source diameter = 88' x 2 = 176'
Cylinder source height = 39'-5" = 39.42'
Slant distance of CR dose point from RB centerline =141'
CR east wall is modeled 2.95' (slant distance through east wall)
Distance between CR east wall and RB source surface
= 141.0' – (2.95'concrete thickness + 1.0' DP distance from wall) – 88.0' (radius of RB) = 49.05'

CR Dose Point Coordinates:

x = 141.0'
y = 19.71' (= 39.42' / 2)

The post-LOCA activity is expected to distribute 50% of the RB volume, which is 1.94E+06 ft^3 (= 0.50 x 3.88E+06 ft^3). Therefore, the CR dose from the RB shine is reduced by a factor 0.494 (= 959,029.21 ft^3 / 1.94E+06 ft^3).

7.6.4 RB Source Volumes:

Figure 5 shows that the location of the CR roof with respect to the projection of the RB radiation source above the operating floor is such that any source within the RB inner radius (83.0') will be shielded by the slant distance in 2.5' of RB concrete wall and CR wall. The RB source volume contributing the CR dose is calculated in the following section.

Angle $\theta = 2 * \text{Cos}^{-1}(38/88) = 2 * \text{Cos}^{-1}(0.432) = 2 * 64.41^0 = 128.82^0$

Area of projected source contributing RB shine dose

$$= \frac{R^2}{2}(\pi/180 * 128.82^0 - \text{Sin } 128.82^0)$$

Where
R = Radius of Circle of Which Segment is a Part
C = Central Angle in Degrees

$$= \frac{(88)^2}{2}\left(\frac{3.14 * 128.82}{180} - 0.779\right) = 3{,}872 * (2.247 - 0.779) = 3{,}872 * 1.468 = 5{,}684.1 \text{ ft}^2$$

Height of RB projected source = 39.42'
Volume of RB projected source = 5,684.1 ft^2 x 39.42 ft = 224,067.22 ft^3

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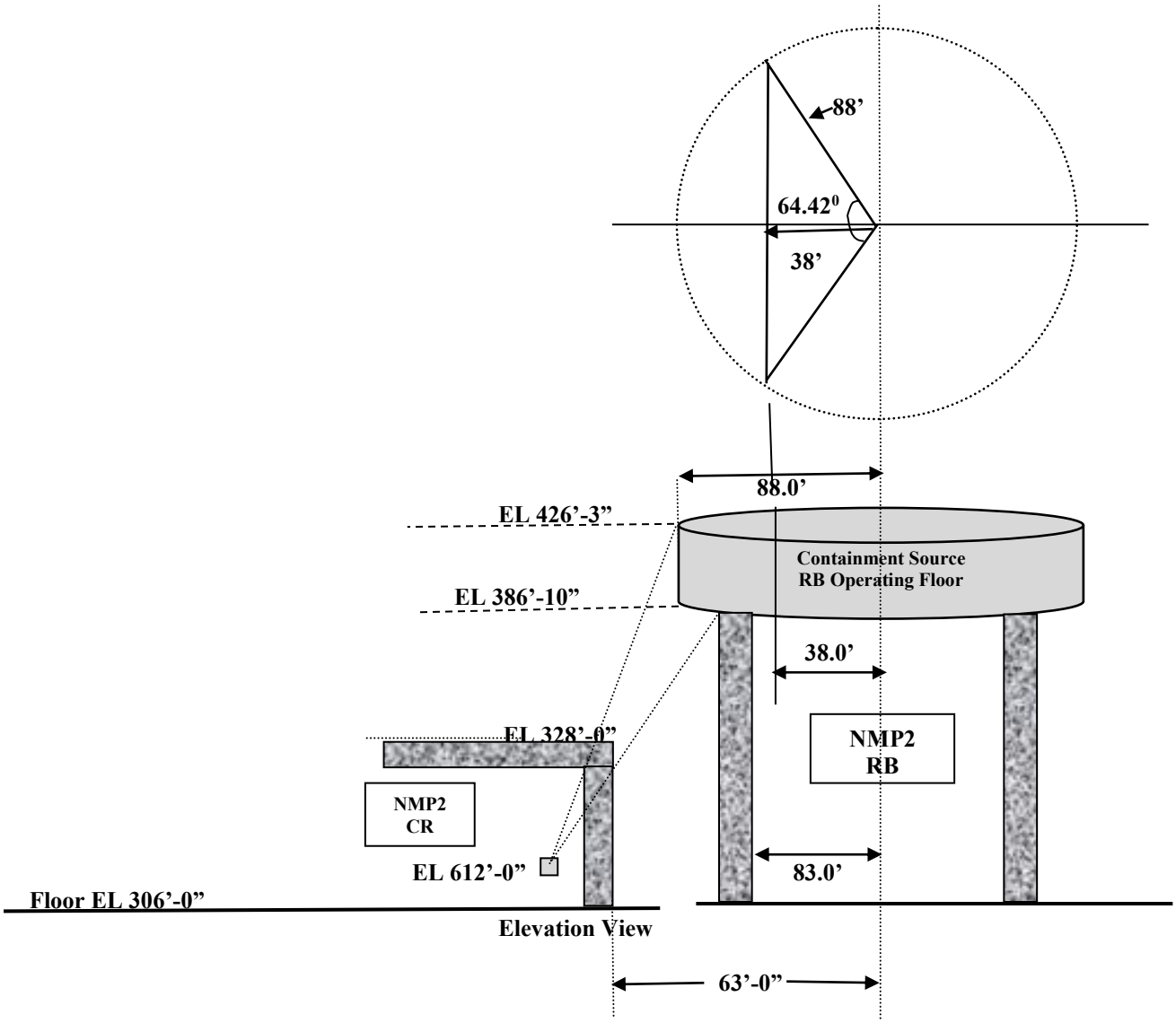

Fractional source volume contributing dose to CR operator
= 224,067.22 ft^3 / 959,029.21 ft^3 = 0.234

The post-LOCA activity is expected to distribute in 50% of the RB volume, which is 1.94E+06 ft^3 (= 0.50 x 3.88E+06 ft^3). The post-LOCA activity below the operating floor is heavily shielded by the compartment walls, ceilings, floor, and 2.5' of the RB wall. Therefore, the CR dose from the RB shine is reduced by a factor 0.494 (= 959,029.21 ft^3 / 1.94E+06 ft^3).

Total source volume related reduction factor applicable to the CR dose

= 0.234 x 0.494 = 0.116, which is applied to the RB shine dose to the CR calculated in the following Section 7.7.

7.7 CR RB shine Dose

720-hr RB shine dose rate CR operator including the control room occupancy factors

= 580.2 mrem = 0.580 rem (Table 15)

Total source volume related reduction factor = 0.116 (Section 7.6.4)

Total RB shine dose to CR operator

= 0.580 rem x 0.116 = 6.73E-02 rem, which is added to other post-LOCA dose contributions in Section 8.1

7.8 SGTS and CREF Filtration Efficiencies

HEPA Filter:

In-place penetration testing acceptance criteria for the safety related HEPA filters are as follows:

SGTS System HEPA Filter – in-place testing penetration and system bypass < 0.05% (Ref. 9.17.4, Section 5.5.7.a)
CREF System HEPA Filter – in-place testing penetration and system bypass < 0.05% (Ref. 9.17.4, Section 5.5.7.a)

GL 99-02 (Ref. 9.13) requires a safety factor of at least 2 should be used to determine the filter efficiencies to be credited in the design basis accident.

Testing penetration (%)
= [(100% - η)/safety factor] – System Bypass = [(100% - η)/2] – 0.05
Where η = SGTS System HEPA filter efficiency to be credited in the analysis
0.05% = [(100% - η)/2] – 0.05
0.2% = (100% - η)
η = 100% - 0.2% = 99.8%

Testing penetration (%)
= [(100% - η)/safety factor] – System Bypass = [(100% - η)/2] – 0.05
Where η = CREF System HEPA filter efficiency to be credited in the analysis
0.05% = [(100% - η)/2] – 0.05
0.2% = (100% - η)
η = 100% - 0.2% = 99.8%

Conservatively, the SGTS & CREF Systems HEPA filter efficiencies of 99% are credited in the analysis

Charcoal Filter:

Laboratory penetration testing acceptance criteria for the safety related Charcoal filters are as follows:

SGTS System Charcoal Filter – in- laboratory testing methyl iodide penetration and system bypass < 0.05% (Ref. 9.17.4, Section 5.5.7.b)

CREF System Charcoal Filter – in- laboratory testing methyl iodide penetration and system bypass < 0.05% (Ref. 9.17.4, Section 5.5.7.b)

GL 99-02 (Ref. 9.13) requires a safety factor of at least 2 should be used to determine the filter efficiencies to be credited in the design basis accident.

Testing methyl iodide penetration (%)
= [(100% - η)/safety factor] – System Bypass = [(100% - η)/2] – 0.05
Where η = SGTS Vent charcoal filter efficiency to be credited in the analysis
SGTS System Charcoal Filter
0.05% = [(100% - η)/2] – 0.05
0.2% = (100% - η)
η = 100% - 0.2% = 99.8%

Testing methyl iodide penetration (%)
= [(100% - η)/safety factor] – System Bypass = [(100% - η)/2] – 0.05
Where η = CREF charcoal filter efficiency to be credited in the analysis
CREF Charcoal Filter
0.05% = [(100% - η)/2] – 0.05
0.2% = (100% - η)
η = 100% - 0.2% = 99.8%

Conservatively, the SGTS & CREF Systems charcoal filter efficiencies of 99% are credited in the analysis

Safety Grade Filter	Filter Efficiency Credited (%)		
	Aerosol	Elemental	Organic
SGTS System	99	99	99
CREF	99	99	99

The NRC approved above filtration efficiencies in Reference 9.26.1, Sections 3.2.1.2.1 for SGTS and Section 3.3 for CR.

7.9 Drywell Spray Aerosol Removal Coefficient

The first order removal coefficient for particulate aerosols can be determined by the following equation from Standard Review Plan 6.5.2 (Reference 9.9, Section III.4.c.4, page 6.5.2-11):
$\lambda_{S,Partic} = (3 \times h \times F \times E) / (2 \times V \times D)$
$\lambda_{S,Partic} = (3 \times h \times F) \times (E/D) / (2 \times V)$
where,
$\lambda_{S,Partic}$ = particulate aerosol removal coefficient by spray wash-out
h = spray drop fall height
F = spray flow
E/D = ratio of a dimensionless collection efficiency (E) to the average spray drop diameter (D)
V = containment building net free volume
Per SRP 6.5.2 (Ref. 9.9, Section III.4.c.4, page 6.5.2-12), since the removal of particulate aerosol material chiefly depends on the relative sizes of the particles and the spray drops, it is convenient to combine parameters that cannot be known. It is conservative to assume E/D to be 10 per meter initially (i.e., 1% efficiency for spray drops of 1 millimeter in diameter), changing abruptly to 1 spray drop per

meter after the particulate aerosol mass has been depleted by a factor of 50 (i.e., 98% of the suspended mass is 10 times more readily removed than the remaining 2%).

Per SRP 6.5.2 (Ref. 9.9, Section III.4.d, page 6.5.2-12), because the removal mechanisms for particulate iodines are significantly different from and slower than the mechanisms for elemental iodine, there is no need to limit the DF for particulate iodines. Therefore the value of DF > 50 for particulate iodines is calculated in the following section for information only. The value of DF ≤ 50 for particulate iodines should be used for the entire duration of CS operation in the dose consequence analysis. There are two different particulate aerosol removal coefficients calculated for the different values of drywell flow rates as follows:

F = effective spray flow rate (Loop B) = 5,237.49 gal/min (Attachment 13.1)
F = 5,237.49 gal/min × 0.13368 ft^3/gal × 0.028317 m^3/ft^3 × 60 min/hr = 1,189.56 m^3/hr
V = Drywell net free sprayed volume = 3.062E+05 ft^3 (Design Input 5.3.2.1)
V = 3.062E+05 ft^3 × 0.028317 m^3/ft^3 = 8.671E+03 m^3
Fall height is assumed to be 50% of full height
Fall Height of DW Spray: Loop B Outer Loop EL303'(Ref. 9.4, Item 7.7)
DW Floor EL 240' (Ref. 9.4, Item 8.1)
Full Height = 303' – 240' = 63' and Fall Height h = 63.00' / 2 = 31.5'× 0.3048 m/ft = 9.60 m
Solving, the particulate aerosol spray removal coefficient equation:
DW Spray Flow of 5,237.49 gpm
For DF ≤ 50:
$\lambda_{S,Partic}$ = (3 × 9.60 m × 1,189.56 m^3/hr) × (10 m^{-1}) / (2 × 8.671E+03 m^3)
$\lambda_{S,Partic}$ ≅ 19.8 per hour
For DF > 50:
$\lambda_{S,Partic}$ = (3 × 9.60 m × 1,189.56 m^3/hr) × (1 m^{-1}) / (2 × 8.671E+03 m^3)
$\lambda_{S,Partic}$ ≅ 1.98 per hour

7.10 Time-dependent Elemental Iodine Removal

The J.E. Cline methodology (Ref. 9.16) is used to determine the deposition and resuspension rates of elemental iodine as follows:

d_i = elemental iodine vapor deposition velocity (cm/s)
$= e^{(2809/T - 12.80 (\pm 0.33))} = e^{(2809/T - 12.5)}$ (Ref. 9.16, pages 4 and 12).

Where T = gas temperature (^{0}K), which is obtained from Table 5.

The elemental iodine deposition rate λ_{ed} (hr^{-1}) $= \frac{d_i * S * 3600}{V}$ (Ref. 9.16, page 4)

Where d_i = deposition velocity (m/sec)
S = surface area of deposition (m^2)
V = volume (m^3)

This equation is same as equation 30 in the Bixler Model in the RADTRAD3.03 code (Ref. 9.2, page 212).

The steam line temperature as a function of the time is given in Reference 9.16, Figure 7, which is reproduced in this section. The equation that closely curve fits the Figure 7 is shown below:

$$T(^oK) = 299.7 + 265.6 * e^{-04.428*10^{-6}t}$$

where

t *time*, sec.

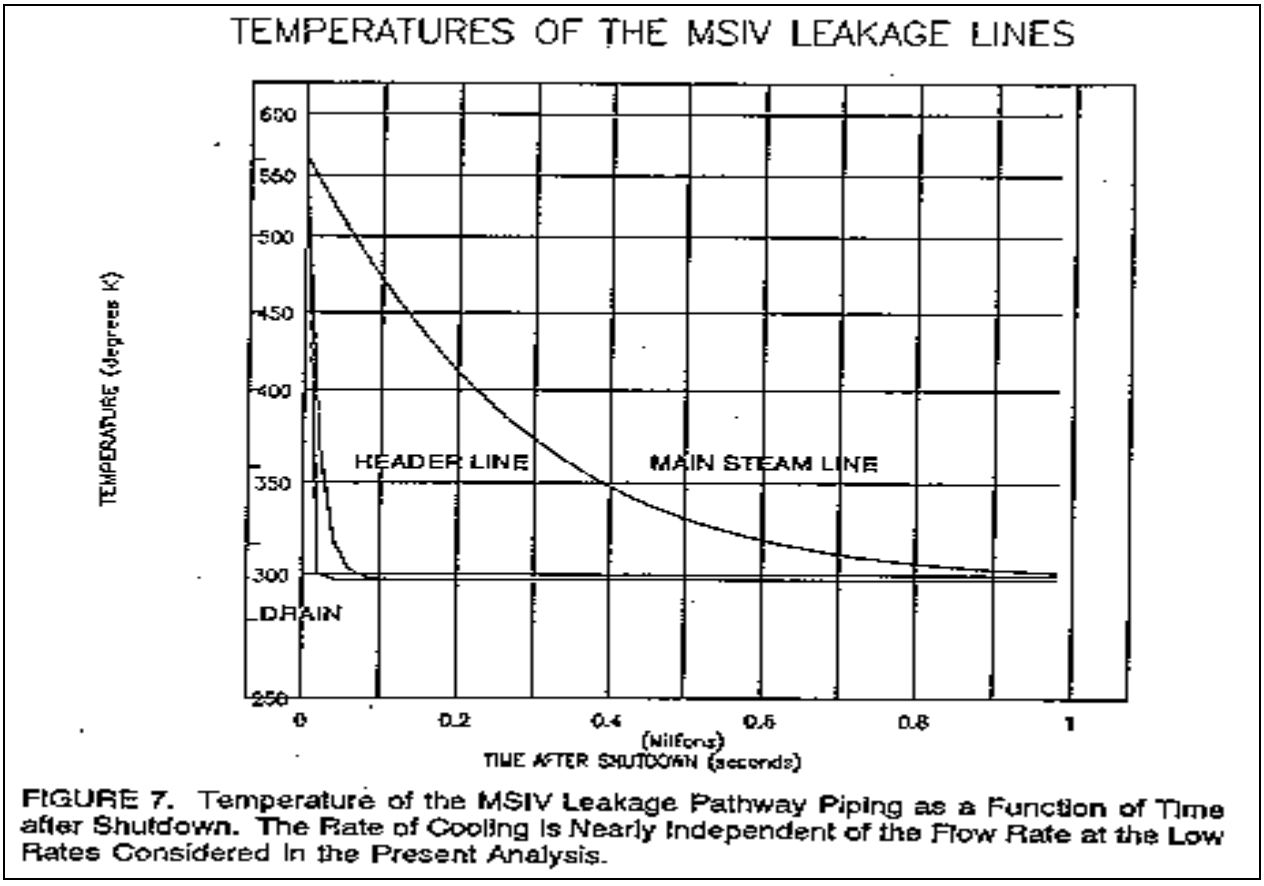

FIGURE 7. Temperature of the MSIV Leakage Pathway Piping as a Function of Time after Shutdown. The Rate of Cooling is Nearly Independent of the Flow Rate at the Low Rates Considered in the Present Analysis.

Using the curve fitting equation, the steam line temperatures at the different time intervals are calculated in Table 5 and used to calculate the elemental iodine deposition velocity (d_i) in Table 5C. The deposition velocity in cm/sec is converted into m/sec and elemental iodine deposition rates at various steam line temperatures are calculated in Tables 5D through and 5H for various well-mixed volumes V_1 through V_5.

A portion of elemental iodine deposited on the pipe surface will be resuspended as an airborne gas (organic iodine). Since the CR filtration efficiencies are the same for all iodine species, the resuspension of elemental iodine will produce the same thyroid organ dose irrespective of the form of iodine.

Resuspension rate of elemental iodine (sec^{-1}) (Ref. 9.16, page 12)

= **$2.32\ (\pm 2.00) \times 10^{-5}\ e^{-600/T} = 4.32 \times 10^{-5}\ e^{-600/T}$**

Resuspension rate of elemental iodine λ_{er} (hr^{-1})

= **$4.32 \times 3600 \times 10^{-5}\ e^{-600/T}$**

The resuspension rates of elemental iodine at various steam line temperatures are calculated in Table 5I.

The elemental iodine removal rate (from the air via deposition, or from the pipe surface via resuspension) is related to the decontamination factor by the following equation

Net Deposition Rate of Elemental Iodine $\lambda_e = \lambda_{ed} - \lambda_{er}$

$1/DF = 1 - \eta = \exp^{(-\lambda e * t)}$ (Ref. 9.2, Equations 4 and 5, page 196)

Where DF = decontamination factor
η = filter efficiency for elemental iodine
λe = elemental iodine removal rate (hr^{-1})
t = time (hr)

Therefore, Elemental Iodine Filter Efficiency = $\mathbf{1 - e^{-(\lambda e * t)}}$

The net amount of elemental iodine deposited on the pipe surface (i.e., net deposition efficiency) is equal to the amount of elemental iodine deposited on the pipe surface (prior to resuspension) minus the amount of elemental iodine that is resuspended from the pipe surface. The amount of elemental iodine that is resuspended from the pipe surface is equal to the product of the amount that was deposited on the pipe surface and the resuspension efficiency.

$\eta_{\text{net deposition}} = \eta_{\text{deposition}} - (\eta_{\text{deposition}} * \eta_{\text{resuspension}})$

The amount of elemental iodine deposited on the pipe surface (prior to resuspension) is the deposition efficiency as calculated using the previously described equation and the elemental iodine removal rates calculated in Table 5D through 5H for well-mixed volumes V_1 through V_5:

$\eta_{\text{deposition}} = \mathbf{1 - e^{-(\lambda ed * t)}}$

The resuspension efficiency is calculated using the previously described equation and the elemental iodine resuspension removal rates calculated in Table 5I:

$\eta_{\text{resuspension}} = \mathbf{1 - e^{-(\lambda er * t)}}$

Therefore, the net amount of elemental iodine deposited on the pipe surface is:

$\eta_{\text{net deposition}} = [\mathbf{1 - e^{-(\lambda ed * t)}}] - \{[\mathbf{1 - e^{-(\lambda ed * t)}}] * [\mathbf{1 - e^{-(\lambda er * t)}}]\}$

The corresponding filter efficiencies for various steam line temperatures are calculated in Tables 5J through 5N for well-mixed volumes V_1 through V_5 and listed all together in Table 5P. The conservative values (at the beginning of each time interval) are used for each time step in the RADTRAD model rather than using time interval average values for each time step. For conservatism, the elemental iodine filter efficiency is minimized by modeling a duration of 1 hour (i.e., t = 1 hour) for each post-LOCA time interval (e.g., 0 to 8 hours, 8 to 24 hours, etc.).

7.11 Mixing Flow Rate Between DW & WW

The mixing flow rate between the DW and WW is assumed to be 1.908E+05 cfm or one WW volume per minute.

1 WW vol/min = 100%/min * 1440 min/day = 1.44E+05 %/day
dN/dt = dN/dt (WW to DW) - dN/dt (DW to WW) = 0 (mass transfer rate balanced)

Assuming constant thermodynamic conditions.
Mass flow rate is proportional to volumetric flow rate.
WW to DW transfer rate = 1 vol/min = 1.908e5 cfm = DW to WW transfer rate (arbitrary selection of the 1 vol/min)

DW to WW = 1.908E+05 cfm / 3.062E+05 ft^3 = 0.623 DW vol/min * 1440 min/day * 100% = 8.971E+04 %/day

Therefore,

WW to DW = 1.440E+05 %/day
DW to WW = 8.971E+04 %/day

Theses volumetric flow rates are used in the RADTRAD inputs for all release pathways except the ESF leakage release pathway.

8.0 RESULTS SUMMARY & CONCLUSIONS

Results Summary

8.1 The post-LOCA EAB, LPZ, & CR doses due to the increased MSIV leakage of 400 scfh are summarized in the following table:

NMP2 Post-LOCA EAB, LPZ, & CR Doses
Total MSIV Leak rate of 400 scfh, Max 200 scfh per Line

Post-LOCA Release Pathway / RADTRAD Run	Post-LOCA TEDE Dose (Rem) Receptor Location		
	Control Room	EAB	LPZ
Containment Leakage NP2CL400.o0	4.67E-01	3.12E-01 (occurs @ 0.0 hr)	3.63E-01
ESF Leakage NP2ES400.o0	3.48E-01	1.85E-01 (occurs @ 16.1 hr)	1.79E-01
MSIV Bypass Leakage NMP2MS01.o0	2.09E+00	5.97E-01 (occurs @ 5.3 hr)	5.73E-01
Drywell Bypass Leakage NMP2MS02.o0	6.97E-01	4.11E-01 (occurs @ 0.8 hr)	1.79E-01
Wetwell Bypass Leakage NMP2MS03.o0	1.71E-02	2.49E-02 (occurs @ 2.0 hr)	1.18E-02
Containment Shine	6.73E-02	N/A	N/A
External Cloud	1.42E-01	N/A	N/A
CR Filter Shine	Negligible	N/A	N/A
Total Dose	**3.82E+00**	**1.53E+00**	**1.31E+00**
Allowable TEDE Limit	**5.00E+00**	**2.50E+01**	**2.50E+01**

8.2 The post-LOCA EAB, LPZ, & CR doses due to the increased MSIV leakage of 200 scfh are summarized in the following table:

NMP2 Post-LOCA EAB, LPZ, & CR Doses
Total MSIV Leak rate of 200 scfh, Max 100 scfh per Line

Post-LOCA Release Pathway / RADTRAD Run	Post-LOCA TEDE Dose (Rem) Receptor Location		
	Control Room	EAB	LPZ
Containment Leakage NP2CL400.o0	4.67E-01	3.12E-01 (occurs @ 0.0 hr)	3.63E-01
ESF Leakage NP2ES400.o0	3.48E-01	1.85E-01 (occurs @ 16.1 hr)	1.79E-01
MSIV Bypass Leakage NMP2MS201.o0	6.35E-01	1.38E-01 (occurs @ 8 hr)	1.81E-01
Drywell Bypass Leakage NMP2MS02.o0	6.97E-01	4.11E-01 (occurs @ 0.8 hr)	1.79E-01
Wetwell Bypass Leakage NMP2MS03.o0	1.71E-02	2.49E-02 (occurs @ 2.0 hr)	1.18E-02
Containment Shine	6.73E-02	N/A	N/A
External Cloud	1.42E-01	N/A	N/A
CR Filter Shine	Negligible	N/A	N/A
Total Dose	**2.37E+00**	**1.07E+00**	**9.14E-01**
Allowable TEDE Limit	**5.00E+00**	**2.50E+01**	**2.50E+01**

8.3 Conclusions

The results in Sections 8.1 & 8.2 indicate that the post-LOCA EAB, LPZ, and CR doses due to the increased MSIV leak rates of either 400 scfh or 200 scfh **total** are within their allowable TEDE limits with adequate dose margin for the continued safe operation of NMP2.

9.0 REFERENCES

9.1 U.S. NRC Regulatory Guide 1.183, Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors, July 2000.

9.2 S.L. Humphreys, et al., NUREG/CR-6604 (including Supplements 1 and 2), "RADTRAD: A Simplified Model for Radionuclide Transport and Removal and Dose Estimation," (originally published December 1997; Supplement 1 dated June 8, 1999, and Supplement 2 dated October 2002).

9.3 10CFR50.67, “Accident Source Term.”

9.4 PSAT3101CF.QA.03, Revision 1, “Design Data Base for Application of Alternative DBA Source Term to Nine Mile Point 2.”

9.5 AEB 98-03, Assessment of Radiological Consequences for the Perry Pilot Plant Application Using The Revised (NUREG-1465) Source Term.

9.6 Calculation H21C-115, Rev 0, “Design Basis Core Inventories.”

9.7 EPA-520/1-88-020, Federal Guidance Report 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion and Ingestion.”

9.8 EPA-402-R-93-081, Federal Guidance Report 12, “External Exposure to Radionuclides in Air, Water and Soil.”

9.9 NUREG-0800, Standard Review Plan, “Containment Spray as a Fission Product Cleanup System,” SRP 6.5.2, Revision 2, 1988.

9.10 Calculation H21C-093, "LOCA Bypass Piping Models for Alternative Source Term Methodology", Revision 0

9.11 NMP2 Calculation H21C076, "X/Qs for Releases from NMP Ul & U2," Rev. 2, 12/22/2003.

9.12 Calculation H21C-097, "Post-LOCA Suppression Pool pH Analysis", Revision 1.

9.13 USNRC, "Laboratory Testing of Nuclear-Grade Activated Charcoal," NRC Generic Letter 99-02, June 3, 1999

9.14 Introduction To Nuclear Engineering By John Lamarsh, Third Printing, December 1977, Addison-Wesley Publishing Company.

9.15 Standard Review Plan Section 15.0.1, Rev. 0, “Radiological Consequence Analyses Using Alternative Source Terms,” July 2000

9.16 J.E. Cline, “MSIV Leakage Iodine Transport Analysis,” Letter Report dated March 26, 1991. (ADAMS Accession Number ML003683718).

9.17 NMP2 Technical Specifications and Bases:

9.17.1 Specification 3.6.1.6, Amendment No. 91, “Two RHR drywell spray subsystems shall be OPERABLE.”

9.17.2 Specification 3.6.4.1 (Amendment No. 168) and SR 3.6.4.1.5, Amendment No. 169, “The secondary containment shall be OPERABLE.”

9.17.3 Specification 3.6.4.3 (Amendment No. 168) and SR 3.6.4.3.2 (Amendment No. 168), “Two SGT subsystems shall be OPERABLE.”

9.17.4 Specification 5.5.7, Amendment No. 95, “Ventilation Filter Testing Program (VFTP).”

9.17.5 Surveillance Requirement SR 3.6.4.1.5, Amendment No. 169, "Verify the secondary containment can be maintained ≥ 0.25 inch of vacuum water gauge for 1 hour using one SGT subsystem at a flow rate of ≤ 2670 cfm."

9.17.6 Bases 3.6.1.6, Rev 45, "Primary Containment Isolation Valves (PCIVs)."

9.17.7 Specification 1.0, Amendment No. 168, "Rated Thermal Power Level."

9.18 NMP2 UFSAR, Section 15.6.5, Revision 22, " Loss-of-Coolant Accidents (Resulting from Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary) Inside Primary Containment"

9.19 Regulatory Issue Summary 2006-04, "Experience with the Implementation of Alternative Source Terms," March 7, 2006.

9.20 MicroShield Computer Code, V&V Version 5.05, Grove Engineering

9.21 Exelon DTSQA Number EX0009077 RADTRAD Version 3.03

9.22 Exelon DTSQA Number EX0009195 MicroShield Version 5.05

9.23 NMP2 Calculation No. PR-(C)-27-S, Revision 2, "Decay Heat Rate for SGTS and Control Room Charcoal Filters Post-LOCA."

9.24 Nine Mile Point Nuclear Station, Unit No. 2 - Issuance of Amendment 124, Re: Technical Specification Improvement To Eliminate Requirements For Hydrogen Recombiners And Hydrogen/Oxygen Monitors Using The Consolidated Line Item Improvement Process (ML032020007)

9.25 NMP2 Severe Accident Procedure N2-SAP-1, Revision 00800, "Primary Containment Injection."

9.26 NMP2 NRC Safety Evaluation Reports (SERs):

9.26.1 Nine Mile Point Nuclear Station, Unit No. 2 - Issuance of Amendment 125 Re: Implementation of Alternative Radiological Source Term (TAC No. MD5758), May 29, 2008.

9.26.2 Nine Mile Point Nuclear Station, Unit No. 2 - Issuance of Amendment 140 Re: Extended Power Uprate (TAC No. ME1476), December 22, 2011.

9.27 ECP-10-000716, Rev. 0000, "ESR-10-000915 NMP-ESR (0000) - Installation of Time Delay for Containment Isolation Valves 2ICS*MOV148 and 2ICS*MOV164 to address concerns with potential Water Cannon events."

9.28 NMP2 Calculation No. PR-(C)-28-E, Revision 2, "Design Basis Loss of Coolant Accident Doses In The Control Room With CREVS MOD N2-98-008."

9.29 Design Analysis Minor Revisions:

9.29.1 ADC-11-000648-CN-001 H21C-106-02.00, Rev 0, "Add Calculation for RCIC Timing Modification ECP-10-000716."

9.29.2 ECP-18-000616-CN-002 PSAT3101CF.QA.03-01.00, Rev 0, "Design Data Base for Application of the Revised DBA Source Term to Nine Mile Point Unit 2."

9.29.3 ECP-13-000087-CN-108 H21C-106-02.00, Rev. 0 "Unit 2 LOCA w/LOOP AST Methodology – HCVS Mod and TS 3.6.1.6 Modification."

9.29.4 ECP-18-000616-CN-001 ES-177-05.00, Rev. 0, "Secondary Containment Bypass Leakage."

9.30 NMP2 UFSAR Section 6.2, Rev 22, "Containment Systems."

9.31 Spray Removal Spreadsheet from H21C-106, Revision 2 (Attachment 13.1).

9.32 D.A. Powers et al, "A Simplified Model of Aerosol Removal by Natural Processes in Reactor Containments," NUREG/CR-6189, USNRC, July 1996.

9.33 U.S. NRC Regulatory Guide 1.52, Revision 2, " Design, Testing, And Maintenance Criteria For Postaccident Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration And Adsorption Units of Light-Water-Cooled Nuclear Power Plants."

9.34 NMP2 Severe Accident Procedure N2-SAP-2, Revision 01000, "RPV, Containment, Radioactivity Release Control."

9.35 NMP2 Calculation No. PR-(C)-24-O, Revision 4, "Calculation of Drywell Radiation General Emergency EAL."

9.35.1 Minor Revision 009718 Rev. 0, to PR-(C)-24-O, "Calculation of Drywell Radiation General Emergency EAL."

9.36 Journal of Nuclear Material, "Fission Products Partitioning in Aerosol Release from Simulated Nuclear Spent Fuel," by F.G. Di Lemma, J.Y. Colle, G. Rasmussen, and R.J.M. Konings.

9.37 International Society of Nuclear Air Treatment Technologies,31st Nuclear Air Cleaning Conference, 19-21 July, 2010, "BWR Steam Line Radionuclide Concentration Distribution following a DBA LOCA," J.E. Metcalf & P.B. Perez.

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10.0 TABLES

Table 1
NMP2 CAVEX Core Inventory

Isotope	Core Inventory (Ci/MWt)	Isotope	Core Inventory (Ci/MWt)	Isotope	Core Inventory (Ci/MWt)
Kr-83m	4.05E+03	Ru-105	3.17E+04	Cs-134	6.26E+03
Kr-85m	9.12E+03	Ru-106	1.85E+04	Cs-136	1.91E+03
Kr-85	4.61E+02	Rh-105	2.95E+04	Cs-137	4.86E+03
Kr-87	1.84E+04	Sb-127	2.56E+03	Ba-139	5.20E+04
Kr-88	2.50E+04	Sb-129	7.91E+03	Ba-140	5.06E+04
Rb-86	6.26E+01	Te-127	2.53E+03	La-140	5.11E+04
Rb-88	2.52E+04	Te-127m	4.33E+02	La-141	4.75E+04
Sr-89	3.44E+04	Te-129	7.41E+03	La-142	4.66E+04
Sr-90	3.68E+03	Te-129m	1.42E+03	Ce-141	4.78E+04
Sr-91	4.24E+04	Te-131m	5.38E+03	Ce-143	4.66E+04
Sr-92	4.39E+04	Te-132	3.86E+04	Ce-144	3.83E+04
Y-90	3.81E+03	I-131	2.72E+04	Pr-143	4.56E+04
Y-91	4.31E+04	I-132	3.96E+04	Nd-147	1.86E+04
Y-92	4.44E+04	I-133	5.64E+04	Np-239	5.45E+05
Y-93	4.81E+04	I-134	6.47E+04	Pu-238	1.19E+02
Zr-95	5.09E+04	I-135	5.33E+04	Pu-239	1.20E+01
Zr-97	4.91E+04	Xe-133	5.64E+04	Pu-240	2.12E+01
Nb-95	5.02E+04	Xe-133m	1.73E+03	Pu-241	4.71E+03
Mo-99	5.14E+04	Xe-135	2.37E+04	Am-241	6.66E+00
Tc-99m	4.53E+04	Xe-135m	1.17E+04	Cm-242	1.83E+03
Ru-103	4.45E+04	Xe-138	5.06E+04	Cm-244	1.21E+02

Core Inventory From Reference 9.6, Table 1

Table 1A
DW Spray Elemental & Particulate Iodine Cutoff Time

Post-LOCA Time (hr)	Aerosol Atom (kg) A	Elemental Iodine Atom B	Cutoff Value	
			Aerosol (kg) C = A/50	Ele. Iodine Atom D = B/200
2	1.7747E+00	2.1372E+21	3.5494E-02	1.0686E+19
2.2			9.7134E-02	1.1647E+20
2.25			5.5477E-02	6.6435E+19
2.3			3.1699E-02	3.7894E+19
2.35			1.8124E-02	2.1614E+19
2.4			1.0375E-02	1.2328E+19

A, B, C, D From RADTRAD Run NP2CL11.o0 from Drywell Compartment Nuclide Inventory

Table 1B
Outstanding Minor Revisions Affecting H21C-106 Rev. 2

Minor Revision Document ID	Posted Changes Again H21C-106-02	Changes Incorporated in H21C-106-03
ADC-11-000648-CN-001 H21C-106-02.00 (Ref. 9.29.1)	100 cfm during the first 5 minutes after the event	Sections 2.1.3.2 & 5.3.2.6
ECP-18-000616-CN-002 PSAT3101CF.QA.03-01.00 (Ref. 9.29.2)	Purge Release Volume Change from 230.4 ft^3 to 247.4 ft^3	Section 5.3.2.4
	Insert 1 - Note to 1" CPS Line 2	Section 5.5.6
	2" bypass line volume changed from 215.0 ft^3 to 232 ft^3	Section 5.3.2.4
	GNF2 core inventory	Replaced by CAVEX inventory (Ref. 9.6)
ECP-13-000087-CN-108 H21C-106.02.00 (Ref. 9.29.3)	Insert 1 - Note to 1" CPS Line 2	Section 5.5.6
	1" CPS Line 2 has most limiting aerosol deposition characteristic	Note (1) underneath Table 6
	Conversion ratio of 0.4056 (Insert 3)	Section 2.3.2
	Inserts 4, 5, & 6	Not Applicable to Revision 3 as Table is deleted

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Table 2
Aerosol Horizontal Settling Surface Areas and Volumes

Main Steam Piping Segment	Horizontal		Vertical	Total Horizontal		Total
	Area(3) A ft^2	Volume B ft^3	Volume C ft^3	Area ft^2	Volume ft^3	Volume D = B+C ft^3
Main Steam Line A (1)						
RPV Nozzle to Inboard MSIV	77.96	119.82	211.47	116.61	179.21	390.68
Interstitial Between MSIVs	38.65	59.39	0.00			
Outboard MSIV to Cat 1	164.35	271.38	157.03	164.35	271.38	428.41
Main Steam Line D (2)						
RPV Nozzle to Inboard MSIV	78.07	119.99	211.82	78.07	119.99	331.81
Interstitial Between MSIVs	38.56	59.27	0.00	202.86	330.58	487.03
Outboard MSIV to Cat 1	164.30	271.31	156.45			

(1) From Calc H21C-093, Rev 0 (Ref. 9.10), Table 6.1-1
(2) From Calc H21C-093, Rev 0 (Ref. 9.10), Table 6.1-4
(3) Areas calculated as diameter*length

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Table 3
Maximum MSIV Leakage = 200 scfh In Shortest (Failed) MSL
Balance of MSIV Leakage 200 scfh In Second Shortest MSL
Total MSIV Leakage = 400 scfh

Post-LOCA Time Interval (hr)	MSIV Leak Rate From DW To Various MSL Control Volumes (cfh)/(cfm)					
	Drywell To MSIV Failed Volume V_1 cfh/cfm	Volume V_1 To Volume V_2 cfh/cfm	Volume V_2 To Atmosphere cfh/cfm	Drywell To Intact Line 1 Volume V_3 cfh/cfm	Volume V_3 To Volume V_4 cfh/cfm	Volume V_4 To Atmosphere cfh/cfm
0-24	81.12	81.12	200.00	81.12	81.12	200.00
	1.352	1.352	3.333	1.352	1.352	3.333
24-720	40.56	40.56	100.00	40.56	40.56	100.00
	0.676	0.676	1.667	0.676	0.676	1.667

MSIV Leak Rate Information From Section 7.2

Table 3A
Maximum MSIV Leakage =100 scfh In Shortest (Failed) MSL
Balance of MSIV Leakage 100 scfh In Second Shortest MSL
Total MSIV Leakage = 200 scfh

Post-LOCA Time Interval (hr)	MSIV Leak Rate From DW To Various MSL Control Volumes (cfh)/(cfm)					
	Drywell To MSIV Failed Volume V_1 cfh/cfm	Volume V_1 To Volume V_2 cfh/cfm	Volume V_2 To Atmosphere cfh/cfm	Drywell To Intact Line 1 Volume V_3 cfh/cfm	Volume V_3 To Volume V_4 cfh/cfm	Volume V_4 To Atmosphere cfh/cfm
0-24	40.56	40.56	100.00	40.56	40.56	100.00
	0.676	0.676	1.667	0.676	0.676	1.667
24-720	20.28	20.28	50.00	20.28	20.28	50.00
	0.338	0.338	0.833	0.338	0.338	0.833

MSIV Leak Rate Information From Table 3 Divided by A factor of 2

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Table 4
NMP2 MSL Aerosol Removal Efficiency Based on the NRC AEB-98-03 Monte Carlo Settling Velocity Distribution
Total Effective Aerosol Removal Efficiency (TEARE) - MSIV Leakage of 400 scfh

Probability			Settling	Settling	Removal Efficiency		MSL A	Removal Efficiency		MSL D
Group	Lower Bound	Upper Bound	Velocity (m/sec) Ai	Velocity (ft/hr) Bi	MSL A Inboard Ci	MSL A Outboard Di	Net Release Fraction Ei	MSL D Inboard Fi	MSL D Outboard Gi	Net Release Fraction Hi
1	0.00%	0.01%	1.170E-04	1.382E+00	66.52%	53.17%	1.57E-05	57.08%	58.36%	1.79E-05
2	0.01%	0.30%	1.331E-04	1.572E+00	69.32%	56.36%	3.88E-04	60.20%	61.45%	4.45E-04
3	0.30%	1.00%	1.661E-04	1.962E+00	73.83%	61.72%	7.01E-04	65.38%	66.56%	8.10E-04
4	1.00%	3.00%	1.965E-04	2.321E+00	76.94%	65.60%	1.59E-03	69.08%	70.19%	1.84E-03
5	3.00%	5.00%	2.509E-04	2.963E+00	80.99%	70.89%	1.11E-03	74.04%	75.04%	1.30E-03
6	5.00%	8.00%	2.967E-04	3.504E+00	83.44%	74.22%	1.28E-03	77.13%	78.04%	1.51E-03
7	8.00%	10.00%	3.589E-04	4.239E+00	85.90%	77.70%	6.29E-04	80.32%	81.13%	7.43E-04
8	10.00%	15.00%	3.995E-04	4.718E+00	87.15%	79.50%	1.32E-03	81.95%	82.72%	1.56E-03
9	15.00%	20.00%	4.971E-04	5.871E+00	89.41%	82.83%	9.09E-04	84.96%	85.62%	1.08E-03
10	20.00%	25.00%	6.015E-04	7.105E+00	91.08%	85.38%	6.52E-04	87.24%	87.81%	7.77E-04
11	25.00%	30.00%	7.104E-04	8.390E+00	92.34%	87.33%	4.85E-04	88.98%	89.49%	5.79E-04
12	30.00%	35.00%	8.229E-04	9.720E+00	93.32%	88.87%	3.72E-04	90.34%	90.79%	4.45E-04
13	35.00%	40.00%	9.510E-04	1.123E+01	94.17%	90.22%	2.85E-04	91.53%	91.93%	3.42E-04
14	40.00%	45.00%	1.093E-03	1.291E+01	94.89%	91.38%	2.20E-04	92.55%	92.90%	2.64E-04
15	45.00%	50.00%	1.235E-03	1.459E+01	95.45%	92.30%	1.75E-04	93.35%	93.67%	2.10E-04
16	50.00%	60.00%	1.383E-03	1.634E+01	95.92%	93.07%	2.83E-04	94.02%	94.31%	3.40E-04
17	60.00%	70.00%	1.689E-03	1.995E+01	96.63%	94.25%	1.94E-04	95.05%	95.29%	2.33E-04
18	70.00%	80.00%	2.099E-03	2.479E+01	97.27%	95.32%	1.28E-04	95.98%	96.18%	1.54E-04
19	80.00%	90.00%	2.606E-03	3.078E+01	97.79%	96.20%	8.41E-05	96.73%	96.90%	1.01E-04
20	90.00%	100.00%	3.478E-03	4.108E+01	98.33%	97.12%	4.79E-05	97.53%	97.66%	5.78E-05
						Total	**1.09E-02**		**Total**	**1.28E-02**
						MSL A Effective Removal Efficiency	**98.91%**		**MSL D Effective Removal Efficiency**	**98.72%**

Bi = Ai * 3.28 ft/m * 3600 sec/hr
Ci = (1-(1/(1+(Bi*116.61)/81.12)))
Di = (1-(1/(1+(Bi*164.35)/200)))
Ei = (upper bound-lower bound)*(1-Ci)*(1-Di)
Fi = (1-(1/(1+(Bi*78.07)/81.12)))
Gi = (1-(1/(1+(Bi*202.86)/200)))
Hi =(upper bound-lower bound)*(1-Fi)*(1-Gi)

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Table 4A

Settling Velocity Probabilistic Distribution - MSIV Leakage of 400 scfh

MSL A Net Settling Velocity Ji	MSL D Net Settling Velocity Ki	MSL A Released Settling Velocity Probability Distribution Li	Cumulative Probability Mi	MSL D Released Settling Velocity Probability Distribution Ni	Cumulative Probability Oi
84.32%	82.13%	0.14%	0.14%	0.14%	0.14%
86.61%	84.66%	3.57%	3.72%	3.47%	3.61%
89.98%	88.42%	6.46%	10.18%	6.33%	9.94%
92.07%	90.78%	14.61%	24.78%	14.40%	24.34%
94.47%	93.52%	10.19%	34.98%	10.12%	34.46%
95.73%	94.98%	11.79%	46.77%	11.76%	46.22%
96.86%	96.29%	5.79%	52.56%	5.80%	52.02%
97.37%	96.88%	12.13%	64.69%	12.18%	64.20%
98.18%	97.84%	8.37%	73.06%	8.44%	72.64%
98.70%	98.45%	6.00%	79.07%	6.07%	78.71%
99.03%	98.84%	4.46%	83.53%	4.52%	83.23%
99.26%	99.11%	3.42%	86.95%	3.47%	86.70%
99.43%	99.32%	2.62%	89.58%	2.67%	89.37%
99.56%	99.47%	2.03%	91.60%	2.06%	91.44%
99.65%	99.58%	1.61%	93.22%	1.64%	93.08%
99.72%	99.66%	2.61%	95.83%	2.66%	95.74%
99.81%	99.77%	1.78%	97.61%	1.82%	97.56%
99.87%	99.85%	1.18%	98.78%	1.20%	98.76%
99.92%	99.90%	0.77%	99.56%	0.79%	99.55%
99.95%	99.94%	0.44%	100.00%	0.45%	100.00%
		100.00%		**100.00%**	

Ji = 1-(1-Ci)*(1-Di)
Ki = 1-(1-Fi)*(1-Gi)
Li = Ei/(Total Ei)
Mi = Cumulative Probability
Ni = Hi/(Total Hi)
O = Cumulative Probability

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Table 4A-1
Effective Aerosol Efficiency and Lambda- MSIV Leakage of 400 scfh

Group	MSL A Penetration		MSL D Penetration		MSL Net Probability
	Inboard	Outboard	Inboard	Outboard	
1	33.48%	46.83%	42.92%	41.64%	0.01%
2	30.68%	43.64%	39.80%	38.55%	0.29%
3	26.17%	38.28%	34.62%	33.44%	0.70%
4	23.06%	34.40%	30.92%	29.81%	2.00%
5	19.01%	29.11%	25.96%	24.96%	2.00%
6	16.56%	25.78%	22.87%	21.96%	3.00%
7	14.10%	22.30%	19.68%	18.87%	2.00%
8	12.85%	20.50%	18.05%	17.28%	5.00%
9	10.59%	17.17%	15.04%	14.38%	5.00%
10	8.92%	14.62%	12.76%	12.19%	5.00%
11	7.66%	12.67%	11.02%	10.51%	5.00%
12	6.68%	11.13%	9.66%	9.21%	5.00%
13	5.83%	9.78%	8.47%	8.07%	5.00%
14	5.11%	8.62%	7.45%	7.10%	5.00%
15	4.55%	7.70%	6.65%	6.33%	5.00%
16	4.08%	6.93%	5.98%	5.69%	10.00%
17	3.37%	5.75%	4.95%	4.71%	10.00%
18	2.73%	4.68%	4.02%	3.82%	10.00%
19	2.21%	3.80%	3.27%	3.10%	10.00%
20	1.67%	2.88%	2.47%	2.34%	10.00%
Eff. Penetration	6.41%	10.40%	9.10%	8.70%	
Efficiency	93.59%	89.60%	90.90%	91.30%	
Lambda (1/hr)	6.61	6.35	6.75	6.35	

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Table 4A-2
Settling Velocity Probabilistic Distribution - MSIV Leakage of 400 scfh

Group	V (m/s)	Steam Line A			Steam Line D		
Seq		1st Node	2nd Node	Exit	1st Node	2nd Node	Exit
1	1.17E-04	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1	1.17E-04	0.01%	0.05%	0.14%	0.01%	0.05%	0.14%
2	1.33E-04	0.01%	0.05%	0.14%	0.01%	0.05%	0.14%
2	1.33E-04	0.30%	1.44%	3.72%	0.30%	1.31%	3.61%
3	1.66E-04	0.30%	1.44%	3.72%	0.30%	1.31%	3.61%
3	1.66E-04	1.00%	4.30%	10.17%	1.00%	3.98%	9.94%
4	1.97E-04	1.00%	4.30%	10.17%	1.00%	3.98%	9.94%
4	1.97E-04	3.00%	11.49%	24.78%	3.00%	10.77%	24.34%
5	2.51E-04	3.00%	11.49%	24.78%	3.00%	10.77%	24.34%
5	2.51E-04	5.00%	17.42%	34.97%	5.00%	16.47%	34.46%
6	2.97E-04	5.00%	17.42%	34.97%	5.00%	16.47%	34.46%
6	2.97E-04	8.00%	25.17%	46.77%	8.00%	24.01%	46.22%
7	3.59E-04	8.00%	25.17%	46.77%	8.00%	24.01%	46.22%
7	3.59E-04	10.00%	29.57%	52.56%	10.00%	28.34%	52.02%
8	3.99E-04	10.00%	29.57%	52.56%	10.00%	28.34%	52.02%
8	3.99E-04	15.00%	39.59%	64.69%	15.00%	38.25%	64.20%
9	4.97E-04	15.00%	39.59%	64.69%	15.00%	38.25%	64.20%
9	4.97E-04	20.00%	47.85%	73.06%	20.00%	46.51%	72.64%
10	6.02E-04	20.00%	47.85%	73.06%	20.00%	46.51%	72.64%
10	6.02E-04	25.00%	54.80%	79.06%	25.00%	53.52%	78.71%
11	7.10E-04	25.00%	54.80%	79.06%	25.00%	53.52%	78.71%
11	7.10E-04	30.00%	60.78%	83.53%	30.00%	59.57%	83.23%
12	8.23E-04	30.00%	60.78%	83.53%	30.00%	59.57%	83.23%
12	8.23E-04	35.00%	65.98%	86.95%	35.00%	64.88%	86.70%
13	9.51E-04	35.00%	65.98%	86.95%	35.00%	64.88%	86.70%
13	9.51E-04	40.00%	70.53%	89.58%	40.00%	69.53%	89.37%
14	1.09E-03	40.00%	70.53%	89.58%	40.00%	69.53%	89.37%
14	1.09E-03	45.00%	74.52%	91.60%	45.00%	73.62%	91.43%
15	1.24E-03	45.00%	74.52%	91.60%	45.00%	73.62%	91.43%
15	1.24E-03	50.00%	78.07%	93.22%	50.00%	77.27%	93.08%
16	1.38E-03	50.00%	78.07%	93.22%	50.00%	77.27%	93.08%
16	1.38E-03	60.00%	84.44%	95.83%	60.00%	83.84%	95.74%
17	1.69E-03	60.00%	84.44%	95.83%	60.00%	83.84%	95.74%
17	1.69E-03	70.00%	89.70%	97.61%	70.00%	89.28%	97.56%
18	2.10E-03	70.00%	89.70%	97.61%	70.00%	89.28%	97.56%
18	2.10E-03	80.00%	93.95%	98.78%	80.00%	93.70%	98.76%
19	2.61E-03	80.00%	93.95%	98.78%	80.00%	93.70%	98.76%
19	2.61E-03	90.00%	97.40%	99.56%	90.00%	97.29%	99.55%
20	3.48E-03	90.00%	97.40%	99.56%	90.00%	97.29%	99.55%
	3.48E-03	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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Table 4B

NMP2 MSL Aerosol Removal Efficiency Based on the NRC AEB-98-03 Monte Carlo Settling Velocity Distribution

Total Effective Aerosol Removal Efficiency (TEARE) - MSIV Leakage of 200 scfh

Probability					Removal Efficiency		MSL A	Removal Efficiency		MSL D
Group	Lower Bound	Upper Bound	Settling Velocity (m/sec) A	Settling Velocity (ft/hr) B	MSL A Inboard C	MSL A Outboard D	Net Release Fraction E	MSL D Inboard F	MSL D Outboard G	Net Release Fraction H
1	0.00%	0.01%	1.170E-04	1.382E+00	79.89%	69.43%	6.15E-06	72.68%	73.71%	7.18E-06
2	0.01%	0.30%	1.331E-04	1.572E+00	81.88%	72.09%	1.47E-04	75.16%	76.13%	1.72E-04
3	0.30%	1.00%	1.661E-04	1.962E+00	84.94%	76.33%	2.49E-04	79.07%	79.92%	2.94E-04
4	1.00%	3.00%	1.965E-04	2.321E+00	86.97%	79.23%	5.41E-04	81.71%	82.48%	6.41E-04
5	3.00%	5.00%	2.509E-04	2.963E+00	89.50%	82.96%	3.58E-04	85.08%	85.74%	4.26E-04
6	5.00%	8.00%	2.967E-04	3.504E+00	90.97%	85.20%	4.01E-04	87.09%	87.67%	4.78E-04
7	8.00%	10.00%	3.589E-04	4.239E+00	92.42%	87.45%	1.90E-04	89.08%	89.58%	2.27E-04
8	10.00%	15.00%	3.995E-04	4.718E+00	93.13%	88.58%	3.92E-04	90.08%	90.54%	4.69E-04
9	15.00%	20.00%	4.971E-04	5.871E+00	94.41%	90.61%	2.63E-04	91.87%	92.25%	3.15E-04
10	20.00%	25.00%	6.015E-04	7.105E+00	95.33%	92.11%	1.84E-04	93.19%	93.51%	2.21E-04
11	25.00%	30.00%	7.104E-04	8.390E+00	96.02%	93.24%	1.35E-04	94.17%	94.45%	1.62E-04
12	30.00%	35.00%	8.229E-04	9.720E+00	96.55%	94.11%	1.02E-04	94.93%	95.17%	1.22E-04
13	35.00%	40.00%	9.510E-04	1.123E+01	97.00%	94.86%	7.72E-05	95.58%	95.80%	9.29E-05
14	40.00%	45.00%	1.093E-03	1.291E+01	97.38%	95.50%	5.91E-05	96.13%	96.32%	7.12E-05
15	45.00%	50.00%	1.235E-03	1.459E+01	97.67%	96.00%	4.66E-05	96.56%	96.73%	5.62E-05
16	50.00%	60.00%	1.383E-03	1.634E+01	97.92%	96.41%	7.49E-05	96.92%	97.07%	9.03E-05
17	60.00%	70.00%	1.689E-03	1.995E+01	98.29%	97.04%	5.07E-05	97.46%	97.59%	6.12E-05
18	70.00%	80.00%	2.099E-03	2.479E+01	98.62%	97.60%	3.31E-05	97.95%	98.05%	4.00E-05
19	80.00%	90.00%	2.606E-03	3.078E+01	98.88%	98.06%	2.17E-05	98.34%	98.42%	2.62E-05
20	90.00%	100.00%	3.478E-03	4.108E+01	99.16%	98.54%	1.23E-05	98.75%	98.81%	1.48E-05
						Total	**3.34E-03**		**Total**	**3.99E-03**
						MSL A Effective Removal Efficiency	**99.67%**	**MSL B Effective Removal Efficiency**		**99.60%**

Bi = Ai * 3.28 ft/m * 3600 sec/hr
Ci = (1-(1/(1+(Bi*116.61)/40.56)))
Di = (1-(1/(1+(Bi*164.35)/100)))
Ei = (upper bound-lower bound)*(1-Ci)*(1-Di)
Fi = (1-(1/(1+(Bi*78.07)/40.56)))
Gi = (1-(1/(1+(Bi*202.86)/100)))
Hi =(upper bound-lower bound)*(1-Fi)*(1-Gi)

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Table 4C
Settling Velocity Probabilistic Distribution - MSIV Leakage of 200 scfh

MSL A Net Settling Velocity J	MSL D Net Settling Velocity K	MSL A Released Settling Velocity Probability Distribution L	Cumulative Probability M	MSL D Released Settling Velocity Probability Distribution N	Cumulative Probability O
93.85%	92.82%	0.18%	0.18%	0.18%	0.18%
94.94%	94.07%	4.39%	4.57%	4.31%	4.49%
96.44%	95.80%	7.46%	12.03%	7.38%	11.87%
97.29%	96.80%	16.19%	28.22%	16.07%	27.95%
98.21%	97.87%	10.70%	38.93%	10.67%	38.62%
98.66%	98.41%	11.99%	50.92%	11.98%	50.60%
99.05%	98.86%	5.69%	56.61%	5.70%	56.31%
99.22%	99.06%	11.73%	68.34%	11.77%	68.07%
99.47%	99.37%	7.85%	76.19%	7.90%	75.97%
99.63%	99.56%	5.51%	81.70%	5.54%	81.51%
99.73%	99.68%	4.02%	85.72%	4.06%	85.57%
99.80%	99.76%	3.04%	88.77%	3.07%	88.64%
99.85%	99.81%	2.31%	91.08%	2.33%	90.97%
99.88%	99.86%	1.77%	92.84%	1.79%	92.76%
99.91%	99.89%	1.39%	94.24%	1.41%	94.17%
99.93%	99.91%	2.24%	96.48%	2.26%	96.43%
99.95%	99.94%	1.52%	97.99%	1.54%	97.97%
99.97%	99.96%	0.99%	98.99%	1.00%	98.97%
99.98%	99.97%	0.65%	99.63%	0.66%	99.63%
99.99%	99.99%	0.37%	100.00%	0.37%	100.00%
		100.00%		**100.00%**	

Ji = 1-(1-Ci)*(1-Di)
Ki = 1-(1-Fi)*(1-Gi)
Li = Ei/(Total Ei)
Mi = Cumulative Probability
Ni = Hi/(Total Hi)
O = Cumulative Probability

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Table 4C-1
Effective Aerosol Efficiency and Lambda- MSIV Leakage of 200 scfh

Group	MSL A Penetration		MSL D Penetration		MSL Net Probability
	Inboard	Outboard	Inboard	Outboard	
1	20.11%	30.57%	27.32%	26.29%	0.01%
2	18.12%	27.91%	24.84%	23.87%	0.29%
3	15.06%	23.67%	20.93%	20.08%	0.70%
4	13.03%	20.77%	18.29%	17.52%	2.00%
5	10.50%	17.04%	14.92%	14.26%	2.00%
6	9.03%	14.80%	12.91%	12.33%	3.00%
7	7.58%	12.55%	10.92%	10.42%	2.00%
8	6.87%	11.42%	9.92%	9.46%	5.00%
9	5.59%	9.39%	8.13%	7.75%	5.00%
10	4.67%	7.89%	6.81%	6.49%	5.00%
11	3.98%	6.76%	5.83%	5.55%	5.00%
12	3.45%	5.89%	5.07%	4.83%	5.00%
13	3.00%	5.14%	4.42%	4.20%	5.00%
14	2.62%	4.50%	3.87%	3.68%	5.00%
15	2.33%	4.00%	3.44%	3.27%	5.00%
16	2.08%	3.59%	3.08%	2.93%	10.00%
17	1.71%	2.96%	2.54%	2.41%	10.00%
18	1.38%	2.40%	2.05%	1.95%	10.00%
19	1.12%	1.94%	1.66%	1.58%	10.00%
20	0.84%	1.46%	1.25%	1.19%	10.00%
Eff. Penetration	3.39%	5.69%	4.92%	4.69%	
Efficiency	96.61%	94.31%	95.08%	95.31%	
Lambda (1/hr)	6.44	6.11	6.53	6.14	

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Table 4C-2
Settling Velocity Probabilistic Distribution - MSIV Leakage of 200 scfh

Group Seq	V (m/s)	Steam Line A			Steam Line D		
		1st Node	2nd Node	Exit	1st Node	2nd Node	Exit
1	1.17E-04	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1	1.17E-04	0.01%	0.06%	0.18%	0.01%	0.06%	0.18%
2	1.33E-04	0.01%	0.06%	0.18%	0.01%	0.06%	0.18%
2	1.33E-04	0.30%	1.61%	4.57%	0.30%	1.52%	4.49%
3	1.66E-04	0.30%	1.61%	4.57%	0.30%	1.52%	4.49%
3	1.66E-04	1.00%	4.71%	12.03%	1.00%	4.49%	11.87%
4	1.97E-04	1.00%	4.71%	12.03%	1.00%	4.49%	11.87%
4	1.97E-04	3.00%	12.40%	28.22%	3.00%	11.92%	27.94%
5	2.51E-04	3.00%	12.40%	28.22%	3.00%	11.92%	27.94%
5	2.51E-04	5.00%	18.59%	38.93%	5.00%	17.98%	38.62%
6	2.97E-04	5.00%	18.59%	38.93%	5.00%	17.98%	38.62%
6	2.97E-04	8.00%	26.57%	50.92%	8.00%	25.85%	50.60%
7	3.59E-04	8.00%	26.57%	50.92%	8.00%	25.85%	50.60%
7	3.59E-04	10.00%	31.04%	56.61%	10.00%	30.28%	56.30%
8	3.99E-04	10.00%	31.04%	56.61%	10.00%	30.28%	56.30%
8	3.99E-04	15.00%	41.16%	68.34%	15.00%	40.35%	68.07%
9	4.97E-04	15.00%	41.16%	68.34%	15.00%	40.35%	68.07%
9	4.97E-04	20.00%	49.40%	76.19%	20.00%	48.61%	75.97%
10	6.02E-04	20.00%	49.40%	76.19%	20.00%	48.61%	75.97%
10	6.02E-04	25.00%	56.28%	81.70%	25.00%	55.53%	81.51%
11	7.10E-04	25.00%	56.28%	81.70%	25.00%	55.53%	81.51%
11	7.10E-04	30.00%	62.14%	85.72%	30.00%	61.45%	85.57%
12	8.23E-04	30.00%	62.14%	85.72%	30.00%	61.45%	85.57%
12	8.23E-04	35.00%	67.23%	88.77%	35.00%	66.60%	88.64%
13	9.51E-04	35.00%	67.23%	88.77%	35.00%	66.60%	88.64%
13	9.51E-04	40.00%	71.66%	91.08%	40.00%	71.09%	90.97%
14	1.09E-03	40.00%	71.66%	91.08%	40.00%	71.09%	90.97%
14	1.09E-03	45.00%	75.53%	92.84%	45.00%	75.02%	92.76%
15	1.24E-03	45.00%	75.53%	92.84%	45.00%	75.02%	92.76%
15	1.24E-03	50.00%	78.96%	94.24%	50.00%	78.51%	94.17%
16	1.38E-03	50.00%	78.96%	94.24%	50.00%	78.51%	94.17%
16	1.38E-03	60.00%	85.10%	96.48%	60.00%	84.77%	96.43%
17	1.69E-03	60.00%	85.10%	96.48%	60.00%	84.77%	96.43%
17	1.69E-03	70.00%	90.15%	97.99%	70.00%	89.92%	97.97%
18	2.10E-03	70.00%	90.15%	97.99%	70.00%	89.92%	97.97%
18	2.10E-03	80.00%	94.23%	98.99%	80.00%	94.09%	98.97%
19	2.61E-03	80.00%	94.23%	98.99%	80.00%	94.09%	98.97%
19	2.61E-03	90.00%	97.53%	99.63%	90.00%	97.46%	99.63%
20	3.48E-03	90.00%	97.53%	99.63%	90.00%	97.46%	99.63%
	3.48E-03	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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Table 4D
CR, EAB, & LPZ Doses - Lanbda Vs. Filter Efficiency

	MSIV Leak Rate	Aerosol Removal Lambda (hr^{-1})				Dose Consequence		
		MSL A		MSL D		CR	EAB	LPZ
	scfh	Inboard	Outboard	Inboard	Outboard	remTEDE	remTEDE	remTEDE
Effective Lambda (1)	400	6.61	6.35	6.75	6.35	2.0581	0.62715	0.58937
Effective Efficiency (2)		93.59%	89.60%	90.90%	91.30%	2.070	0.60367	0.57664
20-group Efficiency (3)		H21C-106, Revision 3				2.0853	0.59699	0.57312
Effective Lambda (4)	200	6.44	6.11	6.53	6.14	0.63152	0.14463	0.18542
Effective Efficiency (5)		96.61%	94.31%	95.08%	95.31%	0.63213	0.13863	0.1814
20-group Efficiency (6)		H21C-106, Revision 3				0.6341	0.13785	0.18093

(1) From RADTRAD Output File NMP2MS11.o0
(2) From RADTRAD Output File NMP2MS12.o0
(3) From RADTRAD Output File NMP2MS01.o0
(4) From RADTRAD Output File NMP2MS211.o0
(5) From RADTRAD Output File NMP2MS212.o0
(6) From RADTRAD Output File NMP2MS201.o0

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Table 5
Steam Line Temperature Vs. Time

Time (hrs)	Temperature	
	°K	°F
0	565.3	557.9
1	561.1	550.3
2	557.0	542.9
3	552.9	535.5
4	548.9	528.3
5	545.0	521.2
6	541.1	514.3
7	537.3	507.4
8	533.5	500.6
9	529.8	494.0
10	526.2	487.4
11	522.6	481.0
12	519.1	474.6
13	515.6	468.4
14	512.2	462.2
15	508.8	456.2
16	505.5	450.2
17	502.3	444.4
18	499.0	438.6
19	495.9	432.9
20	492.8	427.4
21	489.7	421.9
22	486.7	416.5
23	483.8	411.1
24	480.9	405.9
48	423.3	302.2
72	384.0	231.5
96	357.2	183.3
240	305.5	90.2
480	299.8	80.0

Extrapolated Temperature Information From Reference 9.16, Figure 7

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Table 5A
MSIV Failed & Intact Steam Line Volumes
For Elemental Iodine Removal Efficiency Calculation

MSIV Failed MSL		Intact MSL	
Volume V_1 $(ft^3)/(m^3)$	Volume V_2 $(ft^3)/(m^3)$	Volume V_3 $(ft^3)/(m^3)$	Volume V_4 $(ft^3)/(m^3)$
390.68	428.41	331.81	487.03
11.07	12.14	9.40	13.80

MSL Volumes from Table 2

Table 5B
MSIV Failed & Intact Steam Line Surface Areas
For Elemental Iodine Removal Efficiency Calculation

MSIV Failed MSL		Intact MSL	
Surface Area V_1 $(ft^2)/(m^2)$	Surface Area V_2 $(ft^2)/(m^2)$	Surface Area V_3 $(ft^2)/(m^2)$	Surface Area V_4 $(ft^2)/(m^2)$
254.22	259.44	215.9	297.61
23.63	24.12	20.07	27.66

$V1 = (244.93 + 121.41 + 432.30)/\pi = 254.22$ ft^2 (Ref. 9.10, Table 6.1-1)

$V2 = (516.31 + 298.75)/\pi = 259.44$ ft^2 (Ref. 9.10, Table 6.1-1)

$V3 = (245.28 + 433.00)/\pi = 215.90$ ft^2 (Ref. 9.10, Table 6.1-4)

$V4 = (121.15 + 516.17 + 297.65)/\pi = 297.61$ ft^2 (Ref. 9.10, Table 6.1-4)

Table 5C
Elemental Iodine Deposition Velocity - MSIV Leakage

Time (hr)	Temp Degree K* A	Temp Degree F B	(2809/T) - 12.5 C	Deposition Velocity (cm/sec) D = EXP[C]	Deposition Velocity (m/sec) E = D / 100
0	565.3	557.9	-7.53	0.000536	5.362E-06
8	533.5	500.6	-7.23	0.000721	7.211E-06
24	480.9	405.9	-6.66	0.001283	1.283E-05
48	423.3	302.2	-5.86	0.002841	2.841E-05
72	384.0	231.5	-5.18	0.005602	5.602E-05
96	357.2	183.3	-4.64	0.009697	9.697E-05
240	305.5	90.2	-3.30	0.036701	3.670E-04
480	299.8	80.0	-3.13	0.043664	4.366E-04
720					

A & B From Table 5

C Equation From Reference 9.16, page 12

Table 5D
Elemental Iodine Deposition Rate - MSIV Failed Line Volume V_1

Time (hr)	Deposition Velocity (m/sec) A	Main Steam Line		Elemental Iodine Removal Rate (hr^{-1}) D = (AxB)x3600/C	Elemental Iodine Deposition Efficiency E
		Total Surface Area (m^2) B	Total Volume (m^3) C		
0	5.362E-06	23.63	11.07	0.0412	0.0404
8	7.211E-06	23.63	11.07	0.0554	0.0539
24	1.283E-05	23.63	11.07	0.0986	0.0939
48	2.841E-05	23.63	11.07	0.2183	0.1961
72	5.602E-05	23.63	11.07	0.4305	0.3498
96	9.697E-05	23.63	11.07	0.7452	0.5254
240	3.670E-04	23.63	11.07	2.8203	0.9404
480	4.366E-04	23.63	11.07	3.3554	0.9651
720					

A From Table 5C
B & C From Tables 5B & 5A, Respectively
E = 1 - exp(-D * 1 hour)

Table 5E
Elemental Iodine Deposition Rate - Intact Steam Line Volume V_2

Time Hr	Deposition Velocity m/sec A*	Main Steam Line: Total Surface Area (m^2) B	Main Steam Line: Total Volume (m^3) C	Elemental Iodine Removal Rate (hr^{-1}) D = (AxB)x3600/C	Elemental Iodine Deposition Efficiency E
0	5.362E-06	24.12	12.14	0.0383	0.0376
8	7.211E-06	24.12	12.14	0.0516	0.0503
24	1.283E-05	24.12	12.14	0.0918	0.0877
48	2.841E-05	24.12	12.14	0.2032	0.1839
72	5.602E-05	24.12	12.14	0.4007	0.3301
96	9.697E-05	24.12	12.14	0.6936	0.5002
240	3.670E-04	24.12	12.14	2.6251	0.9276
480	4.366E-04	24.12	12.14	3.1231	0.9560
720					

A From Table 5C
B & C From Tables 5B & 5A, Respectively
E = 1 - exp(-D * 1 hour)

Table 5F
Elemental Iodine Deposition Rate - Intact Steam Line Volume V_3

Time Hr	Deposition Velocity m/sec A*	Main Steam Line: Total Surface Area (m^2) B	Main Steam Line: Total Volume (m^3) C	Elemental Iodine Removal Rate (hr^{-1}) D = (AxB)x3600/C	Elemental Iodine Deposition Efficiency E
0	5.362E-06	20.07	9.4	0.0412	0.0404
8	7.211E-06	20.07	9.4	0.0554	0.0539
24	1.283E-05	20.07	9.4	0.0986	0.0939
48	2.841E-05	20.07	9.4	0.2183	0.1962
72	5.602E-05	20.07	9.4	0.4305	0.3498
96	9.697E-05	20.07	9.4	0.7453	0.5254
240	3.670E-04	20.07	9.4	2.8207	0.9404
480	4.366E-04	20.07	9.4	3.3558	0.9651
720					

A From Table 5C
B & C From Tables 5A & 5B
E = 1 - exp(-D * 1 hour)

Table 5G
Elemental Iodine Deposition Rate - Intact Steam Line Volume V_4

Time Hr	Deposition Velocity m/sec A*	Main Steam Line Total Surface Area (m^2) B	Main Steam Line Total Volume (m^3) C	Elemental Iodine Removal Rate (hr^{-1}) D = (AxB)x3600/C	Elemental Iodine Deposition Efficiency E
0	5.362E-06	27.66	13.80	0.0387	0.0380
8	7.211E-06	27.66	13.80	0.0520	0.0507
24	1.283E-05	27.66	13.80	0.0926	0.0884
48	2.841E-05	27.66	13.80	0.2050	0.1854
72	5.602E-05	27.66	13.80	0.4042	0.3325
96	9.697E-05	27.66	13.80	0.6998	0.5033
240	3.670E-04	27.66	13.80	2.6485	0.9292
480	4.366E-04	27.66	13.80	3.1510	0.9572
720					

A From Table 5C
B & C From Tables 5B & 5A, Respectively
E = 1 - exp(-D * 1 hour)

Table 5H
Elemental Iodine Resuspension Rate - MSIV Leakage

Post-LOCA Time (hr)	Temp Degree F	Temp Degree K	-600/T	Resuspension Rate (hr^{-1})	Resuspension Efficiency E
0	557.9	565.3	-1.06	0.0538	0.0524
8	500.6	533.5	-1.12	0.0505	0.0493
24	405.9	480.9	-1.25	0.0447	0.0437
48	302.2	423.3	-1.42	0.0377	0.0370
72	231.5	384.0	-1.56	0.0326	0.0321
96	183.3	357.2	-1.68	0.0290	0.0286
240	90.2	305.5	-1.96	0.0218	0.0216
480	80.0	299.8	-2.00	0.0210	0.0208
720					

Resuspension Rate $(sec)^{-1}$ = 2.32 (± 2.00) x 10^{-5} $e^{-600/T}$ = 4.32 x 10^{-5} $e^{-600/T}$

Resuspension Rate $(hr)^{-1}$ = 4.32 x 3600 x 10^{-5} $e^{-600/T}$

E = 1 - exp(- resuspension rate * 1 hour)

Table 5I
Net Elemental Iodine Removal Efficiency - MSIV Failed Line Volume V_1

Post-LOCA Time (hr)	Temp Degree (F)	Elemental Iodine Deposition Efficiency A	Elemental Iodine Resuspension Efficiency B	Elemental Iodine Net Deposition Efficiency (%) C
0	557.9	0.0404	0.0524	3.82%
8	500.6	0.0539	0.0493	5.12%
24	405.9	0.0939	0.0437	8.98%
48	302.2	0.1961	0.0370	18.89%
72	231.5	0.3498	0.0321	33.86%
96	183.3	0.5254	0.0286	51.03%
240	90.2	0.9404	0.0216	92.01%
480	80.0	0.9651	0.0208	94.50%
720				

A From Table 5D
B From Table 5H
C = [A - (A*B)] * 100%

Table 5J
Net Elemental Iodine Removal Efficiency - Intact Steam Line Volume V_2

Post-LOCA Time (hr)	Temp Degree (F)	Elemental Iodine Deposition Efficiency A	Elemental Iodine Resuspension Efficiency B	Elemental Iodine Net Deposition Efficiency (%) C
0	557.9	0.0376	0.0524	3.56%
8	500.6	0.0503	0.0493	4.78%
24	405.9	0.0877	0.0437	8.39%
48	302.2	0.1839	0.0370	17.71%
72	231.5	0.3301	0.0321	31.95%
96	183.3	0.5002	0.0286	48.59%
240	90.2	0.9276	0.0216	90.75%
480	80.0	0.9560	0.0208	93.61%
720				

A From Table 5E
B From Table 5H
C = [A - (A*B)] * 100%

Table 5K
Net Elemental Iodine Removal Efficiency - Intact Steam Line Volume V_3

Post-LOCA Time (hr)	Temp Degree (F)	Elemental Iodine Deposition Efficiency A	Elemental Iodine Resuspension Efficiency B	Elemental Iodine Net Deposition Efficiency (%) C
0	557.9	0.0404	0.0524	3.83%
8	500.6	0.0539	0.0493	5.13%
24	405.9	0.0939	0.0437	8.98%
48	302.2	0.1962	0.0370	18.89%
72	231.5	0.3498	0.0321	33.86%
96	183.3	0.5254	0.0286	51.04%
240	90.2	0.9404	0.0216	92.01%
480	80.0	0.9651	0.0208	94.50%
720				

A From Table 5F
B From Table 5H
C = [A - (A*B)] * 100%

Table 5L
Net Elemental Iodine Removal Efficiency - Intact Steam Line Volume V_4

Post-LOCA Time (hr)	Temp Degree (F)	Elemental Iodine Deposition Efficiency A	Elemental Iodine Resuspension Efficiency B	Elemental Iodine Net Deposition Efficiency (%) C
0	557.9	0.0380	0.0524	3.60%
8	500.6	0.0507	0.0493	4.82%
24	405.9	0.0884	0.0437	8.46%
48	302.2	0.1854	0.0370	17.85%
72	231.5	0.3325	0.0321	32.19%
96	183.3	0.5033	0.0286	48.89%
240	90.2	0.9292	0.0216	90.92%
480	80.0	0.9572	0.0208	93.73%
720				

A From Table 5G
B From Table 5H
C = [A - (A*B)] * 100%

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Table 5M
Elemental Iodine Deposition Efficiencies in MSL Volumes

Post-LOCA Time (hr)	Elemental Iodine Deposition Efficiencies in MSL Volume			
	V_1 A	V_2 B	V_3 C	V_4 D
0	3.82%	3.56%	3.83%	3.60%
8	5.12%	4.78%	5.13%	4.82%
24	8.98%	8.39%	8.98%	8.46%
48	18.89%	17.71%	18.89%	17.85%
72	33.86%	31.95%	33.86%	32.19%
96	51.03%	48.59%	51.04%	48.89%
240	92.01%	90.75%	92.01%	90.92%
480	94.50%	93.61%	94.50%	93.73%
720				

A From Table 5I
B From Table 5J
C From Table 5K
D From Table 5L

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Table 6
Aerosol Removal Efficiencies - Other Bypass Leakages

Bypass Leakage Pathways	Bypass Leakage scfh A	Horizontal Internal Piping Surface Area ft² B	Horizontal Projected Internal Surface Area ft² C = B / π	Settling Velocity ft/hr D	Product cfh E = C * D	Leakage At Accident Condition cfh F=A*0.4056	Aerosol Removal efficiency G
MSL lnboard Drains	1.875	42.40	13.50	0.777	1.05E+01	0.7605	93.24%
MSL Outboard Drains	0.625	0.00	0.00	0.777	0.00E+00	0.2535	0.00%
Drywell Floor Drain	1.875	13.41	4.27	0.777	3.32E+00	0.7605	81.35%
Drywell Floor Drain Tank Vent	0.9375	15.44	4.92	0.777	3.82E+00	0.3803	90.95%
Drywell Equip Drain	1.25	14.67	4.67	0.777	3.63E+00	0.5070	87.75%
Drywell Equip Drain Tank Vent	0.625	4.54	1.45	0.777	1.12E+00	0.2535	81.59%
2in.CPS Line in Drywell	0.625	4.57	1.46	0.777	1.13E+00	0.2535	81.69%
PASS Sample A	0.2344	0.22	0.07	0.777	5.44E-02	0.0951	36.41%
PASS Sample B	0.2344	0.22	0.07	0.777	5.44E-02	0.0951	36.41%
PASS Retum A	0.2344	0.22	0.07	0.777	5.44E-02	0.0951	36.41%
PASS Retum B	0.2344	0.25	0.08	0.777	6.19E-02	0.0951	39.42%
lAS Line l	0.9375	1.98	0.63	0.777	4.90E-01	0.3803	56.30%
lAS Line 2	0.9375	1.15	0.37	0.777	2.85E-01	0.3803	42.80%
IAS Line 3	3.6	1.43	0.46	0.777	3.54E-01	1.4602	19.40%
lAS Line 4		8.18	2.61	0.777	2.02E+00		
lAS Line 5		1.99	0.63	0.777	4.92E-01		
GSN		1.96	0.62	0.777	4.85E-01		
1in. CPS Line 1		4.17	1.33	0.777	1.03E+00		
1in. CPS Line 2		1.42	0.45	0.777	3.51E-01		
12in.CPS Line in Wetwell	3.75	34.43	10.96	0.777	8.52E+00	1.5210	84.85%
2in.CPS Line in Wetwell	0.625	9.40	2.99	0.777	2.33E+00	0.2535	90.17%
Feedwater Line A	12	72.01	22.93	0.777	1.78E+01	4.8672	78.55%
Feedwater Line B	12	71.90	22.90	0.777	1.78E+01	4.8672	78.52%
RWCU	2.5	26.28	8.37	0.777	6.50E+00	1.0140	86.51%
14 in.CPS Line in Drywell	4.38	40.40	12.87	0.777	1.00E+01	1.7765	84.91%

A From Section 5.5.6

B From Reference 9.10, Table 6.11-2

D = 3rd Percentile Settling Velocity = 6.58E-05 m/sec (Ref. 9.26.1, Section 3.2.1.2.4.2) x 3.28 ft/m x 3600 sec/hr = 0.777 ft/hr

F = cfh @ Accident Condition = [14.7 psia / (40 psig + 14.7 psia)] x [800R / 530R]= 0.4056 cfh

G = Aerosol Removal Efficiency = $\eta = 1 - (1 + E/F)^{-1}$

(1) 1in CPS Line 2 provides the most limiting characteristic for aerosol deposition because of having the smallest values of A*μ (Column F) for the given volumetric flow yields the lowest aerosol removal efficiency (Ref. 9.29.3, Insert 2)

Table 7
Control Room χ/Q Values - NMP2 Site-specific Release Points

Time (hr)	Control Room χ/Q Values for Various NMP2 Release Points				
	Combined Radwaste & Reactor Bldg Vent (s/m^3) A	Post Accident Sampling System Panel (PASS) (s/m^3) B	Standby Gas Treatment Sys Building (SGTS) (s/m^3) C	Main Steam Tunnel (s/m^3) D	Main Stack (s/m^3) E
0-2	1.09E-03	3.84E-04	5.33E-04	1.47E-03	8.03E-05
2-8	7.23E-04	2.28E-04	3.72E-04	9.74E-04	4.48E-05
8-24	2.50E-04	8.23E-05	1.36E-04	3.63E-04	1.68E-05
24-96	1.92E-04	6.28E-05	9.17E-05	2.45E-04	1.20E-05
96-720	1.47E-04	4.57E-05	6.72E-05	1.90E-04	8.83E-06

A, B, C, D & E From Reference 9.11, Table 7.3.4

Table 8
Control Room χ/Q Normalization Factors

Time (hr)	NMP2 Release Point			
	Combined Radwaste & Reactor Bldg Vent	Post Accident Sampling System Panel (PASS)	Standby Gas Treatment Sys Building (SGTS)	Main Steam Tunnel
0-2	0.74	0.26	0.36	1.00
2-8	0.74	0.23	**0.38**	1.00
8-24	0.69	0.23	0.37	1.00
24-96	**0.78**	**0.26**	0.37	1.00
96-720	0.77	0.24	0.35	1.00

U2 Combined Radwaste & Reactor Vent: Multiplier = 0.78
U2 Post Accident Sampling Sys. Panel (PASS): Multiplier = 0.26
U2 Standby Gas Treatment Sys. Building (SGTS) : Multiplier = 0.38
U2 Main Steam Tunnel: Multiplier = 1.00

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Table 9

Combined Other Bypass Pathway Aerosol Removal Efficiencies

	χ/Q Set	χ/Q Multiplier A	Release Path Description	Flowrate (actual) cfh B	Adjusted Flowrate C=A x B	Efficiency D	Penetration E=B*(1-D/100)	Combined Flow Rate		Adjusted Flow Rate		Combined Efficiency J
								cfh F	cfm G = F/60	cfh H	cfm I = H/60	
DW Bypass	Tunnel	1.00	MSL Inboard Drains	0.7605	0.7605	93.24%	0.0514	18.2946	0.3049	14.9595	0.2493	73.05%
			MSL Outboard Drains	0.2535	0.2535	0.00%	0.2535					
	Radwaste	0.78	DW Floor Drain	0.7605	0.5932	81.35%	0.1418					
			DW Floor Drain Tank Vent	0.3803	0.2966	90.95%	0.0344					
			DW Equip.Drain	0.5070	0.3955	87.75%	0.0621					
			DW Equip.Drain Tank Vent	0.2535	0.1977	81.59%	0.0467					
	PASS	0.26	PASS Sample A	0.0951	0.0247	36.41%	0.0605					
			PASS Sample B	0.0951	0.0247	36.41%	0.0605					
			PASS Return A	0.0951	0.0247	36.41%	0.0605					
			PASS Return B	0.0951	0.0247	36.42%	0.0576					
	SGTS	0.38	2in.CPS Line in DW	0.2535	0.0963	81.69%	0.0464					
			IAS Line 1	0.3803	0.1445	56.30%	0.1662					
			IAS Line 2	0.3803	0.1445	42.80%	0.2175					
			IAS Line 3	0.0000	0.0000	0.00%	0.0000					
			IAS Line 4	0.0000	0.0000	0.00%	0.0000					
			IAS Line 5	0.0000	0.0000	0.00%	0.0000					
			GSN	0.0000	0.0000	0.00%	0.0000					
			l in.CPS Line 1	0.0000	0.0000	0.00%	0.0000					
			l in.CPS Line 2	1.4602	0.5549	19.40%	1.1769					
	Tunnel	1.00	Feedwater Line A	4.8672	4.8672	78.55%	1.0442					
			Feedwater Line B	4.8672	4.8672	78.52%	1.0455					
			RWCU	1.0140	1.0140	86.51%	0.1368					
	SGTS	0.38	14 in. CPS Line in DW	1.7765	0.6751	84.91%	0.2681					
WW Bypass	SGTS	0.38	l 2 in.CPS Line in WW	1.5210	0.5780	84.85%	0.2304	1.7745	0.0296	0.6743	0.0112	85.61%
			2 in.CPS Line inWW	0.2535	0.0963	90.17%	0.0249					

A From Table 8

B & D Table 6

E = Penetration Uses Actual Flowrate

F = Σcolumn B Actual Flowrate for the Given Release Category

H = Σcolumn C Adjusted Flowrate for the Given Release Category

J = 1 - (Σ Column E / Σ Column B)

Table 9A
System Bypass Leak Rate at Testing Condition

System Bypass Leakage ID	Leak Rate @ Accident Condition A cfh	Factor To Convert Accident To Test Condition B	Leak Rate @ Testing Condition C = A / B scfh
Drywell	14.9595	0.4056	36.88
Wetwell	0.6743	0.4056	1.66

A From Table 9, Column H
B From Section 2.3.2

Table 10
NMP2 Post-LOCA External Cloud WB Doses

Time Interval (hr)	External Cloud WB Dose (rem)	
	Without Occupancy Factor	With Occupancy Factor
Containment Leakage		
0 - 24	1.9151E+00	1.9151E+00
24 -96	2.8287E-01	1.6972E-01
96 - 720	2.8503E-01	1.1401E-01
Total	**2.4830E+00**	**2.1988E+00**
RADTRAD Run	**NP2CL22.o0**	
ESF Leakage		
0 - 24	8.1247E-01	8.1247E-01
24 -96	4.4013E-01	2.6408E-01
96 - 720	1.1988E-01	4.7952E-02
Total	**1.3725E+00**	**1.1245E+00**
RADTRAD Run	**NP2ES22.o0**	
Bypass Leakage		
0 - 24	2.6017E+01	2.6017E+01
24 -96	3.5732E+00	2.1439E+00
96 - 720	4.3447E+00	1.7379E+00
Total	**3.3935E+01**	**2.9899E+01**
RADTRAD Run	**NP2MS22.o0**	

Table 10A
Modified Offsite χ/Q Values - System Bypass Pathways 5 & 6

Time Interval (hr)	Offsite Receptor	Actual Value A	System Bypass Pathway	
			Drywell B=A*(1)	Wetwell C=A*(2)
Ratio	EAB / LPZ	-	1.22E+00	2.63E+00
Worst 2-hr (Ground-level)	EAB	1.19E-04	1.46E-04	3.13E-04
0-8 hr	LPZ	1.62E-05	1.98E-05	4.26E-05
8-24 hr		1.09E-05	1.33E-05	2.87E-05
24-96 hr		4.59E-06	5.61E-06	1.21E-05
96-720 hr		1.33E-06	1.63E-06	3.50E-06

A From Sections 5.7.2 & 5.7.5
(1) The ratio of G/H from Table 9 DW Bypass
(2) The ratio of G/H from Table 9 WW Bypass

Table 11
Post-LOCA RB Airborne Isotopic Activity - Containment Leakage

Isotope	Post-LOCA RB Isotopic Activity (Ci) Containment Leakage				
	2.0 hr	8.0 hrs	24.0 hrs	96 hrs	720 hrs
Kr-83m	3.221E+03	2.028E+03	8.920E+00	0.000E+00	0.000E+00
Kr-85m	1.121E+04	2.611E+04	3.754E+03	2.868E-02	0.000E+00
Kr-85	7.725E+02	4.551E+03	7.778E+03	4.091E+03	3.105E+03
Kr-87	1.036E+04	2.320E+03	6.467E-01	0.000E+00	0.000E+00
Kr-88	2.571E+04	3.503E+04	1.206E+03	1.481E-05	0.000E+00
Rb-86	3.594E+00	2.061E+00	6.795E-01	1.781E-01	5.169E-02
Rb-88	2.101E+04	4.388E+04	3.653E+03	4.488E-05	0.000E+00
Sr-89	6.800E+01	4.777E+01	2.715E+01	1.075E+01	5.735E+00
Sr-90	7.283E+00	5.134E+00	2.945E+00	1.214E+00	9.243E-01
Sr-91	7.252E+01	3.300E+01	5.890E+00	1.270E-02	0.000E+00
Sr-92	5.209E+01	7.914E+00	7.581E-02	3.142E-10	0.000E+00
Y-90	1.368E-01	4.041E-01	6.568E-01	7.846E-01	9.292E-01
Y-91	8.646E-01	6.571E-01	4.087E-01	1.690E-01	9.472E-02
Y-92	9.113E+00	1.286E+01	7.268E-01	3.074E-07	0.000E+00
Y-93	8.298E-01	3.875E-01	7.414E-02	2.185E-04	0.000E+00
Zr-95	1.006E+00	7.075E-01	4.029E-01	1.609E-01	9.255E-02
Zr-97	8.951E-01	4.934E-01	1.468E-01	3.160E-03	0.000E+00
Nb-95	9.934E-01	7.003E-01	4.017E-01	1.655E-01	1.175E-01
Mo-99	1.245E+01	8.241E+00	3.996E+00	7.737E-01	8.409E-04
Tc-99m	1.119E+01	7.694E+00	4.003E+00	7.932E-01	8.621E-04
Ru-103	1.099E+01	7.715E+00	4.374E+00	1.711E+00	8.245E-01
Ru-105	5.739E+00	1.586E+00	7.482E-02	4.053E-07	0.000E+00
Ru-106	4.576E+00	3.224E+00	1.847E+00	7.575E-01	5.500E-01
Rh-105	7.276E+00	4.849E+00	2.118E+00	2.140E-01	7.951E-07
Sb-127	1.248E+01	8.409E+00	4.278E+00	1.028E+00	7.266E-03
Sb-129	2.839E+01	7.643E+00	3.365E-01	1.334E-06	0.000E+00
Te-127	1.251E+01	8.721E+00	4.773E+00	1.334E+00	2.455E-01
Te-127m	2.142E+00	1.510E+00	8.661E-01	3.551E-01	2.338E-01
Te-129	3.210E+01	1.153E+01	2.894E+00	9.390E-01	4.188E-01
Te-129m	7.026E+00	4.942E+00	2.801E+00	1.086E+00	4.843E-01

Table 11 (Cont'd)
Post-LOCA RB Airborne Isotopic Activity - Containment Leakage

Isotope	Post-LOCA RB Isotopic Activity (Ci) Containment Leakage				
	2.0 hr	8.0 hrs	24.0 hrs	96 hrs	720 hrs
Te-131m	2.542E+01	1.560E+01	6.182E+00	4.830E-01	2.018E-07
Te-132	1.876E+02	1.254E+02	6.243E+01	1.360E+01	4.109E-02
I-131	1.711E+03	1.087E+03	5.130E+02	1.535E+02	1.245E+01
I-132	1.673E+03	3.031E+02	7.500E+01	1.623E+01	4.904E-02
I-133	3.341E+03	1.776E+03	5.202E+02	1.827E+01	1.297E-08
I-134	8.428E+02	4.761E+00	7.621E-06	0.000E+00	0.000E+00
I-135	2.737E+03	9.467E+02	8.830E+01	1.797E-02	0.000E+00
Xe-133	9.398E+04	5.368E+05	8.422E+05	3.005E+05	7.459E+03
Xe-133m	2.858E+03	1.562E+04	2.170E+04	4.495E+03	1.060E+00
Xe-135	4.015E+04	1.545E+05	7.812E+04	1.699E+02	0.000E+00
Xe-135m	1.678E+03	1.687E+02	4.096E+01	8.336E-03	0.000E+00
Xe-138	2.423E+02	3.334E-05	0.000E+00	0.000E+00	0.000E+00
Cs-134	3.605E+02	2.086E+02	7.046E+01	2.059E+01	1.533E+01
Cs-136	1.095E+02	6.255E+01	2.041E+01	5.103E+00	9.828E-01
Cs-137	2.799E+02	1.620E+02	5.475E+01	1.604E+01	1.221E+01
Ba-139	3.764E+01	1.298E+00	2.386E-04	0.000E+00	0.000E+00
Ba-140	9.968E+01	6.932E+01	3.835E+01	1.343E+01	2.489E+00
La-140	2.345E+00	8.147E+00	1.284E+01	1.181E+01	2.892E+00
La-141	6.606E-01	1.616E-01	5.515E-03	6.948E-09	0.000E+00
La-142	3.752E-01	1.782E-02	7.679E-06	0.000E+00	0.000E+00
Ce-141	2.363E+00	1.659E+00	9.387E-01	3.632E-01	1.591E-01
Ce-143	2.211E+00	1.374E+00	5.631E-01	5.119E-02	7.929E-08
Ce-144	1.895E+00	1.335E+00	7.644E-01	3.129E-01	2.240E-01
Pr-143	9.047E-01	6.479E-01	3.812E-01	1.515E-01	3.176E-02
Nd-147	3.662E-01	2.541E-01	1.397E-01	4.769E-02	7.044E-03
Np-239	2.631E+01	1.723E+01	8.123E+00	1.385E+00	5.016E-04
Pu-238	5.888E-03	4.151E-03	2.381E-03	9.823E-04	7.510E-04
Pu-239	5.939E-04	4.190E-04	2.408E-04	9.984E-05	7.642E-05
Pu-240	1.049E-03	7.394E-04	4.241E-04	1.749E-04	1.334E-04
Pu-241	2.330E-01	1.643E-01	9.422E-02	3.884E-02	2.952E-02
Am-241	1.319E-04	9.313E-05	5.369E-05	2.265E-05	2.064E-05
Cm-242	3.620E-02	2.549E-02	1.458E-02	5.938E-03	4.054E-03
Cm-244	2.395E-03	1.688E-03	9.682E-04	3.992E-04	3.035E-04

Post-LOCA RB Isotopic Activity From RADTRAD Run NP2CL00.o0

Table 12
Post-LOCA RB Airborne Isotopic Activity: ESF Leakage

Isotope	Post-LOCA RB Isotopic Activity ESF Leakage				
	2.0 hr	8.0 hrs	24.0 hrs	96 hrs	720 hrs
I-131	9.680E+03	5.260E+04	8.196E+04	5.399E+04	6.749E+02
I-132	9.774E+03	9.681E+03	1.296E+02	4.173E-08	0.000E+00
I-133	1.891E+04	8.593E+04	8.320E+04	6.444E+03	7.058E-07
I-134	4.769E+03	2.304E+02	1.219E-03	0.000E+00	0.000E+00
I-135	1.548E+04	4.582E+04	1.412E+04	6.339E+00	0.000E+00
Xe-133	6.955E+02	2.181E+04	1.076E+05	1.607E+05	6.928E+02
Xe-133m	4.857E+01	1.481E+03	6.755E+03	6.804E+03	3.005E-01
Xe-135	7.956E+03	1.672E+05	2.670E+05	2.417E+03	0.000E+00
Xe-135m	7.958E+03	1.302E+04	7.068E+03	3.153E+00	0.000E+00

Post-LOCA RB Isotopic Activity From RADTRAD Run NP2ES00.o0

Table 13
Post-LOCA RB Airborne Isotopic Activity - Containment + ESF Leakages

Isotope	Post-LOCA RB Isotopic Activity (Ci) Containment + ESF Leakages				
	2.0 hr	8.0 hrs	24.0 hrs	96 hrs	720 hrs
Kr-83m	3.221E+03	2.028E+03	8.920E+00	0.000E+00	0.000E+00
Kr-85m	1.121E+04	2.611E+04	3.754E+03	2.868E-02	0.000E+00
Kr-85	7.725E+02	4.551E+03	7.778E+03	4.091E+03	3.105E+03
Kr-87	1.036E+04	2.320E+03	6.467E-01	0.000E+00	0.000E+00
Kr-88	2.571E+04	3.503E+04	1.206E+03	1.481E-05	0.000E+00
Rb-86	3.594E+00	2.061E+00	6.795E-01	1.781E-01	5.169E-02
Rb-88	2.101E+04	4.388E+04	3.653E+03	4.488E-05	0.000E+00
Sr-89	6.800E+01	4.777E+01	2.715E+01	1.075E+01	5.735E+00
Sr-90	7.283E+00	5.134E+00	2.945E+00	1.214E+00	9.243E-01
Sr-91	7.252E+01	3.300E+01	5.890E+00	1.270E-02	0.000E+00
Sr-92	5.209E+01	7.914E+00	7.581E-02	3.142E-10	0.000E+00
Y-90	1.368E-01	4.041E-01	6.568E-01	7.846E-01	9.292E-01
Y-91	8.646E-01	6.571E-01	4.087E-01	1.690E-01	9.472E-02
Y-92	9.113E+00	1.286E+01	7.268E-01	3.074E-07	0.000E+00
Y-93	8.298E-01	3.875E-01	7.414E-02	2.185E-04	0.000E+00
Zr-95	1.006E+00	7.075E-01	4.029E-01	1.609E-01	9.255E-02
Zr-97	8.951E-01	4.934E-01	1.468E-01	3.160E-03	0.000E+00
Nb-95	9.934E-01	7.003E-01	4.017E-01	1.655E-01	1.175E-01
Mo-99	1.245E+01	8.241E+00	3.996E+00	7.737E-01	8.409E-04
Tc-99m	1.119E+01	7.694E+00	4.003E+00	7.932E-01	8.621E-04
Ru-103	1.099E+01	7.715E+00	4.374E+00	1.711E+00	8.245E-01
Ru-105	5.739E+00	1.586E+00	7.482E-02	4.053E-07	0.000E+00
Ru-106	4.576E+00	3.224E+00	1.847E+00	7.575E-01	5.500E-01
Rh-105	7.276E+00	4.849E+00	2.118E+00	2.140E-01	7.951E-07
Sb-127	1.248E+01	8.409E+00	4.278E+00	1.028E+00	7.266E-03
Sb-129	2.839E+01	7.643E+00	3.365E-01	1.334E-06	0.000E+00
Te-127	1.251E+01	8.721E+00	4.773E+00	1.334E+00	2.455E-01
Te-127m	2.142E+00	1.510E+00	8.661E-01	3.551E-01	2.338E-01
Te-129	3.210E+01	1.153E+01	2.894E+00	9.390E-01	4.188E-01
Te-129m	7.026E+00	4.942E+00	2.801E+00	1.086E+00	4.843E-01

Table 13 (Cont'd)
Post-LOCA RB Airborne Isotopic Activity - Containment +ESF Leakages

Isotope	Post-LOCA RB Isotopic Activity (Ci) Containment + ESF Leakages				
	2.0 hr	8.0 hrs	24.0 hrs	96 hrs	720 hrs
Te-131m	2.542E+01	1.560E+01	6.182E+00	4.830E-01	2.018E-07
Te-132	1.876E+02	1.254E+02	6.243E+01	1.360E+01	4.109E-02
I-131	1.139E+04	5.369E+04	8.247E+04	5.414E+04	6.873E+02
I-132	1.145E+04	9.984E+03	2.046E+02	1.623E+01	4.904E-02
I-133	2.225E+04	8.770E+04	8.372E+04	6.462E+03	7.187E-07
I-134	5.611E+03	2.352E+02	1.227E-03	0.000E+00	0.000E+00
I-135	1.822E+04	4.676E+04	1.421E+04	6.356E+00	0.000E+00
Xe-133	9.467E+04	5.586E+05	9.498E+05	4.611E+05	8.152E+03
Xe-133m	2.906E+03	1.710E+04	2.846E+04	1.130E+04	1.361E+00
Xe-135	4.810E+04	3.217E+05	3.451E+05	2.587E+03	0.000E+00
Xe-135m	9.636E+03	1.319E+04	7.109E+03	3.161E+00	0.000E+00
Xe-138	2.423E+02	3.334E-05	0.000E+00	0.000E+00	0.000E+00
Cs-134	3.605E+02	2.086E+02	7.046E+01	2.059E+01	1.533E+01
Cs-136	1.095E+02	6.255E+01	2.041E+01	5.103E+00	9.828E-01
Cs-137	2.799E+02	1.620E+02	5.475E+01	1.604E+01	1.221E+01
Ba-139	3.764E+01	1.298E+00	2.386E-04	0.000E+00	0.000E+00
Ba-140	9.968E+01	6.932E+01	3.835E+01	1.343E+01	2.489E+00
La-140	2.345E+00	8.147E+00	1.284E+01	1.181E+01	2.892E+00
La-141	6.606E-01	1.616E-01	5.515E-03	6.948E-09	0.000E+00
La-142	3.752E-01	1.782E-02	7.679E-06	0.000E+00	0.000E+00
Ce-141	2.363E+00	1.659E+00	9.387E-01	3.632E-01	1.591E-01
Ce-143	2.211E+00	1.374E+00	5.631E-01	5.119E-02	7.929E-08
Ce-144	1.895E+00	1.335E+00	7.644E-01	3.129E-01	2.240E-01
Pr-143	9.047E-01	6.479E-01	3.812E-01	1.515E-01	3.176E-02
Nd-147	3.662E-01	2.541E-01	1.397E-01	4.769E-02	7.044E-03
Np-239	2.631E+01	1.723E+01	8.123E+00	1.385E+00	5.016E-04
Pu-238	5.888E-03	4.151E-03	2.381E-03	9.823E-04	7.510E-04
Pu-239	5.939E-04	4.190E-04	2.408E-04	9.984E-05	7.642E-05
Pu-240	1.049E-03	7.394E-04	4.241E-04	1.749E-04	1.334E-04
Pu-241	2.330E-01	1.643E-01	9.422E-02	3.884E-02	2.952E-02
Am-241	1.319E-04	9.313E-05	5.369E-05	2.265E-05	2.064E-05
Cm-242	3.620E-02	2.549E-02	1.458E-02	5.938E-03	4.054E-03
Cm-244	2.395E-03	1.688E-03	9.682E-04	3.992E-04	3.035E-04

Table 14
Post-LOCA RB Airborne Isotopic Activity - Containment + ESF Leakages
Sorted for MiscroShield Input

Isotope	Post-LOCA RB Isotopic Activity (Ci) Containment + ESF Leakages				
	2.0 hr	8.0 hrs	24.0 hrs	96 hrs	720 hrs
Am-241	1.319E-04	9.313E-05	5.369E-05	2.265E-05	2.064E-05
Ba-139	3.764E+01	1.298E+00	2.386E-04	0.000E+00	0.000E+00
Ba-140	9.968E+01	6.932E+01	3.835E+01	1.343E+01	2.489E+00
Ce-141	2.363E+00	1.659E+00	9.387E-01	3.632E-01	1.591E-01
Ce-143	2.211E+00	1.374E+00	5.631E-01	5.119E-02	7.929E-08
Ce-144	1.895E+00	1.335E+00	7.644E-01	3.129E-01	2.240E-01
Cm-242	3.620E-02	2.549E-02	1.458E-02	5.938E-03	4.054E-03
Cm-244	2.395E-03	1.688E-03	9.682E-04	3.992E-04	3.035E-04
Cs-134	3.605E+02	2.086E+02	7.046E+01	2.059E+01	1.533E+01
Cs-136	1.095E+02	6.255E+01	2.041E+01	5.103E+00	9.828E-01
Cs-137	2.799E+02	1.620E+02	5.475E+01	1.604E+01	1.221E+01
I-131	1.139E+04	5.369E+04	8.247E+04	5.414E+04	6.873E+02
I-132	1.145E+04	9.984E+03	2.046E+02	1.623E+01	4.904E-02
I-133	2.225E+04	8.770E+04	8.372E+04	6.462E+03	7.187E-07
I-134	5.611E+03	2.352E+02	1.227E-03	0.000E+00	0.000E+00
I-135	1.822E+04	4.676E+04	1.421E+04	6.356E+00	0.000E+00
Kr-83m	3.221E+03	2.028E+03	8.920E+00	0.000E+00	0.000E+00
Kr-85	7.725E+02	4.551E+03	7.778E+03	4.091E+03	3.105E+03
Kr-85m	1.121E+04	2.611E+04	3.754E+03	2.868E-02	0.000E+00
Kr-87	1.036E+04	2.320E+03	6.467E-01	0.000E+00	0.000E+00
Kr-88	2.571E+04	3.503E+04	1.206E+03	1.481E-05	0.000E+00
La-140	2.345E+00	8.147E+00	1.284E+01	1.181E+01	2.892E+00
La-141	6.606E-01	1.616E-01	5.515E-03	6.948E-09	0.000E+00
La-142	3.752E-01	1.782E-02	7.679E-06	0.000E+00	0.000E+00
Mo-99	1.245E+01	8.241E+00	3.996E+00	7.737E-01	8.409E-04
Nb-95	9.934E-01	7.003E-01	4.017E-01	1.655E-01	1.175E-01
Nd-147	3.662E-01	2.541E-01	1.397E-01	4.769E-02	7.044E-03
Np-239	2.631E+01	1.723E+01	8.123E+00	1.385E+00	5.016E-04
Pr-143	9.047E-01	6.479E-01	3.812E-01	1.515E-01	3.176E-02
Pu-238	5.888E-03	4.151E-03	2.381E-03	9.823E-04	7.510E-04
Pu-239	5.939E-04	4.190E-04	2.408E-04	9.984E-05	7.642E-05
Pu-240	1.049E-03	7.394E-04	4.241E-04	1.749E-04	1.334E-04

Table 14 (Cont'd)
Post-LOCA RB Airborne Isotopic Activity - Containment + ESF Leakages
Sorted for MiscroShield Input

Isotope	Post-LOCA RB Isotopic Activity (Ci) Containment + ESF Leakages				
	2.0 hr	8.0 hrs	24.0 hrs	96 hrs	720 hrs
Pu-241	2.330E-01	1.643E-01	9.422E-02	3.884E-02	2.952E-02
Rb-86	3.594E+00	2.061E+00	6.795E-01	1.781E-01	5.169E-02
Rb-88	2.101E+04	4.388E+04	3.653E+03	4.488E-05	0.000E+00
Rh-105	7.276E+00	4.849E+00	2.118E+00	2.140E-01	7.951E-07
Ru-103	1.099E+01	7.715E+00	4.374E+00	1.711E+00	8.245E-01
Ru-105	5.739E+00	1.586E+00	7.482E-02	4.053E-07	0.000E+00
Ru-106	4.576E+00	3.224E+00	1.847E+00	7.575E-01	5.500E-01
Sb-127	1.248E+01	8.409E+00	4.278E+00	1.028E+00	7.266E-03
Sb-129	2.839E+01	7.643E+00	3.365E-01	1.334E-06	0.000E+00
Sr-89	6.800E+01	4.777E+01	2.715E+01	1.075E+01	5.735E+00
Sr-90	7.283E+00	5.134E+00	2.945E+00	1.214E+00	9.243E-01
Sr-91	7.252E+01	3.300E+01	5.890E+00	1.270E-02	0.000E+00
Sr-92	5.209E+01	7.914E+00	7.581E-02	3.142E-10	0.000E+00
Tc-99m	1.119E+01	7.694E+00	4.003E+00	7.932E-01	8.621E-04
Te-127	1.251E+01	8.721E+00	4.773E+00	1.334E+00	2.455E-01
Te-127m	2.142E+00	1.510E+00	8.661E-01	3.551E-01	2.338E-01
Te-129	3.210E+01	1.153E+01	2.894E+00	9.390E-01	4.188E-01
Te-129m	7.026E+00	4.942E+00	2.801E+00	1.086E+00	4.843E-01
Te-131m	2.542E+01	1.560E+01	6.182E+00	4.830E-01	2.018E-07
Te-132	1.876E+02	1.254E+02	6.243E+01	1.360E+01	4.109E-02
Xe-133	9.467E+04	5.586E+05	9.498E+05	4.611E+05	8.152E+03
Xe-133m	2.906E+03	1.710E+04	2.846E+04	1.130E+04	1.361E+00
Xe-135	4.810E+04	3.217E+05	3.451E+05	2.587E+03	0.000E+00
Xe-135m	9.636E+03	1.319E+04	7.109E+03	3.161E+00	0.000E+00
Xe-138	2.423E+02	3.334E-05	0.000E+00	0.000E+00	0.000E+00
Y-90	1.368E-01	4.041E-01	6.568E-01	7.846E-01	9.292E-01
Y-91	8.646E-01	6.571E-01	4.087E-01	1.690E-01	9.472E-02
Y-92	9.113E+00	1.286E+01	7.268E-01	3.074E-07	0.000E+00
Y-93	8.298E-01	3.875E-01	7.414E-02	2.185E-04	0.000E+00
Zr-95	1.006E+00	7.075E-01	4.029E-01	1.609E-01	9.255E-02
Zr-97	8.951E-01	4.934E-01	1.468E-01	3.160E-03	0.000E+00

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Table 15
Post-LOCA NMP2 RB Shine Integrated Gamma Dose to NMP2 CR
(Without Total Source Volume Related Reduction Factor)

Post-LOCA Period t (hr)	Control Room Gamma Dose Rate (mrem/hr)	Control Room Integrated Gamma Dose (w/o CROF) (mrem)	Control Room Occupancy Factor (unitless)	Control Room Integrated Gamma Dose (with CROF) (mrem)	Control Room Cumulative Gamma Dose (mrem)	MicroShield Run No.
2	2.310E+01	2.310E+01	1.0	2.310E+01	2.310E+01	NMP2CS02.MS5
8	3.293E+01	1.681E+02	1.0	1.681E+02	1.912E+02	NMP2CS08.MS5
24	3.991E+00	2.954E+02	1.0	2.954E+02	4.866E+02	NMP2CS24.MS5
96	5.002E-02	1.455E+02	0.6	8.729E+01	5.738E+02	NMP2CS96.MS5
720	1.104E-03	1.595E+01	0.4	6.380E+00	5.802E+02	NMP2C720.MS5
720-hrs Cumulative Gamma Dose					**5.802E+02**	

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Table 16
720 hr - Post-LOCA Total Elemental & Organic Iodine Inventory and Aerosol Mass on CREF Filter

Post-LOCA Release Path	CR Filer	Elemental Iodine (atom)	Organic Iodine (atom)	Aerosol Mass (kg)	Reference RADTRAD Run
Containment	Recirc Filter	1.075E+13	1.0321E+12	1.071E-08	NP2CL400.o0
Leakage	Intake Filter	1.929E+14	1.8292E+13	1.843E-07	
ESF	Recirc Filter	3.767E+14	1.1652E+13	0.000E+00	NP2ES400.o0
Leakage	Intake Filter	6.647E+15	2.0558E+14	0.000E+00	
MSIV	Recirc Filter	9.698E+13	7.417E+14	7.108E-09	NMP2MS00.o0
Leakage	Intake Filter	1.721E+15	1.298E+16	1.215E-07	
Total		**9.045E+15**	**1.3957E+16**	**3.235E-07**	
Total (Elemental + Organic) Iodine Atom		**2.3003E+16**			

Table 17
Conversion of Iodine Activity Into Iodine Atoms

Isotope	CR Region @ 0.5 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	6.082E-03	2.255E+14	3.708E+16	7.654E-01
I-132	7.732E-03	3.418E+12	4.420E+14	1.160E-02
I-133	1.243E-02	4.967E+13	3.997E+15	1.686E-01
I-134	9.761E-03	1.644E+12	1.685E+14	5.581E-03
I-135	1.133E-02	1.439E+13	1.270E+15	4.884E-02
Total		2.946E+14		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 0.5 hr from CR Compartment Nuclide Inventory

Table 17A
2-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 2.0 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	1.675E+03	6.211E+19	3.708E+16	7.817E-01
I-132	1.640E+03	7.249E+17	4.420E+14	9.125E-03
I-133	3.271E+03	1.308E+19	3.997E+15	1.646E-01
I-134	8.252E+02	1.390E+17	1.685E+14	1.750E-03
I-135	2.679E+03	3.404E+18	1.270E+15	4.284E-02
Total		7.945E+19		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 2.0 hr from RB Compartment Nuclide Inventory

Table 17B
4-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 4.0 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	1.376E+03	5.104E+19	3.708E+16	7.995E-01
I-132	8.417E+02	3.720E+17	4.420E+14	5.827E-03
I-133	2.533E+03	1.012E+19	3.997E+15	1.586E-01
I-134	1.405E+02	2.367E+16	1.685E+14	3.707E-04
I-135	1.798E+03	2.284E+18	1.270E+15	3.577E-02
Total		6.384E+19		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 4.0 hr from RB Compartment Nuclide Inventory

Table 17C
8-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 8.0 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	9.376E+02	3.477E+19	3.708E+16	8.269E-01
I-132	2.635E+02	1.165E+17	4.420E+14	2.771E-03
I-133	1.531E+03	6.121E+18	3.997E+15	1.456E-01
I-134	4.106E+00	6.918E+14	1.685E+14	1.645E-05
I-135	8.166E+02	1.037E+18	1.270E+15	2.467E-02
Total		4.204E+19		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 8.0 hr from RB Compartment Nuclide Inventory

Table 17D
16-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 16 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	5.362E+02	1.988E+19	3.708E+16	8.667E-01
I-132	8.302E+01	3.669E+16	4.420E+14	1.599E-03
I-133	6.901E+02	2.758E+18	3.997E+15	1.202E-01
I-134	4.325E-03	7.286E+11	1.685E+14	3.176E-08
I-135	2.076E+02	2.637E+17	1.270E+15	1.149E-02
Total		2.294E+19		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 16 hr from RB Compartment Nuclide Inventory

Table 17E
24-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 24 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	3.969E+02	1.472E+19	3.708E+16	8.953E-01
I-132	5.910E+01	2.612E+16	4.420E+14	1.589E-03
I-133	4.025E+02	1.609E+18	3.997E+15	9.786E-02
I-134	5.896E-06	9.933E+08	1.685E+14	6.042E-11
I-135	6.832E+01	8.678E+16	1.270E+15	5.278E-03
Total		1.644E+19		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 24 hr from RB Compartment Nuclide Inventory

Table 17F
48-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 48 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	1.601E+02	5.937E+18	3.708E+16	9.473E-01
I-132	2.174E+01	9.608E+15	4.420E+14	1.533E-03
I-133	7.946E+01	3.176E+17	3.997E+15	5.068E-02
I-135	2.423E+00	3.077E+15	1.270E+15	4.910E-04
Total		6.268E+18		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 48 hr from RB Compartment Nuclide Inventory

Table 17G
96 hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 96 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	1.255E+02	4.652E+18	3.708E+16	9.861E-01
I-132	1.327E+01	5.864E+15	4.420E+14	1.243E-03
I-133	1.493E+01	5.968E+16	3.997E+15	1.265E-02
I-135	1.469E-02	1.866E+13	1.270E+15	3.955E-06
Total		4.717E+18		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 96 hr from RB Compartment Nuclide Inventory

Table 17H
240-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 240 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	7.028E+01	2.606E+18	3.708E+16	9.992E-01
I-132	3.478E+00	1.537E+15	4.420E+14	5.893E-04
I-133	1.156E-01	4.620E+14	3.997E+15	1.771E-04
I-135	3.817E-09	4.849E+06	1.270E+15	1.859E-12
Total		2.608E+18		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 240 hr from RB Compartment Nuclide Inventory

Table 17I
480-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 480 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	2.675E+01	9.917E+17	3.708E+16	9.998E-01
I-132	3.734E-01	1.650E+14	4.420E+14	1.664E-04
I-133	3.502E-05	1.400E+11	3.997E+15	1.411E-07
Total		9.919E+17		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 480 hr from RB Compartment Nuclide Inventory

Table 17J
720-hrs Conversion of Iodine Activity Into Iodine Atoms

Isotope	RB Region @ 720 hr		Iodine Atoms Per (Curie)	Isotopic Iodine Fraction
	Activity (Curie) A	Atoms B	Ci = Bi /Ai	Di = Bi/ΣB
I-131	1.018E+01	3.774E+17	3.708E+16	1.000E+00
I-132	4.010E-02	1.772E+13	4.420E+14	4.696E-05
I-133	1.061E-08	4.240E+07	3.997E+15	1.124E-10
Total		3.774E+17		1.000E+00

A & B From RADTRAD Run NP2CL400.o0 output file @ 720 hr from RB Compartment Nuclide Inventory

Table 18
720-hr Post-LOCA Iodine Activity Deposited on CREF Charcoal Filter

Isotope	Iodine Atoms Per Curie	Fraction Of Iodine	Elemental & Organic Iodine Atoms On CR Charcoal 720 Hrs	Iodine Atoms on CR Charcoal Filter At 720 Hrs	Iodine Activity CR Charcoal Filter At 720 Hrs Ci
	A	B	C	Di =Bi * C	Ei = Di / Ai
I-131	3.708E+16	7.654E-01	2.3003E+16	1.761E+16	4.748E-01
I-132	4.420E+14	1.160E-02		2.668E+14	6.036E-01
I-133	3.997E+15	1.686E-01		3.877E+15	9.700E-01
I-134	1.685E+14	5.581E-03		1.284E+14	7.620E-01
I-135	1.270E+15	4.884E-02		1.123E+15	8.845E-01
Total Iodine Activity on CREF Charcoal Filter					**3.695E+00**

A & B From Table 17
C From Table 16

Table 19
Post-LOCA SGTS Filter Iodine Atoms
Containment Leakage

Post-LOCA Period t (hr)	Reactor Building			
	Elemental Iodine Atoms A	Organic Iodine Atoms B	Total Iodine Atoms C = A + B	Net Iodine Atoms $D = D_2 - D_1$
2	4.7236E+17	8.8430E+16	5.6079E+17	5.6079E+17
4	1.3790E+18	6.3558E+17	2.0146E+18	1.4538E+18
8	2.5651E+18	2.8041E+18	5.3692E+18	3.3546E+18
16	3.6343E+18	9.1826E+18	1.2817E+19	7.4477E+18
24	4.0192E+18	1.6342E+19	2.0361E+19	7.5443E+18
48	4.2877E+18	2.9677E+19	3.3965E+19	1.3604E+19
96	4.4542E+18	4.6968E+19	5.1422E+19	1.7458E+19
240	4.7774E+18	8.1549E+19	8.6326E+19	3.4904E+19
480	5.0313E+18	1.0871E+20	1.1374E+20	2.7415E+19
720	5.1279E+18	1.1905E+20	1.2418E+20	1.0437E+19

Time-Dependent Elemental & Organic Iodine Atoms & Aerosol Mass From NP2CL400.o0

Table 20
Post-LOCA SGTS Filter Iodine Atoms - ESF Leakage

Post-LOCA Period t (hr)	Reactor Building			
	Elemental Iodine Atoms A	Organic Iodine Atoms B	Total Iodine Atoms C = A + B	Net Iodine Atoms $D = D_2 - D_1$
2	3.3786E+19	1.0449E+18	3.4831E+19	3.4831E+19
4	2.6124E+20	8.0796E+18	2.6932E+20	2.3449E+20
8	1.1869E+21	3.6709E+19	1.2236E+21	9.5429E+20
16	3.9107E+21	1.2095E+20	4.0317E+21	2.8080E+21
24	6.9288E+21	2.1429E+20	7.1431E+21	3.1114E+21
48	1.5253E+22	4.7174E+20	1.5725E+22	8.5817E+21
96	2.7786E+22	8.5937E+20	2.8645E+22	1.2921E+22
240	4.7178E+22	1.4591E+21	4.8637E+22	1.9992E+22
480	5.6175E+22	1.7374E+21	5.7912E+22	9.2753E+21
720	5.7843E+22	1.7890E+21	5.9632E+22	1.7196E+21

Time-dependent Elemental & Organic Iodine Atoms From NP2ES400.o0

Table 21
Post-LOCA SGTS Filter Iodine Atoms
Containment + ESF Leakages

Post-LOCA Period t (hr)	Reactor Building		
	Containment Leakage Net Iodine Atoms A	ESF Leakage Net Iodine Atoms B	Total Iodine Atoms C = A + B
2	5.6079E+17	3.4831E+19	3.5392E+19
4	1.4538E+18	2.3449E+20	2.3594E+20
8	3.3546E+18	9.5429E+20	9.5764E+20
16	7.4477E+18	2.8080E+21	2.8155E+21
24	7.5443E+18	3.1114E+21	3.1190E+21
48	1.3604E+19	8.5817E+21	8.5953E+21
96	1.7458E+19	1.2921E+22	1.2938E+22
240	3.4904E+19	1.9992E+22	2.0027E+22
480	2.7415E+19	9.2753E+21	9.3027E+21
720	1.0437E+19	1.7196E+21	1.7300E+21

A From Table 19
B From Table 20

Table 22
2 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	2-hrs Iodine Atoms Per Curie A	2-hrs Fraction of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 2 hrs C	Iodine Atoms on SGTS Charcoal Filter At 2 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 2 hrs Ci Ei = Di / Ai
I-131	3.708E+16	7.817E-01	3.5392E+19	2.767E+19	7.461E+02
I-132	4.420E+14	9.125E-03		3.229E+17	7.306E+02
I-133	3.997E+15	1.646E-01		5.825E+18	1.457E+03
I-134	1.685E+14	1.750E-03		6.192E+16	3.676E+02
I-135	1.270E+15	4.284E-02		1.516E+18	1.194E+03

A & B From Table 17A
C From Table 21

Table 22A
4 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 4 hrs C	Iodine Atoms on SGTS Charcoal Filter At 4 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 4 hrs Ci Ei = Di / Ai
I-131	3.708E+16	7.995E-01	2.3594E+20	1.886E+20	5.087E+03
I-132	4.420E+14	5.827E-03		1.375E+18	3.111E+03
I-133	3.997E+15	1.586E-01		3.742E+19	9.361E+03
I-134	1.685E+14	3.707E-04		8.746E+16	5.192E+02
I-135	1.270E+15	3.577E-02		8.440E+18	6.645E+03

A & B From Table 17B
C From Table 21

Table 22B
8 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 8 hrs C	Iodine Atoms on SGTS Charcoal Filter At 8 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 8 hrs Ci Ei = Di / Ai
I-131	3.708E+16	8.269E-01	9.5764E+20	7.919E+20	2.136E+04
I-132	4.420E+14	2.771E-03		2.653E+18	6.003E+03
I-133	3.997E+15	1.456E-01		1.394E+20	3.488E+04
I-134	1.685E+14	1.645E-05		1.576E+16	9.354E+01
I-135	1.270E+15	2.467E-02		2.363E+19	1.860E+04

A & B From Table 17C
C From Table 21

Table 22C
16 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 16 hrs C	Iodine Atoms on SGTS Charcoal Filter At 16 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 16 hrs Ci Ei = Di / Ai
I-131	3.708E+16	8.667E-01	2.8155E+21	2.440E+21	6.581E+04
I-132	4.420E+14	1.599E-03		4.503E+18	1.019E+04
I-133	3.997E+15	1.202E-01		3.385E+20	8.468E+04
I-134	1.685E+14	3.176E-08		8.942E+13	5.308E-01
I-135	1.270E+15	1.149E-02		3.236E+19	2.548E+04

A & B From Table 17D
C From Table 21

Table 22D
24 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 24 hrs C	Iodine Atoms on SGTS Charcoal Filter At 24 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 24 hrs Ci Ei = Di / Ai
I-131	3.708E+16	8.953E-01	3.1190E+21	2.792E+21	7.531E+04
I-132	4.420E+14	1.589E-03		4.956E+18	1.121E+04
I-133	3.997E+15	9.786E-02		3.052E+20	7.636E+04
I-134	1.685E+14	6.042E-11		1.885E+11	1.119E-03
I-135	1.270E+15	5.278E-03		1.646E+19	1.296E+04

A & B From Table 17E
C From Table 21

Table 22E
48 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 48 hrs C	Iodine Atoms on SGTS Charcoal Filter At 48 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 48 hrs Ci Ei = Di / Ai
I-131	3.708E+16	9.473E-01	8.5953E+21	8.142E+21	2.196E+05
I-132	4.420E+14	1.533E-03		1.318E+19	2.981E+04
I-133	3.997E+15	5.068E-02		4.356E+20	1.090E+05
I-135	1.270E+15	4.910E-04		4.220E+18	3.322E+03

A & B From Table 17F
C From Table 21

Table 22F
96 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 96 hrs C	Iodine Atoms on SGTS Charcoal Filter At 96 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 96 hrs Ci Ei = Di / Ai
I-131	3.708E+16	9.861E-01	1.2938E+22	1.276E+22	3.441E+05
I-132	4.420E+14	1.243E-03		1.608E+19	3.638E+04
I-133	3.997E+15	1.265E-02		1.637E+20	4.095E+04
I-135	1.270E+15	3.955E-06		5.116E+16	4.028E+01

A & B From Table 17G
C From Table 21

Table 22G
240 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 240 hrs C	Iodine Atoms on SGTS Charcoal Filter At 240 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 240 hrs Ci Ei = Di / Ai
I-131	3.708E+16	9.992E-01	2.0027E+22	2.001E+22	5.397E+05
I-132	4.420E+14	5.893E-04		1.180E+19	2.670E+04
I-133	3.997E+15	1.771E-04		3.547E+18	8.875E+02
I-135	1.270E+15	1.859E-12		3.723E+10	2.931E-05

A & B From Table 17H
C From Table 21

Table 22H
480 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 480 hrs C	Iodine Atoms on SGTS Charcoal Filter At 480 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 480 hrs Ci Ei = Di / Ai
I-131	3.708E+16	9.998E-01	9.3027E+21	9.301E+21	2.508E+05
I-132	4.420E+14	1.664E-04		1.548E+18	3.502E+03
I-133	3.997E+15	1.411E-07		1.313E+15	3.284E-01

A & B From Table 17I
C From Table 21

Table 22I
720 hrs Post-LOCA Iodine Isotopic Activity on SGTS Charcoal Filter

Isotope	Iodine Atoms Per Curie A	Fraction Of Iodine B	Elemental & Organic Iodine Atoms On SGTS Charcoal At 720 hrs C	Iodine Atoms on SGTS Charcoal Filter At 720 hrs Di =Bi * C	Iodine Activity on SGTS Charcoal Filter At 720 hrs Ci Ei = Di / Ai
I-131	3.708E+16	1.000E+00	1.7300E+21	1.730E+21	4.665E+04
I-132	4.420E+14	4.696E-05		8.124E+16	1.838E+02
I-133	3.997E+15	1.124E-10		1.944E+11	4.863E-05

A & B From Table 17J
C From Table 21

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Table 23
Post-LOCA Iodine Loading On SGTS Charcoal Filter

Isotope	2 hrs	4 hrs	8 hrs	16 hrs	24 hrs	48 hrs	96 hrs	240 hrs	480 hrs	720 hrs
I-131	7.461E+02	5.087E+03	2.136E+04	6.581E+04	7.531E+04	2.196E+05	3.441E+05	5.397E+05	2.508E+05	4.665E+04
I-132	7.306E+02	3.111E+03	6.003E+03	1.019E+04	1.121E+04	2.981E+04	3.638E+04	2.670E+04	3.502E+03	1.838E+02
I-133	1.457E+03	9.361E+03	3.488E+04	8.468E+04	7.636E+04	1.090E+05	4.095E+04	8.875E+02	3.284E-01	4.863E-05
I-134	3.676E+02	5.192E+02	9.354E+01	5.308E-01	1.119E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I-135	1.194E+03	6.645E+03	1.860E+04	2.548E+04	1.296E+04	3.322E+03	4.028E+01	2.931E-05	0.000E+00	0.000E+00

Iodine Isotopic Activity Information From Tables 22 through 22I

Table 24 (UFSAR Table 15.6-14)
Post-LOCA Primary Containment Activity
At End of Release From Vessel

Isotope	Activity (Curie) A	Isotope	Activity (Curie) A
Kr-83m	7.810E+06	I-131	9.733E+05
Kr-85m	2.720E+07	I-132	1.369E+06
Kr-85	1.873E+06	I-133	1.900E+06
Kr-87	2.513E+07	I-134	4.792E+05
Kr-88	6.235E+07	I-135	1.556E+06
Rb-86	1.709E+03	Xe-133	2.282E+08
Rb-88	1.697E+07	Xe-133m	6.948E+06
Sr-89	9.410E+04	Xe-135	1.003E+08
Sr-90	1.008E+04	Xe-135m	6.692E+06
Sr-91	1.004E+05	Xe-138	5.877E+05
Sr-92	7.208E+04	Cs-134	1.714E+05
Y-90	1.168E+02	Cs-136	5.208E+04
Y-91	1.182E+03	Cs-137	1.331E+05
Y-92	2.767E+03	Ba-139	5.209E+04
Y-93	1.148E+03	Ba-140	1.379E+05
Zr-95	1.393E+03	La-140	1.672E+03
Zr-97	1.239E+03	La-141	9.142E+02
Nb-95	1.375E+03	La-142	5.193E+02
Mo-99	1.723E+04	Ce-141	3.272E+03
Tc-99m	1.548E+04	Ce-143	3.059E+03
Ru-103	1.521E+04	Ce-144	2.622E+03
Ru-105	7.941E+03	Pr-143	1.249E+03
Ru-106	6.332E+03	Nd-147	5.067E+02
Rh-105	1.007E+04	Np-239	3.641E+04
Sb-127	1.727E+04	Pu-238	8.147E+00
Sb-129	3.929E+04	Pu-239	8.218E-01
Te-127	1.731E+04	Pu-240	1.451E+00
Te-127m	2.965E+03	Pu-241	3.225E+02
Te-129	4.443E+04	Am-241	1.824E-01
Te-129m	9.723E+03	Cm-242	5.010E+01
Te-131m	3.517E+04	Cm-244	3.314E+00
Te-132	2.596E+05	**Total**	**4.916E+08**

A From RADTRAD Output File NP2CL400.o0 @ 2.0 hr from Drywell Compartment Nuclide Inventory

Table 25

Post-LOCA 720-hr Containment, ESF, & Bypass leakage Activity Release to Environment

Isotope	720-hr Post-LOCA Activity Released to Environment				Isotope	720-hr Post-LOCA Activity Released to Environment			
	Containment Leakage A	ESF Leakage B	Bypass Leakage C	Total A+B+C		Containment Leakage A	ESF Leakage B	Bypass Leakage C	Total A+B+C
Kr-83m	3.880E+03	0.000E+00	3.183E+03	7.063E+03	I-131	1.686E+02	1.566E+04	2.384E+03	1.822E+04
Kr-85m	4.567E+04	0.000E+00	3.518E+04	8.085E+04	I-132	1.258E+02	2.310E+02	2.588E+02	6.156E+02
Kr-85	2.996E+05	0.000E+00	2.096E+05	5.092E+05	I-133	2.279E+02	5.021E+03	8.544E+02	6.103E+03
Kr-87	7.495E+03	0.000E+00	6.497E+03	1.399E+04	I-134	1.391E+02	9.430E+01	5.547E+01	2.889E+02
Kr-88	5.593E+04	0.000E+00	4.441E+04	1.003E+05	I-135	1.858E+02	1.112E+03	3.053E+02	1.603E+03
Rb-86	3.356E-01	0.000E+00	3.171E-01	6.527E-01	Xe-133	1.052E+07	3.649E+06	7.276E+06	2.144E+07
Rb-88	3.049E+04	0.000E+00	2.499E+04	5.548E+04	Xe-133m	1.522E+05	1.301E+05	1.044E+05	3.868E+05
Sr-89	8.086E+00	0.000E+00	1.931E+01	2.739E+01	Xe-135	4.060E+05	1.140E+06	2.944E+05	1.840E+06
Sr-90	1.015E+00	0.000E+00	2.422E+00	3.436E+00	Xe-135m	5.482E+02	1.751E+04	7.534E+02	1.881E+04
Sr-91	1.259E+00	0.000E+00	3.411E+00	4.670E+00	Xe-138	1.310E+02	0.000E+00	2.630E+02	3.941E+02
Sr-92	6.965E-01	0.000E+00	2.068E+00	2.764E+00	Cs-134	3.909E+01	0.000E+00	4.476E+01	8.385E+01
Y-90	7.610E-01	0.000E+00	1.805E+00	2.566E+00	Cs-136	9.781E+00	0.000E+00	8.598E+00	1.838E+01
Y-91	1.255E-01	0.000E+00	2.984E-01	4.239E-01	Cs-137	3.048E+01	0.000E+00	3.509E+01	6.557E+01
Y-92	2.256E-01	0.000E+00	4.349E-01	6.605E-01	Ba-139	5.455E-01	0.000E+00	1.615E+00	2.161E+00
Y-93	1.468E-02	0.000E+00	3.957E-02	5.424E-02	Ba-140	8.084E+00	0.000E+00	1.933E+01	2.742E+01
Zr-95	1.236E-01	0.000E+00	2.951E-01	4.186E-01	La-140	6.079E+00	0.000E+00	1.428E+01	2.036E+01
Zr-97	1.874E-02	0.000E+00	4.848E-02	6.722E-02	La-141	9.200E-03	0.000E+00	2.678E-02	3.598E-02
Nb-95	1.358E-01	0.000E+00	3.241E-01	4.599E-01	La-142	5.269E-03	0.000E+00	1.568E-02	2.095E-02
Mo-99	4.544E-01	0.000E+00	1.103E+00	1.558E+00	Ce-141	2.595E-01	0.000E+00	6.197E-01	8.792E-01
Tc-99m	4.387E-01	0.000E+00	1.057E+00	1.496E+00	Ce-143	5.924E-02	0.000E+00	1.473E-01	2.065E-01
Ru-103	1.253E+00	0.000E+00	2.991E+00	4.244E+00	Ce-144	2.565E-01	0.000E+00	6.122E-01	8.686E-01
Ru-105	8.171E-02	0.000E+00	2.358E-01	3.175E-01	Pr-143	8.931E-02	0.000E+00	2.129E-01	3.022E-01
Ru-106	6.235E-01	0.000E+00	1.488E+00	2.112E+00	Nd-147	2.778E-02	0.000E+00	6.646E-02	9.423E-02
Rh-105	2.115E-01	0.000E+00	5.193E-01	7.308E-01	Np-239	8.909E-01	0.000E+00	2.171E+00	3.062E+00
Sb-127	5.421E-01	0.000E+00	1.308E+00	1.850E+00	Pu-238	8.219E-04	0.000E+00	1.962E-03	2.784E-03
Sb-129	4.021E-01	0.000E+00	1.163E+00	1.565E+00	Pu-239	8.354E-05	0.000E+00	1.994E-04	2.829E-04
Te-127	7.748E-01	0.000E+00	1.855E+00	2.630E+00	Pu-240	1.462E-04	0.000E+00	3.491E-04	4.953E-04
Te-127m	2.839E-01	0.000E+00	6.778E-01	9.617E-01	Pu-241	3.244E-02	0.000E+00	7.743E-02	1.099E-01
Te-129	1.037E+00	0.000E+00	2.658E+00	3.695E+00	Am-241	2.011E-05	0.000E+00	4.800E-05	6.811E-05
Te-129m	7.791E-01	0.000E+00	1.860E+00	2.639E+00	Cm-242	4.796E-03	0.000E+00	1.145E-02	1.624E-02
Te-131m	6.559E-01	0.000E+00	1.638E+00	2.294E+00	Cm-244	3.334E-04	0.000E+00	7.958E-04	1.129E-03
Te-132	7.463E+00	0.000E+00	1.805E+01	2.552E+01					

A From RADTRAD Output File NP2CL400.o0 @ 720 hr from Environment Compartment Nuclide Inventory

B From RADTRAD Output File NP2ES400.o0 @ 720 hr from Environment Compartment Nuclide Inventory

C From RADTRAD Output File NP2MS00.o0 @ 720 hr from Environment Compartment Nuclide Inventory

Table 26 (UFSAR Table 15.6-15b)
Loss-of-Coolant-Accident (Design Basis Analyses)
Total Activity Released to Environment

Istope	Activity (Curie)	Istope	Activity (Curie)
Kr-83m	7.063E+03	I-131	1.822E+04
Kr-85m	8.085E+04	I-132	6.156E+02
Kr-85	5.092E+05	I-133	6.103E+03
Kr-87	1.399E+04	I-134	2.889E+02
Kr-88	1.003E+05	I-135	1.603E+03
Rb-86	6.527E-01	Xe-133	2.144E+07
Rb-88	5.548E+04	Xe-133m	3.868E+05
Sr-89	2.739E+01	Xe-135	1.840E+06
Sr-90	3.436E+00	Xe-135m	1.881E+04
Sr-91	4.670E+00	Xe-138	3.941E+02
Sr-92	2.764E+00	Cs-134	8.385E+01
Y-90	2.566E+00	Cs-136	1.838E+01
Y-91	4.239E-01	Cs-137	6.557E+01
Y-92	6.605E-01	Ba-139	2.161E+00
Y-93	5.424E-02	Ba-140	2.742E+01
Zr-95	4.186E-01	La-140	2.036E+01
Zr-97	6.722E-02	La-141	3.598E-02
Nb-95	4.599E-01	La-142	2.095E-02
Mo-99	1.558E+00	Ce-141	8.792E-01
Tc-99m	1.496E+00	Ce-143	2.065E-01
Ru-103	4.244E+00	Ce-144	8.686E-01
Ru-105	3.175E-01	Pr-143	3.022E-01
Ru-106	2.112E+00	Nd-147	9.423E-02
Rh-105	7.308E-01	Np-239	3.062E+00
Sb-127	1.850E+00	Pu-238	2.784E-03
Sb-129	1.565E+00	Pu-239	2.829E-04
Te-127	2.630E+00	Pu-240	4.953E-04
Te-127m	9.617E-01	Pu-241	1.099E-01
Te-129	3.695E+00	Am-241	6.811E-05
Te-129m	2.639E+00	Cm-242	1.624E-02
Te-131m	2.294E+00	Cm-244	1.129E-03
Te-132	2.552E+01		

Combined Activity Information From Table 25

11.0 FIGURES

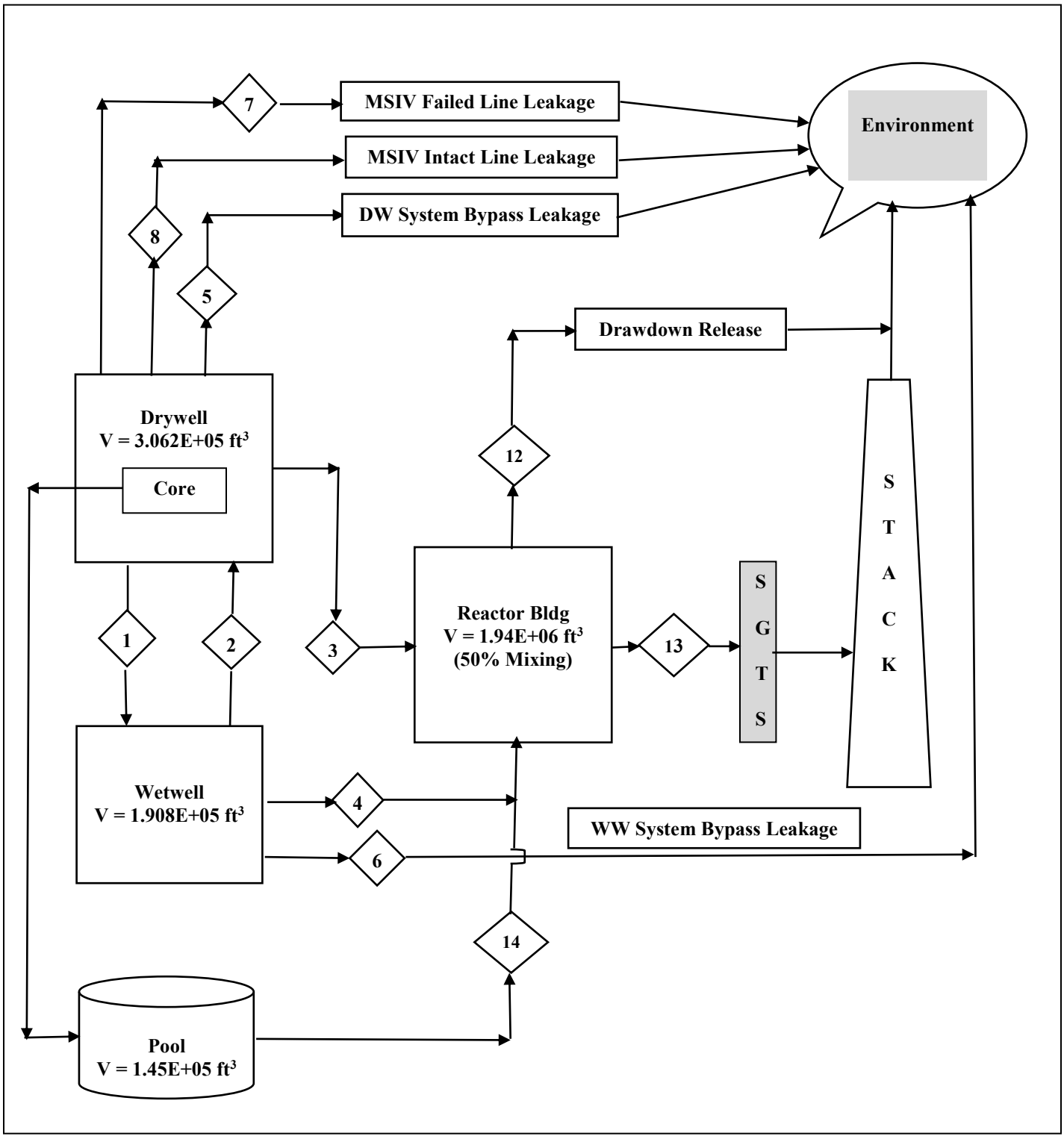

Figure 1: NMP2 Post-LOCA Releases - RADTRAD Nodalization

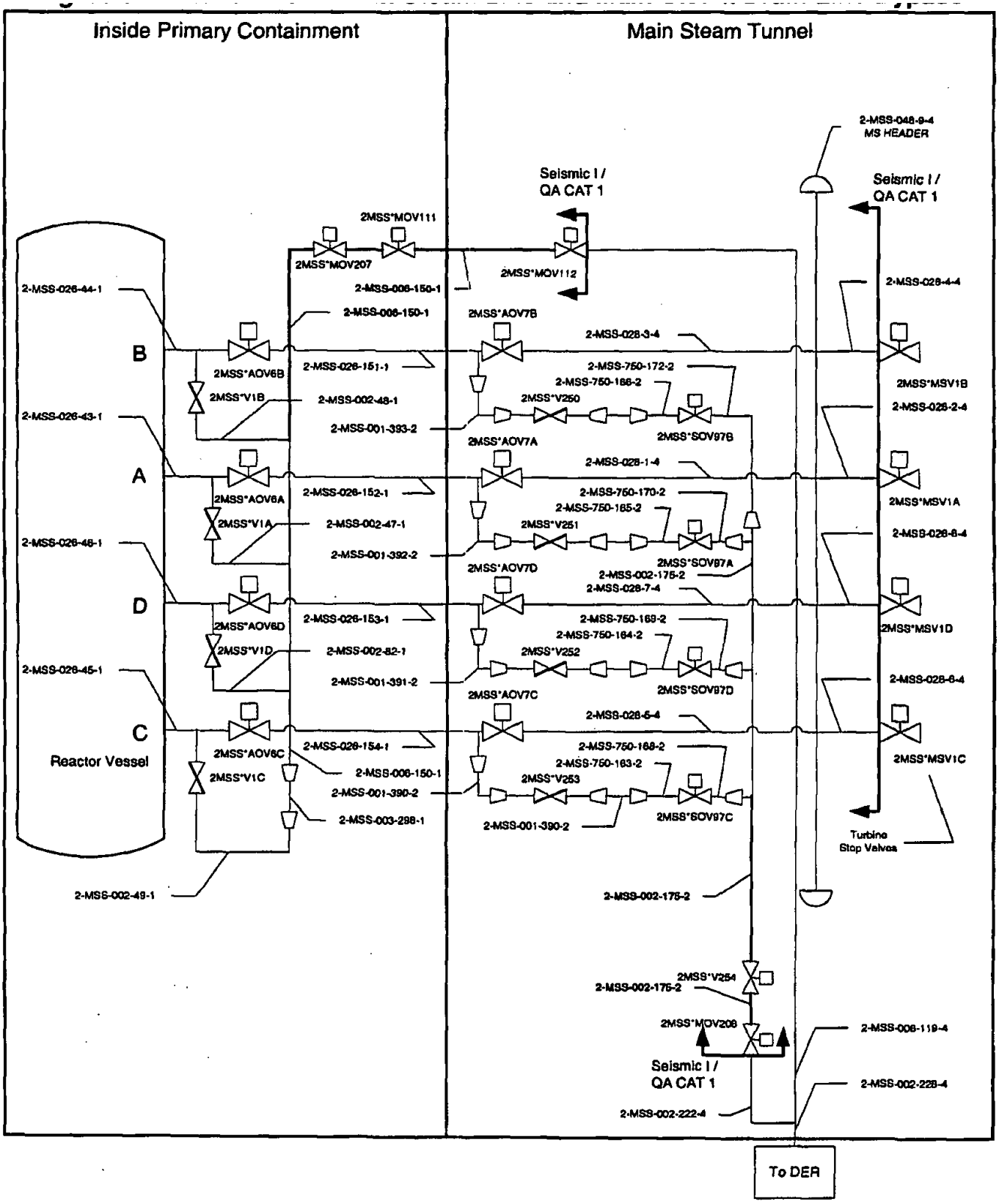

Figure 2: Schematic of Main Steam Lines and Main Steam Drain Lines (Reference 9.10, Figure 5-1)

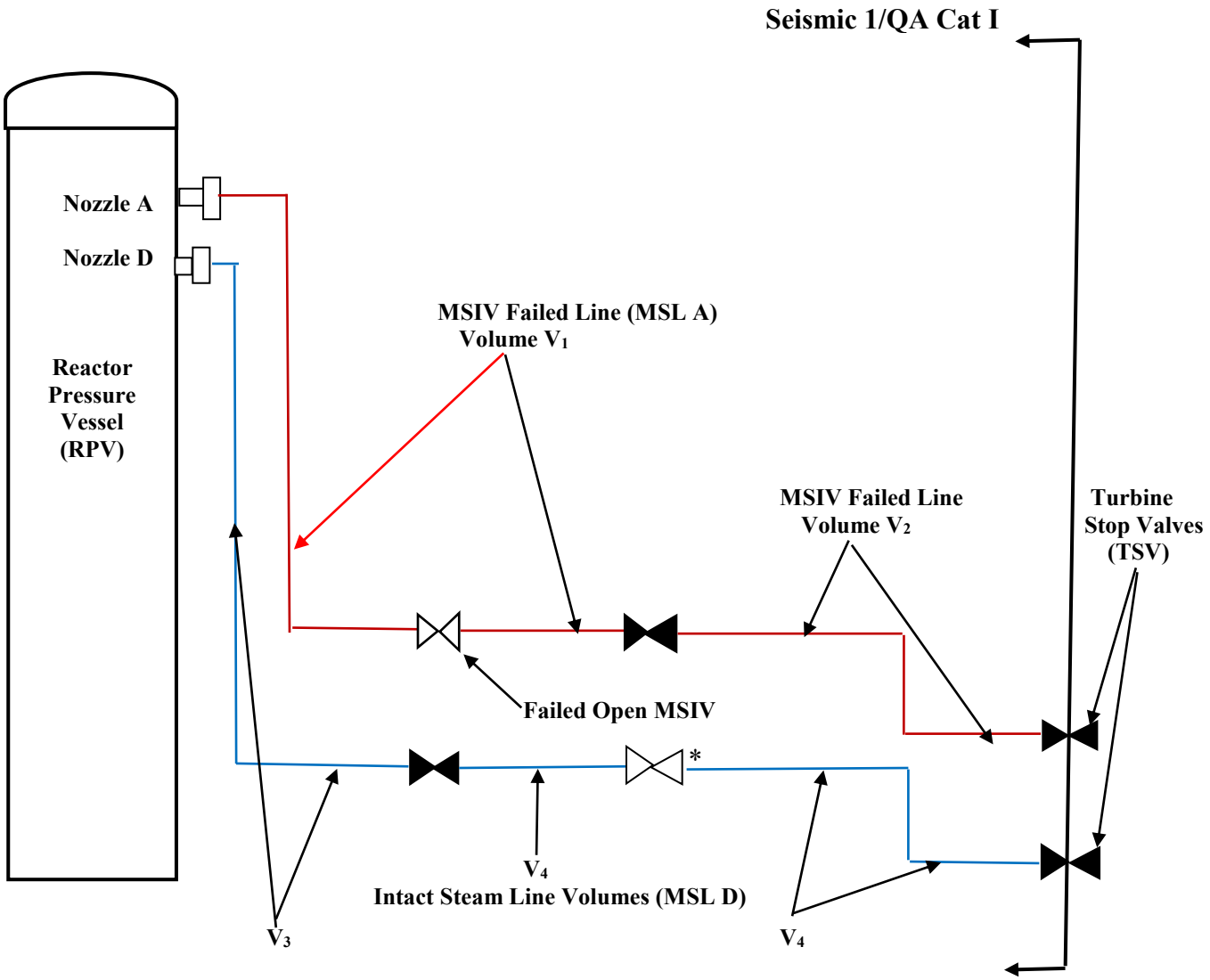

Figure 3: Schematic of MSIV Failed & Intact Steam Line Volume Descriptions
V_1 = RPV Nozzle A to Outboard MSIV
V_2 = Outboard MSIV to TSV
V_3 = RPV Nozzle D to Inboard MSIV
V_4 = Volume between Inboard MSIV to TSV
***Note: Valve is assumed open for modelling purposes. It is not failed open.**

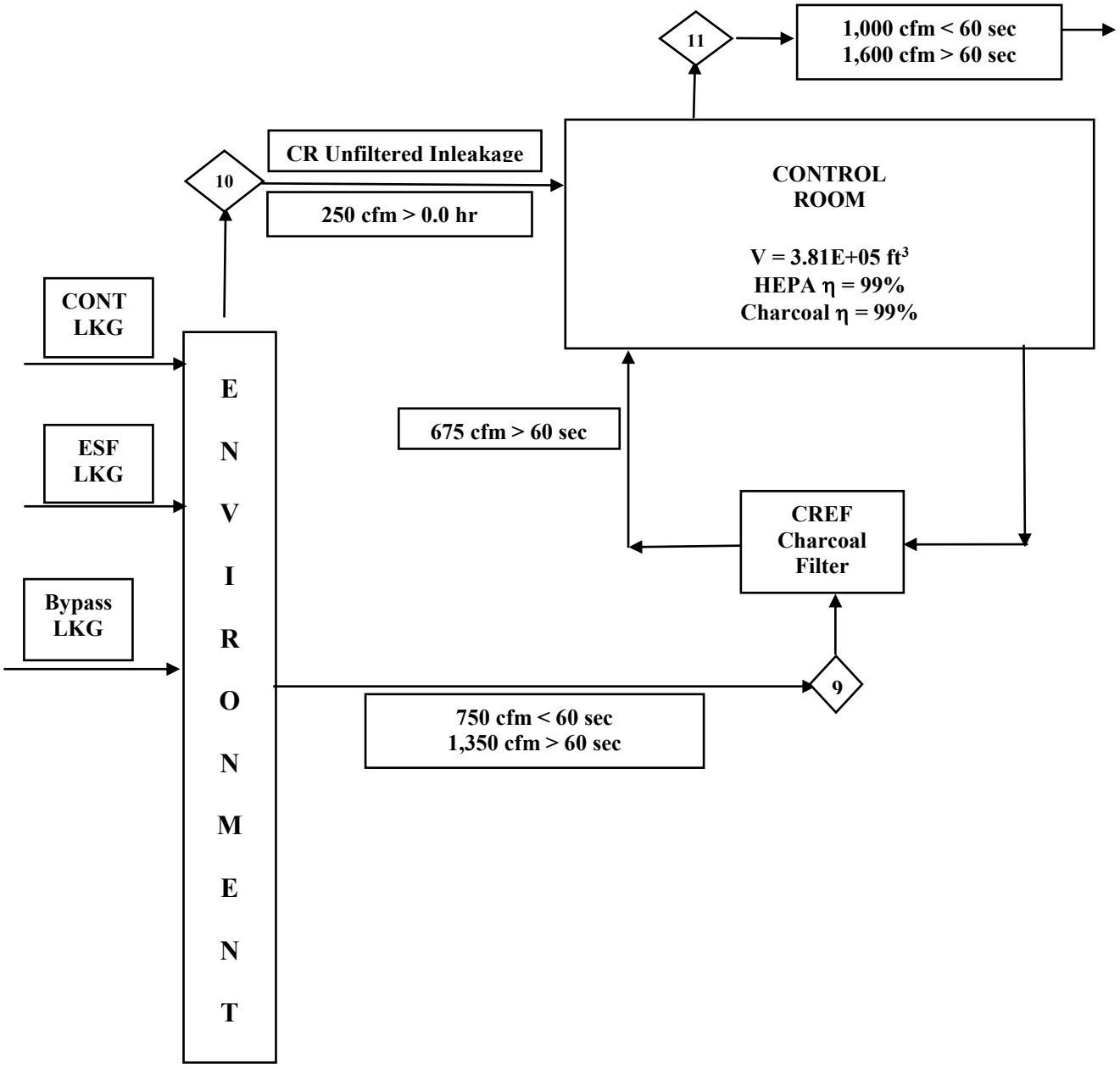

Figure 4 – NMP2 Control Room RADTRAD Nodalization

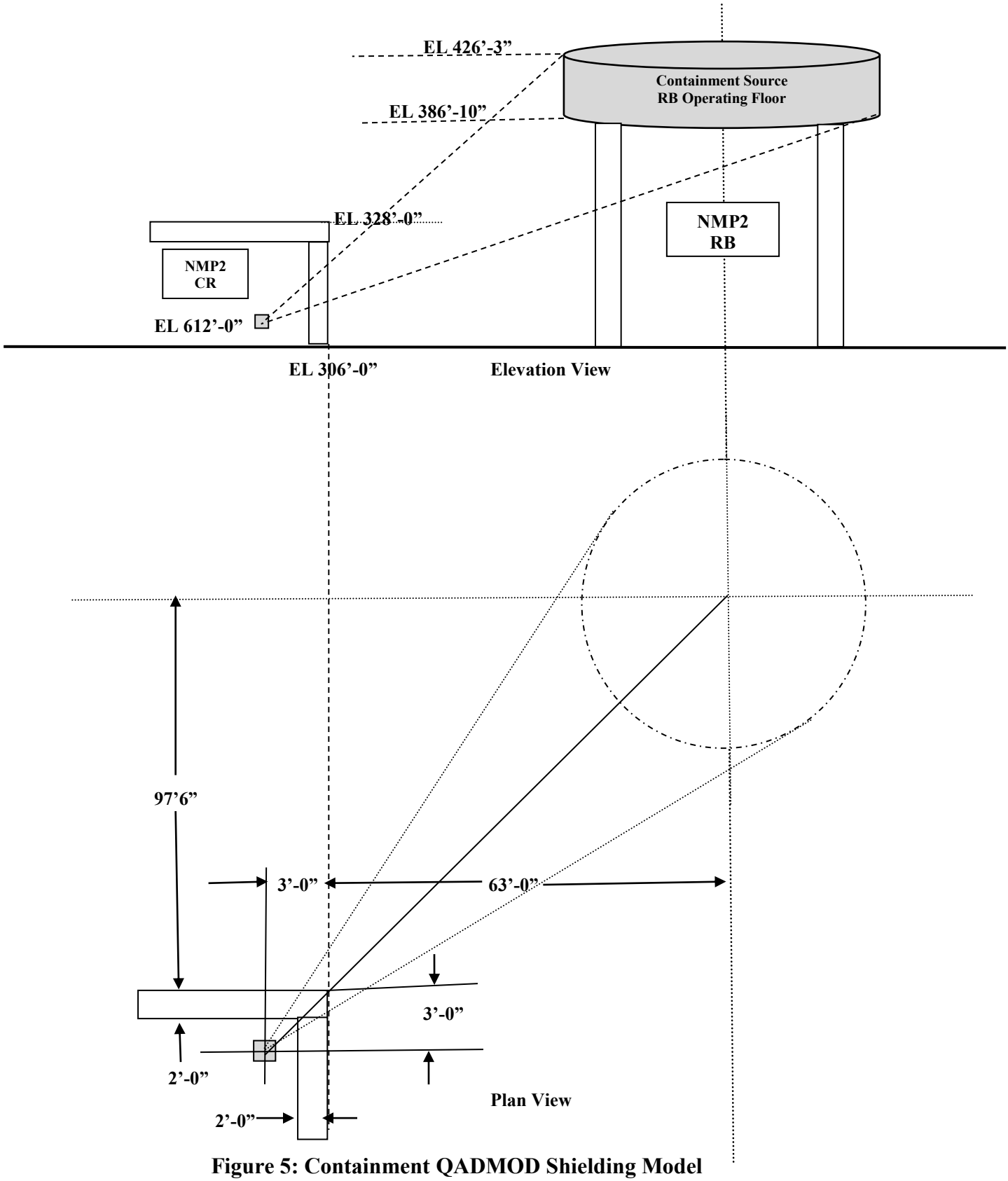

Figure 5: Containment QADMOD Shielding Model

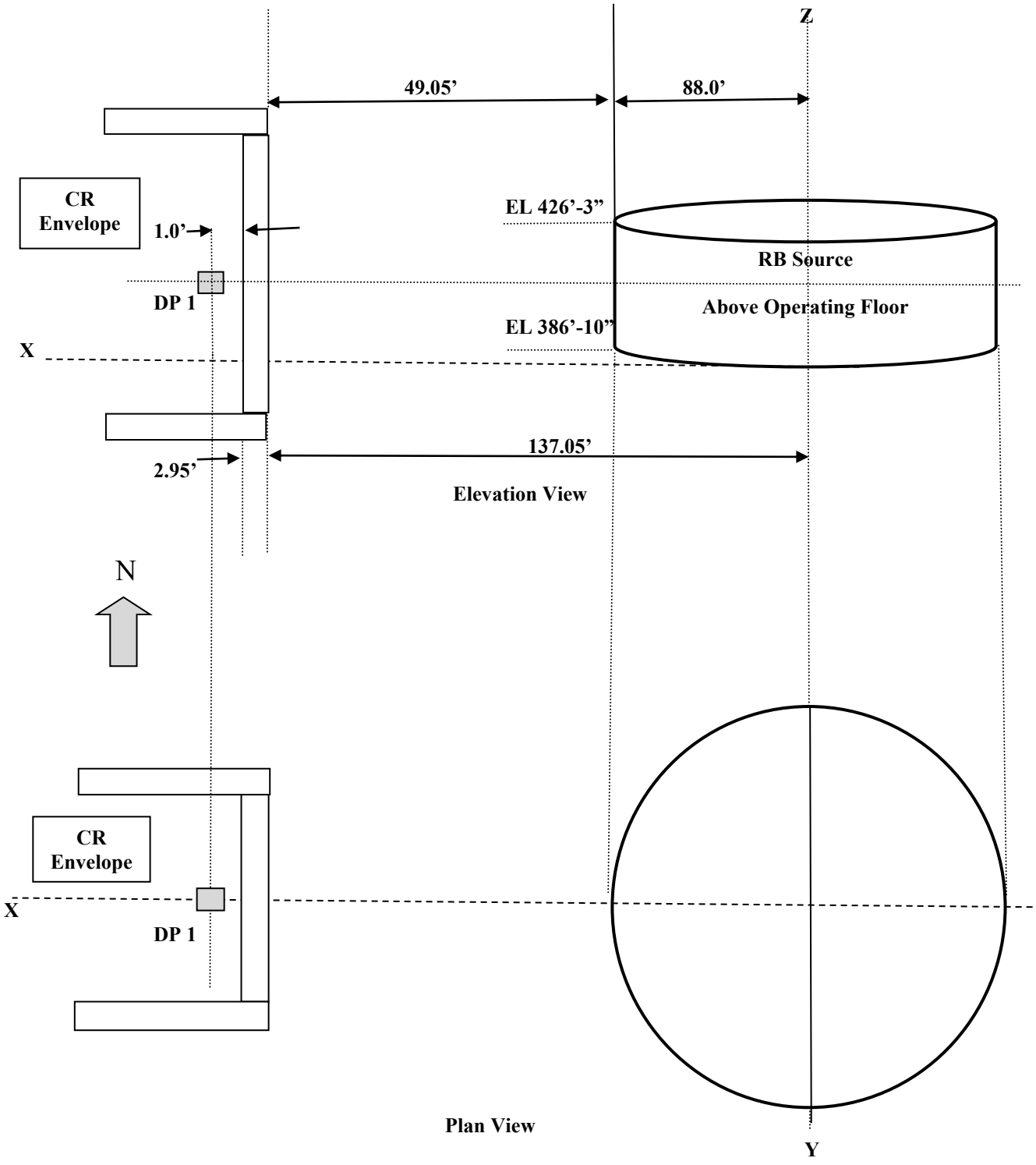

Figure 6: MicroShield Shielding Model

12.0 AFFECTED DOCUMENTS

Upon approval of this calculation, the following documents should be reviewed & Revised as Appropriate:

UFSAR Information To Be Reviewed & Revised as Appropriate (Ref. 9.18):

UFSAR Section 15.6.5.5.1, Revision 22, " Design Basis Analyses"

UFSAR Section 15.6.5.5.2, Revision 22, "Fission Product Release from Fuel"

UFSAR Section 15.6.5.5.3, Revision 22, "Fission Product Transport to the Environment"

UFSAR Table 15.6-13, Revision 22, "Loss-of-Coolant-Accident – Parameters Tabulated for Postulated Accident Analyses"

UFSAR Table 15.6-14, Revision 22, "Loss-of-Coolant Accident (Design Basis Analysis) Activity Available for Release From Primary Containment (And Deposited) At End of Release From Vessel"

UFSAR Table 15.6-15b, Revision 22, "Loss-of-Coolant Accident (Design Basis Analysis) Activity Release To Environment"

UFSAR Table 15.6.16b, Revision 22, "Loss-of-Coolant Accident (Design Basis Analysis) Radiological Effects"

13.0 ATTACHMENTS

Attachment 13.1 - Spray Removal Spreadsheet from H21C-106, Revision 0
Attachment 13.2 - RADTRAD Partial Output File "NP2CL400.o0"
Attachment 13.3 – RADTRAD Partial Output File "NP2ES400.o0"
Attachment 13.4 - RADTRAD Partial Output File "NMP2MS00.o0"
Attachment 13.5 - RADTRAD Partial Output File "NMP2MS01.o0"
Attachment 13.6 - RADTRAD Partial Output File "NMP2MS02.o0"
Attachment 13.7 - RADTRAD Partial Output File "NMP2MS03.o0"
Attachment 13.8 - RADTRAD Partial Output File "NP2CL11.o0"
Attachment 13.9 - RADTRAD Partial Output File "NP2CL22.o0"
Attachment 13.10 - RADTRAD Partial Output File "NP2ES22.o0"
Attachment 13.11 - RADTRAD Partial Output File "NP2MS22.o0"
Attachment 13.12 – RADTRAD Partial Output File "NP2CL00.o0"
Attachment 13.13 - RADTRAD Partial Output File "NP2ES00.o0"
Attachment 13.14 – RADTRAD Nuclide Inventory File "nmp2.nif"
Attachment 13.15 – RADTRAD Release Fraction and Timing File "bwr_dba.rft"
Attachment 13.16 – RADTRAD Dose Conversion Factor File "nmp2.inp"
Attachment 13.17 –MicroShield Output Files "[NMP2CS02, 08, 24, 96, & 720].MS5
Attachment 13.18 - RADTRAD Partial Output File "NMP2MS201.o0"
1st Pass Attributes – General Overview
2nd Pass Attributes – Technical Review
3rd Pass Attributes – Administrative

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Attachment 13.1 – Spray Removal Spreadsheet from H21C-106, Revision 0

The purpose of this Attachment is to retain the calculations necessary to reduce the drywell spray system information to determine the average spray flowrate. The original analysis from H21C-106 Rev. 0 is retained for this purpose. Note, the computation of the spray removal rate constants are in the main body of this analysis.

The inputs to this calculation are derived from PSAT3101CF.QA.03 (Ref. 9.4) items 3.20, 7.7, 7.8, 8.1 and Attachment 7. The reproduced spreadsheet from H21C-106 Rev. 0 is on the following page.

Originator/Date	Reviewer/Date	Calculation No.	Revision
J. Metcalf 5/31/07	M. Berg 5/31/07	H21C-106	00

Ref.

131 being airborne at that time (slightly conservative).

Sprays are continued until six hours. By this time, the Ci of I-131 aerosol airborne is estimated to decrease to 4.96E3 Ci. The actual Ci of I-131 aerosol airborne at that time is 4.08E3 Ci. The difference is that the estimating process does not consider decay or containment leakage; it is small in any case.

Spray Removal Spreadsheet

Flow per nozzle = 104.125 gpm

Column A	Column B		Column C	Column D	Column E	Column F
Inner, Loop A			Nozzles	Flow fraction	Number	Product
Elevation	301.5	feet	54	1	27	27
Height	61.5	feet		0.9	10	9
Elevation	301.23	feet	2	0.8	8	6.4
Height	61.23	feet		0.7	7	4.9
Elevation	299.25	feet	2	0.6	5	3
Height	59.25	feet		0.5	4	2
Elevation	298.5	feet	2	0.4	1	0.4
Height	58.5	feet		0.3	1	0.3
Elevation	297	feet	4	0	5	0
Height	57	feet		Sums:	68	53
Average height =	61.04625	feet		Note: only 4 nozzles not installed		
Height x # of nozzles =	3235.451	feet		- remaining "zero" is due to one		
				100% blockage case.		
				Spray flow =	5518.63	gpm
				Nominal =	6664.00	gpm
				Percent =	83%	

Outer, Loop B			Nozzles	Flow fraction	Number	Product
Elevation	303	feet	59	1	32	32
Height	63	feet		0.9	4	3.6
Height x # of nozzles =	3168.9	feet		0.8	10	8
				0.7	3	2.1
				0.6	2	1.2
				0.5	6	3
				0.2	2	0.4
				0	9	0
				Sums:	68	50.3
				Note: 9 nozzles not installed		
				Spray flow =	5237.49	gpm
				Nominal =	6143.38	gpm
				Percent =	85%	

DW volume =	3.06E+05	ft3
Spray flow fraction =		1
Fall height fraction =		0.5
Lambda =	1.98E+01	per hour

Attachment 13.2 - RADTRAD Partial Output File "NP2CL400.o0"

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:20:21
 ##########################################################################

 ##########################################################################
                    File information
 ##########################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2CL400.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




     #####    ####   #####    #  #     #  #####   #     #  #####
     #    #  #       #        #  ##    #  #    #  #     #     #
     #    #  #       #        #  # #   #  #    #  #     #     #
     #####    ####   ####     #  #  #  #  #####   #     #     #
     #            #  #        #  #   # #  #       #     #     #
     #            #  #        #  #    ##  #       #     #     #
     #         ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Containment Leakage from Drywell & Wetwell (DW+WW) Using CAVEX Core Inventory
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   6
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
 Dummy
   3
```

```
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
RB
  3
 1.9400E+06
  0
  0
  0
  0
  0
Compartment 5:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 6:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Pathways:
 13
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW to RB
  1
  4
  2
Pathway 4:
WW to RB
  2
  4
  2
Pathway 5:
CR Filtered Intake
```

```
  5
  6
  2
Pathway 6:
CR Unfiltered Inleakage
  5
  6
  2
Pathway 7:
CR Exhaust to Environment
  6
  5
  2
Pathway 8:
Drawdown Release from RB to Environment
  4
  5
  2
Pathway 9:
RB Exhaust to Environment
  4
  5
  2
Pathway 10:
DW to Dummy (Bypass Pathway 5)
  1
  3
  2
Pathway 11:
WW to  Dummy (Bypass Pathway 6)
  2
  3
  2
Pathway 12:
DW to  Dummy (MSIV Failed Pathway 7)
  1
  3
  2
Pathway 13:
DW to  Dummy (Intact MSIV Pathway  8)
  1
  3
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
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  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
Overlying Pool:
```

```
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  0.0000E+00
  0
  0
  0
  0
Compartments:
  6
Compartment 1:
  1
  1
  1
  0.0000E+00
  6
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
  2.4000E+00   0.0000E+00
  6.0000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  6
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+01
  2.4000E+00   0.0000E+00
  6.0000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
```

```
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  1
  1
  0
  0
  0
  0
  0
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  0
Compartment 6:
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  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Pathways:
 13
Pathway 1:
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  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
  0
```

```
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
  3
```

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```
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  8
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.8000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+02   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.8000E+02   2.5000E+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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 8:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   2.6700E+03   0.0000E+00   0.0000E+00   0.0000E+00
```

```
  1.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 9:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   4.4000E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   2.4930E-01   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.2470E-01   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 11:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.1200E-02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   5.6000E-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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 13:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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
Dose Locations:
  3
Location 1:
EAB
  5
  1
  3
  0.0000E+00   1.1900E-04
  1.0000E+00   2.9600E-05
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  0
Location 2:
LPZ
  5
  1
  6
  0.0000E+00   1.6200E-05
  1.0000E+00   1.4200E-05
```

```
  8.0000E+00   5.4100E-07
  2.4000E+01   2.3100E-07
  9.6000E+01   7.6500E-08
  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   2.3000E-04
  0
Location 3:
CR
  6
  0
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  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
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2CL400.o0
  1
  1
  1
  0
  0
End of Scenario File
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:20:21
 ##########################################################################

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

 Number of Nuclides =  63

 Inventory Power =   1.0000E+00 MWth
 Plant Power Level =   4.0670E+03 MWth

 Number of compartments    =   6

 Compartment information

 Compartment number  1  (Source term fraction =   1.0000E+00
 )
 Name: DW
 Compartment volume =   3.0620E+05 (Cubic feet)
 Compartment type is Normal
 Removal devices within compartment:
      Spray(s)
 Pathways into and out of compartment  1
    Inlet Pathway Number   2: WW to DW
    Exit Pathway Number    1: DW to WW
    Exit Pathway Number    3: DW to RB
    Exit Pathway Number   10: DW to Dummy (Bypass Pathway 5)
    Exit Pathway Number   12: DW to  Dummy (MSIV Failed Pathway 7)
    Exit Pathway Number   13: DW to  Dummy (Intact MSIV Pathway  8)

 Compartment number  2
 Name: WW
 Compartment volume =   1.9080E+05 (Cubic feet)
 Compartment type is Normal
 Pathways into and out of compartment  2
    Inlet Pathway Number   1: DW to WW
    Exit Pathway Number    2: WW to DW
    Exit Pathway Number    4: WW to RB
    Exit Pathway Number   11: WW to  Dummy (Bypass Pathway 6)

 Compartment number  3
 Name: Dummy
 Compartment volume =   1.0000E+02 (Cubic feet)
 Compartment type is Normal
 Pathways into and out of compartment  3
    Inlet Pathway Number  10: DW to Dummy (Bypass Pathway 5)
    Inlet Pathway Number  11: WW to  Dummy (Bypass Pathway 6)
    Inlet Pathway Number  12: DW to  Dummy (MSIV Failed Pathway 7)
    Inlet Pathway Number  13: DW to  Dummy (Intact MSIV Pathway  8)

 Compartment number  4
 Name: RB
 Compartment volume =   1.9400E+06 (Cubic feet)
 Compartment type is Normal
 Pathways into and out of compartment  4
```

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```
   Inlet Pathway Number   3: DW to RB
   Inlet Pathway Number   4: WW to RB
   Exit Pathway Number    8: Drawdown Release from RB to Environment
   Exit Pathway Number    9: RB Exhaust to Environment

Compartment number  5
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  5
   Inlet Pathway Number   7: CR Exhaust to Environment
   Inlet Pathway Number   8: Drawdown Release from RB to Environment
   Inlet Pathway Number   9: RB Exhaust to Environment
   Exit Pathway Number    5: CR Filtered Intake
   Exit Pathway Number    6: CR Unfiltered Inleakage

Compartment number  6
Name: CR
Compartment volume =   3.8100E+05 (Cubic feet)
Compartment type is Control Room
Removal devices within compartment:
     Filter(s)
Pathways into and out of compartment  6
   Inlet Pathway Number   5: CR Filtered Intake
   Inlet Pathway Number   6: CR Unfiltered Inleakage
   Exit Pathway Number    7: CR Exhaust to Environment

Total number of pathways =  13
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:20:21
##########################################################################

##########################################################################
                    Scenario Description
##########################################################################

Radioactive Decay is enabled
Calculation of Daughters is enabled

Release Fractions and Timings
               GAP       EARLY IN-VESSEL  LATE RELEASE    RELEASE MASS
            0.500000 hr    1.5000 hrs      0.0000 hrs          (gm)
NOBLES       5.0000E-02     9.5000E-01      0.0000E+00        6.081E+03
IODINE       5.0000E-02     2.5000E-01      0.0000E+00        3.546E+02
CESIUM       5.0000E-02     2.0000E-01      0.0000E+00        6.176E+04
TELLURIUM    0.0000E+00     5.0000E-02      0.0000E+00        4.865E+01
STRONTIUM    0.0000E+00     2.0000E-02      0.0000E+00        2.292E+03
BARIUM       0.0000E+00     2.0000E-02      0.0000E+00        5.648E+01
RUTHENIUM    0.0000E+00     2.5000E-03      0.0000E+00        7.182E+01
CERIUM       0.0000E+00     5.0000E-04      0.0000E+00        5.553E+02
LANTHANUM    0.0000E+00     2.0000E-04      0.0000E+00        8.499E+00

Inventory Power =      4067. MWt

Nuclide  Group  Specific     half     Whole Body   Inhaled     Inhaled
 Name          Inventory    life        DCF       Thyroid    Effective
               (Ci/MWt)     (s)     (Sv-m3/Bq-s)  (Sv/Bq)     (Sv/Bq)
 Kr-83m    1   4.050E+03  6.696E+03   1.500E-18   0.000E+00   0.000E+00
 Kr-85m    1   9.120E+03  1.613E+04   7.480E-15   0.000E+00   0.000E+00
 Kr-85     1   4.610E+02  3.386E+08   1.190E-16   0.000E+00   0.000E+00
 Kr-87     1   1.840E+04  4.578E+03   4.120E-14   0.000E+00   0.000E+00
 Kr-88     1   2.500E+04  1.022E+04   1.020E-13   0.000E+00   0.000E+00
 Rb-86     3   6.260E+01  1.612E+06   4.810E-15   1.330E-09   1.790E-09
 Rb-88     3   2.520E+04  1.062E+03   3.360E-14   1.370E-12   2.260E-11
 Sr-89     5   3.440E+04  4.363E+06   7.730E-17   7.960E-12   1.760E-09
 Sr-90     5   3.680E+03  9.190E+08   7.530E-18   2.690E-10   6.470E-08
 Sr-91     5   4.240E+04  3.420E+04   4.929E-14   9.640E-12   2.577E-10
 Sr-92     5   4.390E+04  9.756E+03   6.790E-14   3.920E-12   1.700E-10
 Y-90      9   3.810E+03  2.304E+05   1.900E-16   5.170E-13   2.280E-09
 Y-91      9   4.310E+04  5.055E+06   2.600E-16   8.500E-12   1.320E-08
 Y-92      9   4.440E+04  1.274E+04   1.300E-14   1.050E-12   2.110E-10
 Y-93      9   4.810E+04  3.636E+04   4.800E-15   9.260E-13   5.820E-10
 Zr-95     9   5.090E+04  5.528E+06   3.600E-14   1.440E-09   6.390E-09
 Zr-97     9   4.910E+04  6.084E+04   4.432E-14   2.310E-11   1.171E-09
 Nb-95     9   5.020E+04  3.037E+06   3.740E-14   3.580E-10   1.570E-09
 Mo-99     7   5.140E+04  2.376E+05   7.280E-15   1.520E-11   1.070E-09
 Tc-99m    7   4.530E+04  2.167E+04   5.890E-15   5.010E-11   8.800E-12
 Ru-103    7   4.450E+04  3.394E+06   2.251E-14   2.570E-10   2.421E-09
 Ru-105    7   3.170E+04  1.598E+04   3.810E-14   4.150E-12   1.230E-10
 Ru-106    7   1.850E+04  3.181E+07   1.040E-14   1.720E-09   1.290E-07
 Rh-105    7   2.950E+04  1.273E+05   3.720E-15   2.880E-12   2.580E-10
 Sb-127    4   2.560E+03  3.326E+05   3.330E-14   6.150E-11   1.630E-09
 Sb-129    4   7.910E+03  1.555E+04   7.140E-14   9.720E-12   1.740E-10
 Te-127    4   2.530E+03  3.366E+04   2.420E-16   1.840E-12   8.600E-11
 Te-127m   4   4.330E+02  9.418E+06   1.470E-16   9.660E-11   5.810E-09
```

Te-129	4	7.410E+03	4.176E+03	2.750E-15	5.090E-13	2.090E-11
Te-129m	4	1.420E+03	2.903E+06	3.337E-15	1.560E-10	6.484E-09
Te-131m	4	5.380E+03	1.080E+05	7.463E-14	3.610E-08	1.758E-09
Te-132	4	3.860E+04	2.815E+05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.720E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.960E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.640E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.470E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.330E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.640E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-133m	1	1.730E+03	1.927E+05	1.370E-15	0.000E+00	0.000E+00
Xe-135	1	2.370E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Xe-135m	1	1.170E+04	9.180E+02	2.040E-14	0.000E+00	0.000E+00
Xe-138	1	5.060E+04	8.520E+02	5.770E-14	0.000E+00	0.000E+00
Cs-134	3	6.260E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.910E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.860E+03	9.467E+08	2.725E-14	7.930E-09	8.630E-09
Ba-139	6	5.200E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	5.060E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09
La-140	9	5.110E+04	1.450E+05	1.170E-13	6.870E-11	1.310E-09
La-141	9	4.750E+04	1.415E+04	2.390E-15	9.400E-12	1.570E-10
La-142	9	4.660E+04	5.550E+03	1.440E-13	8.740E-12	6.840E-11
Ce-141	8	4.780E+04	2.808E+06	3.430E-15	2.550E-11	2.420E-09
Ce-143	8	4.660E+04	1.188E+05	1.290E-14	6.230E-12	9.160E-10
Ce-144	8	3.830E+04	2.456E+07	2.773E-15	2.920E-10	1.010E-07
Pr-143	9	4.560E+04	1.172E+06	2.100E-17	1.680E-18	2.190E-09
Nd-147	9	1.860E+04	9.487E+05	6.190E-15	1.820E-11	1.850E-09
Np-239	8	5.450E+05	2.035E+05	7.690E-15	7.620E-12	6.780E-10
Pu-238	8	1.190E+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	2.120E+01	2.064E+10	4.750E-18	3.760E-10	8.330E-05
Pu-241	8	4.710E+03	4.734E+08	7.250E-20	9.150E-12	1.340E-06
Am-241	9	6.660E+00	1.366E+10	8.180E-16	1.600E-09	1.200E-04
Cm-242	9	1.830E+03	1.408E+07	5.690E-18	9.410E-10	4.670E-06
Cm-244	9	1.210E+02	5.649E+08	4.910E-18	1.010E-09	6.700E-05

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-133m	Xe-133	1.00	none	0.00	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Xe-135m	Xe-135	0.99	Cs-135	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	Am-241	1.00	none	0.00	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

Iodine fractions

Aerosol	=	9.5000E-01
Elemental	=	4.8500E-02
Organic	=	1.5000E-03

COMPARTMENT DATA

Compartment number 1: DW

Sprays: Aerosal Removal Data

Time (hr)	Removal Coef. (hr^-1)
0.0000E+00	0.0000E+00
3.3330E-01	1.9800E+01
2.2500E+00	0.0000E+00
2.4000E+00	0.0000E+00
6.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00

Sprays: Elemental Removal Data

Time (hr)	Removal Coef. (hr^-1)
0.0000E+00	0.0000E+00
3.3330E-01	1.9800E+01
2.2500E+00	1.9800E+01
2.4000E+00	0.0000E+00
6.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00

Compartment number 2: WW

Compartment number 3: Dummy

Compartment number 4: RB

Compartment number 5: Environment

Compartment number 6: CR

Compartment Filter Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.7500E+02	0.0000E+00	0.0000E+00	0.0000E+00
1.6700E-02	6.7500E+02	9.9000E+01	9.9000E+01	9.9000E+01
7.2000E+02	6.7500E+02	0.0000E+00	0.0000E+00	0.0000E+00

PATHWAY DATA

Pathway number 1: DW to WW

Convection Data

Time (hr)	Flow Rate (% / day)
0.0000E+00	0.0000E+00
2.0000E+00	8.9710E+04
7.2000E+02	0.0000E+00

Pathway number 2: WW to DW

Convection Data

Time (hr)	Flow Rate (% / day)
0.0000E+00	0.0000E+00
2.0000E+00	1.4400E+05
7.2000E+02	0.0000E+00

Pathway number 3: DW to RB

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.0280E+02	0.0000E+00	0.0000E+00	0.0000E+00
8.3300E-02	2.7500E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	1.3800E+00	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: WW to RB

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.4600E+00	0.0000E+00	0.0000E+00	0.0000E+00
8.3300E-02	1.4600E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	7.3000E-01	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 5: CR Filtered Intake

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	7.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00

1.6700E-02	1.3500E+03	9.9000E+01	9.9000E+01	9.9000E+01
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 6: CR Unfiltered Inleakage

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
2.0000E+00	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
4.0000E+00	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
1.6000E+01	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
4.8000E+01	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+02	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
4.8000E+02	2.5000E+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 7: CR Exhaust to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.0000E+03	1.0000E+02	1.0000E+02	1.0000E+02
1.6700E-02	1.6000E+03	1.0000E+02	1.0000E+02	1.0000E+02
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 8: Drawdown Release from RB to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	2.6700E+03	0.0000E+00	0.0000E+00	0.0000E+00
1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 9: RB Exhaust to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.0000E+00	4.4000E+03	9.9000E+01	9.9000E+01	9.9000E+01
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 10: DW to Dummy (Bypass Pathway 5)

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	2.4930E-01	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	1.2470E-01	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 11: WW to Dummy (Bypass Pathway 6)

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.1200E-02	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	5.6000E-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 12: DW to Dummy (MSIV Failed Pathway 7)

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3520E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.7600E-01	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 13: DW to Dummy (Intact MSIV Pathway 8)

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3520E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.7600E-01	0.0000E+00	0.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

LOCATION DATA

Location EAB is in compartment 5

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	1.1900E-04
1.0000E+00	2.9600E-05
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	3.5000E-04

Location LPZ is in compartment 5

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	1.6200E-05
1.0000E+00	1.4200E-05
8.0000E+00	5.4100E-07
2.4000E+01	2.3100E-07
9.6000E+01	7.6500E-08
7.2000E+02	0.0000E+00

Location Breathing Rate Data

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

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  8.0000E+00                1.8000E-04
  2.4000E+01                2.3000E-04
  7.2000E+02                2.3000E-04
Location CR     is in compartment   6

Location X/Q Data
 Time (hr)         X/Q (s * m^-3)
  0.0000E+00          1.4700E-03
  1.0000E+00          8.0300E-05
  2.0000E+00          4.4800E-05
  8.0000E+00          1.6800E-05
  2.4000E+01          1.2000E-05
  9.6000E+01          8.8300E-06
  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                3.5000E-04

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       1.0000E-02
 1.0000E+00       1.0000E-01
 2.0000E+00       5.0000E-01
 8.0000E+00       1.0000E+00
 2.4000E+01       2.0000E+00
 9.6000E+01       5.0000E+00
 7.2000E+02       0.0000E+00
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:20:21
##########################################################################




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

EAB Doses:

Time (h) = 0.0167	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.4339E-06	9.1664E-04	4.5228E-05
Accumulated dose (rem)	6.4339E-06	9.1664E-04	4.5228E-05

LPZ Doses:

Time (h) = 0.0167	Whole Body	Thyroid	TEDE
Delta dose (rem)	8.7588E-07	1.2479E-04	6.1570E-06
Accumulated dose (rem)	8.7588E-07	1.2479E-04	6.1570E-06

CR Doses:

Time (h) = 0.0167	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.1243E-09	8.9558E-06	3.8315E-07
Accumulated dose (rem)	4.1243E-09	8.9558E-06	3.8315E-07

DW Compartment Nuclide Inventory:

Time (h) = 0.0167	Ci	kg	Atoms	Decay
Kr-83m	2.7332E+04	1.3464E-06	9.7692E+18	4.4085E+16
Kr-85m	6.1772E+04	7.5061E-06	5.3180E+19	9.9487E+16
Kr-85	3.1305E+03	7.9867E-03	5.6584E+22	5.0366E+15
Kr-87	1.2382E+05	4.3712E-06	3.0257E+19	1.9995E+17
Kr-88	1.6908E+05	1.3484E-05	9.2275E+19	2.7248E+17
Rb-86	4.2509E+02	5.2243E-06	3.6583E+19	6.8391E+14
Rb-88	1.7112E+05	1.4175E-06	9.7005E+18	2.7286E+17
I-131	1.8470E+05	1.4898E-03	6.8487E+21	2.9716E+17
I-132	2.6793E+05	2.5956E-05	1.1842E+20	4.3174E+17
I-133	3.8278E+05	3.3791E-04	1.5300E+21	6.1598E+17
I-134	4.3360E+05	1.6254E-05	7.3046E+19	7.0138E+17
I-135	3.6131E+05	1.0288E-04	4.5895E+20	5.8172E+17
Xe-133	3.8300E+05	2.0461E-03	9.2647E+21	6.1617E+17
Xe-133m	1.1748E+04	2.6684E-05	1.2082E+20	1.8900E+16
Xe-135	1.6123E+05	6.3133E-05	2.8163E+20	2.5902E+17

Xe-135m	7.8357E+04	8.6076E-07	3.8397E+18	1.2587E+17
Xe-138	3.2721E+05	3.4101E-06	1.4881E+19	5.3714E+17
Cs-134	4.2510E+04	3.2856E-02	1.4766E+23	6.8392E+16
Cs-136	1.2970E+04	1.7696E-04	7.8360E+20	2.0867E+16
Cs-137	3.3003E+04	3.7942E-01	1.6678E+24	5.3097E+16

DW Transport Group Inventory:

Time (h) = 0.0167	Atmosphere	Sump	
Noble gases (atoms)	6.6456E+22	0.0000E+00	
Elemental I (atoms)	4.3791E+20	0.0000E+00	
Organic I (atoms)	1.3544E+19	0.0000E+00	
Aerosols (kg)	4.1434E-01	0.0000E+00	
Dose Effective (Ci/cc) I-131 (Thyroid)			3.0090E-05
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			3.8536E-05
Total I (Ci)			1.6303E+06

DW to WW Transport Group Inventory:
Time (h) = 0.0167 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

WW to DW Transport Group Inventory:
Time (h) = 0.0167 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1179E+19
Elemental I (atoms)	0.0000E+00	7.3678E+16
Organic I (atoms)	0.0000E+00	2.2787E+15
Aerosols (kg)	0.0000E+00	6.9695E-05

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7109E+16
Elemental I (atoms)	0.0000E+00	1.7868E+14
Organic I (atoms)	0.0000E+00	5.5260E+12
Aerosols (kg)	0.0000E+00	1.6902E-07

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4702E+17
Elemental I (atoms)	0.0000E+00	9.6899E+14
Organic I (atoms)	0.0000E+00	2.9969E+13

Aerosols (kg) 0.0000E+00 9.1662E-07

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4702E+17
Elemental I (atoms)	0.0000E+00	9.6899E+14
Organic I (atoms)	0.0000E+00	2.9969E+13
Aerosols (kg)	0.0000E+00	9.1662E-07

RB Compartment Nuclide Inventory:

Time (h) = 0.0167	Ci	kg	Atoms	Decay
Kr-83m	4.5954E+00	2.2638E-10	1.6425E+15	6.0676E+12
Kr-85m	1.0386E+01	1.2620E-09	8.9412E+15	1.3696E+13
Kr-85	5.2634E-01	1.3428E-06	9.5137E+18	6.9345E+11
Kr-87	2.0818E+01	7.3494E-10	5.0873E+15	2.7515E+13
Kr-88	2.8427E+01	2.2671E-09	1.5514E+16	3.7506E+13
Rb-86	7.1471E-02	8.7837E-10	6.1508E+15	9.4163E+10
Rb-88	2.8770E+01	2.3833E-10	1.6310E+15	3.7579E+13
I-131	3.1053E+01	2.5048E-07	1.1515E+18	4.0913E+13
I-132	4.5018E+01	4.3613E-09	1.9897E+16	5.9407E+13
I-133	6.4358E+01	5.6813E-08	2.5724E+17	8.4808E+13
I-134	7.2901E+01	2.7328E-09	1.2281E+16	9.6494E+13
I-135	6.0748E+01	1.7298E-08	7.7164E+16	8.0084E+13
Xe-133	6.4394E+01	3.4402E-07	1.5577E+18	8.4837E+13
Xe-133m	1.9752E+00	4.4865E-09	2.0314E+16	2.6022E+12
Xe-135	2.7107E+01	1.0615E-08	4.7351E+16	3.5667E+13
Xe-135m	1.3174E+01	1.4472E-10	6.4558E+14	1.7320E+13
Xe-138	5.5014E+01	5.7335E-10	2.5020E+15	7.3742E+13
Cs-134	7.1473E+00	5.5241E-06	2.4826E+19	9.4165E+12
Cs-136	2.1806E+00	2.9753E-08	1.3175E+17	2.8730E+12
Cs-137	5.5488E+00	6.3793E-05	2.8042E+20	7.3105E+12

RB Transport Group Inventory:

Time (h) = 0.0167	Atmosphere	Sump	
Noble gases (atoms)	1.1173E+19	0.0000E+00	
Elemental I (atoms)	7.3626E+16	0.0000E+00	
Organic I (atoms)	2.2771E+15	0.0000E+00	
Aerosols (kg)	6.9663E-05	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		7.9850E-10
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.0226E-09
Total I (Ci)			2.7408E+02

DW to RB Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1179E+19
Elemental I (atoms)	0.0000E+00	7.3678E+16
Organic I (atoms)	0.0000E+00	2.2787E+15
Aerosols (kg)	0.0000E+00	6.9695E-05

WW to RB Transport Group Inventory:

Pathway

Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.1369E+15
Elemental I (atoms)	0.0000E+00	3.3856E+13
Organic I (atoms)	0.0000E+00	1.0471E+12
Aerosols (kg)	0.0000E+00	3.2027E-08

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 0.0167	Ci	kg	Atoms	Bq
Kr-83m	2.1138E-03	1.0413E-13	7.5555E+11	7.8212E+07
Kr-85m	4.7759E-03	5.8034E-13	4.1116E+12	1.7671E+08
Kr-85	2.4198E-04	6.1735E-10	4.3739E+15	8.9534E+06
Kr-87	9.5784E-03	3.3815E-13	2.3407E+12	3.5440E+08
Kr-88	1.3074E-02	1.0426E-12	7.1352E+12	4.8374E+08
Rb-86	3.2859E-05	4.0383E-13	2.8278E+12	1.2158E+06
Rb-88	1.3227E-02	1.0957E-13	7.4984E+11	4.8941E+08
I-131	1.4277E-02	1.1516E-10	5.2939E+14	5.2824E+08
I-132	2.0700E-02	2.0054E-12	9.1492E+12	7.6591E+08
I-133	2.9590E-02	2.6121E-11	1.1827E+14	1.0948E+09
I-134	3.3555E-02	1.2578E-12	5.6528E+12	1.2415E+09
I-135	2.7933E-02	7.9539E-12	3.5481E+13	1.0335E+09
Xe-133	2.9605E-02	1.5816E-10	7.1614E+14	1.0954E+09
Xe-133m	9.0808E-04	2.0626E-12	9.3394E+12	3.3599E+07
Xe-135	1.2461E-02	4.8794E-12	2.1766E+13	4.6104E+08
Xe-135m	6.0641E-03	6.6614E-14	2.9716E+11	2.2437E+08
Xe-138	2.5400E-02	2.6472E-13	1.1552E+12	9.3982E+08
Cs-134	3.2859E-03	2.5397E-09	1.1414E+16	1.2158E+08
Cs-136	1.0025E-03	1.3679E-11	6.0571E+13	3.7094E+07
Cs-137	2.5511E-03	2.9329E-08	1.2892E+17	9.4389E+07

Environment Transport Group Inventory:

	Total	Release	
Time (h) = 0.0167	Release	Rate/s	
Noble gases (atoms)	5.1369E+15	8.5444E+13	
Elemental I (atoms)	3.3850E+13	5.6305E+11	
Organic I (atoms)	1.0469E+12	1.7414E+10	
Aerosols (kg)	3.2027E-08	5.3273E-10	
Dose Effective (Ci) I-131 (Thyroid)			2.0167E-02

Dose Effective (Ci) I-131 (ICRP2 Thyroid) 2.5829E-02
Total I (Ci) 1.2605E-01

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6729E+12
Elemental I (atoms)	0.0000E+00	1.7616E+10
Organic I (atoms)	0.0000E+00	5.4483E+08
Aerosols (kg)	0.0000E+00	1.6665E-11

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.9096E+11
Elemental I (atoms)	0.0000E+00	5.8721E+09
Organic I (atoms)	0.0000E+00	1.8161E+08
Aerosols (kg)	0.0000E+00	5.5549E-12

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	2.4249E+09	0.0000E+00
Elemental I (atoms)	1.5982E+07	0.0000E+00
Organic I (atoms)	4.9428E+05	0.0000E+00
Aerosols (kg)	1.5119E-14	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.1369E+15
Elemental I (atoms)	0.0000E+00	3.3856E+13
Organic I (atoms)	0.0000E+00	1.0471E+12
Aerosols (kg)	0.0000E+00	3.2027E-08

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 0.0167	Ci	kg	Atoms	Decay
Kr-83m	1.4647E-06	7.2158E-17	5.2355E+08	1.6829E+06
Kr-85m	3.3104E-06	4.0226E-16	2.8500E+09	3.7993E+06
Kr-85	1.6777E-07	4.2802E-13	3.0324E+12	1.9240E+05
Kr-87	6.6355E-06	2.3426E-16	1.6215E+09	7.6307E+06
Kr-88	9.0611E-06	7.2262E-16	4.9451E+09	1.0404E+07
Rb-86	2.2781E-08	2.7998E-16	1.9605E+09	2.6125E+04

Rb-88	9.1704E-06	7.5967E-17	5.1987E+08	1.0429E+07
I-131	9.8981E-06	7.9840E-14	3.6703E+11	1.1351E+07
I-132	1.4345E-05	1.3898E-15	6.3405E+09	1.6476E+07
I-133	2.0514E-05	1.8109E-14	8.1995E+10	2.3529E+07
I-134	2.3237E-05	8.7106E-16	3.9147E+09	2.6755E+07
I-135	1.9363E-05	5.5137E-15	2.4596E+10	2.2217E+07
Xe-133	2.0525E-05	1.0965E-13	4.9651E+11	2.3538E+07
Xe-133m	6.2958E-07	1.4300E-15	6.4751E+09	7.2197E+05
Xe-135	8.6403E-06	3.3834E-15	1.5093E+10	9.8968E+06
Xe-135m	4.1993E-06	4.6129E-17	2.0577E+08	4.8033E+06
Xe-138	1.7536E-05	1.8275E-16	7.9751E+08	2.0412E+07
Cs-134	2.2782E-06	1.7608E-12	7.9132E+12	2.6126E+06
Cs-136	6.9507E-07	9.4837E-15	4.1994E+10	7.9711E+05
Cs-137	1.7687E-06	2.0334E-11	8.9382E+13	2.0283E+06

CR Transport Group Inventory:

Time (h) = 0.0167	Atmosphere	Sump	
Noble gases (atoms)	3.5615E+12	0.0000E+00	
Elemental I (atoms)	2.3468E+10	0.0000E+00	
Organic I (atoms)	7.2581E+08	0.0000E+00	
Aerosols (kg)	2.2205E-11	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.2960E-15
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.6597E-15
Total I (Ci)			8.7358E-05

Time (h) = 0.0167	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6729E+12
Elemental I (atoms)	0.0000E+00	1.7616E+10
Organic I (atoms)	0.0000E+00	5.4483E+08
Aerosols (kg)	0.0000E+00	1.6665E-11

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.9096E+11
Elemental I (atoms)	0.0000E+00	5.8721E+09
Organic I (atoms)	0.0000E+00	1.8161E+08
Aerosols (kg)	0.0000E+00	5.5549E-12

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	2.4249E+09	0.0000E+00
Elemental I (atoms)	1.5982E+07	0.0000E+00
Organic I (atoms)	4.9428E+05	0.0000E+00

Aerosols (kg) 1.5119E-14 0.0000E+00

EAB Doses:

Time (h) = 0.0833	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.6681E-04	1.1255E-01	5.5301E-03
Accumulated dose (rem)	7.7325E-04	1.1347E-01	5.5753E-03

LPZ Doses:

Time (h) = 0.0833	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0439E-04	1.5322E-02	7.5284E-04
Accumulated dose (rem)	1.0527E-04	1.5447E-02	7.5899E-04

CR Doses:

Time (h) = 0.0833	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2185E-06	1.3040E-03	5.6416E-05
Accumulated dose (rem)	1.2226E-06	1.3129E-03	5.6799E-05

DW Compartment Nuclide Inventory:

Time (h) = 0.0833	Ci	kg	Atoms	Decay
Kr-83m	1.3290E+05	6.5469E-06	4.7502E+19	8.2573E+17
Kr-85m	3.0475E+05	3.7031E-05	2.6236E+20	1.8815E+18
Kr-85	1.5604E+04	3.9810E-02	2.8205E+23	9.5905E+16
Kr-87	5.9517E+05	2.1012E-05	1.4544E+20	3.7167E+18
Kr-88	8.2919E+05	6.6128E-05	4.5253E+20	5.1327E+18
Rb-86	2.1187E+03	2.6038E-05	1.8233E+20	1.3022E+16
Rb-88	8.5180E+05	7.0562E-06	4.8288E+19	5.1830E+18
I-131	9.2043E+05	7.4244E-03	3.4130E+22	5.6576E+18
I-132	1.3216E+06	1.2803E-04	5.8412E+20	8.1649E+18
I-133	1.9038E+06	1.6806E-03	7.6096E+21	1.1712E+19
I-134	2.0504E+06	7.6862E-05	3.4543E+20	1.2897E+19
I-135	1.7885E+06	5.0926E-04	2.2717E+21	1.1026E+19
Xe-133	1.9091E+06	1.0199E-02	4.6181E+22	1.1733E+19
Xe-133m	5.8555E+04	1.3300E-04	6.0223E+20	3.5987E+17
Xe-135	8.0920E+05	3.1687E-04	1.4135E+21	4.9544E+18
Xe-135m	3.7104E+05	4.0759E-06	1.8182E+19	2.3105E+18
Xe-138	1.3420E+06	1.3986E-05	6.1032E+19	8.9986E+18
Cs-134	2.1189E+05	1.6377E-01	7.3601E+23	1.3023E+18
Cs-136	6.4640E+04	8.8196E-04	3.9053E+21	3.9730E+17
Cs-137	1.6451E+05	1.8913E+00	8.3135E+24	1.0111E+18

DW Transport Group Inventory:

Time (h) = 0.0833	Atmosphere	Sump	
Noble gases (atoms)	3.3123E+23	0.0000E+00	
Elemental I (atoms)	2.1796E+21	0.0000E+00	
Organic I (atoms)	6.7412E+19	0.0000E+00	
Aerosols (kg)	2.0653E+00	0.0000E+00	
Dose Effective (Ci/cc) I-131 (Thyroid)			1.4982E-04
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			1.9154E-04
Total I (Ci)			7.9847E+06

DW to WW Transport Group Inventory:

Time (h) = 0.0833 Leakage Transport

Noble gases (atoms) 0.0000E+00
Elemental I (atoms) 0.0000E+00
Organic I (atoms) 0.0000E+00
Aerosols (kg) 0.0000E+00

WW to DW Transport Group Inventory:
Time (h) = 0.0833 Leakage Transport

Noble gases (atoms) 0.0000E+00
Elemental I (atoms) 0.0000E+00
Organic I (atoms) 0.0000E+00
Aerosols (kg) 0.0000E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.0833	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7799E+20
Elemental I (atoms)	0.0000E+00	1.8305E+18
Organic I (atoms)	0.0000E+00	5.6614E+16
Aerosols (kg)	0.0000E+00	1.7332E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 0.0833	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.7415E+17
Elemental I (atoms)	0.0000E+00	4.4392E+15
Organic I (atoms)	0.0000E+00	1.3729E+14
Aerosols (kg)	0.0000E+00	4.2033E-06

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 0.0833	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6560E+18
Elemental I (atoms)	0.0000E+00	2.4075E+16
Organic I (atoms)	0.0000E+00	7.4457E+14
Aerosols (kg)	0.0000E+00	2.2795E-05

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

	Pathway	
Time (h) = 0.0833	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6560E+18
Elemental I (atoms)	0.0000E+00	2.4075E+16
Organic I (atoms)	0.0000E+00	7.4457E+14
Aerosols (kg)	0.0000E+00	2.2795E-05

RB Compartment Nuclide Inventory:

Time (h) = 0.0833	Ci	kg	Atoms	Decay
Kr-83m	1.1128E+02	5.4818E-09	3.9773E+16	4.8703E+14
Kr-85m	2.5517E+02	3.1006E-08	2.1968E+17	1.1114E+15
Kr-85	1.3066E+01	3.3333E-05	2.3616E+20	5.6711E+13
Kr-87	4.9834E+02	1.7593E-08	1.2178E+17	2.1895E+15
Kr-88	6.9429E+02	5.5369E-08	3.7891E+17	3.0300E+15

Rb-86	1.7740E+00	2.1802E-08	1.5267E+17	7.7002E+12
Rb-88	7.1321E+02	5.9082E-09	4.0432E+16	3.0647E+15
I-131	7.7068E+02	6.2164E-06	2.8577E+19	3.3454E+15
I-132	1.1022E+03	1.0678E-07	4.8714E+17	4.8081E+15
I-133	1.5940E+03	1.4072E-06	6.3715E+18	6.9241E+15
I-134	1.7168E+03	6.4357E-08	2.8923E+17	7.5849E+15
I-135	1.4975E+03	4.2641E-07	1.9021E+18	6.5150E+15
Xe-133	1.5985E+03	8.5397E-06	3.8667E+19	6.9380E+15
Xe-133m	4.9028E+01	1.1136E-07	5.0425E+17	2.1280E+14
Xe-135	6.7755E+02	2.6532E-07	1.1835E+18	2.9318E+15
Xe-135m	3.1068E+02	3.4128E-09	1.5224E+16	1.3590E+15
Xe-138	1.1236E+03	1.1710E-08	5.1102E+16	5.2120E+15
Cs-134	1.7742E+02	1.3713E-04	6.1627E+20	7.7009E+14
Cs-136	5.4123E+01	7.3847E-07	3.2700E+18	2.3493E+14
Cs-137	1.3774E+02	1.5836E-03	6.9609E+21	5.9787E+14

RB Transport Group Inventory:

Time (h) = 0.0833	Atmosphere	Sump	
Noble gases (atoms)	2.7734E+20	0.0000E+00	
Elemental I (atoms)	1.8249E+18	0.0000E+00	
Organic I (atoms)	5.6441E+16	0.0000E+00	
Aerosols (kg)	1.7293E-03	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.9799E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.5310E-08
Total I (Ci)			6.6812E+03

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.0833	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7799E+20
Elemental I (atoms)	0.0000E+00	1.8305E+18
Organic I (atoms)	0.0000E+00	5.6614E+16
Aerosols (kg)	0.0000E+00	1.7332E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.0833	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.0833	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.3639E+17
Elemental I (atoms)	0.0000E+00	4.1898E+15
Organic I (atoms)	0.0000E+00	1.2958E+14
Aerosols (kg)	0.0000E+00	3.9679E-06

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.0833	Filtered	Transported

Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 0.0833	Ci	kg	Atoms	Bq
Kr-83m	2.5691E-01	1.2656E-11	9.1827E+13	9.5056E+09
Kr-85m	5.8699E-01	7.1328E-11	5.0535E+14	2.1719E+10
Kr-85	2.9980E-02	7.6485E-08	5.4188E+17	1.1092E+09
Kr-87	1.1538E+00	4.0735E-11	2.8197E+14	4.2692E+10
Kr-88	1.5995E+00	1.2756E-10	8.7294E+14	5.9182E+10
Rb-86	4.0706E-03	5.0027E-11	3.5031E+14	1.5061E+08
Rb-88	1.6373E+00	1.3563E-11	9.2819E+13	6.0581E+10
I-131	1.7684E+00	1.4265E-08	6.5575E+16	6.5433E+10
I-132	2.5366E+00	2.4574E-10	1.1211E+15	9.3853E+10
I-133	3.6596E+00	3.2306E-09	1.4628E+16	1.3541E+11
I-134	3.9914E+00	1.4962E-10	6.7242E+14	1.4768E+11
I-135	3.4420E+00	9.8011E-10	4.3721E+15	1.2735E+11
Xe-133	3.6678E+00	1.9595E-08	8.8723E+16	1.3571E+11
Xe-133m	1.1250E-01	2.5553E-10	1.1570E+15	4.1625E+09
Xe-135	1.5520E+00	6.0775E-10	2.7111E+15	5.7425E+10
Xe-135m	7.2179E-01	7.9289E-12	3.5369E+13	2.6706E+10
Xe-138	2.7089E+00	2.8232E-11	1.2320E+14	1.0023E+11
Cs-134	4.0710E-01	3.1464E-07	1.4141E+18	1.5063E+10
Cs-136	1.2419E-01	1.6945E-09	7.5033E+15	4.5951E+09
Cs-137	3.1605E-01	3.6336E-06	1.5972E+19	1.1694E+10

Environment Transport Group Inventory:

Time (h) = 0.0833	Total Release	Release Rate/s	
Noble gases (atoms)	6.3639E+17	2.1221E+15	
Elemental I (atoms)	4.1889E+15	1.3968E+13	
Organic I (atoms)	1.2955E+14	4.3202E+11	
Aerosols (kg)	3.9679E-06	1.3232E-08	
Dose Effective (Ci) I-131 (Thyroid)			2.4963E+00
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			3.1926E+00
Total I (Ci)			1.5398E+01

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.0833	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.9389E+14
Elemental I (atoms)	3.8534E+12	5.6540E+10
Organic I (atoms)	1.1918E+11	1.7487E+09
Aerosols (kg)	3.6494E-09	5.3527E-11

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 0.0833	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1038E+14
Elemental I (atoms)	0.0000E+00	7.2668E+11
Organic I (atoms)	0.0000E+00	2.2475E+10

Aerosols (kg) 0.0000E+00 6.8819E-10

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 0.0833	Pathway Filtered	Transported
Noble gases (atoms)	3.6551E+12	0.0000E+00
Elemental I (atoms)	4.2941E+09	0.0000E+00
Organic I (atoms)	1.3281E+08	0.0000E+00
Aerosols (kg)	4.0670E-12	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 0.0833	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.3639E+17
Elemental I (atoms)	0.0000E+00	4.1898E+15
Organic I (atoms)	0.0000E+00	1.2958E+14
Aerosols (kg)	0.0000E+00	3.9679E-06

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 0.0833	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 0.0833	Ci	kg	Atoms	Decay
Kr-83m	2.8109E-04	1.3848E-14	1.0047E+11	9.6351E+08
Kr-85m	6.4458E-04	7.8325E-14	5.5492E+11	2.2008E+09
Kr-85	3.3005E-05	8.4203E-11	5.9657E+14	1.1238E+08
Kr-87	1.2589E-03	4.4443E-14	3.0763E+11	4.3285E+09
Kr-88	1.7538E-03	1.3987E-13	9.5717E+11	5.9978E+09
Rb-86	7.5499E-07	9.2787E-15	6.4974E+10	2.6967E+06
Rb-88	3.8765E-04	3.2112E-15	2.1975E+10	1.2202E+09
I-131	3.2799E-04	2.6456E-12	1.2162E+13	1.1716E+09
I-132	4.6810E-04	4.5350E-14	2.0689E+11	1.6799E+09
I-133	6.7841E-04	5.9888E-13	2.7117E+12	2.4247E+09
I-134	7.3067E-04	2.7390E-14	1.2309E+11	2.6502E+09
I-135	6.3732E-04	1.8148E-13	8.0953E+11	2.2809E+09
Xe-133	4.0375E-03	2.1570E-11	9.7666E+13	1.3747E+10
Xe-133m	1.2382E-04	2.8124E-13	1.2735E+12	4.2162E+08
Xe-135	1.7064E-03	6.6819E-13	2.9807E+12	5.8031E+09
Xe-135m	7.5350E-04	8.2772E-15	3.6923E+10	2.6297E+09
Xe-138	2.8384E-03	2.9582E-14	1.2909E+11	1.0195E+10
Cs-134	7.5508E-05	5.8360E-11	2.6228E+14	2.6969E+08
Cs-136	2.3034E-05	3.1429E-13	1.3917E+12	8.2275E+07
Cs-137	5.8622E-05	6.7395E-10	2.9625E+15	2.0938E+08

CR Transport Group Inventory:

Time (h) = 0.0833	Atmosphere	Sump
Noble gases (atoms)	7.0058E+14	0.0000E+00
Elemental I (atoms)	7.7665E+11	0.0000E+00

```
Organic I (atoms)      2.4020E+10  0.0000E+00
Aerosols (kg)          7.3596E-10  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)         4.2904E-14
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   5.4844E-14
Total I (Ci)                                   2.8425E-03

                       Deposition Recirculating
Time (h) =   0.0833     Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  1.7868E+09
Organic I (atoms)      0.0000E+00  5.5261E+07
Aerosols (kg)          0.0000E+00  1.6923E-12
```

CR Filtered Intake Transport Group Inventory:

```
                         Pathway
Time (h) =   0.0833     Filtered   Transported
Noble gases (atoms)    0.0000E+00  5.9389E+14
Elemental I (atoms)    3.8534E+12  5.6540E+10
Organic I (atoms)      1.1918E+11  1.7487E+09
Aerosols (kg)          3.6494E-09  5.3527E-11
```

CR Unfiltered Inleakage Transport Group Inventory:

```
                         Pathway
Time (h) =   0.0833     Filtered   Transported
Noble gases (atoms)    0.0000E+00  1.1038E+14
Elemental I (atoms)    0.0000E+00  7.2668E+11
Organic I (atoms)      0.0000E+00  2.2475E+10
Aerosols (kg)          0.0000E+00  6.8819E-10
```

CR Exhaust to Environment Transport Group Inventory:

```
                         Pathway
Time (h) =   0.0833     Filtered   Transported
Noble gases (atoms)    3.6551E+12  0.0000E+00
Elemental I (atoms)    4.2941E+09  0.0000E+00
Organic I (atoms)      1.3281E+08  0.0000E+00
Aerosols (kg)          4.0670E-12  0.0000E+00
```

EAB Doses:

```
Time (h) =   0.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.3502E-03  1.1707E+00  5.6893E-02
Accumulated dose (rem)  8.1235E-03  1.2841E+00  6.2469E-02
```

LPZ Doses:

```
Time (h) =   0.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0006E-03  1.5937E-01  7.7452E-03
Accumulated dose (rem)  1.1059E-03  1.7481E-01  8.5041E-03
```

CR Doses:

```
Time (h) =   0.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.0934E-05  8.2916E-02  3.5837E-03
Accumulated dose (rem)  7.2156E-05  8.4229E-02  3.6405E-03
```

DW Compartment Nuclide Inventory:

Time (h) = 0.3333	Ci	kg	Atoms	Decay
Kr-83m	4.8468E+05	2.3877E-05	1.7324E+20	1.1548E+19
Kr-85m	1.1737E+06	1.4261E-04	1.0104E+21	2.7275E+19
Kr-85	6.2466E+04	1.5936E-01	1.1291E+24	1.4265E+18
Kr-87	2.0790E+06	7.3397E-05	5.0806E+20	5.0530E+19
Kr-88	3.1229E+06	2.4905E-04	1.7043E+21	7.3314E+19
Rb-86	8.4779E+03	1.0419E-04	7.2961E+20	1.9364E+17
Rb-88	3.3378E+06	2.7650E-05	1.8922E+20	7.6238E+19
I-131	3.6815E+06	2.9696E-02	1.3651E+23	8.4103E+19
I-132	5.0917E+06	4.9328E-04	2.2505E+21	1.1839E+20
I-133	7.5578E+06	6.6717E-03	3.0209E+22	1.7324E+20
I-134	6.7359E+06	2.5250E-04	1.1348E+21	1.6848E+20
I-135	6.9741E+06	1.9859E-03	8.8587E+21	1.6116E+20
Xe-133	7.6421E+06	4.0827E-02	1.8486E+23	1.7451E+20
Xe-133m	2.3436E+05	5.3232E-04	2.4103E+21	5.3519E+18
Xe-135	3.3171E+06	1.2989E-03	5.7943E+21	7.4900E+19
Xe-135m	1.2818E+06	1.4080E-05	6.2810E+19	3.0849E+19
Xe-138	2.5831E+06	2.6921E-05	1.1748E+20	8.4384E+19
Cs-134	8.4822E+05	6.5559E-01	2.9463E+24	1.9370E+19
Cs-136	2.5862E+05	3.5286E-03	1.5625E+22	5.9072E+18
Cs-137	6.5853E+05	7.5709E+00	3.3280E+25	1.5038E+19

DW Transport Group Inventory:

Time (h) = 0.3333	Atmosphere	Sump	
Noble gases (atoms)	1.3257E+24	0.0000E+00	
Elemental I (atoms)	8.6798E+21	0.0000E+00	
Organic I (atoms)	2.6845E+20	0.0000E+00	
Aerosols (kg)	8.2673E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		5.9724E-04
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		7.5893E-04
Total I (Ci)			3.0041E+07

DW to WW Transport Group Inventory:

Time (h) = 0.3333 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

WW to DW Transport Group Inventory:

Time (h) = 0.3333 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.3333	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.8960E+20
Elemental I (atoms)	0.0000E+00	2.5628E+18

Organic I (atoms)	0.0000E+00	7.9263E+16
Aerosols (kg)	0.0000E+00	2.4292E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0793E+19
Elemental I (atoms)	0.0000E+00	7.0827E+16
Organic I (atoms)	0.0000E+00	2.1905E+15
Aerosols (kg)	0.0000E+00	6.7299E-05

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.8530E+19
Elemental I (atoms)	0.0000E+00	3.8411E+17
Organic I (atoms)	0.0000E+00	1.1880E+16
Aerosols (kg)	0.0000E+00	3.6498E-04

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.8530E+19
Elemental I (atoms)	0.0000E+00	3.8411E+17
Organic I (atoms)	0.0000E+00	1.1880E+16
Aerosols (kg)	0.0000E+00	3.6498E-04

RB Compartment Nuclide Inventory:

Time (h) = 0.3333	Ci	kg	Atoms	Decay
Kr-83m	1.3977E+02	6.8857E-09	4.9960E+16	4.5710E+15
Kr-85m	3.3847E+02	4.1128E-08	2.9139E+17	1.0747E+16
Kr-85	1.8014E+01	4.5959E-05	3.2561E+20	5.6022E+14
Kr-87	5.9956E+02	2.1167E-08	1.4652E+17	2.0075E+16
Kr-88	9.0059E+02	7.1822E-08	4.9150E+17	2.8942E+16
Rb-86	2.4449E+00	3.0048E-08	2.1041E+17	7.6050E+13
Rb-88	9.6258E+02	7.9739E-09	5.4568E+16	2.9993E+16
I-131	1.0616E+03	8.5633E-06	3.9366E+19	3.3031E+16
I-132	1.4202E+03	1.3759E-07	6.2770E+17	4.5752E+16
I-133	2.1796E+03	1.9240E-06	8.7119E+18	6.8085E+16
I-134	1.9425E+03	7.2818E-08	3.2725E+17	6.7289E+16
I-135	2.0112E+03	5.7270E-07	2.5547E+18	6.3432E+16
Xe-133	2.2039E+03	1.1774E-05	5.3312E+19	6.8537E+16
Xe-133m	6.7585E+01	1.5351E-07	6.9510E+17	2.1019E+15
Xe-135	9.5661E+02	3.7459E-07	1.6710E+18	2.9357E+16
Xe-135m	3.6965E+02	4.0606E-09	1.8114E+16	1.2272E+16
Xe-138	7.4494E+02	7.7637E-09	3.3880E+16	3.5302E+16
Cs-134	2.4462E+02	1.8906E-04	8.4967E+20	7.6073E+15
Cs-136	7.4581E+01	1.0176E-06	4.5060E+18	2.3201E+15
Cs-137	1.8991E+02	2.1833E-03	9.5974E+21	5.9060E+15

RB Transport Group Inventory:

Time (h) = 0.3333	Atmosphere	Sump
Noble gases (atoms)	3.8232E+20	0.0000E+00

Elemental I (atoms)	2.5020E+18	0.0000E+00	
Organic I (atoms)	7.7381E+16	0.0000E+00	
Aerosols (kg)	2.3842E-03	0.0000E+00	
Dose Effective (Ci/cc) I-131 (Thyroid)			2.7179E-08
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			3.4512E-08
Total I (Ci)			8.6152E+03

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.3333	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.8960E+20
Elemental I (atoms)	0.0000E+00	2.5628E+18
Organic I (atoms)	0.0000E+00	7.9263E+16
Aerosols (kg)	0.0000E+00	2.4292E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.3333	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.3333	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.2188E+18
Elemental I (atoms)	0.0000E+00	4.7381E+16
Organic I (atoms)	0.0000E+00	1.4654E+15
Aerosols (kg)	0.0000E+00	4.5013E-05

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.3333	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 0.3333	Ci	kg	Atoms	Bq
Kr-83m	2.7678E+00	1.3635E-10	9.8931E+14	1.0241E+11
Kr-85m	6.5172E+00	7.9193E-10	5.6107E+15	2.4114E+11
Kr-85	3.4011E-01	8.6769E-07	6.1475E+18	1.2584E+10
Kr-87	1.2141E+01	4.2864E-10	2.9670E+15	4.4923E+11
Kr-88	1.7541E+01	1.3989E-09	9.5729E+15	6.4900E+11
Rb-86	4.6169E-02	5.6741E-10	3.9733E+15	1.7082E+09
Rb-88	1.8401E+01	1.5243E-10	1.0431E+15	6.8083E+11
I-131	2.0052E+01	1.6175E-07	7.4356E+17	7.4194E+11
I-132	2.7715E+01	2.6850E-09	1.2249E+16	1.0254E+12
I-133	4.1324E+01	3.6479E-08	1.6518E+17	1.5290E+12
I-134	4.0626E+01	1.5229E-09	6.8441E+15	1.5031E+12

I-135	3.8481E+01	1.0958E-08	4.8880E+16	1.4238E+12
Xe-133	4.1609E+01	2.2229E-07	1.0065E+18	1.5395E+12
Xe-133m	1.2761E+00	2.8986E-09	1.3125E+16	4.7216E+10
Xe-135	1.7849E+01	6.9894E-09	3.1179E+16	6.6042E+11
Xe-135m	7.4952E+00	8.2336E-11	3.6729E+14	2.7732E+11
Xe-138	2.0983E+01	2.1869E-10	9.5431E+14	7.7638E+11
Cs-134	4.6183E+00	3.5695E-06	1.6042E+19	1.7088E+11
Cs-136	1.4085E+00	1.9218E-08	8.5096E+16	5.2114E+10
Cs-137	3.5855E+00	4.1221E-05	1.8120E+20	1.3266E+11

Environment Transport Group Inventory:

Time (h) = 0.3333	Total Release	Release Rate/s	
Noble gases (atoms)	7.2188E+18	6.0162E+15	
Elemental I (atoms)	4.7370E+16	3.9479E+13	
Organic I (atoms)	1.4651E+15	1.2210E+12	
Aerosols (kg)	4.5013E-05	3.7515E-08	
Dose Effective (Ci) I-131 (Thyroid)			2.8251E+01
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			3.5992E+01
Total I (Ci)			1.6820E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.7589E+15
Elemental I (atoms)	4.3901E+13	4.6106E+11
Organic I (atoms)	1.3578E+12	1.4260E+10
Aerosols (kg)	4.1707E-08	4.3795E-10

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2520E+15
Elemental I (atoms)	0.0000E+00	8.2178E+12
Organic I (atoms)	0.0000E+00	2.5416E+11
Aerosols (kg)	0.0000E+00	7.8072E-09

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	2.5950E+14	0.0000E+00
Elemental I (atoms)	2.7912E+11	0.0000E+00
Organic I (atoms)	8.6327E+09	0.0000E+00
Aerosols (kg)	2.6542E-10	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.2188E+18
Elemental I (atoms)	0.0000E+00	4.7381E+16
Organic I (atoms)	0.0000E+00	1.4654E+15
Aerosols (kg)	0.0000E+00	4.5013E-05

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 0.3333	Ci	kg	Atoms	Decay
Kr-83m	2.8336E-03	1.3959E-13	1.0128E+12	5.3862E+10
Kr-85m	6.8616E-03	8.3378E-13	5.9072E+12	1.2777E+11
Kr-85	3.6520E-04	9.3170E-10	6.6010E+15	6.7029E+09
Kr-87	1.2155E-02	4.2911E-13	2.9703E+12	2.3486E+11
Kr-88	1.8257E-02	1.4560E-12	9.9640E+12	3.4285E+11
Rb-86	8.0692E-06	9.9170E-14	6.9444E+11	1.4919E+08
Rb-88	7.2123E-03	5.9746E-14	4.0886E+11	1.0879E+11
I-131	3.5038E-03	2.8262E-11	1.2992E+14	6.4793E+10
I-132	4.6624E-03	4.5169E-13	2.0607E+12	8.8534E+10
I-133	7.1935E-03	6.3501E-12	2.8753E+13	1.3339E+11
I-134	6.4112E-03	2.4033E-13	1.0801E+12	1.2782E+11
I-135	6.6379E-03	1.8901E-12	8.4316E+12	1.2392E+11
Xe-133	4.4652E-02	2.3855E-10	1.0801E+15	8.1971E+11
Xe-133m	1.3683E-03	3.1079E-12	1.4072E+13	2.5126E+10
Xe-135	1.9084E-02	7.4730E-12	3.3336E+13	3.4898E+11
Xe-135m	5.9785E-03	6.5674E-14	2.9296E+11	1.2440E+11
Xe-138	1.5102E-02	1.5739E-13	6.8683E+11	3.7152E+11
Cs-134	8.0733E-04	6.2398E-10	2.8043E+15	1.4924E+10
Cs-136	2.4615E-04	3.3585E-12	1.4872E+13	4.5512E+09
Cs-137	6.2678E-04	7.2059E-09	3.1675E+16	1.1587E+10

CR Transport Group Inventory:

Time (h) = 0.3333	Atmosphere	Sump	
Noble gases (atoms)	7.7494E+15	0.0000E+00	
Elemental I (atoms)	8.2570E+12	0.0000E+00	
Organic I (atoms)	2.5537E+11	0.0000E+00	
Aerosols (kg)	7.8688E-09	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		4.5673E-13
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		5.7989E-13
Total I (Ci)			2.8409E-02

Time (h) = 0.3333	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.1657E+11
Organic I (atoms)	0.0000E+00	3.6053E+09
Aerosols (kg)	0.0000E+00	1.1085E-10

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.7589E+15
Elemental I (atoms)	4.3901E+13	4.6106E+11

Organic I (atoms)	1.3578E+12	1.4260E+10
Aerosols (kg)	4.1707E-08	4.3795E-10

CR Unfiltered Inleakage Transport Group Inventory:

	Pathway	
Time (h) = 0.3333	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2520E+15
Elemental I (atoms)	0.0000E+00	8.2178E+12
Organic I (atoms)	0.0000E+00	2.5416E+11
Aerosols (kg)	0.0000E+00	7.8072E-09

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.3333	Filtered	Transported
Noble gases (atoms)	2.5950E+14	0.0000E+00
Elemental I (atoms)	2.7912E+11	0.0000E+00
Organic I (atoms)	8.6327E+09	0.0000E+00
Aerosols (kg)	2.6542E-10	0.0000E+00

EAB Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.8172E-03	1.0011E+00	4.8185E-02
Accumulated dose (rem)	1.3941E-02	2.2852E+00	1.1065E-01

LPZ Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.9193E-04	1.3628E-01	6.5596E-03
Accumulated dose (rem)	1.8978E-03	3.1110E-01	1.5064E-02

CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1051E-04	1.4277E-01	6.1632E-03
Accumulated dose (rem)	1.8267E-04	2.2700E-01	9.8037E-03

DW Compartment Nuclide Inventory:

Time (h) = 0.5000	Ci	kg	Atoms	Decay
Kr-83m	6.8328E+05	3.3660E-05	2.4422E+20	2.4719E+19
Kr-85m	1.7158E+06	2.0849E-04	1.4771E+21	5.9788E+19
Kr-85	9.3706E+04	2.3907E-01	1.6938E+24	3.1809E+18
Kr-87	2.8479E+06	1.0054E-04	6.9594E+20	1.0618E+20
Kr-88	4.4979E+06	3.5870E-04	2.4547E+21	1.5915E+20
Rb-86	1.5498E+03	1.9046E-05	1.3337E+20	2.6449E+17
Rb-88	9.9719E+05	8.2605E-06	5.6530E+19	1.0720E+20
I-131	6.8011E+05	5.4858E-03	2.5219E+22	1.1498E+20
I-132	9.5780E+05	9.2791E-05	4.2333E+20	1.6121E+20
I-133	1.3891E+06	1.2263E-03	5.5524E+21	2.3651E+20
I-134	1.0912E+06	4.0905E-05	1.8383E+20	2.2240E+20
I-135	1.2666E+06	3.6067E-04	1.6089E+21	2.1929E+20
Xe-133	1.1458E+07	6.1213E-02	2.7717E+23	3.8909E+20
Xe-133m	3.5109E+05	7.9747E-04	3.6109E+21	1.1930E+19
Xe-135	4.9801E+06	1.9501E-03	8.6992E+21	1.6817E+20

Xe-135m	1.4413E+06	1.5833E-05	7.0627E+19	6.2132E+19
Xe-138	2.3781E+06	2.4784E-05	1.0816E+20	1.4087E+20
Cs-134	1.5509E+05	1.1987E-01	5.3872E+23	2.6460E+19
Cs-136	4.7270E+04	6.4496E-04	2.8559E+21	8.0685E+18
Cs-137	1.2041E+05	1.3843E+00	6.0851E+24	2.0542E+19

DW Transport Group Inventory:

Time (h) = 0.5000	Atmosphere	Sump	
Noble gases (atoms)	1.9883E+24	0.0000E+00	
Elemental I (atoms)	1.5828E+21	1.1424E+22	
Organic I (atoms)	4.0137E+20	0.0000E+00	
Aerosols (kg)	1.5116E+00	1.0891E+01	
Dose Effective (Ci/cc) I-131 (Thyroid)			1.1012E-04
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			1.3954E-04
Total I (Ci)			5.3849E+06

DW to WW Transport Group Inventory:

Time (h) = 0.5000 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

WW to DW Transport Group Inventory:

Time (h) = 0.5000 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.3846E+20
Elemental I (atoms)	0.0000E+00	2.8737E+18
Organic I (atoms)	0.0000E+00	1.0936E+17
Aerosols (kg)	0.0000E+00	2.7256E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4287E+19
Elemental I (atoms)	0.0000E+00	9.9012E+16
Organic I (atoms)	0.0000E+00	4.9187E+15
Aerosols (kg)	0.0000E+00	9.4169E-05

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3171E+20
Elemental I (atoms)	0.0000E+00	5.3696E+17
Organic I (atoms)	0.0000E+00	2.6675E+16

Aerosols (kg) 0.0000E+00 5.1070E-04

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3171E+20
Elemental I (atoms)	0.0000E+00	5.3696E+17
Organic I (atoms)	0.0000E+00	2.6675E+16
Aerosols (kg)	0.0000E+00	5.1070E-04

RB Compartment Nuclide Inventory:

Time (h) = 0.5000	Ci	kg	Atoms	Decay
Kr-83m	1.8038E+02	8.8860E-09	6.4473E+16	8.1315E+15
Kr-85m	4.5295E+02	5.5040E-08	3.8995E+17	1.9534E+16
Kr-85	2.4738E+01	6.3111E-05	4.4714E+20	1.0343E+15
Kr-87	7.5182E+02	2.6542E-08	1.8372E+17	3.5121E+16
Kr-88	1.1874E+03	9.4695E-08	6.4803E+17	5.2141E+16
Rb-86	2.7121E+00	3.3331E-08	2.3340E+17	1.3446E+14
Rb-88	1.0905E+03	9.0334E-09	6.1819E+16	5.2786E+16
I-131	1.1777E+03	9.4993E-06	4.3669E+19	5.8395E+16
I-132	1.5081E+03	1.4610E-07	6.6655E+17	7.8959E+16
I-133	2.4058E+03	2.1238E-06	9.6162E+18	1.2003E+17
I-134	1.8899E+03	7.0844E-08	3.1838E+17	1.1074E+17
I-135	2.1937E+03	6.2465E-07	2.7865E+18	1.1107E+17
Xe-133	3.0260E+03	1.6166E-05	7.3198E+19	1.2653E+17
Xe-133m	9.2767E+01	2.1071E-07	9.5409E+17	3.8801E+15
Xe-135	1.3279E+03	5.2000E-07	2.3196E+18	5.4675E+16
Xe-135m	4.5042E+02	4.9479E-09	2.2072E+16	2.1387E+16
Xe-138	6.2781E+02	6.5429E-09	2.8552E+16	5.0613E+16
Cs-134	2.7141E+02	2.0977E-04	9.4276E+20	1.3452E+16
Cs-136	8.2722E+01	1.1287E-06	4.9978E+18	4.1019E+15
Cs-137	2.1072E+02	2.4225E-03	1.0649E+22	1.0444E+16

RB Transport Group Inventory:

Time (h) = 0.5000	Atmosphere	Sump	
Noble gases (atoms)	5.2495E+20	0.0000E+00	
Elemental I (atoms)	2.7662E+18	0.0000E+00	
Organic I (atoms)	1.0589E+17	0.0000E+00	
Aerosols (kg)	2.6453E-03	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.0081E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.8043E-08
Total I (Ci)			9.1751E+03

DW to RB Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.3846E+20
Elemental I (atoms)	0.0000E+00	2.8737E+18
Organic I (atoms)	0.0000E+00	1.0936E+17
Aerosols (kg)	0.0000E+00	2.7256E-03

WW to RB Transport Group Inventory:

Pathway

Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3397E+19
Elemental I (atoms)	0.0000E+00	8.4275E+16
Organic I (atoms)	0.0000E+00	2.7138E+15
Aerosols (kg)	0.0000E+00	8.0230E-05

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 0.5000	Ci	kg	Atoms	Bq
Kr-83m	4.9505E+00	2.4387E-10	1.7694E+15	1.8317E+11
Kr-85m	1.1910E+01	1.4472E-09	1.0253E+16	4.4066E+11
Kr-85	6.3125E-01	1.6105E-06	1.1410E+19	2.3356E+10
Kr-87	2.1357E+01	7.5398E-10	5.2191E+15	7.9021E+11
Kr-88	3.1771E+01	2.5337E-09	1.7339E+16	1.1755E+12
Rb-86	8.2278E-02	1.0112E-09	7.0808E+15	3.0443E+09
Rb-88	3.2653E+01	2.7050E-10	1.8511E+15	1.2082E+12
I-131	3.5731E+01	2.8821E-07	1.3249E+18	1.3221E+12
I-132	4.8207E+01	4.6703E-09	2.1307E+16	1.7837E+12
I-133	7.3427E+01	6.4819E-08	2.9349E+17	2.7168E+12
I-134	6.7380E+01	2.5258E-09	1.1351E+16	2.4931E+12
I-135	6.7916E+01	1.9339E-08	8.6269E+16	2.5129E+12
Xe-133	7.7226E+01	4.1257E-07	1.8681E+18	2.8574E+12
Xe-133m	2.3682E+00	5.3792E-09	2.4356E+16	8.7623E+10
Xe-135	3.3416E+01	1.3085E-08	5.8371E+16	1.2364E+12
Xe-135m	1.3140E+01	1.4435E-10	6.4392E+14	4.8620E+11
Xe-138	3.0252E+01	3.1528E-10	1.3758E+15	1.1193E+12
Cs-134	8.2315E+00	6.3621E-06	2.8592E+19	3.0457E+11
Cs-136	2.5099E+00	3.4246E-08	1.5164E+17	9.2866E+10
Cs-137	6.3907E+00	7.3471E-05	3.2296E+20	2.3646E+11

Environment Transport Group Inventory:

	Total	Release	
Time (h) = 0.5000	Release	Rate/s	
Noble gases (atoms)	1.3397E+19	7.4429E+15	
Elemental I (atoms)	8.4256E+16	4.6809E+13	
Organic I (atoms)	2.7132E+15	1.5074E+12	
Aerosols (kg)	8.0230E-05	4.4572E-08	
Dose Effective (Ci) I-131 (Thyroid)			5.0274E+01

Dose Effective (Ci) I-131 (ICRP2 Thyroid) 6.3896E+01
Total I (Ci) 2.9266E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2546E+16
Elemental I (atoms)	7.8110E+13	8.0660E+11
Organic I (atoms)	2.5153E+12	2.5952E+10
Aerosols (kg)	7.4360E-08	7.6778E-10

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.3237E+15
Elemental I (atoms)	0.0000E+00	1.4617E+13
Organic I (atoms)	0.0000E+00	4.7069E+11
Aerosols (kg)	0.0000E+00	1.3915E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	7.1276E+14	0.0000E+00
Elemental I (atoms)	7.5194E+11	0.0000E+00
Organic I (atoms)	2.3478E+10	0.0000E+00
Aerosols (kg)	7.1684E-10	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3397E+19
Elemental I (atoms)	0.0000E+00	8.4275E+16
Organic I (atoms)	0.0000E+00	2.7138E+15
Aerosols (kg)	0.0000E+00	8.0230E-05

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 0.5000	Ci	kg	Atoms	Decay
Kr-83m	4.8636E-03	2.3960E-13	1.7384E+12	1.4006E+11
Kr-85m	1.2213E-02	1.4841E-12	1.0514E+13	3.4067E+11
Kr-85	6.6701E-04	1.7017E-09	1.2056E+16	1.8195E+10
Kr-87	2.0271E-02	7.1566E-13	4.9538E+12	5.9887E+11
Kr-88	3.2016E-02	2.5533E-12	1.7473E+13	9.0473E+11
Rb-86	1.4011E-05	1.7220E-13	1.2058E+12	3.9779E+08

Rb-88	1.4924E-02	1.2363E-13	8.4604E+11	3.4502E+11
I-131	6.0823E-03	4.9061E-11	2.2553E+14	1.7272E+11
I-132	7.7323E-03	7.4910E-13	3.4176E+12	2.2866E+11
I-133	1.2425E-02	1.0969E-11	4.9665E+13	3.5438E+11
I-134	9.7607E-03	3.6589E-13	1.6443E+12	3.1182E+11
I-135	1.1330E-02	3.2262E-12	1.4391E+13	3.2652E+11
Xe-133	8.1528E-02	4.3556E-10	1.9722E+15	2.2246E+12
Xe-133m	2.4969E-03	5.6716E-12	2.5680E+13	6.8164E+10
Xe-135	3.5081E-02	1.3737E-11	6.1279E+13	9.5181E+11
Xe-135m	9.0944E-03	9.9902E-14	4.4565E+11	2.9522E+11
Xe-138	1.6928E-02	1.7642E-13	7.6987E+11	7.3862E+11
Cs-134	1.4022E-03	1.0837E-09	4.8705E+15	3.9800E+10
Cs-136	4.2736E-04	5.8310E-12	2.5820E+13	1.2134E+10
Cs-137	1.0886E-03	1.2515E-08	5.5014E+16	3.0899E+10

CR Transport Group Inventory:

Time (h) = 0.5000	Atmosphere	Sump	
Noble gases (atoms)	1.4151E+16	0.0000E+00	
Elemental I (atoms)	1.4290E+13	0.0000E+00	
Organic I (atoms)	4.6125E+11	0.0000E+00	
Aerosols (kg)	1.3666E-08	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		7.9104E-13
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.0002E-12
Total I (Ci)			4.7330E-02

Time (h) = 0.5000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	3.1405E+11
Organic I (atoms)	0.0000E+00	9.8057E+09
Aerosols (kg)	0.0000E+00	2.9939E-10

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2546E+16
Elemental I (atoms)	7.8110E+13	8.0660E+11
Organic I (atoms)	2.5153E+12	2.5952E+10
Aerosols (kg)	7.4360E-08	7.6778E-10

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.3237E+15
Elemental I (atoms)	0.0000E+00	1.4617E+13
Organic I (atoms)	0.0000E+00	4.7069E+11
Aerosols (kg)	0.0000E+00	1.3915E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	7.1276E+14	0.0000E+00
Elemental I (atoms)	7.5194E+11	0.0000E+00
Organic I (atoms)	2.3478E+10	0.0000E+00

Aerosols (kg) 7.1684E-10 0.0000E+00

EAB Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.2695E-02	3.3489E+00	1.6673E-01
Accumulated dose (rem)	3.6636E-02	5.6341E+00	2.7738E-01

LPZ Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.0896E-03	4.5590E-01	2.2698E-02
Accumulated dose (rem)	4.9874E-03	7.6700E-01	3.7761E-02

CR Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.6578E-04	8.8954E-01	3.8713E-02
Accumulated dose (rem)	9.4844E-04	1.1165E+00	4.8517E-02

DW Compartment Nuclide Inventory:

Time (h) = 1.0000	Ci	kg	Atoms	Decay
Kr-83m	4.1590E+06	2.0489E-04	1.4866E+21	1.9628E+20
Kr-85m	1.1646E+07	1.4152E-03	1.0026E+22	5.2049E+20
Kr-85	6.8722E+05	1.7532E+00	1.2421E+25	2.9583E+19
Kr-87	1.5903E+07	5.6144E-04	3.8863E+21	7.8467E+20
Kr-88	2.9196E+07	2.3284E-03	1.5934E+22	1.3340E+21
Rb-86	1.7117E+03	2.1036E-05	1.4731E+20	3.7754E+17
Rb-88	3.7786E+06	3.1302E-05	2.1421E+20	2.4219E+20
Sr-89	9.4148E+04	3.2407E-03	2.1928E+22	5.6986E+18
Sr-90	1.0077E+04	7.3877E-02	4.9433E+23	6.0989E+17
Sr-91	1.0794E+05	2.9776E-05	1.9705E+20	6.6434E+18
Sr-92	9.3086E+04	7.4058E-06	4.8477E+19	5.9785E+18
Y-90	1.1031E+02	2.0274E-07	1.3566E+18	6.5742E+15
Y-91	1.1811E+03	4.8163E-05	3.1873E+20	7.1468E+16
Y-92	2.1957E+03	2.2819E-07	1.4937E+18	1.1877E+17
Y-93	1.2298E+03	3.6862E-07	2.3869E+18	7.5617E+16
Zr-95	1.3932E+03	6.4853E-05	4.1111E+20	8.4328E+16
Zr-97	1.2905E+03	6.7508E-07	4.1912E+18	7.8845E+16
Nb-95	1.3747E+03	3.5156E-05	2.2285E+20	8.3197E+16
Mo-99	1.7411E+04	3.6301E-05	2.2082E+20	1.0562E+18
Tc-99m	1.5496E+04	2.9470E-06	1.7926E+19	9.3751E+17
Ru-103	1.5221E+04	4.7163E-04	2.7575E+21	9.2136E+17
Ru-105	9.2826E+03	1.3809E-06	7.9201E+18	5.8245E+17
Ru-106	6.3321E+03	1.8927E-03	1.0753E+22	3.8323E+17
Rh-105	1.0097E+04	1.1962E-05	6.8609E+19	6.1117E+17
Sb-127	1.7395E+04	6.5137E-05	3.0887E+20	1.0546E+18
Sb-129	4.6125E+04	8.2023E-06	3.8291E+19	2.8971E+18
Te-127	1.7314E+04	6.5605E-06	3.1109E+19	1.0476E+18
Te-127m	2.9644E+03	3.1427E-04	1.4902E+21	1.7941E+17
Te-129	4.8004E+04	2.2922E-06	1.0701E+19	2.9446E+18
Te-129m	9.7225E+03	3.2274E-04	1.5066E+21	5.8840E+17
Te-131m	3.5991E+04	4.5135E-05	2.0749E+20	2.1898E+18
Te-132	2.6193E+05	8.6276E-04	3.9361E+21	1.5884E+19
I-131	9.4887E+05	7.6538E-03	3.5185E+22	1.7621E+20
I-132	1.3573E+06	1.3149E-04	5.9990E+20	2.4889E+20

I-133	1.9089E+06	1.6851E-03	7.6299E+21	3.6061E+20
I-134	1.0268E+06	3.8491E-05	1.7299E+20	3.0323E+20
I-135	1.6794E+06	4.7821E-04	2.1332E+21	3.3041E+20
Xe-133	8.3940E+07	4.4844E-01	2.0305E+24	3.6155E+21
Xe-133m	2.5676E+06	5.8322E-03	2.6408E+22	1.1070E+20
Xe-135	3.6976E+07	1.4479E-02	6.4590E+22	1.5860E+21
Xe-135m	6.2209E+06	6.8337E-05	3.0484E+20	3.6584E+20
Xe-138	4.0325E+06	4.2026E-05	1.8340E+20	4.3057E+20
Cs-134	1.7143E+05	1.3250E-01	5.9545E+23	3.7777E+19
Cs-136	5.2191E+04	7.1211E-04	3.1532E+21	1.1516E+19
Cs-137	1.3309E+05	1.5301E+00	6.7260E+24	2.9329E+19
Ba-139	8.6120E+04	5.2650E-06	2.2811E+19	5.8646E+18
Ba-140	1.3825E+05	1.8884E-03	8.1232E+21	8.3714E+18
La-140	1.5301E+03	2.7528E-06	1.1841E+19	9.0382E+16
La-141	1.0904E+03	1.9281E-07	8.2351E+17	6.8744E+16
La-142	8.1400E+02	5.6863E-08	2.4115E+17	5.4731E+16
Ce-141	3.2721E+03	1.1484E-04	4.9047E+20	1.9803E+17
Ce-143	3.1240E+03	4.7042E-06	1.9811E+19	1.8998E+17
Ce-144	2.6218E+03	8.2201E-04	3.4377E+21	1.5868E+17
Pr-143	1.2490E+03	1.8548E-05	7.8109E+19	7.5584E+16
Nd-147	5.0801E+02	6.2796E-06	2.5726E+19	3.0764E+16
Np-239	3.6856E+04	1.5887E-04	4.0031E+20	2.2369E+18
Pu-238	8.1469E+00	4.7588E-04	1.2041E+21	4.9305E+14
Pu-239	8.2165E-01	1.3219E-02	3.3308E+22	4.9725E+13
Pu-240	1.4514E+00	6.3723E-04	1.5990E+21	8.7837E+13
Pu-241	3.2245E+02	3.2606E-03	8.1476E+21	1.9515E+16
Am-241	1.8240E-01	5.3244E-05	1.3305E+20	1.1039E+13
Cm-242	5.0104E+01	1.5136E-05	3.7666E+19	3.0325E+15
Cm-244	3.3135E+00	4.0482E-05	9.9912E+19	2.0053E+14

DW Transport Group Inventory:

Time (h) = 1.0000	Atmosphere	Sump	
Noble gases (atoms)	1.4575E+25	0.0000E+00	
Elemental I (atoms)	2.1693E+21	3.2386E+22	
Organic I (atoms)	1.0607E+21	0.0000E+00	
Aerosols (kg)	1.7747E+00	2.8198E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.5274E-04
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.9206E-04
Total I (Ci)			6.9213E+06

DW to WW Transport Group Inventory:

Time (h) = 1.0000 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

WW to DW Transport Group Inventory:

Time (h) = 1.0000 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

DW to RB Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7702E+21
Elemental I (atoms)	0.0000E+00	3.4442E+18
Organic I (atoms)	0.0000E+00	3.0661E+17
Aerosols (kg)	0.0000E+00	3.1967E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2661E+20
Elemental I (atoms)	0.0000E+00	1.5073E+17
Organic I (atoms)	0.0000E+00	2.2801E+16
Aerosols (kg)	0.0000E+00	1.3687E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2289E+21
Elemental I (atoms)	0.0000E+00	8.1744E+17
Organic I (atoms)	0.0000E+00	1.2365E+17
Aerosols (kg)	0.0000E+00	7.4227E-04

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2289E+21
Elemental I (atoms)	0.0000E+00	8.1744E+17
Organic I (atoms)	0.0000E+00	1.2365E+17
Aerosols (kg)	0.0000E+00	7.4227E-04

RB Compartment Nuclide Inventory:

Time (h) = 1.0000	Ci	kg	Atoms	Decay
Kr-83m	7.7069E+02	3.7966E-08	2.7547E+17	3.5818E+16
Kr-85m	2.1581E+03	2.6224E-07	1.8579E+18	9.3966E+16
Kr-85	1.2734E+02	3.2488E-04	2.3018E+21	5.3033E+15
Kr-87	2.9469E+03	1.0404E-07	7.2014E+17	1.4453E+17
Kr-88	5.4102E+03	4.3146E-07	2.9526E+18	2.4186E+17
Rb-86	3.0479E+00	3.7458E-08	2.6230E+17	3.2646E+14
Rb-88	2.9645E+03	2.4558E-08	1.6806E+17	1.6588E+17
Sr-89	2.2382E+01	7.7042E-07	5.2130E+18	6.9770E+14
Sr-90	2.3958E+00	1.7563E-05	1.1752E+20	7.4673E+13
Sr-91	2.5661E+01	7.0789E-09	4.6847E+16	8.0897E+14
Sr-92	2.2130E+01	1.7606E-09	1.1525E+16	7.1800E+14
Y-90	3.1872E-02	5.8581E-11	3.9198E+14	9.2428E+11
Y-91	2.8198E-01	1.1498E-08	7.6092E+16	8.7752E+12
Y-92	1.4797E+00	1.5378E-10	1.0066E+15	3.5216E+13
Y-93	2.9237E-01	8.7633E-11	5.6746E+14	9.2109E+12
Zr-95	3.3122E-01	1.5418E-08	9.7736E+16	1.0325E+13
Zr-97	3.0681E-01	1.6049E-10	9.9639E+14	9.6241E+12
Nb-95	3.2681E-01	8.3578E-09	5.2981E+16	1.0186E+13
Mo-99	4.1391E+00	8.6301E-09	5.2497E+16	1.2922E+14

Tc-99m	3.6839E+00	7.0060E-10	4.2617E+15	1.1478E+14
Ru-103	3.6187E+00	1.1212E-07	6.5555E+17	1.1280E+14
Ru-105	2.2068E+00	3.2830E-10	1.8829E+15	7.0483E+13
Ru-106	1.5054E+00	4.4996E-07	2.5563E+18	4.6921E+13
Rh-105	2.4004E+00	2.8439E-09	1.6311E+16	7.4826E+13
Sb-127	4.1354E+00	1.5485E-08	7.3429E+16	1.2905E+14
Sb-129	1.0966E+01	1.9500E-09	9.1032E+15	3.5046E+14
Te-127	4.1162E+00	1.5597E-09	7.3957E+15	1.2826E+14
Te-127m	7.0474E-01	7.4714E-08	3.5428E+17	2.1966E+13
Te-129	1.1412E+01	5.4493E-10	2.5439E+15	3.5873E+14
Te-129m	2.3114E+00	7.6726E-08	3.5818E+17	7.2043E+13
Te-131m	8.5563E+00	1.0730E-08	4.9327E+16	2.6765E+14
Te-132	6.2269E+01	2.0511E-07	9.3575E+17	1.9435E+15
I-131	1.3699E+03	1.1050E-05	5.0797E+19	1.4320E+17
I-132	1.5710E+03	1.5220E-07	6.9436E+17	1.8140E+17
I-133	2.7571E+03	2.4338E-06	1.1020E+19	2.9196E+17
I-134	1.4831E+03	5.5595E-08	2.4985E+17	2.2268E+17
I-135	2.4256E+03	6.9070E-07	3.0811E+18	2.6501E+17
Xe-133	1.5551E+04	8.3080E-05	3.7618E+20	6.4820E+17
Xe-133m	4.7556E+02	1.0802E-06	4.8910E+18	1.9849E+16
Xe-135	6.8107E+03	2.6670E-06	1.1897E+19	2.8369E+17
Xe-135m	1.0896E+03	1.1969E-08	5.3391E+16	7.1272E+16
Xe-138	7.4724E+02	7.7876E-09	3.3984E+16	9.6978E+16
Cs-134	3.0525E+02	2.3593E-04	1.0603E+21	3.2674E+16
Cs-136	9.2933E+01	1.2680E-06	5.6148E+18	9.9569E+15
Cs-137	2.3699E+02	2.7246E-03	1.1977E+22	2.5367E+16
Ba-139	2.0474E+01	1.2517E-09	5.4229E+15	6.9106E+14
Ba-140	3.2867E+01	4.4895E-07	1.9312E+18	1.0248E+15
La-140	4.8680E-01	8.7581E-10	3.7673E+15	1.3668E+13
La-141	2.5923E-01	4.5839E-11	1.9578E+14	8.3060E+12
La-142	1.9352E-01	1.3518E-11	5.7331E+13	6.4760E+12
Ce-141	7.7781E-01	2.7298E-08	1.1659E+17	2.4245E+13
Ce-143	7.4268E-01	1.1184E-09	4.7097E+15	2.3224E+13
Ce-144	6.2329E-01	1.9542E-07	8.1726E+17	1.9428E+13
Pr-143	2.9714E-01	4.4126E-09	1.8583E+16	9.2588E+12
Nd-147	1.2077E-01	1.4929E-09	6.1159E+15	3.7659E+12
Np-239	8.7621E+00	3.7769E-08	9.5167E+16	2.7363E+14
Pu-238	1.9368E-03	1.1313E-07	2.8626E+17	6.0368E+10
Pu-239	1.9534E-04	3.1426E-06	7.9186E+18	6.0883E+09
Pu-240	3.4504E-04	1.5149E-07	3.8013E+17	1.0755E+10
Pu-241	7.6658E-02	7.7516E-07	1.9370E+18	2.3893E+12
Am-241	4.3366E-05	1.2659E-08	3.1631E+16	1.3516E+09
Cm-242	1.1912E-02	3.5984E-09	8.9546E+15	3.7128E+11
Cm-244	7.8773E-04	9.6239E-09	2.3753E+16	2.4553E+10

RB Transport Group Inventory:

Time (h) = 1.0000	Atmosphere	Sump	
Noble gases (atoms)	2.7006E+21	0.0000E+00	
Elemental I (atoms)	3.1839E+18	0.0000E+00	
Organic I (atoms)	2.9359E+17	0.0000E+00	
Aerosols (kg)	2.9997E-03	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.4767E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		4.3517E-08
Total I (Ci)			9.6067E+03

DW to RB Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7702E+21
Elemental I (atoms)	0.0000E+00	3.4442E+18
Organic I (atoms)	0.0000E+00	3.0661E+17
Aerosols (kg)	0.0000E+00	3.1967E-03

WW to RB Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 1.0000	Ci	kg	Atoms	Bq
Kr-83m	2.1807E+01	1.0743E-09	7.7944E+15	8.0685E+11
Kr-85m	5.7276E+01	6.9598E-09	4.9309E+16	2.1192E+12
Kr-85	3.2353E+00	8.2539E-06	5.8478E+19	1.1970E+11
Kr-87	8.7906E+01	3.1034E-09	2.1482E+16	3.2525E+12
Kr-88	1.4735E+02	1.1751E-08	8.0419E+16	5.4521E+12
Rb-86	2.0116E-01	2.4723E-09	1.7312E+16	7.4431E+09
Rb-88	1.0446E+02	8.6535E-10	5.9219E+15	3.8651E+12
Sr-89	4.2326E-01	1.4569E-08	9.8580E+16	1.5661E+10
Sr-90	4.5301E-02	3.3210E-07	2.2222E+18	1.6761E+09
Sr-91	4.9053E-01	1.3532E-10	8.9550E+14	1.8150E+10
Sr-92	4.3484E-01	3.4595E-11	2.2645E+14	1.6089E+10
Y-90	5.6718E-04	1.0425E-12	6.9756E+12	2.0986E+07
Y-91	5.3249E-03	2.1713E-10	1.4369E+15	1.9702E+08
Y-92	2.2470E-02	2.3352E-12	1.5286E+13	8.3138E+08
Y-93	5.5853E-03	1.6741E-12	1.0840E+13	2.0665E+08
Zr-95	6.2634E-03	2.9155E-10	1.8482E+15	2.3175E+08
Zr-97	5.8369E-03	3.0533E-12	1.8956E+13	2.1597E+08
Nb-95	6.1797E-03	1.5804E-10	1.0018E+15	2.2865E+08
Mo-99	7.8388E-02	1.6344E-10	9.9420E+14	2.9004E+09
Tc-99m	6.9670E-02	1.3250E-11	8.0597E+13	2.5778E+09

Ru-103	6.8432E-02	2.1203E-09	1.2397E+16	2.5320E+09
Ru-105	4.2714E-02	6.3544E-12	3.6445E+13	1.5804E+09
Ru-106	2.8465E-02	8.5083E-09	4.8338E+16	1.0532E+09
Rh-105	4.5397E-02	5.3785E-11	3.0848E+14	1.6797E+09
Sb-127	7.8283E-02	2.9314E-10	1.3900E+15	2.8965E+09
Sb-129	2.1238E-01	3.7768E-11	1.7631E+14	7.8582E+09
Te-127	7.7838E-02	2.9494E-11	1.3986E+14	2.8800E+09
Te-127m	1.3326E-02	1.4127E-09	6.6990E+15	4.9306E+08
Te-129	2.1810E-01	1.0414E-11	4.8617E+13	8.0696E+09
Te-129m	4.3705E-02	1.4508E-09	6.7727E+15	1.6171E+09
Te-131m	1.6235E-01	2.0359E-10	9.3593E+14	6.0068E+09
Te-132	1.1790E+00	3.8835E-09	1.7717E+16	4.3623E+10
I-131	8.8226E+01	7.1165E-07	3.2715E+18	3.2644E+12
I-132	1.1150E+02	1.0802E-08	4.9283E+16	4.1257E+12
I-133	1.7983E+02	1.5875E-07	7.1881E+17	6.6539E+12
I-134	1.3640E+02	5.1130E-09	2.2978E+16	5.0467E+12
I-135	1.6315E+02	4.6458E-08	2.0724E+17	6.0367E+12
Xe-133	3.9543E+02	2.1125E-06	9.5655E+18	1.4631E+13
Xe-133m	1.2108E+01	2.7503E-08	1.2453E+17	4.4801E+11
Xe-135	1.7314E+02	6.7798E-08	3.0244E+17	6.4061E+12
Xe-135m	4.3556E+01	4.7847E-10	2.1344E+15	1.6116E+12
Xe-138	5.8118E+01	6.0570E-10	2.6432E+15	2.1504E+12
Cs-134	2.0134E+01	1.5561E-05	6.9935E+19	7.4495E+11
Cs-136	6.1355E+00	8.3714E-08	3.7069E+17	2.2701E+11
Cs-137	1.5631E+01	1.7971E-04	7.8995E+20	5.7836E+11
Ba-139	4.1783E-01	2.5544E-11	1.1067E+14	1.5460E+10
Ba-140	6.2169E-01	8.4920E-09	3.6529E+16	2.3002E+10
La-140	8.4324E-03	1.5171E-11	6.5258E+13	3.1200E+08
La-141	5.0330E-03	8.8995E-13	3.8010E+12	1.8622E+08
La-142	3.9169E-03	2.7362E-13	1.1604E+12	1.4493E+08
Ce-141	1.4708E-02	5.1620E-10	2.2047E+15	5.4421E+08
Ce-143	1.4087E-02	2.1213E-11	8.9333E+13	5.2122E+08
Ce-144	1.1786E-02	3.6952E-09	1.5454E+16	4.3608E+08
Pr-143	5.6172E-03	8.3417E-11	3.5129E+14	2.0784E+08
Nd-147	2.2846E-03	2.8240E-11	1.1569E+14	8.4528E+07
Np-239	1.6598E-01	7.1547E-10	1.8028E+15	6.1414E+09
Pu-238	3.6623E-05	2.1392E-09	5.4129E+15	1.3550E+06
Pu-239	3.6935E-06	5.9422E-08	1.4973E+17	1.3666E+05
Pu-240	6.5243E-06	2.8645E-09	7.1878E+15	2.4140E+05
Pu-241	1.4495E-03	1.4657E-08	3.6626E+16	5.3632E+07
Am-241	8.1997E-07	2.3935E-10	5.9809E+14	3.0339E+04
Cm-242	2.2524E-04	6.8044E-11	1.6933E+14	8.3339E+06
Cm-244	1.4895E-05	1.8198E-10	4.4914E+14	5.5112E+05

Environment Transport Group Inventory:

Time (h) = 1.0000	Total Release	Release Rate/s	
Noble gases (atoms)	6.8634E+19	1.9065E+16	
Elemental I (atoms)	2.0689E+17	5.7470E+13	
Organic I (atoms)	1.0381E+16	2.8836E+12	
Aerosols (kg)	1.9670E-04	5.4639E-08	
Dose Effective (Ci) I-131 (Thyroid)			1.2368E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.5622E+02
Total I (Ci)			6.7912E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.4280E+16
Elemental I (atoms)	1.9184E+14	1.9554E+12
Organic I (atoms)	9.6263E+12	9.7780E+10
Aerosols (kg)	1.8235E-07	1.8586E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1904E+16
Elemental I (atoms)	0.0000E+00	3.5891E+13
Organic I (atoms)	0.0000E+00	1.8008E+12
Aerosols (kg)	0.0000E+00	3.4116E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	5.1042E+15	0.0000E+00
Elemental I (atoms)	3.6894E+12	0.0000E+00
Organic I (atoms)	1.4585E+11	0.0000E+00
Aerosols (kg)	3.5324E-09	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 1.0000	Ci	kg	Atoms	Decay
Kr-83m	2.0277E-02	9.9891E-13	7.2477E+12	8.6227E+11
Kr-85m	5.6780E-02	6.8996E-12	4.8883E+13	2.2811E+12
Kr-85	3.3505E-03	8.5478E-09	6.0560E+16	1.2945E+11
Kr-87	7.7534E-02	2.7373E-12	1.8947E+13	3.4540E+12
Kr-88	1.4234E-01	1.1352E-11	7.7685E+13	5.8520E+12
Rb-86	3.1641E-05	3.8887E-13	2.7230E+12	1.9331E+09
Rb-88	6.8186E-02	5.6485E-13	3.8654E+12	2.6517E+12
Sr-89	7.3293E-05	2.5228E-12	1.7070E+13	1.5690E+09
Sr-90	7.8451E-06	5.7512E-11	3.8483E+14	1.6793E+08
Sr-91	8.4029E-05	2.3180E-14	1.5340E+11	1.8143E+09

Sr-92	7.2466E-05	5.7653E-15	3.7738E+10	1.5992E+09
Y-90	1.1051E-07	2.0313E-16	1.3592E+09	2.2120E+06
Y-91	9.2465E-07	3.7704E-14	2.4952E+11	1.9762E+07
Y-92	5.8931E-06	6.1244E-16	4.0089E+09	1.0202E+08
Y-93	9.5739E-07	2.8696E-16	1.8582E+09	2.0661E+07
Zr-95	1.0846E-06	5.0487E-14	3.2004E+11	2.3218E+07
Zr-97	1.0047E-06	5.2554E-16	3.2628E+09	2.1610E+07
Nb-95	1.0702E-06	2.7368E-14	1.7349E+11	2.2907E+07
Mo-99	1.3554E-05	2.8260E-14	1.7190E+11	2.9048E+08
Tc-99m	1.2063E-05	2.2942E-15	1.3955E+10	2.5810E+08
Ru-103	1.1850E-05	3.6716E-13	2.1467E+12	2.5367E+08
Ru-105	7.2264E-06	1.0750E-15	6.1657E+09	1.5758E+08
Ru-106	4.9295E-06	1.4734E-12	8.3709E+12	1.0552E+08
Rh-105	7.8603E-06	9.3125E-15	5.3411E+10	1.6826E+08
Sb-127	1.3542E-05	5.0708E-14	2.4045E+11	2.9012E+08
Sb-129	3.5907E-05	6.3854E-15	2.9809E+10	7.8340E+08
Te-127	1.3479E-05	5.1073E-15	2.4218E+10	2.8843E+08
Te-127m	2.3077E-06	2.4466E-13	1.1601E+12	4.9398E+07
Te-129	3.7370E-05	1.7844E-15	8.3303E+09	8.0465E+08
Te-129m	7.5688E-06	2.5124E-13	1.1729E+12	1.6201E+08
Te-131m	2.8018E-05	3.5137E-14	1.6152E+11	6.0138E+08
Te-132	2.0391E-04	6.7164E-13	3.0642E+12	4.3692E+09
I-131	1.3879E-02	1.1195E-10	5.1466E+14	8.4225E+11
I-132	1.5457E-02	1.4975E-12	6.8320E+12	1.0183E+12
I-133	2.7935E-02	2.4660E-11	1.1166E+14	1.7107E+12
I-134	1.5027E-02	5.6329E-13	2.5315E+12	1.1775E+12
I-135	2.4577E-02	6.9982E-12	3.1218E+13	1.5386E+12
Xe-133	4.0898E-01	2.1849E-09	9.8931E+15	1.5812E+13
Xe-133m	1.2499E-02	2.8391E-11	1.2855E+14	4.8380E+11
Xe-135	1.7707E-01	6.9337E-11	3.0930E+14	6.8337E+12
Xe-135m	2.3742E-02	2.6081E-13	1.1634E+12	1.3413E+12
Xe-138	1.9660E-02	2.0490E-13	8.9414E+11	1.9582E+12
Cs-134	3.1689E-03	2.4492E-09	1.1007E+16	1.9352E+11
Cs-136	9.6477E-04	1.3164E-11	5.8289E+13	5.8956E+10
Cs-137	2.4603E-03	2.8285E-08	1.2433E+17	1.5024E+11
Ba-139	6.7043E-05	4.0987E-15	1.7758E+10	1.5246E+09
Ba-140	1.0763E-04	1.4701E-12	6.3238E+12	2.3044E+09
La-140	1.7280E-06	3.1088E-15	1.3373E+10	3.3643E+07
La-141	8.4888E-07	1.5010E-16	6.4109E+08	1.8556E+07
La-142	6.3369E-07	4.4267E-17	1.8773E+08	1.4317E+07
Ce-141	2.5469E-06	8.9386E-14	3.8177E+11	5.4520E+07
Ce-143	2.4320E-06	3.6621E-15	1.5422E+10	5.2186E+07
Ce-144	2.0410E-06	6.3992E-13	2.6762E+12	4.3689E+07
Pr-143	9.7322E-07	1.4453E-14	6.0864E+10	2.0826E+07
Nd-147	3.9548E-07	4.8886E-15	2.0027E+10	8.4679E+06
Np-239	2.8692E-05	1.2368E-13	3.1163E+11	6.1505E+08
Pu-238	6.3422E-09	3.7046E-13	9.3739E+11	1.3576E+05
Pu-239	6.3964E-10	1.0291E-11	2.5930E+13	1.3691E+04
Pu-240	1.1299E-09	4.9607E-13	1.2448E+12	2.4185E+04
Pu-241	2.5102E-07	2.5383E-12	6.3428E+12	5.3732E+06
Am-241	1.4201E-10	4.1452E-14	1.0358E+11	3.0396E+03
Cm-242	3.9005E-08	1.1783E-14	2.9323E+10	8.3494E+05
Cm-244	2.5795E-09	3.1514E-14	7.7780E+10	5.5215E+04

CR Transport Group Inventory:

Time (h) = 1.0000	Atmosphere	Sump
Noble gases (atoms)	7.1046E+16	0.0000E+00

```
Elemental I (atoms)     3.2311E+13  0.0000E+00
Organic I (atoms)       1.6799E+12  0.0000E+00
Aerosols (kg)           3.0966E-08  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)          1.7933E-12
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)    2.2435E-12
Total I (Ci)                                    9.6875E-02

                        Deposition Recirculating
Time (h) =   1.0000      Surfaces     Filter
Noble gases (atoms)     0.0000E+00  0.0000E+00
Elemental I (atoms)     0.0000E+00  1.5409E+12
Organic I (atoms)       0.0000E+00  6.0913E+10
Aerosols (kg)           0.0000E+00  1.4753E-09
```

CR Filtered Intake Transport Group Inventory:

```
                          Pathway
Time (h) =   1.0000      Filtered   Transported
Noble gases (atoms)     0.0000E+00  6.4280E+16
Elemental I (atoms)     1.9184E+14  1.9554E+12
Organic I (atoms)       9.6263E+12  9.7780E+10
Aerosols (kg)           1.8235E-07  1.8586E-09
```

CR Unfiltered Inleakage Transport Group Inventory:

```
                          Pathway
Time (h) =   1.0000      Filtered   Transported
Noble gases (atoms)     0.0000E+00  1.1904E+16
Elemental I (atoms)     0.0000E+00  3.5891E+13
Organic I (atoms)       0.0000E+00  1.8008E+12
Aerosols (kg)           0.0000E+00  3.4116E-08
```

CR Exhaust to Environment Transport Group Inventory:

```
                          Pathway
Time (h) =   1.0000      Filtered   Transported
Noble gases (atoms)     5.1042E+15  0.0000E+00
Elemental I (atoms)     3.6894E+12  0.0000E+00
Organic I (atoms)       1.4585E+11  0.0000E+00
Aerosols (kg)           3.5324E-09  0.0000E+00
```

EAB Doses:

```
Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.3325E-02  3.2956E-02  3.4810E-02
Accumulated dose (rem)  6.9961E-02  5.6671E+00  3.1219E-01
```

LPZ Doses:

```
Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.5987E-02  1.5810E-02  1.6700E-02
Accumulated dose (rem)  2.0975E-02  7.8281E-01  5.4461E-02
```

CR Doses:

```
Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.6380E-03  2.0664E+00  9.2092E-02
```

Accumulated dose (rem) 3.5865E-03 3.1830E+00 1.4061E-01

DW Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
Kr-83m	7.8100E+06	3.8474E-04	2.7915E+21	1.0733E+21
Kr-85m	2.7195E+07	3.3046E-03	2.3412E+22	3.2905E+21
Kr-85	1.8733E+06	4.7791E+00	3.3859E+25	2.0802E+20
Kr-87	2.5134E+07	8.8732E-04	6.1420E+21	3.8419E+21
Kr-88	6.2349E+07	4.9723E-03	3.4027E+22	7.9409E+21
Rb-86	1.7090E+03	2.1004E-05	1.4708E+20	6.0536E+17
Rb-88	1.6971E+07	1.4059E-04	9.6208E+20	4.9793E+20
Sr-89	9.4099E+04	3.2390E-03	2.1916E+22	1.8236E+19
Sr-90	1.0078E+04	7.3881E-02	4.9436E+23	1.9523E+18
Sr-91	1.0035E+05	2.7683E-05	1.8320E+20	2.0510E+19
Sr-92	7.2082E+04	5.7347E-06	3.7538E+19	1.6919E+19
Y-90	1.1680E+02	2.1468E-07	1.4365E+18	2.0674E+16
Y-91	1.1820E+03	4.8198E-05	3.1896E+20	2.2866E+17
Y-92	2.7669E+03	2.8755E-07	1.8823E+18	3.0412E+17
Y-93	1.1483E+03	3.4418E-07	2.2287E+18	2.3394E+17
Zr-95	1.3927E+03	6.4827E-05	4.1094E+20	2.6987E+17
Zr-97	1.2387E+03	6.4799E-07	4.0230E+18	2.4728E+17
Nb-95	1.3748E+03	3.5157E-05	2.2287E+20	2.6631E+17
Mo-99	1.7230E+04	3.5924E-05	2.1852E+20	3.3633E+18
Tc-99m	1.5478E+04	2.9436E-06	1.7906E+19	2.9889E+18
Ru-103	1.5211E+04	4.7131E-04	2.7556E+21	2.9482E+18
Ru-105	7.9413E+03	1.1814E-06	6.7757E+18	1.7273E+18
Ru-106	6.3319E+03	1.8926E-03	1.0753E+22	1.2267E+18
Rh-105	1.0068E+04	1.1929E-05	6.8415E+19	1.9534E+18
Sb-127	1.7266E+04	6.4653E-05	3.0658E+20	3.3630E+18
Sb-129	3.9289E+04	6.9868E-06	3.2616E+19	8.5737E+18
Te-127	1.7305E+04	6.5572E-06	3.1093E+19	3.3449E+18
Te-127m	2.9646E+03	3.1429E-04	1.4903E+21	5.7428E+17
Te-129	4.4427E+04	2.1214E-06	9.9034E+18	8.9551E+18
Te-129m	9.7227E+03	3.2274E-04	1.5067E+21	1.8834E+18
Te-131m	3.5170E+04	4.4106E-05	2.0276E+20	6.9290E+18
Te-132	2.5963E+05	8.5519E-04	3.9015E+21	5.0620E+19
I-131	9.7331E+05	7.8509E-03	3.6091E+22	3.0442E+20
I-132	1.3689E+06	1.3261E-04	6.0501E+20	4.3109E+20
I-133	1.8997E+06	1.6770E-03	7.5933E+21	6.1465E+20
I-134	4.7918E+05	1.7962E-05	8.0726E+19	3.9909E+20
I-135	1.5560E+06	4.4306E-04	1.9764E+21	5.4611E+20
Xe-133	2.2815E+08	1.2189E+00	5.5189E+24	2.5377E+22
Xe-133m	6.9481E+06	1.5782E-02	7.1460E+22	7.7478E+20
Xe-135	1.0026E+08	3.9259E-02	1.7513E+23	1.1186E+22
Xe-135m	6.6917E+06	7.3509E-05	3.2791E+20	1.3680E+21
Xe-138	5.8765E+05	6.1244E-06	2.6726E+19	7.0527E+20
Cs-134	1.7142E+05	1.3249E-01	5.9543E+23	6.0611E+19
Cs-136	5.2076E+04	7.1054E-04	3.1463E+21	1.8460E+19
Cs-137	1.3309E+05	1.5301E+00	6.7260E+24	4.7057E+19
Ba-139	5.2086E+04	3.1844E-06	1.3796E+19	1.4880E+19
Ba-140	1.3794E+05	1.8843E-03	8.1052E+21	2.6766E+19
La-140	1.6715E+03	3.0073E-06	1.2936E+19	2.8128E+17
La-141	9.1416E+02	1.6164E-07	6.9039E+17	2.0191E+17
La-142	5.1926E+02	3.6274E-08	1.5383E+17	1.4206E+17
Ce-141	3.2715E+03	1.1482E-04	4.9038E+20	6.3385E+17
Ce-143	3.0592E+03	4.6066E-06	1.9400E+19	6.0177E+17

Ce-144	2.6216E+03	8.2196E-04	3.4375E+21	5.0790E+17
Pr-143	1.2492E+03	1.8552E-05	7.8126E+19	2.4192E+17
Nd-147	5.0670E+02	6.2634E-06	2.5659E+19	9.8345E+16
Np-239	3.6409E+04	1.5694E-04	3.9545E+20	7.1164E+18
Pu-238	8.1474E+00	4.7591E-04	1.2042E+21	1.5783E+15
Pu-239	8.2181E-01	1.3222E-02	3.3315E+22	1.5918E+14
Pu-240	1.4514E+00	6.3726E-04	1.5990E+21	2.8117E+14
Pu-241	3.2246E+02	3.2607E-03	8.1480E+21	6.2467E+16
Am-241	1.8244E-01	5.3254E-05	1.3307E+20	3.5338E+13
Cm-242	5.0098E+01	1.5134E-05	3.7662E+19	9.7061E+15
Cm-244	3.3136E+00	4.0483E-05	9.9917E+19	6.4191E+14

DW Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	3.9692E+25	0.0000E+00	
Elemental I (atoms)	2.1372E+21	7.5050E+22	
Organic I (atoms)	2.3466E+21	0.0000E+00	
Aerosols (kg)	1.7747E+00	6.3337E+01	
Dose Effective (Ci/cc) I-131 (Thyroid)			1.5492E-04
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			1.9238E-04
Total I (Ci)			6.2770E+06

DW to WW Transport Group Inventory:

Time (h) = 2.0000 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

WW to DW Transport Group Inventory:

Time (h) = 2.0000 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7396E+22
Elemental I (atoms)	0.0000E+00	4.6054E+18
Organic I (atoms)	0.0000E+00	1.2273E+18
Aerosols (kg)	0.0000E+00	4.1530E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5525E+21
Elemental I (atoms)	0.0000E+00	2.5599E+17
Organic I (atoms)	0.0000E+00	1.0627E+17
Aerosols (kg)	0.0000E+00	2.2356E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.4193E+21
Elemental I (atoms)	0.0000E+00	1.3883E+18
Organic I (atoms)	0.0000E+00	5.7631E+17
Aerosols (kg)	0.0000E+00	1.2124E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.4193E+21
Elemental I (atoms)	0.0000E+00	1.3883E+18
Organic I (atoms)	0.0000E+00	5.7631E+17
Aerosols (kg)	0.0000E+00	1.2124E-03

RB Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
Kr-83m	3.1810E+03	1.5670E-07	1.1370E+18	3.1246E+17
Kr-85m	1.1076E+04	1.3459E-06	9.5357E+18	9.7840E+17
Kr-85	7.6297E+02	1.9465E-03	1.3791E+22	6.2761E+16
Kr-87	1.0237E+04	3.6140E-07	2.5016E+18	1.0994E+18
Kr-88	2.5394E+04	2.0252E-06	1.3859E+19	2.3409E+18
Rb-86	3.5170E+00	4.3224E-08	3.0267E+17	7.6756E+14
Rb-88	2.0693E+04	1.7141E-07	1.1730E+18	1.3531E+18
Sr-89	6.6931E+01	2.3038E-06	1.5589E+19	7.0100E+15
Sr-90	7.1682E+00	5.2550E-05	3.5163E+20	7.5055E+14
Sr-91	7.1377E+01	1.9690E-08	1.3030E+17	7.7513E+15
Sr-92	5.1271E+01	4.0790E-09	2.6700E+16	6.1182E+15
Y-90	1.3439E-01	2.4701E-10	1.6528E+15	1.1542E+13
Y-91	8.5100E-01	3.4701E-08	2.2964E+17	8.8630E+13
Y-92	8.9360E+00	9.2867E-10	6.0789E+15	6.4458E+14
Y-93	8.1677E-01	2.4481E-10	1.5853E+15	8.8506E+13
Zr-95	9.9059E-01	4.6110E-08	2.9230E+17	1.0374E+14
Zr-97	8.8110E-01	4.6090E-10	2.8615E+15	9.4160E+13
Nb-95	9.7785E-01	2.5007E-08	1.5852E+17	1.0238E+14
Mo-99	1.2255E+01	2.5552E-08	1.5543E+17	1.2899E+15
Tc-99m	1.1009E+01	2.0938E-09	1.2736E+16	1.1476E+15
Ru-103	1.0819E+01	3.3523E-07	1.9600E+18	1.1332E+15
Ru-105	5.6485E+00	8.4030E-10	4.8195E+15	6.3996E+14
Ru-106	4.5038E+00	1.3462E-06	7.6481E+18	4.7159E+14
Rh-105	7.1615E+00	8.4846E-09	4.8662E+16	7.5048E+14
Sb-127	1.2281E+01	4.5987E-08	2.1806E+17	1.2907E+15
Sb-129	2.7946E+01	4.9696E-09	2.3200E+16	3.1733E+15
Te-127	1.2309E+01	4.6640E-09	2.2116E+16	1.2849E+15
Te-127m	2.1087E+00	2.2355E-07	1.0600E+18	2.2078E+14
Te-129	3.1600E+01	1.5089E-09	7.0441E+15	3.3672E+15
Te-129m	6.9156E+00	2.2956E-07	1.0717E+18	7.2409E+14
Te-131m	2.5016E+01	3.1372E-08	1.4422E+17	2.6496E+15
Te-132	1.8467E+02	6.0828E-07	2.7751E+18	1.9421E+16
I-131	1.6749E+03	1.3510E-05	6.2106E+19	3.4838E+17
I-132	1.6402E+03	1.5890E-07	7.2494E+17	3.9822E+17
I-133	3.2714E+03	2.8878E-06	1.3076E+19	6.9857E+17
I-134	8.2517E+02	3.0932E-08	1.3901E+17	3.7447E+17
I-135	2.6794E+03	7.6297E-07	3.4035E+18	6.0990E+17

Xe-133	9.2822E+04	4.9589E-04	2.2454E+21	7.6484E+18
Xe-133m	2.8228E+03	6.4116E-06	2.9031E+19	2.3318E+17
Xe-135	3.9658E+04	1.5529E-05	6.9274E+19	3.3064E+18
Xe-135m	1.6590E+03	1.8224E-08	8.1295E+16	2.8440E+17
Xe-138	2.3935E+02	2.4944E-09	1.0885E+16	1.7156E+17
Cs-134	3.5276E+02	2.7265E-04	1.2253E+21	7.6885E+16
Cs-136	1.0717E+02	1.4622E-06	6.4748E+18	2.3402E+16
Cs-137	2.7389E+02	3.1488E-03	1.3841E+22	5.9693E+16
Ba-139	3.7048E+01	2.2650E-09	9.8130E+15	5.0551E+15
Ba-140	9.8118E+01	1.3402E-06	5.7651E+18	1.0285E+16
La-140	2.3029E+00	4.1431E-09	1.7822E+16	1.8627E+14
La-141	6.5023E-01	1.1498E-10	4.9106E+14	7.4443E+13
La-142	3.6934E-01	2.5801E-11	1.0942E+14	4.8928E+13
Ce-141	2.3263E+00	8.1644E-08	3.4870E+17	2.4363E+14
Ce-143	2.1759E+00	3.2766E-09	1.3799E+16	2.3022E+14
Ce-144	1.8647E+00	5.8465E-07	2.4450E+18	1.9526E+14
Pr-143	8.9046E-01	1.3224E-08	5.5688E+16	9.3136E+13
Nd-147	3.6041E-01	4.4551E-09	1.8251E+16	3.7786E+13
Np-239	2.5897E+01	1.1163E-07	2.8128E+17	2.7281E+15
Pu-238	5.7951E-03	3.3851E-07	8.5652E+17	6.0678E+11
Pu-239	5.8454E-04	9.4044E-06	2.3696E+19	6.1200E+10
Pu-240	1.0324E-03	4.5327E-07	1.1374E+18	1.0810E+11
Pu-241	2.2936E-01	2.3193E-06	5.7955E+18	2.4016E+13
Am-241	1.2978E-04	3.7884E-08	9.4664E+16	1.3587E+10
Cm-242	3.5634E-02	1.0765E-08	2.6788E+16	3.7314E+12
Cm-244	2.3569E-03	2.8795E-08	7.1069E+16	2.4678E+11

RB Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	1.6162E+22	0.0000E+00	
Elemental I (atoms)	3.8050E+18	0.0000E+00	
Organic I (atoms)	1.1127E+18	0.0000E+00	
Aerosols (kg)	3.5120E-03	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		4.2006E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		5.1797E-08
Total I (Ci)			1.0091E+04

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7396E+22
Elemental I (atoms)	0.0000E+00	4.6054E+18
Organic I (atoms)	0.0000E+00	1.2273E+18
Aerosols (kg)	0.0000E+00	4.1530E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1510E+21
Elemental I (atoms)	4.7236E+17	4.7713E+15
Organic I (atoms)	8.8430E+16	8.9323E+14
Aerosols (kg)	4.3942E-04	4.4386E-06

Environment Integral Nuclide Release:

Time (h) = 2.0000	Ci	kg	Atoms	Bq
Kr-83m	2.7801E+02	1.3696E-08	9.9371E+16	1.0287E+13
Kr-85m	8.8626E+02	1.0769E-07	7.6299E+17	3.2792E+13
Kr-85	5.7548E+01	1.4682E-04	1.0402E+21	2.1293E+12
Kr-87	9.6386E+02	3.4028E-08	2.3554E+17	3.5663E+13
Kr-88	2.1052E+03	1.6789E-07	1.1489E+18	7.7893E+13
Rb-86	2.0564E-01	2.5273E-09	1.7697E+16	7.6086E+09
Rb-88	5.8087E+02	4.8118E-09	3.2929E+16	2.1492E+13
Sr-89	4.8472E-01	1.6685E-08	1.1289E+17	1.7935E+10
Sr-90	5.1882E-02	3.8035E-07	2.5450E+18	1.9196E+09
Sr-91	5.5786E-01	1.5389E-10	1.0184E+15	2.0641E+10
Sr-92	4.8669E-01	3.8720E-11	2.5346E+14	1.8008E+10
Y-90	6.7950E-04	1.2489E-12	8.3569E+12	2.5141E+07
Y-91	6.1042E-03	2.4891E-10	1.6472E+15	2.2585E+08
Y-92	2.9644E-02	3.0807E-12	2.0166E+13	1.0968E+09
Y-93	6.3545E-03	1.9046E-12	1.2333E+13	2.3512E+08
Zr-95	7.1730E-03	3.3389E-10	2.1166E+15	2.6540E+08
Zr-97	6.6582E-03	3.4829E-12	2.1623E+13	2.4635E+08
Nb-95	7.0774E-03	1.8099E-10	1.1473E+15	2.6186E+08
Mo-99	8.9683E-02	1.8699E-10	1.1375E+15	3.3183E+09
Tc-99m	7.9783E-02	1.5173E-11	9.2296E+13	2.9520E+09
Ru-103	7.8368E-02	2.4282E-09	1.4197E+16	2.8996E+09
Ru-105	4.8212E-02	7.1723E-12	4.1136E+13	1.7839E+09
Ru-106	3.2600E-02	9.7443E-09	5.5360E+16	1.2062E+09
Rh-105	5.1980E-02	6.1584E-11	3.5321E+14	1.9233E+09
Sb-127	8.9589E-02	3.3547E-10	1.5908E+15	3.3148E+09
Sb-129	2.3963E-01	4.2613E-11	1.9893E+14	8.8663E+09
Te-127	8.9141E-02	3.3777E-11	1.6017E+14	3.2982E+09
Te-127m	1.5262E-02	1.6180E-09	7.6722E+15	5.6469E+08
Te-129	2.4803E-01	1.1843E-11	5.5288E+13	9.1769E+09
Te-129m	5.0055E-02	1.6615E-09	7.7566E+15	1.8520E+09
Te-131m	1.8551E-01	2.3264E-10	1.0695E+15	6.8639E+09
Te-132	1.3491E+00	4.4438E-09	2.0273E+16	4.9916E+10
I-131	9.0301E+01	7.2838E-07	3.3484E+18	3.3411E+12
I-132	1.1366E+02	1.1011E-08	5.0235E+16	4.2053E+12
I-133	1.8394E+02	1.6237E-07	7.3522E+17	6.8058E+12
I-134	1.3787E+02	5.1683E-09	2.3227E+16	5.1013E+12
I-135	1.6662E+02	4.7446E-08	2.1165E+17	6.1650E+12
Xe-133	7.0103E+03	3.7452E-05	1.6958E+20	2.5938E+14

Xe-133m	2.1360E+02	4.8518E-07	2.1968E+18	7.9032E+12
Xe-135	3.0158E+03	1.1809E-06	5.2680E+18	1.1159E+14
Xe-135m	2.1226E+02	2.3317E-09	1.0401E+16	7.8536E+12
Xe-138	1.1785E+02	1.2282E-09	5.3596E+15	4.3604E+12
Cs-134	2.0582E+01	1.5908E-05	7.1493E+19	7.6154E+11
Cs-136	6.2718E+00	8.5574E-08	3.7893E+17	2.3206E+11
Cs-137	1.5980E+01	1.8371E-04	8.0754E+20	5.9124E+11
Ba-139	4.5917E-01	2.8072E-11	1.2162E+14	1.6989E+10
Ba-140	7.1184E-01	9.7235E-09	4.1826E+16	2.6338E+10
La-140	1.0307E-02	1.8544E-11	7.9767E+13	3.8137E+08
La-141	5.6708E-03	1.0027E-12	4.2827E+12	2.0982E+08
La-142	4.3202E-03	3.0180E-13	1.2799E+12	1.5985E+08
Ce-141	1.6844E-02	5.9117E-10	2.5249E+15	6.2324E+08
Ce-143	1.6100E-02	2.4245E-11	1.0210E+14	5.9571E+08
Ce-144	1.3498E-02	4.2320E-09	1.7698E+16	4.9942E+08
Pr-143	6.4343E-03	9.5551E-11	4.0239E+14	2.3807E+08
Nd-147	2.6158E-03	3.2334E-11	1.3246E+14	9.6783E+07
Np-239	1.8987E-01	8.1842E-10	2.0622E+15	7.0251E+09
Pu-238	4.1943E-05	2.4500E-09	6.1993E+15	1.5519E+06
Pu-239	4.2301E-06	6.8056E-08	1.7148E+17	1.5651E+05
Pu-240	7.4722E-06	3.2807E-09	8.2320E+15	2.7647E+05
Pu-241	1.6601E-03	1.6787E-08	4.1947E+16	6.1423E+07
Am-241	9.3912E-07	2.7413E-10	6.8500E+14	3.4747E+04
Cm-242	2.5796E-04	7.7927E-11	1.9392E+14	9.5444E+06
Cm-244	1.7059E-05	2.0841E-10	5.1438E+14	6.3118E+05

Environment Transport Group Inventory:

Time (h) = 2.0000	Total Release	Release Rate/s	
Noble gases (atoms)	1.2195E+21	1.6937E+17	
Elemental I (atoms)	2.1165E+17	2.9396E+13	
Organic I (atoms)	1.1273E+16	1.5656E+12	
Aerosols (kg)	2.0114E-04	2.7937E-08	
Dose Effective (Ci) I-131 (Thyroid)			1.2656E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.5978E+02
Total I (Ci)			6.9239E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2317E+17
Elemental I (atoms)	1.9208E+14	1.9579E+12
Organic I (atoms)	9.6716E+12	9.8237E+10
Aerosols (kg)	1.8258E-07	1.8609E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2809E+16
Elemental I (atoms)	0.0000E+00	3.5936E+13
Organic I (atoms)	0.0000E+00	1.8093E+12
Aerosols (kg)	0.0000E+00	3.4158E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	2.6943E+16	0.0000E+00
Elemental I (atoms)	1.0488E+13	0.0000E+00
Organic I (atoms)	4.9985E+11	0.0000E+00
Aerosols (kg)	1.0098E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1510E+21
Elemental I (atoms)	4.7236E+17	4.7713E+15
Organic I (atoms)	8.8430E+16	8.9323E+14
Aerosols (kg)	4.3942E-04	4.4386E-06

CR Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
Kr-83m	2.3403E-02	1.1529E-12	8.3648E+12	3.6438E+12
Kr-85m	8.1490E-02	9.9021E-12	7.0155E+13	1.1015E+13
Kr-85	5.6133E-03	1.4321E-08	1.0146E+17	6.8986E+11
Kr-87	7.5314E-02	2.6589E-12	1.8405E+13	1.3196E+13
Kr-88	1.8683E-01	1.4900E-11	1.0196E+14	2.6733E+13
Rb-86	2.2140E-05	2.7210E-13	1.9054E+12	5.4145E+09
Rb-88	1.6033E-01	1.3282E-12	9.0892E+12	1.5999E+13
Sr-89	5.1780E-05	1.7823E-12	1.2060E+13	9.6647E+09
Sr-90	5.5455E-06	4.0654E-11	2.7203E+14	1.0347E+09
Sr-91	5.5219E-05	1.5233E-14	1.0081E+11	1.0786E+10
Sr-92	3.9664E-05	3.1556E-15	2.0656E+10	8.7154E+09
Y-90	1.3683E-07	2.5149E-16	1.6828E+09	1.8293E+07
Y-91	6.6512E-07	2.7121E-14	1.7948E+11	1.2269E+08
Y-92	1.1477E-05	1.1928E-15	7.8076E+09	1.2708E+09
Y-93	6.3188E-07	1.8939E-16	1.2264E+09	1.2309E+08
Zr-95	7.6634E-07	3.5672E-14	2.2613E+11	1.4303E+08
Zr-97	6.8164E-07	3.5657E-16	2.2137E+09	1.3049E+08
Nb-95	7.5649E-07	1.9346E-14	1.2264E+11	1.4114E+08
Mo-99	9.4809E-06	1.9768E-14	1.2025E+11	1.7806E+09
Tc-99m	8.5172E-06	1.6198E-15	9.8531E+09	1.5827E+09
Ru-103	8.3700E-06	2.5934E-13	1.5163E+12	1.5624E+09
Ru-105	4.3699E-06	6.5008E-16	3.7285E+09	9.0009E+08
Ru-106	3.4843E-06	1.0415E-12	5.9168E+12	6.5014E+08
Rh-105	5.5403E-06	6.5639E-15	3.7646E+10	1.0350E+09
Sb-127	9.5008E-06	3.5577E-14	1.6870E+11	1.7810E+09
Sb-129	2.1620E-05	3.8446E-15	1.7948E+10	4.4656E+09
Te-127	9.5224E-06	3.6082E-15	1.7110E+10	1.7718E+09
Te-127m	1.6313E-06	1.7294E-13	8.2008E+11	3.0437E+08

Te-129	2.4447E-05	1.1673E-15	5.4495E+09	4.6941E+09
Te-129m	5.3501E-06	1.7759E-13	8.2907E+11	9.9823E+08
Te-131m	1.9353E-05	2.4270E-14	1.1157E+11	3.6636E+09
Te-132	1.4286E-04	4.7058E-13	2.1469E+12	2.6804E+10
I-131	9.6932E-03	7.8187E-11	3.5943E+14	2.3680E+12
I-132	8.0543E-03	7.8029E-13	3.5599E+12	2.5034E+12
I-133	1.8938E-02	1.6717E-11	7.5695E+13	4.7389E+12
I-134	4.7768E-03	1.7906E-13	8.0473E+11	2.3474E+12
I-135	1.5511E-02	4.4167E-12	1.9702E+13	4.1157E+12
Xe-133	6.8216E-01	3.6443E-09	1.6501E+16	8.4049E+13
Xe-133m	2.0715E-02	4.7053E-11	2.1305E+14	2.5619E+12
Xe-135	2.8315E-01	1.1088E-10	4.9461E+14	3.5675E+13
Xe-135m	7.8467E-03	8.6197E-14	3.8451E+11	2.9954E+12
Xe-138	1.7609E-03	1.8352E-14	8.0084E+10	2.9011E+12
Cs-134	2.2207E-03	1.7164E-09	7.7138E+15	5.4243E+11
Cs-136	6.7465E-04	9.2050E-12	4.0760E+13	1.6507E+11
Cs-137	1.7242E-03	1.9823E-08	8.7135E+16	4.2114E+11
Ba-139	2.8661E-05	1.7522E-15	7.5915E+09	7.4294E+09
Ba-140	7.5906E-05	1.0368E-12	4.4600E+12	1.4183E+10
La-140	2.4937E-06	4.4865E-15	1.9299E+10	3.0853E+08
La-141	5.0303E-07	8.8948E-17	3.7990E+08	1.0497E+08
La-142	2.8573E-07	1.9960E-17	8.4650E+07	7.1430E+07
Ce-141	1.7993E-06	6.3146E-14	2.6970E+11	3.3584E+08
Ce-143	1.6834E-06	2.5349E-15	1.0675E+10	3.1824E+08
Ce-144	1.4426E-06	4.5230E-13	1.8915E+12	2.6918E+08
Pr-143	6.9010E-07	1.0248E-14	4.3158E+10	1.2849E+08
Nd-147	2.7882E-07	3.4465E-15	1.4119E+10	5.2109E+07
Np-239	2.0035E-05	8.6359E-14	2.1760E+11	3.7669E+09
Pu-238	4.4832E-09	2.6188E-13	6.6262E+11	8.3650E+05
Pu-239	4.5222E-10	7.2754E-12	1.8332E+13	8.4368E+04
Pu-240	7.9868E-10	3.5066E-13	8.7989E+11	1.4902E+05
Pu-241	1.7744E-07	1.7943E-12	4.4836E+12	3.3108E+07
Am-241	1.0041E-10	2.9311E-14	7.3243E+10	1.8732E+04
Cm-242	2.7567E-08	8.3279E-15	2.0724E+10	5.1442E+06
Cm-244	1.8234E-09	2.2277E-14	5.4981E+10	3.4022E+05

CR Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	1.1887E+17	0.0000E+00	
Elemental I (atoms)	2.2248E+13	0.0000E+00	
Organic I (atoms)	1.1623E+12	0.0000E+00	
Aerosols (kg)	2.1701E-08	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.2371E-12
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.5217E-12
Total I (Ci)			5.6973E-02

Time (h) = 2.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	4.3805E+12
Organic I (atoms)	0.0000E+00	2.0876E+11
Aerosols (kg)	0.0000E+00	4.2175E-09

CR Filtered Intake Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported

Noble gases (atoms)	0.0000E+00	1.2317E+17
Elemental I (atoms)	1.9208E+14	1.9579E+12
Organic I (atoms)	9.6716E+12	9.8237E+10
Aerosols (kg)	1.8258E-07	1.8609E-09

CR Unfiltered Inleakage Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2809E+16
Elemental I (atoms)	0.0000E+00	3.5936E+13
Organic I (atoms)	0.0000E+00	1.8093E+12
Aerosols (kg)	0.0000E+00	3.4158E-08

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	2.6943E+16	0.0000E+00
Elemental I (atoms)	1.0488E+13	0.0000E+00
Organic I (atoms)	4.9985E+11	0.0000E+00
Aerosols (kg)	1.0098E-08	0.0000E+00

EAB Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5678E-02	9.0278E-03	1.6096E-02
Accumulated dose (rem)	8.5639E-02	5.6761E+00	3.2829E-01

LPZ Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.5211E-03	4.3309E-03	7.7218E-03
Accumulated dose (rem)	2.8496E-02	7.8714E-01	6.2183E-02

CR Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.5878E-04	4.0752E-01	1.8599E-02
Accumulated dose (rem)	4.3453E-03	3.5905E+00	1.5921E-01

DW Compartment Nuclide Inventory:

Time (h) = 2.2500	Ci	kg	Atoms	Decay
Kr-83m	4.3831E+06	2.1592E-04	1.5666E+21	1.2263E+21
Kr-85m	1.6117E+07	1.9584E-03	1.3875E+22	3.8378E+21
Kr-85	1.1540E+06	2.9440E+00	2.0858E+25	2.4645E+20
Kr-87	1.3510E+07	4.7697E-04	3.3016E+21	4.3239E+21
Kr-88	3.6134E+07	2.8817E-03	1.9720E+22	9.1818E+21
Rb-86	5.3333E+01	6.5546E-07	4.5898E+18	6.1078E+17
Rb-88	9.6456E+06	7.9903E-05	5.4680E+20	6.0980E+20
Sr-89	2.9372E+03	1.0110E-04	6.8409E+20	1.8535E+19
Sr-90	3.1462E+02	2.3064E-03	1.5433E+22	1.9842E+18
Sr-91	3.0761E+03	8.4859E-07	5.6157E+18	2.0826E+19
Sr-92	2.1109E+03	1.6794E-07	1.0993E+18	1.7143E+19
Y-90	4.4875E+00	8.2481E-09	5.5190E+16	2.1056E+16
Y-91	3.7057E+01	1.5110E-06	9.9997E+18	2.3241E+17

Y-92	1.8729E+02	1.9464E-08	1.2741E+17	3.1432E+17
Y-93	3.5239E+01	1.0562E-08	6.8394E+16	2.3756E+17
Zr-95	4.3472E+01	2.0236E-06	1.2828E+19	2.7429E+17
Zr-97	3.8277E+01	2.0023E-08	1.2431E+17	2.5119E+17
Nb-95	4.2918E+01	1.0976E-06	6.9576E+18	2.7067E+17
Mo-99	5.3647E+02	1.1185E-06	6.8041E+18	3.4179E+18
Tc-99m	4.8298E+02	9.1852E-08	5.5873E+17	3.0377E+18
Ru-103	4.7477E+02	1.4711E-05	8.6010E+19	2.9964E+18
Ru-105	2.3843E+02	3.5470E-08	2.0343E+17	1.7521E+18
Ru-106	1.9767E+02	5.9084E-05	3.3567E+20	1.2468E+18
Rh-105	3.1397E+02	3.7198E-07	2.1335E+18	1.9853E+18
Sb-127	5.3800E+02	2.0146E-06	9.5529E+18	3.4177E+18
Sb-129	1.1783E+03	2.0954E-07	9.7820E+17	8.6966E+18
Te-127	5.4013E+02	2.0466E-07	9.7048E+17	3.3996E+18
Te-127m	9.2550E+01	9.8118E-06	4.6526E+19	5.8368E+17
Te-129	1.3545E+03	6.4677E-08	3.0193E+17	9.0915E+18
Te-129m	3.0352E+02	1.0075E-05	4.7034E+19	1.9143E+18
Te-131m	1.0916E+03	1.3690E-06	6.2933E+18	7.0403E+18
Te-132	8.0872E+03	2.6638E-05	1.2153E+20	5.1443E+19
I-131	5.9152E+04	4.7713E-04	2.1934E+21	3.0836E+20
I-132	7.8067E+04	7.5631E-06	3.4505E+19	4.3649E+20
I-133	1.1460E+05	1.0116E-04	4.5805E+20	6.2232E+20
I-134	2.3920E+04	8.9664E-07	4.0296E+18	4.0089E+20
I-135	9.2196E+04	2.6253E-05	1.1711E+20	5.5235E+20
Xe-133	1.4036E+08	7.4984E-01	3.3952E+24	3.0055E+22
Xe-133m	4.2663E+06	9.6905E-03	4.3878E+22	9.1709E+20
Xe-135	6.0652E+07	2.3750E-02	1.0595E+23	1.3224E+22
Xe-135m	2.1045E+06	2.3118E-05	1.0313E+20	1.4679E+21
Xe-138	1.7407E+05	1.8141E-06	7.9165E+18	7.1381E+20
Cs-134	5.3515E+03	4.1361E-03	1.8588E+22	6.1155E+19
Cs-136	1.6249E+03	2.2170E-05	9.8169E+19	1.8625E+19
Cs-137	4.1550E+03	4.7768E-02	2.0998E+23	4.7479E+19
Ba-139	1.4340E+03	8.7666E-08	3.7981E+17	1.5039E+19
Ba-140	4.3040E+03	5.8790E-05	2.5289E+20	2.7204E+19
La-140	7.0458E+01	1.2676E-07	5.4527E+17	2.8685E+17
La-141	2.7308E+01	4.8286E-09	2.0623E+16	2.0476E+17
La-142	1.4487E+01	1.0120E-09	4.2919E+15	1.4365E+17
Ce-141	1.0211E+02	3.5838E-06	1.5306E+19	6.4422E+17
Ce-143	9.5003E+01	1.4306E-07	6.0246E+17	6.1146E+17
Ce-144	8.1842E+01	2.5660E-05	1.0731E+20	5.1621E+17
Pr-143	3.9029E+01	5.7960E-07	2.4409E+18	2.4588E+17
Nd-147	1.5808E+01	1.9541E-07	8.0052E+17	9.9952E+16
Np-239	1.1332E+03	4.8845E-06	1.2307E+19	7.2317E+18
Pu-238	2.5435E-01	1.4857E-05	3.7593E+19	1.6041E+15
Pu-239	2.5657E-02	4.1277E-04	1.0401E+21	1.6179E+14
Pu-240	4.5312E-02	1.9894E-05	4.9919E+19	2.8577E+14
Pu-241	1.0067E+01	1.0180E-04	2.5437E+20	6.3490E+16
Am-241	5.6959E-03	1.6626E-06	4.1546E+18	3.5916E+13
Cm-242	1.5639E+00	4.7245E-07	1.1757E+18	9.8650E+15
Cm-244	1.0345E-01	1.2638E-06	3.1192E+18	6.5242E+14

DW Transport Group Inventory:

Time (h) = 2.2500	Atmosphere	Sump
Noble gases (atoms)	2.4442E+25	0.0000E+00
Elemental I (atoms)	6.6435E+19	7.8026E+22
Organic I (atoms)	1.4393E+21	0.0000E+00
Aerosols (kg)	5.5477E-02	6.5809E+01

Dose Effective (Ci/cc) I-131 (Thyroid) 9.3863E-06
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid) 1.1611E-05
Total I (Ci) 3.6793E+05

DW to WW Transport Group Inventory:
Time (h) = 2.2500 Leakage Transport

Noble gases (atoms) 1.7402E+26
Elemental I (atoms) 5.6182E+21
Organic I (atoms) 1.0271E+22
Aerosols (kg) 4.6670E+00

WW to DW Transport Group Inventory:
Time (h) = 2.2500 Leakage Transport

Noble gases (atoms) 3.1591E+26
Elemental I (atoms) 9.7111E+21
Organic I (atoms) 1.8660E+22
Aerosols (kg) 8.0662E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.2500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9904E+22
Elemental I (atoms)	0.0000E+00	4.6863E+18
Organic I (atoms)	0.0000E+00	1.3754E+18
Aerosols (kg)	0.0000E+00	4.2203E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 2.2500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7799E+21
Elemental I (atoms)	0.0000E+00	2.6333E+17
Organic I (atoms)	0.0000E+00	1.1969E+17
Aerosols (kg)	0.0000E+00	2.2966E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 2.2500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.6527E+21
Elemental I (atoms)	0.0000E+00	1.4281E+18
Organic I (atoms)	0.0000E+00	6.4910E+17
Aerosols (kg)	0.0000E+00	1.2455E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

	Pathway	
Time (h) = 2.2500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.6527E+21
Elemental I (atoms)	0.0000E+00	1.4281E+18
Organic I (atoms)	0.0000E+00	6.4910E+17
Aerosols (kg)	0.0000E+00	1.2455E-03

RB Compartment Nuclide Inventory:

Time (h) = 2.2500	Ci	kg	Atoms	Decay
Kr-83m	3.6920E+03	1.8188E-07	1.3196E+18	4.3238E+17
Kr-85m	1.3576E+04	1.6496E-06	1.1687E+19	1.4077E+18
Kr-85	9.7202E+02	2.4798E-03	1.7569E+22	9.2926E+16
Kr-87	1.1380E+04	4.0177E-07	2.7810E+18	1.4770E+18
Kr-88	3.0437E+04	2.4274E-06	1.6611E+19	3.3141E+18
Rb-86	3.4634E+00	4.2565E-08	2.9806E+17	8.8389E+14
Rb-88	2.6388E+04	2.1860E-07	1.4959E+18	2.0388E+18
Sr-89	6.8281E+01	2.3503E-06	1.5903E+19	9.2929E+15
Sr-90	7.3138E+00	5.3618E-05	3.5877E+20	9.9506E+14
Sr-91	7.1510E+01	1.9727E-08	1.3055E+17	1.0164E+16
Sr-92	4.9072E+01	3.9041E-09	2.5555E+16	7.8124E+15
Y-90	1.5379E-01	2.8266E-10	1.8914E+15	1.6251E+13
Y-91	8.7137E-01	3.5531E-08	2.3514E+17	1.1768E+14
Y-92	1.0767E+01	1.1189E-09	7.3244E+15	9.5790E+14
Y-93	8.1919E-01	2.4554E-10	1.5900E+15	1.1613E+14
Zr-95	1.0106E+00	4.7042E-08	2.9820E+17	1.3753E+14
Zr-97	8.8982E-01	4.6547E-10	2.8898E+15	1.2406E+14
Nb-95	9.9772E-01	2.5515E-08	1.6174E+17	1.3574E+14
Mo-99	1.2471E+01	2.6003E-08	1.5817E+17	1.7074E+15
Tc-99m	1.1228E+01	2.1353E-09	1.2989E+16	1.5211E+15
Ru-103	1.1037E+01	3.4198E-07	1.9995E+18	1.5023E+15
Ru-105	5.5427E+00	8.2456E-10	4.7291E+15	8.2893E+14
Ru-106	4.5952E+00	1.3735E-06	7.8033E+18	6.2521E+14
Rh-105	7.2989E+00	8.6474E-09	4.9596E+16	9.9445E+14
Sb-127	1.2507E+01	4.6833E-08	2.2208E+17	1.7092E+15
Sb-129	2.7392E+01	4.8712E-09	2.2740E+16	4.1076E+15
Te-127	1.2556E+01	4.7578E-09	2.2561E+16	1.7033E+15
Te-127m	2.1515E+00	2.2809E-07	1.0816E+18	2.9271E+14
Te-129	3.1487E+01	1.5035E-09	7.0190E+15	4.4089E+15
Te-129m	7.0559E+00	2.3422E-07	1.0934E+18	9.5997E+14
Te-131m	2.5377E+01	3.1825E-08	1.4630E+17	3.5004E+15
Te-132	1.8800E+02	6.1926E-07	2.8252E+18	2.5713E+16
I-131	1.6589E+03	1.3381E-05	6.1513E+19	4.0403E+17
I-132	1.5383E+03	1.4903E-07	6.7989E+17	4.5137E+17
I-133	3.2161E+03	2.8390E-06	1.2855E+19	8.0685E+17
I-134	6.7129E+02	2.5164E-08	1.1309E+17	3.9937E+17
I-135	2.5874E+03	7.3677E-07	3.2866E+18	6.9781E+17
Xe-133	1.1813E+05	6.3111E-04	2.8576E+21	1.1317E+19
Xe-133m	3.5870E+03	8.1476E-06	3.6892E+19	3.4465E+17
Xe-135	5.0001E+04	1.9580E-05	8.7342E+19	4.8680E+18
Xe-135m	1.4555E+03	1.5989E-08	7.1324E+16	3.3906E+17
Xe-138	1.4662E+02	1.5281E-09	6.6683E+15	1.7820E+17
Cs-134	3.4752E+02	2.6860E-04	1.2071E+21	8.8555E+16
Cs-136	1.0552E+02	1.4397E-06	6.3750E+18	2.6947E+16
Cs-137	2.6982E+02	3.1020E-03	1.3636E+22	6.8754E+16
Ba-139	3.3335E+01	2.0380E-09	8.8294E+15	6.2426E+15
Ba-140	1.0005E+02	1.3667E-06	5.8789E+18	1.3631E+16
La-140	2.7100E+00	4.8756E-09	2.0972E+16	2.6750E+14
La-141	6.3482E-01	1.1225E-10	4.7942E+14	9.6140E+13
La-142	3.3678E-01	2.3526E-11	9.9773E+13	6.0844E+13
Ce-141	2.3732E+00	8.3290E-08	3.5574E+17	3.2297E+14
Ce-143	2.2085E+00	3.3257E-09	1.4005E+16	3.0425E+14
Ce-144	1.9026E+00	5.9651E-07	2.4946E+18	2.5886E+14
Pr-143	9.0914E-01	1.3501E-08	5.6856E+16	1.2351E+14
Nd-147	3.6749E-01	4.5426E-09	1.8610E+16	5.0075E+13

Np-239	2.6342E+01	1.1355E-07	2.8611E+17	3.6101E+15
Pu-238	5.9128E-03	3.4538E-07	8.7393E+17	8.0445E+11
Pu-239	5.9644E-04	9.5957E-06	2.4179E+19	8.1139E+10
Pu-240	1.0534E-03	4.6248E-07	1.1605E+18	1.4331E+11
Pu-241	2.3402E-01	2.3664E-06	5.9133E+18	3.1839E+13
Am-241	1.3243E-04	3.8656E-08	9.6595E+16	1.8014E+10
Cm-242	3.6356E-02	1.0983E-08	2.7331E+16	4.9468E+12
Cm-244	2.4048E-03	2.9380E-08	7.2513E+16	3.2718E+11

RB Transport Group Inventory:

Time (h) = 2.2500	Atmosphere	Sump	
Noble gases (atoms)	2.0584E+22	0.0000E+00	
Elemental I (atoms)	3.7442E+18	0.0000E+00	
Organic I (atoms)	1.3638E+18	0.0000E+00	
Aerosols (kg)	3.4624E-03	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		4.1485E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		5.0982E-08
Total I (Ci)			9.6720E+03

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.2500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9904E+22
Elemental I (atoms)	0.0000E+00	4.6863E+18
Organic I (atoms)	0.0000E+00	1.3754E+18
Aerosols (kg)	0.0000E+00	4.2203E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.2500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4173E+21
Elemental I (atoms)	0.0000E+00	7.4309E+16
Organic I (atoms)	0.0000E+00	1.4278E+17
Aerosols (kg)	0.0000E+00	6.1722E-05

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 2.2500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 2.2500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7769E+21
Elemental I (atoms)	6.0022E+17	6.0629E+15
Organic I (atoms)	1.3022E+17	1.3153E+15
Aerosols (kg)	5.5740E-04	5.6303E-06

Environment Integral Nuclide Release:

Time (h) = 2.2500	Ci	kg	Atoms	Bq
Kr-83m	3.9348E+02	1.9384E-08	1.4064E+17	1.4559E+13
Kr-85m	1.3038E+03	1.5843E-07	1.1224E+18	4.8240E+13
Kr-85	8.7091E+01	2.2219E-04	1.5742E+21	3.2224E+12
Kr-87	1.3246E+03	4.6763E-08	3.2369E+17	4.9010E+13
Kr-88	3.0477E+03	2.4306E-07	1.6633E+18	1.1277E+14
Rb-86	2.0683E-01	2.5419E-09	1.7800E+16	7.6527E+09
Rb-88	7.8708E+02	6.5201E-09	4.4619E+16	2.9122E+13
Sr-89	5.0799E-01	1.7485E-08	1.1831E+17	1.8796E+10
Sr-90	5.4374E-02	3.9862E-07	2.6673E+18	2.0118E+09
Sr-91	5.8237E-01	1.6065E-10	1.0632E+15	2.1548E+10
Sr-92	5.0376E-01	4.0078E-11	2.6234E+14	1.8639E+10
Y-90	7.3005E-04	1.3418E-12	8.9787E+12	2.7012E+07
Y-91	6.4007E-03	2.6100E-10	1.7272E+15	2.3683E+08
Y-92	3.3135E-02	3.4435E-12	2.2541E+13	1.2260E+09
Y-93	6.6351E-03	1.9888E-12	1.2878E+13	2.4550E+08
Zr-95	7.5174E-03	3.4992E-10	2.2182E+15	2.7814E+08
Zr-97	6.9624E-03	3.6420E-12	2.2611E+13	2.5761E+08
Nb-95	7.4174E-03	1.8969E-10	1.2024E+15	2.7444E+08
Mo-99	9.3936E-02	1.9586E-10	1.1914E+15	3.4756E+09
Tc-99m	8.3609E-02	1.5901E-11	9.6723E+13	3.0935E+09
Ru-103	8.2129E-02	2.5447E-09	1.4878E+16	3.0388E+09
Ru-105	5.0125E-02	7.4568E-12	4.2768E+13	1.8546E+09
Ru-106	3.4166E-02	1.0212E-08	5.8019E+16	1.2641E+09
Rh-105	5.4468E-02	6.4532E-11	3.7011E+14	2.0153E+09
Sb-127	9.3853E-02	3.5144E-10	1.6665E+15	3.4726E+09
Sb-129	2.4908E-01	4.4294E-11	2.0678E+14	9.2161E+09
Te-127	9.3420E-02	3.5398E-11	1.6785E+14	3.4565E+09
Te-127m	1.5995E-02	1.6957E-09	8.0408E+15	5.9181E+08
Te-129	2.5884E-01	1.2360E-11	5.7699E+13	9.5770E+09
Te-129m	5.2459E-02	1.7414E-09	8.1292E+15	1.9410E+09
Te-131m	1.9417E-01	2.4351E-10	1.1194E+15	7.1844E+09
Te-132	1.4132E+00	4.6549E-09	2.1237E+16	5.2288E+10
I-131	9.0870E+01	7.3298E-07	3.3695E+18	3.3622E+12
I-132	1.1419E+02	1.1063E-08	5.0472E+16	4.2252E+12
I-133	1.8505E+02	1.6335E-07	7.3965E+17	6.8467E+12
I-134	1.3812E+02	5.1775E-09	2.3268E+16	5.1104E+12
I-135	1.6752E+02	4.7701E-08	2.1279E+17	6.1982E+12
Xe-133	1.0602E+04	5.6638E-05	2.5645E+20	3.9226E+14
Xe-133m	3.2269E+02	7.3297E-07	3.3188E+18	1.1940E+13
Xe-135	4.5385E+03	1.7772E-06	7.9278E+18	1.6792E+14
Xe-135m	2.5841E+02	2.8387E-09	1.2663E+16	9.5612E+12
Xe-138	1.2350E+02	1.2871E-09	5.6169E+15	4.5697E+12
Cs-134	2.0702E+01	1.6000E-05	7.1908E+19	7.6597E+11
Cs-136	6.3081E+00	8.6070E-08	3.8112E+17	2.3340E+11
Cs-137	1.6072E+01	1.8478E-04	8.1224E+20	5.9468E+11
Ba-139	4.7100E-01	2.8795E-11	1.2475E+14	1.7427E+10
Ba-140	7.4594E-01	1.0189E-08	4.3829E+16	2.7600E+10
La-140	1.1191E-02	2.0133E-11	8.6604E+13	4.1405E+08
La-141	5.8902E-03	1.0415E-12	4.4484E+12	2.1794E+08
La-142	4.4392E-03	3.1011E-13	1.3152E+12	1.6425E+08
Ce-141	1.7653E-02	6.1955E-10	2.6461E+15	6.5316E+08
Ce-143	1.6854E-02	2.5380E-11	1.0688E+14	6.2360E+08
Ce-144	1.4146E-02	4.4353E-09	1.8548E+16	5.2341E+08
Pr-143	6.7440E-03	1.0015E-10	4.2176E+14	2.4953E+08
Nd-147	2.7410E-03	3.3882E-11	1.3880E+14	1.0142E+08
Np-239	1.9885E-01	8.5715E-10	2.1598E+15	7.3575E+09

Pu-238	4.3958E-05	2.5677E-09	6.4970E+15	1.6264E+06
Pu-239	4.4333E-06	7.1326E-08	1.7972E+17	1.6403E+05
Pu-240	7.8311E-06	3.4383E-09	8.6274E+15	2.8975E+05
Pu-241	1.7398E-03	1.7593E-08	4.3962E+16	6.4373E+07
Am-241	9.8424E-07	2.8730E-10	7.1791E+14	3.6417E+04
Cm-242	2.7035E-04	8.1670E-11	2.0323E+14	1.0003E+07
Cm-244	1.7878E-05	2.1842E-10	5.3909E+14	6.6150E+05

Environment Transport Group Inventory:

Time (h) = 2.2500	Total Release	Release Rate/s	
Noble gases (atoms)	1.8451E+21	2.2779E+17	
Elemental I (atoms)	2.1294E+17	2.6289E+13	
Organic I (atoms)	1.1694E+16	1.4437E+12	
Aerosols (kg)	2.0234E-04	2.4980E-08	
Dose Effective (Ci) I-131 (Thyroid)			1.2734E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.6074E+02
Total I (Ci)			6.9575E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4103E+17
Elemental I (atoms)	1.9212E+14	1.9582E+12
Organic I (atoms)	9.6835E+12	9.8358E+10
Aerosols (kg)	1.8261E-07	1.8612E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6117E+16
Elemental I (atoms)	0.0000E+00	3.5943E+13
Organic I (atoms)	0.0000E+00	1.8115E+12
Aerosols (kg)	0.0000E+00	3.4164E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	3.4826E+16	0.0000E+00
Elemental I (atoms)	1.1827E+13	0.0000E+00
Organic I (atoms)	5.6987E+11	0.0000E+00
Aerosols (kg)	1.1406E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7769E+21
Elemental I (atoms)	6.0022E+17	6.0629E+15
Organic I (atoms)	1.3022E+17	1.3153E+15
Aerosols (kg)	5.5740E-04	5.6303E-06

CR Compartment Nuclide Inventory:

Time (h) = 2.2500	Ci	kg	Atoms	Decay
Kr-83m	2.3703E-02	1.1677E-12	8.4721E+12	4.4418E+12
Kr-85m	8.7156E-02	1.0591E-11	7.5034E+13	1.3871E+13
Kr-85	6.2404E-03	1.5921E-08	1.1280E+17	8.9045E+11
Kr-87	7.3061E-02	2.5793E-12	1.7854E+13	1.5710E+13
Kr-88	1.9541E-01	1.5584E-11	1.0664E+14	3.3207E+13
Rb-86	2.0248E-05	2.4884E-13	1.7425E+12	6.1086E+09
Rb-88	1.7485E-01	1.4484E-12	9.9119E+12	2.0826E+13
Sr-89	4.7473E-05	1.6341E-12	1.1057E+13	1.1290E+10
Sr-90	5.0850E-06	3.7278E-11	2.4944E+14	1.2088E+09
Sr-91	4.9719E-05	1.3716E-14	9.0766E+10	1.2505E+10
Sr-92	3.4118E-05	2.7144E-15	1.7768E+10	9.9223E+09
Y-90	1.3880E-07	2.5512E-16	1.7071E+09	2.2730E+07
Y-91	6.1240E-07	2.4972E-14	1.6526E+11	1.4360E+08
Y-92	1.1708E-05	1.2168E-15	7.9647E+09	1.6409E+09
Y-93	5.6955E-07	1.7071E-16	1.1054E+09	1.4277E+08
Zr-95	7.0263E-07	3.2706E-14	2.0733E+11	1.6709E+08
Zr-97	6.1866E-07	3.2362E-16	2.0092E+09	1.5179E+08
Nb-95	6.9367E-07	1.7740E-14	1.1245E+11	1.6490E+08
Mo-99	8.6708E-06	1.8079E-14	1.0997E+11	2.0779E+09
Tc-99m	7.8063E-06	1.4846E-15	9.0306E+09	1.8488E+09
Ru-103	7.6736E-06	2.3777E-13	1.3902E+12	1.8252E+09
Ru-105	3.8536E-06	5.7328E-16	3.2880E+09	1.0347E+09
Ru-106	3.1949E-06	9.5496E-13	5.4254E+12	7.5954E+08
Rh-105	5.0747E-06	6.0122E-15	3.4482E+10	1.2088E+09
Sb-127	8.6956E-06	3.2561E-14	1.5440E+11	2.0791E+09
Sb-129	1.9045E-05	3.3867E-15	1.5810E+10	5.1312E+09
Te-127	8.7299E-06	3.3079E-15	1.5686E+10	2.0698E+09
Te-127m	1.4959E-06	1.5858E-13	7.5198E+11	3.5559E+08
Te-129	2.1892E-05	1.0454E-15	4.8800E+09	5.4360E+09
Te-129m	4.9057E-06	1.6284E-13	7.6021E+11	1.1662E+09
Te-131m	1.7644E-05	2.2127E-14	1.0172E+11	4.2695E+09
Te-132	1.3071E-04	4.3055E-13	1.9643E+12	3.1285E+10
I-131	8.8602E-03	7.1468E-11	3.2854E+14	2.6717E+12
I-132	6.8440E-03	6.6304E-13	3.0250E+12	2.7469E+12
I-133	1.7182E-02	1.5168E-11	6.8678E+13	5.3303E+12
I-134	3.5864E-03	1.3444E-13	6.0419E+11	2.4834E+12
I-135	1.3823E-02	3.9362E-12	1.7559E+13	4.5957E+12
Xe-133	7.5752E-01	4.0470E-09	1.8324E+16	1.0841E+14
Xe-133m	2.2967E-02	5.2168E-11	2.3621E+14	3.3012E+12
Xe-135	3.1089E-01	1.2174E-10	5.4306E+14	4.5736E+13
Xe-135m	6.1390E-03	6.7437E-14	3.0082E+11	3.2256E+12
Xe-138	9.4132E-04	9.8103E-15	4.2811E+10	2.9455E+12
Cs-134	2.0316E-03	1.5703E-09	7.0569E+15	6.1205E+11
Cs-136	6.1686E-04	8.4166E-12	3.7269E+13	1.8622E+11
Cs-137	1.5774E-03	1.8135E-08	7.9716E+16	4.7520E+11
Ba-139	2.3177E-05	1.4169E-15	6.1388E+09	8.2757E+09

Ba-140	6.9564E-05	9.5021E-13	4.0874E+12	1.6566E+10
La-140	2.5741E-06	4.6310E-15	1.9921E+10	3.8984E+08
La-141	4.4136E-07	7.8044E-17	3.3333E+08	1.2043E+08
La-142	2.3415E-07	1.6357E-17	6.9369E+07	7.9921E+07
Ce-141	1.6496E-06	5.7894E-14	2.4727E+11	3.9233E+08
Ce-143	1.5355E-06	2.3122E-15	9.7374E+09	3.7096E+08
Ce-144	1.3228E-06	4.1473E-13	1.7344E+12	3.1448E+08
Pr-143	6.3328E-07	9.4044E-15	3.9604E+10	1.5016E+08
Nd-147	2.5550E-07	3.1583E-15	1.2939E+10	6.0861E+07
Np-239	1.8315E-05	7.8946E-14	1.9892E+11	4.3950E+09
Pu-238	4.1110E-09	2.4013E-13	6.0760E+11	9.7727E+05
Pu-239	4.1468E-10	6.6716E-12	1.6810E+13	9.8568E+04
Pu-240	7.3236E-10	3.2155E-13	8.0683E+11	1.7410E+05
Pu-241	1.6271E-07	1.6453E-12	4.1113E+12	3.8679E+07
Am-241	9.2084E-11	2.6879E-14	6.7166E+10	2.1885E+04
Cm-242	2.5277E-08	7.6361E-15	1.9002E+10	6.0098E+06
Cm-244	1.6720E-09	2.0427E-14	5.0415E+10	3.9747E+05

CR Transport Group Inventory:

Time (h) = 2.2500	Atmosphere	Sump	
Noble gases (atoms)	1.3211E+17	0.0000E+00	
Elemental I (atoms)	2.0272E+13	0.0000E+00	
Organic I (atoms)	1.0610E+12	0.0000E+00	
Aerosols (kg)	1.9853E-08	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.1275E-12
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.3821E-12
Total I (Ci)			5.0296E-02

Time (h) = 2.2500	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	4.9398E+12
Organic I (atoms)	0.0000E+00	2.3801E+11
Aerosols (kg)	0.0000E+00	4.7638E-09

CR Filtered Intake Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4103E+17
Elemental I (atoms)	1.9212E+14	1.9582E+12
Organic I (atoms)	9.6835E+12	9.8358E+10
Aerosols (kg)	1.8261E-07	1.8612E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6117E+16
Elemental I (atoms)	0.0000E+00	3.5943E+13
Organic I (atoms)	0.0000E+00	1.8115E+12
Aerosols (kg)	0.0000E+00	3.4164E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported

Noble gases (atoms)	3.4826E+16	0.0000E+00
Elemental I (atoms)	1.1827E+13	0.0000E+00
Organic I (atoms)	5.6987E+11	0.0000E+00
Aerosols (kg)	1.1406E-08	0.0000E+00

EAB Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0631E-02	5.3107E-03	1.0878E-02
Accumulated dose (rem)	9.6270E-02	5.6814E+00	3.3917E-01

LPZ Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.1001E-03	2.5477E-03	5.2187E-03
Accumulated dose (rem)	3.3596E-02	7.8969E-01	6.7401E-02

CR Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.6875E-04	2.2697E-01	1.0442E-02
Accumulated dose (rem)	4.8140E-03	3.8175E+00	1.6965E-01

DW Compartment Nuclide Inventory:

Time (h) = 2.4000	Ci	kg	Atoms	Decay
Kr-83m	4.1442E+06	2.0416E-04	1.4813E+21	1.3115E+21
Kr-85m	1.5745E+07	1.9132E-03	1.3555E+22	4.1560E+21
Kr-85	1.1538E+06	2.9436E+00	2.0855E+25	2.6951E+20
Kr-87	1.2448E+07	4.3946E-04	3.0420E+21	4.5831E+21
Kr-88	3.4831E+07	2.7777E-03	1.9009E+22	9.8906E+21
Rb-86	5.8016E+01	7.1302E-07	4.9929E+18	6.1194E+17
Rb-88	1.8684E+07	1.5478E-04	1.0592E+21	8.3282E+20
Sr-89	3.1956E+03	1.0999E-04	7.4427E+20	1.8598E+19
Sr-90	3.4232E+02	2.5096E-03	1.6792E+22	1.9911E+18
Sr-91	3.3106E+03	9.1327E-07	6.0438E+18	2.0892E+19
Sr-92	2.2103E+03	1.7585E-07	1.1511E+18	1.7188E+19
Y-90	5.4307E+00	9.9817E-09	6.6790E+16	2.1156E+16
Y-91	4.0421E+01	1.6482E-06	1.0907E+19	2.3322E+17
Y-92	2.6363E+02	2.7398E-08	1.7934E+17	3.1863E+17
Y-93	3.7949E+01	1.1375E-08	7.3655E+16	2.3832E+17
Zr-95	4.7297E+01	2.2016E-06	1.3956E+19	2.7524E+17
Zr-97	4.1392E+01	2.1652E-08	1.3443E+17	2.5202E+17
Nb-95	4.6698E+01	1.1942E-06	7.5703E+18	2.7160E+17
Mo-99	5.8279E+02	1.2151E-06	7.3916E+18	3.4296E+18
Tc-99m	5.2534E+02	9.9909E-08	6.0774E+17	3.0482E+18
Ru-103	5.1653E+02	1.6004E-05	9.3574E+19	3.0068E+18
Ru-105	2.5342E+02	3.7700E-08	2.1622E+17	1.7573E+18
Ru-106	2.1507E+02	6.4286E-05	3.6523E+20	1.2511E+18
Rh-105	3.4137E+02	4.0444E-07	2.3196E+18	1.9921E+18
Sb-127	5.8472E+02	2.1895E-06	1.0382E+19	3.4294E+18
Sb-129	1.2516E+03	2.2257E-07	1.0390E+18	8.7219E+18
Te-127	5.8761E+02	2.2265E-07	1.0558E+18	3.4113E+18
Te-127m	1.0070E+02	1.0676E-05	5.0623E+19	5.8569E+17
Te-129	1.4520E+03	6.9332E-08	3.2367E+17	9.1201E+18
Te-129m	3.3024E+02	1.0962E-05	5.1175E+19	1.9209E+18
Te-131m	1.1837E+03	1.4844E-06	6.8238E+18	7.0640E+18

Te-132	8.7877E+03	2.8946E-05	1.3206E+20	5.1619E+19
I-131	6.0391E+04	4.8713E-04	2.2393E+21	3.0957E+20
I-132	7.6619E+04	7.4227E-06	3.3864E+19	4.3806E+20
I-133	1.1648E+05	1.0282E-04	4.6556E+20	6.2465E+20
I-134	2.1701E+04	8.1348E-07	3.6559E+18	4.0136E+20
I-135	9.2708E+04	2.6399E-05	1.1776E+20	5.5422E+20
Xe-133	1.4023E+08	7.4914E-01	3.3921E+24	3.2857E+22
Xe-133m	4.2575E+06	9.6705E-03	4.3787E+22	1.0022E+21
Xe-135	5.9975E+07	2.3485E-02	1.0476E+23	1.4429E+22
Xe-135m	1.4050E+06	1.5434E-05	6.8847E+19	1.5024E+21
Xe-138	1.1217E+05	1.1690E-06	5.1013E+18	7.1663E+20
Cs-134	5.8227E+03	4.5003E-03	2.0225E+22	6.1271E+19
Cs-136	1.7674E+03	2.4114E-05	1.0678E+20	1.8661E+19
Cs-137	4.5209E+03	5.1975E-02	2.2847E+23	4.7570E+19
Ba-139	1.4469E+03	8.8456E-08	3.8323E+17	1.5069E+19
Ba-140	4.6814E+03	6.3946E-05	2.7507E+20	2.7297E+19
La-140	8.8546E+01	1.5930E-07	6.8525E+17	2.8843E+17
La-141	2.8937E+01	5.1167E-09	2.1853E+16	2.0535E+17
La-142	1.4735E+01	1.0293E-09	4.3653E+15	1.4395E+17
Ce-141	1.1110E+02	3.8990E-06	1.6653E+19	6.4644E+17
Ce-143	1.0304E+02	1.5517E-07	6.5345E+17	6.1352E+17
Ce-144	8.9047E+01	2.7919E-05	1.1676E+20	5.1799E+17
Pr-143	4.2486E+01	6.3093E-07	2.6570E+18	2.4673E+17
Nd-147	1.7193E+01	2.1253E-07	8.7067E+17	1.0030E+17
Np-239	1.2307E+03	5.3048E-06	1.3367E+19	7.2564E+18
Pu-238	2.7675E-01	1.6166E-05	4.0904E+19	1.6097E+15
Pu-239	2.7917E-02	4.4913E-04	1.1317E+21	1.6235E+14
Pu-240	4.9302E-02	2.1646E-05	5.4315E+19	2.8676E+14
Pu-241	1.0953E+01	1.1076E-04	2.7677E+20	6.3708E+16
Am-241	6.1978E-03	1.8092E-06	4.5207E+18	3.6040E+13
Cm-242	1.7016E+00	5.1404E-07	1.2792E+18	9.8990E+15
Cm-244	1.1256E-01	1.3751E-06	3.3939E+18	6.5467E+14

DW Transport Group Inventory:

Time (h) = 2.4000	Atmosphere	Sump	
Noble gases (atoms)	2.4433E+25	0.0000E+00	
Elemental I (atoms)	1.2329E+19	7.8120E+22	
Organic I (atoms)	1.4355E+21	0.0000E+00	
Aerosols (kg)	6.0430E-02	6.5809E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		9.5658E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.1806E-05
Total I (Ci)			3.6789E+05

DW to WW Transport Group Inventory:

Time (h) = 2.4000 Leakage Transport

Noble gases (atoms)	3.1104E+26
Elemental I (atoms)	5.7951E+21
Organic I (atoms)	1.8336E+22
Aerosols (kg)	5.0231E+00

WW to DW Transport Group Inventory:

Time (h) = 2.4000 Leakage Transport

Noble gases (atoms)	4.5294E+26
Elemental I (atoms)	9.9287E+21
Organic I (atoms)	2.6725E+22

Aerosols (kg) 8.3767E+00

DW to RB Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.1880E+22
Elemental I (atoms)	0.0000E+00	4.6889E+18
Organic I (atoms)	0.0000E+00	1.4917E+18
Aerosols (kg)	0.0000E+00	4.2254E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9590E+21
Elemental I (atoms)	0.0000E+00	2.6356E+17
Organic I (atoms)	0.0000E+00	1.3023E+17
Aerosols (kg)	0.0000E+00	2.3013E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0624E+22
Elemental I (atoms)	0.0000E+00	1.4294E+18
Organic I (atoms)	0.0000E+00	7.0627E+17
Aerosols (kg)	0.0000E+00	1.2480E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0624E+22
Elemental I (atoms)	0.0000E+00	1.4294E+18
Organic I (atoms)	0.0000E+00	7.0627E+17
Aerosols (kg)	0.0000E+00	1.2480E-03

RB Compartment Nuclide Inventory:

Time (h) = 2.4000	Ci	kg	Atoms	Decay
Kr-83m	3.9284E+03	1.9352E-07	1.4041E+18	5.1110E+17
Kr-85m	1.4925E+04	1.8136E-06	1.2849E+19	1.7020E+18
Kr-85	1.0937E+03	2.7903E-03	1.9769E+22	1.1424E+17
Kr-87	1.1800E+04	4.1657E-07	2.8835E+18	1.7166E+18
Kr-88	3.3016E+04	2.6331E-06	1.8019E+19	3.9694E+18
Rb-86	3.3997E+00	4.1782E-08	2.9258E+17	9.5210E+14
Rb-88	3.0017E+04	2.4866E-07	1.7016E+18	2.5422E+18
Sr-89	6.7287E+01	2.3161E-06	1.5672E+19	1.0642E+16
Sr-90	7.2080E+00	5.2842E-05	3.5358E+20	1.1395E+15
Sr-91	6.9708E+01	1.9230E-08	1.2726E+17	1.1569E+16
Sr-92	4.6541E+01	3.7027E-09	2.4237E+16	8.7634E+15
Y-90	1.6274E-01	2.9911E-10	2.0014E+15	1.9334E+13
Y-91	8.6081E-01	3.5101E-08	2.3229E+17	1.3490E+14
Y-92	1.1653E+01	1.2110E-09	7.9270E+15	1.1731E+15
Y-93	7.9906E-01	2.3950E-10	1.5509E+15	1.3223E+14
Zr-95	9.9590E-01	4.6358E-08	2.9387E+17	1.5749E+14

Zr-97	8.7156E-01	4.5592E-10	2.8305E+15	1.4159E+14
Nb-95	9.8327E-01	2.5146E-08	1.5940E+17	1.5544E+14
Mo-99	1.2271E+01	2.5586E-08	1.5564E+17	1.9535E+15
Tc-99m	1.1062E+01	2.1037E-09	1.2797E+16	1.7418E+15
Ru-103	1.0876E+01	3.3699E-07	1.9703E+18	1.7203E+15
Ru-105	5.3360E+00	7.9381E-10	4.5528E+15	9.3715E+14
Ru-106	4.5286E+00	1.3536E-06	7.6903E+18	7.1599E+14
Rh-105	7.1880E+00	8.5160E-09	4.8843E+16	1.1385E+15
Sb-127	1.2312E+01	4.6103E-08	2.1861E+17	1.9561E+15
Sb-129	2.6354E+01	4.6865E-09	2.1878E+16	4.6423E+15
Te-127	1.2373E+01	4.6883E-09	2.2231E+16	1.9506E+15
Te-127m	2.1204E+00	2.2479E-07	1.0659E+18	3.3521E+14
Te-129	3.0573E+01	1.4599E-09	6.8152E+15	5.0138E+15
Te-129m	6.9536E+00	2.3082E-07	1.0776E+18	1.0994E+15
Te-131m	2.4923E+01	3.1256E-08	1.4368E+17	4.0009E+15
Te-132	1.8504E+02	6.0949E-07	2.7806E+18	2.9425E+16
I-131	1.6320E+03	1.3164E-05	6.0515E+19	4.3676E+17
I-132	1.4583E+03	1.4128E-07	6.4453E+17	4.8113E+17
I-133	3.1497E+03	2.7805E-06	1.2590E+19	8.7017E+17
I-134	5.8684E+02	2.1998E-08	9.8863E+16	4.1186E+17
I-135	2.5070E+03	7.1387E-07	3.1845E+18	7.4848E+17
Xe-133	1.3283E+05	7.0963E-04	3.2132E+21	1.3906E+19
Xe-133m	4.0294E+03	9.1524E-06	4.1441E+19	4.2325E+17
Xe-135	5.5818E+04	2.1857E-05	9.7503E+19	5.9609E+18
Xe-135m	1.2614E+03	1.3857E-08	6.1814E+16	3.6645E+17
Xe-138	1.0632E+02	1.1081E-09	4.8356E+15	1.8080E+17
Cs-134	3.4121E+02	2.6372E-04	1.1852E+21	9.5400E+16
Cs-136	1.0357E+02	1.4131E-06	6.2572E+18	2.9025E+16
Cs-137	2.6492E+02	3.0457E-03	1.3388E+22	7.4068E+16
Ba-139	3.0465E+01	1.8625E-09	8.0694E+15	6.8770E+15
Ba-140	9.8572E+01	1.3465E-06	5.7918E+18	1.5607E+16
La-140	2.9121E+00	5.2392E-09	2.2537E+16	3.2200E+14
La-141	6.0929E-01	1.0774E-10	4.6015E+14	1.0852E+14
La-142	3.1026E-01	2.1674E-11	9.1916E+13	6.7278E+13
Ce-141	2.3387E+00	8.2077E-08	3.5055E+17	3.6985E+14
Ce-143	2.1697E+00	3.2672E-09	1.3759E+16	3.4781E+14
Ce-144	1.8750E+00	5.8787E-07	2.4585E+18	2.9645E+14
Pr-143	8.9638E-01	1.3311E-08	5.6058E+16	1.4147E+14
Nd-147	3.6203E-01	4.4751E-09	1.8333E+16	5.7334E+13
Np-239	2.5913E+01	1.1170E-07	2.8145E+17	4.1300E+15
Pu-238	5.8273E-03	3.4038E-07	8.6128E+17	9.2125E+11
Pu-239	5.8782E-04	9.4571E-06	2.3829E+19	9.2921E+10
Pu-240	1.0381E-03	4.5579E-07	1.1437E+18	1.6412E+11
Pu-241	2.3063E-01	2.3322E-06	5.8277E+18	3.6462E+13
Am-241	1.3052E-04	3.8098E-08	9.5201E+16	2.0630E+10
Cm-242	3.5829E-02	1.0824E-08	2.6935E+16	5.6650E+12
Cm-244	2.3700E-03	2.8955E-08	7.1463E+16	3.7469E+11

RB Transport Group Inventory:

Time (h) = 2.4000	Atmosphere	Sump	
Noble gases (atoms)	2.3156E+22	0.0000E+00	
Elemental I (atoms)	3.6640E+18	0.0000E+00	
Organic I (atoms)	1.5089E+18	0.0000E+00	
Aerosols (kg)	3.3998E-03	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		4.0741E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		4.9969E-08
Total I (Ci)			9.3339E+03

DW to RB Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.1880E+22
Elemental I (atoms)	0.0000E+00	4.6889E+18
Organic I (atoms)	0.0000E+00	1.4917E+18
Aerosols (kg)	0.0000E+00	4.2254E-03

WW to RB Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.4659E+21
Elemental I (atoms)	0.0000E+00	7.5974E+16
Organic I (atoms)	0.0000E+00	2.0450E+17
Aerosols (kg)	0.0000E+00	6.4098E-05

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2235E+21
Elemental I (atoms)	6.7514E+17	6.8196E+15
Organic I (atoms)	1.5927E+17	1.6088E+15
Aerosols (kg)	6.2674E-04	6.3307E-06

Environment Integral Nuclide Release:

Time (h) = 2.4000	Ci	kg	Atoms	Bq
Kr-83m	4.7016E+02	2.3161E-08	1.6805E+17	1.7396E+13
Kr-85m	1.5930E+03	1.9357E-07	1.3714E+18	5.8941E+13
Kr-85	1.0818E+02	2.7599E-04	1.9553E+21	4.0026E+12
Kr-87	1.5562E+03	5.4940E-08	3.8029E+17	5.7579E+13
Kr-88	3.6894E+03	2.9423E-07	2.0135E+18	1.3651E+14
Rb-86	2.0753E-01	2.5505E-09	1.7860E+16	7.6786E+09
Rb-88	9.1795E+02	7.6042E-09	5.2038E+16	3.3964E+13
Sr-89	5.2182E-01	1.7962E-08	1.2154E+17	1.9308E+10
Sr-90	5.5856E-02	4.0948E-07	2.7400E+18	2.0667E+09
Sr-91	5.9673E-01	1.6462E-10	1.0894E+15	2.2079E+10
Sr-92	5.1341E-01	4.0846E-11	2.6737E+14	1.8996E+10
Y-90	7.6302E-04	1.4024E-12	9.3841E+12	2.8232E+07
Y-91	6.5776E-03	2.6821E-10	1.7750E+15	2.4337E+08
Y-92	3.5487E-02	3.6880E-12	2.4141E+13	1.3130E+09
Y-93	6.7998E-03	2.0381E-12	1.3198E+13	2.5159E+08
Zr-95	7.7222E-03	3.5946E-10	2.2786E+15	2.8572E+08
Zr-97	7.1418E-03	3.7359E-12	2.3194E+13	2.6425E+08

Nb-95	7.6196E-03	1.9486E-10	1.2352E+15	2.8192E+08
Mo-99	9.6460E-02	2.0112E-10	1.2234E+15	3.5690E+09
Tc-99m	8.5884E-02	1.6333E-11	9.9354E+13	3.1777E+09
Ru-103	8.4365E-02	2.6140E-09	1.5284E+16	3.1215E+09
Ru-105	5.1228E-02	7.6209E-12	4.3709E+13	1.8954E+09
Ru-106	3.5097E-02	1.0491E-08	5.9600E+16	1.2986E+09
Rh-105	5.5947E-02	6.6283E-11	3.8016E+14	2.0700E+09
Sb-127	9.6385E-02	3.6092E-10	1.7114E+15	3.5663E+09
Sb-129	2.5453E-01	4.5263E-11	2.1130E+14	9.4177E+09
Te-127	9.5964E-02	3.6362E-11	1.7242E+14	3.5507E+09
Te-127m	1.6431E-02	1.7419E-09	8.2599E+15	6.0794E+08
Te-129	2.6515E-01	1.2661E-11	5.9105E+13	9.8105E+09
Te-129m	5.3889E-02	1.7888E-09	8.3508E+15	1.9939E+09
Te-131m	1.9930E-01	2.4994E-10	1.1490E+15	7.3742E+09
Te-132	1.4513E+00	4.7803E-09	2.1809E+16	5.3696E+10
I-131	9.1206E+01	7.3568E-07	3.3820E+18	3.3746E+12
I-132	1.1450E+02	1.1092E-08	5.0606E+16	4.2364E+12
I-133	1.8570E+02	1.6392E-07	7.4224E+17	6.8707E+12
I-134	1.3824E+02	5.1821E-09	2.3289E+16	5.1150E+12
I-135	1.6804E+02	4.7848E-08	2.1344E+17	6.2173E+12
Xe-133	1.3163E+04	7.0322E-05	3.1841E+20	4.8703E+14
Xe-133m	4.0040E+02	9.0948E-07	4.1181E+18	1.4815E+13
Xe-135	5.6155E+03	2.1990E-06	9.8092E+18	2.0777E+14
Xe-135m	2.8238E+02	3.1020E-09	1.3837E+16	1.0448E+13
Xe-138	1.2577E+02	1.3107E-09	5.7198E+15	4.6533E+12
Cs-134	2.0772E+01	1.6055E-05	7.2152E+19	7.6857E+11
Cs-136	6.3295E+00	8.6361E-08	3.8241E+17	2.3419E+11
Cs-137	1.6127E+01	1.8541E-04	8.1499E+20	5.9670E+11
Ba-139	4.7737E-01	2.9184E-11	1.2644E+14	1.7663E+10
Ba-140	7.6621E-01	1.0466E-08	4.5020E+16	2.8350E+10
La-140	1.1779E-02	2.1191E-11	9.1155E+13	4.3581E+08
La-141	6.0162E-03	1.0638E-12	4.5435E+12	2.2260E+08
La-142	4.5040E-03	3.1463E-13	1.3343E+12	1.6665E+08
Ce-141	1.8134E-02	6.3642E-10	2.7182E+15	6.7095E+08
Ce-143	1.7301E-02	2.6052E-11	1.0971E+14	6.4012E+08
Ce-144	1.4532E-02	4.5561E-09	1.9054E+16	5.3767E+08
Pr-143	6.9283E-03	1.0289E-10	4.3329E+14	2.5635E+08
Nd-147	2.8154E-03	3.4802E-11	1.4257E+14	1.0417E+08
Np-239	2.0418E-01	8.8013E-10	2.2177E+15	7.5547E+09
Pu-238	4.5156E-05	2.6377E-09	6.6741E+15	1.6708E+06
Pu-239	4.5542E-06	7.3270E-08	1.8462E+17	1.6851E+05
Pu-240	8.0445E-06	3.5320E-09	8.8626E+15	2.9765E+05
Pu-241	1.7872E-03	1.8073E-08	4.5160E+16	6.6128E+07
Am-241	1.0111E-06	2.9513E-10	7.3748E+14	3.7410E+04
Cm-242	2.7771E-04	8.3895E-11	2.0877E+14	1.0275E+07
Cm-244	1.8366E-05	2.2438E-10	5.5379E+14	6.7953E+05

Environment Transport Group Inventory:

Time (h) = 2.4000	Total Release	Release Rate/s	
Noble gases (atoms)	2.2916E+21	2.6523E+17	
Elemental I (atoms)	2.1370E+17	2.4734E+13	
Organic I (atoms)	1.1987E+16	1.3874E+12	
Aerosols (kg)	2.0304E-04	2.3500E-08	
Dose Effective (Ci) I-131 (Thyroid)			1.2780E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.6131E+02

Total I (Ci) 6.9768E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5377E+17
Elemental I (atoms)	1.9214E+14	1.9584E+12
Organic I (atoms)	9.6918E+12	9.8442E+10
Aerosols (kg)	1.8263E-07	1.8614E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.8477E+16
Elemental I (atoms)	0.0000E+00	3.5947E+13
Organic I (atoms)	0.0000E+00	1.8131E+12
Aerosols (kg)	0.0000E+00	3.4168E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	4.0002E+16	0.0000E+00
Elemental I (atoms)	1.2573E+13	0.0000E+00
Organic I (atoms)	6.0892E+11	0.0000E+00
Aerosols (kg)	1.2137E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2235E+21
Elemental I (atoms)	6.7514E+17	6.8196E+15
Organic I (atoms)	1.5927E+17	1.6088E+15
Aerosols (kg)	6.2674E-04	6.3307E-06

CR Compartment Nuclide Inventory:

Time (h) = 2.4000	Ci	kg	Atoms	Decay
Kr-83m	2.4098E-02	1.1871E-12	8.6134E+12	4.9288E+12
Kr-85m	9.1555E-02	1.1125E-11	7.8821E+13	1.5691E+13
Kr-85	6.7093E-03	1.7117E-08	1.2127E+17	1.0223E+12
Kr-87	7.2384E-02	2.5554E-12	1.7689E+13	1.7192E+13
Kr-88	2.0254E-01	1.6152E-11	1.1054E+14	3.7261E+13
Rb-86	1.9191E-05	2.3585E-13	1.6515E+12	6.4966E+09
Rb-88	1.8202E-01	1.5078E-12	1.0318E+13	2.3946E+13

Sr-89	4.5068E-05	1.5513E-12	1.0497E+13	1.2201E+10
Sr-90	4.8278E-06	3.5393E-11	2.3682E+14	1.3064E+09
Sr-91	4.6690E-05	1.2880E-14	8.5236E+10	1.3454E+10
Sr-92	3.1173E-05	2.4800E-15	1.6234E+10	1.0565E+10
Y-90	1.3936E-07	2.5614E-16	1.7139E+09	2.5425E+07
Y-91	5.8283E-07	2.3766E-14	1.5728E+11	1.5536E+08
Y-92	1.1715E-05	1.2175E-15	7.9693E+09	1.8664E+09
Y-93	5.3520E-07	1.6042E-16	1.0388E+09	1.5364E+08
Zr-95	6.6704E-07	3.1050E-14	1.9683E+11	1.8057E+08
Zr-97	5.8376E-07	3.0537E-16	1.8958E+09	1.6362E+08
Nb-95	6.5858E-07	1.6842E-14	1.0676E+11	1.7821E+08
Mo-99	8.2192E-06	1.7137E-14	1.0424E+11	2.2442E+09
Tc-99m	7.4090E-06	1.4090E-15	8.5711E+09	1.9978E+09
Ru-103	7.2846E-06	2.2571E-13	1.3197E+12	1.9725E+09
Ru-105	3.5740E-06	5.3168E-16	3.0494E+09	1.1078E+09
Ru-106	3.0332E-06	9.0663E-13	5.1508E+12	8.2085E+08
Rh-105	4.8144E-06	5.7039E-15	3.2714E+10	1.3060E+09
Sb-127	8.2464E-06	3.0879E-14	1.4642E+11	2.2459E+09
Sb-129	1.7651E-05	3.1389E-15	1.4654E+10	5.4923E+09
Te-127	8.2871E-06	3.1401E-15	1.4890E+10	2.2368E+09
Te-127m	1.4202E-06	1.5056E-13	7.1394E+11	3.8430E+08
Te-129	2.0477E-05	9.7780E-16	4.5647E+09	5.8445E+09
Te-129m	4.6574E-06	1.5460E-13	7.2173E+11	1.2604E+09
Te-131m	1.6693E-05	2.0935E-14	9.6237E+10	4.6075E+09
Te-132	1.2393E-04	4.0823E-13	1.8624E+12	3.3792E+10
I-131	8.3953E-03	6.7717E-11	3.1130E+14	2.8415E+12
I-132	6.2074E-03	6.0137E-13	2.7436E+12	2.8752E+12
I-133	1.6208E-02	1.4308E-11	6.4784E+13	5.6588E+12
I-134	3.0198E-03	1.1320E-13	5.0873E+11	2.5483E+12
I-135	1.2901E-02	3.6734E-12	1.6387E+13	4.8587E+12
Xe-133	8.1390E-01	4.3482E-09	1.9688E+16	1.2442E+14
Xe-133m	2.4653E-02	5.5997E-11	2.5355E+14	3.7862E+12
Xe-135	3.3182E-01	1.2993E-10	5.7962E+14	5.2287E+13
Xe-135m	5.3907E-03	5.9217E-14	2.6416E+11	3.3402E+12
Xe-138	6.5224E-04	6.7975E-15	2.9663E+10	2.9616E+12
Cs-134	1.9260E-03	1.4886E-09	6.6901E+15	6.5100E+11
Cs-136	5.8460E-04	7.9765E-12	3.5320E+13	1.9804E+11
Cs-137	1.4954E-03	1.7192E-08	7.5572E+16	5.0543E+11
Ba-139	2.0405E-05	1.2475E-15	5.4048E+09	8.7042E+09
Ba-140	6.6022E-05	9.0184E-13	3.8793E+12	1.7900E+10
La-140	2.6068E-06	4.6900E-15	2.0174E+10	4.3991E+08
La-141	4.0810E-07	7.2161E-17	3.0820E+08	1.2879E+08
La-142	2.0781E-07	1.4517E-17	6.1564E+07	8.4267E+07
Ce-141	1.5660E-06	5.4960E-14	2.3473E+11	4.2398E+08
Ce-143	1.4532E-06	2.1883E-15	9.2157E+09	4.0038E+08
Ce-144	1.2558E-06	3.9375E-13	1.6467E+12	3.3987E+08
Pr-143	6.0151E-07	8.9326E-15	3.7618E+10	1.6231E+08
Nd-147	2.4248E-07	2.9973E-15	1.2279E+10	6.5763E+07
Np-239	1.7356E-05	7.4814E-14	1.8851E+11	4.7462E+09
Pu-238	3.9030E-09	2.2798E-13	5.7687E+11	1.0562E+06
Pu-239	3.9371E-10	6.3342E-12	1.5960E+13	1.0653E+05
Pu-240	6.9531E-10	3.0528E-13	7.6602E+11	1.8815E+05
Pu-241	1.5448E-07	1.5621E-12	3.9033E+12	4.1802E+07
Am-241	8.7430E-11	2.5521E-14	6.3772E+10	2.3652E+04
Cm-242	2.3998E-08	7.2496E-15	1.8040E+10	6.4948E+06
Cm-244	1.5874E-09	1.9394E-14	4.7865E+10	4.2955E+05

CR Transport Group Inventory:

Time (h) = 2.4000	Atmosphere	Sump	
Noble gases (atoms)	1.4201E+17	0.0000E+00	
Elemental I (atoms)	1.9173E+13	0.0000E+00	
Organic I (atoms)	1.0048E+12	0.0000E+00	
Aerosols (kg)	1.8821E-08	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.0665E-12
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.3047E-12
Total I (Ci)			4.6731E-02

Time (h) = 2.4000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	5.2512E+12
Organic I (atoms)	0.0000E+00	2.5432E+11
Aerosols (kg)	0.0000E+00	5.0690E-09

CR Filtered Intake Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5377E+17
Elemental I (atoms)	1.9214E+14	1.9584E+12
Organic I (atoms)	9.6918E+12	9.8442E+10
Aerosols (kg)	1.8263E-07	1.8614E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.8477E+16
Elemental I (atoms)	0.0000E+00	3.5947E+13
Organic I (atoms)	0.0000E+00	1.8131E+12
Aerosols (kg)	0.0000E+00	3.4168E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 2.4000	Pathway Filtered	Transported
Noble gases (atoms)	4.0002E+16	0.0000E+00
Elemental I (atoms)	1.2573E+13	0.0000E+00
Organic I (atoms)	6.0892E+11	0.0000E+00
Aerosols (kg)	1.2137E-08	0.0000E+00

EAB Doses:

Time (h) = 4.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.4900E-01	5.1158E-02	1.5143E-01
Accumulated dose (rem)	2.4527E-01	5.7326E+00	4.9059E-01

LPZ Doses:

Time (h) = 4.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.1481E-02	2.4542E-02	7.2643E-02
Accumulated dose (rem)	1.0508E-01	8.1423E-01	1.4004E-01

CR Doses:

Time (h) = 4.0000 Whole Body Thyroid TEDE
Delta dose (rem) 6.1850E-03 1.7772E+00 8.5951E-02
Accumulated dose (rem) 1.0999E-02 5.5947E+00 2.5560E-01

DW Compartment Nuclide Inventory:

Time (h) = 4.0000	Ci	kg	Atoms	Decay
Kr-83m	2.2798E+06	1.1231E-04	8.1486E+20	1.9763E+21
Kr-85m	1.2275E+07	1.4916E-03	1.0568E+22	7.1264E+21
Kr-85	1.1522E+06	2.9396E+00	2.0827E+25	5.1523E+20
Kr-87	5.1969E+06	1.8347E-04	1.2700E+21	6.3522E+21
Kr-88	2.3538E+07	1.8771E-03	1.2846E+22	1.6032E+22
Rb-86	5.7793E+01	7.1027E-07	4.9736E+18	6.2428E+17
Rb-88	2.8906E+07	2.3946E-04	1.6387E+21	6.3922E+21
Sr-89	3.1882E+03	1.0974E-04	7.4256E+20	1.9279E+19
Sr-90	3.4185E+02	2.5061E-03	1.6769E+22	2.0640E+18
Sr-91	2.9417E+03	8.1151E-07	5.3704E+18	2.1558E+19
Sr-92	1.4660E+03	1.1663E-07	7.6344E+17	1.7574E+19
Y-90	1.1206E+01	2.0597E-08	1.3782E+17	2.2892E+16
Y-91	4.1367E+01	1.6868E-06	1.1163E+19	2.4193E+17
Y-92	6.7924E+02	7.0590E-08	4.6207E+17	4.2176E+17
Y-93	3.3956E+01	1.0178E-08	6.5904E+16	2.4598E+17
Zr-95	4.7198E+01	2.1970E-06	1.3927E+19	2.8530E+17
Zr-97	3.8710E+01	2.0249E-08	1.2571E+17	2.6055E+17
Nb-95	4.6633E+01	1.1926E-06	7.5598E+18	2.8155E+17
Mo-99	5.7229E+02	1.1932E-06	7.2584E+18	3.5526E+18
Tc-99m	5.2227E+02	9.9324E-08	6.0419E+17	3.1592E+18
Ru-103	5.1520E+02	1.5963E-05	9.3334E+19	3.1167E+18
Ru-105	1.9713E+02	2.9326E-08	1.6820E+17	1.8050E+18
Ru-106	2.1475E+02	6.4189E-05	3.6467E+20	1.2969E+18
Rh-105	3.3729E+02	3.9961E-07	2.2919E+18	2.0644E+18
Sb-127	5.7695E+02	2.1604E-06	1.0244E+19	3.5532E+18
Sb-129	9.6688E+02	1.7194E-07	8.0266E+17	8.9570E+18
Te-127	5.8565E+02	2.2191E-07	1.0523E+18	3.5359E+18
Te-127m	1.0056E+02	1.0661E-05	5.0554E+19	6.0714E+17
Te-129	1.2208E+03	5.8294E-08	2.7214E+17	9.3980E+18
Te-129m	3.2966E+02	1.0943E-05	5.1086E+19	1.9912E+18
Te-131m	1.1391E+03	1.4285E-06	6.5671E+18	7.3115E+18
Te-132	8.6520E+03	2.8499E-05	1.3002E+20	5.3477E+19
I-131	5.9990E+04	4.8389E-04	2.2245E+21	3.2240E+20
I-132	5.0641E+04	4.9061E-06	2.2383E+19	4.5137E+20
I-133	1.1032E+05	9.7383E-05	4.4094E+20	6.4882E+20
I-134	6.1184E+03	2.2935E-07	1.0307E+18	4.0398E+20
I-135	7.8309E+04	2.2299E-05	9.9470E+19	5.7240E+20
Xe-133	1.3884E+08	7.4174E-01	3.3586E+24	6.2593E+22
Xe-133m	4.1644E+06	9.4592E-03	4.2830E+22	1.8996E+21
Xe-135	5.3058E+07	2.0777E-02	9.2681E+22	2.6460E+22
Xe-135m	3.1867E+04	3.5006E-07	1.5616E+18	1.5724E+21
Xe-138	1.0331E+03	1.0767E-08	4.6984E+16	7.2168E+20
Cs-134	5.8143E+03	4.4938E-03	2.0196E+22	6.2511E+19
Cs-136	1.7587E+03	2.3996E-05	1.0626E+20	1.9036E+19
Cs-137	4.5146E+03	5.1903E-02	2.2815E+23	4.8533E+19
Ba-139	6.4623E+02	3.9508E-08	1.7117E+17	1.5280E+19
Ba-140	4.6580E+03	6.3626E-05	2.7369E+20	2.8293E+19
La-140	2.1288E+02	3.8300E-07	1.6475E+18	3.1977E+17
La-141	2.1792E+01	3.8533E-09	1.6457E+16	2.1072E+17

La-142	7.1667E+00	5.0064E-10	2.1232E+15	1.4619E+17
Ce-141	1.1082E+02	3.8893E-06	1.6611E+19	6.7009E+17
Ce-143	9.9500E+01	1.4983E-07	6.3098E+17	6.3510E+17
Ce-144	8.8910E+01	2.7876E-05	1.1658E+20	5.3695E+17
Pr-143	4.2627E+01	6.3302E-07	2.6658E+18	2.5579E+17
Nd-147	1.7097E+01	2.1134E-07	8.6581E+17	1.0395E+17
Np-239	1.2051E+03	5.1945E-06	1.3089E+19	7.5159E+18
Pu-238	2.7637E-01	1.6143E-05	4.0848E+19	1.6686E+15
Pu-239	2.7884E-02	4.4862E-04	1.1304E+21	1.6829E+14
Pu-240	4.9234E-02	2.1616E-05	5.4240E+19	2.9726E+14
Pu-241	1.0938E+01	1.1061E-04	2.7638E+20	6.6041E+16
Am-241	6.1925E-03	1.8076E-06	4.5168E+18	3.7360E+13
Cm-242	1.6988E+00	5.1318E-07	1.2770E+18	1.0261E+16
Cm-244	1.1240E-01	1.3732E-06	3.3892E+18	6.7864E+14

DW Transport Group Inventory:

Time (h) = 4.0000	Atmosphere	Sump	
Noble gases (atoms)	2.4346E+25	0.0000E+00	
Elemental I (atoms)	1.3074E+19	7.8120E+22	
Organic I (atoms)	1.3989E+21	0.0000E+00	
Aerosols (kg)	6.0422E-02	6.5809E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		9.3336E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.1293E-05
Total I (Ci)			3.0538E+05

DW to WW Transport Group Inventory:

Time (h) = 4.0000 Leakage Transport

Noble gases (atoms)	1.7698E+27
Elemental I (atoms)	6.5915E+21
Organic I (atoms)	1.0313E+23
Aerosols (kg)	8.6396E+00

WW to DW Transport Group Inventory:

Time (h) = 4.0000 Leakage Transport

Noble gases (atoms)	1.9117E+27
Elemental I (atoms)	1.0715E+22
Organic I (atoms)	1.1152E+23
Aerosols (kg)	1.1993E+01

DW to RB Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.2909E+22
Elemental I (atoms)	0.0000E+00	4.7004E+18
Organic I (atoms)	0.0000E+00	2.7140E+18
Aerosols (kg)	0.0000E+00	4.2775E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.8654E+21
Elemental I (atoms)	0.0000E+00	2.6460E+17
Organic I (atoms)	0.0000E+00	2.4104E+17

Aerosols (kg) 0.0000E+00 2.3485E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0963E+22
Elemental I (atoms)	0.0000E+00	1.4350E+18
Organic I (atoms)	0.0000E+00	1.3072E+18
Aerosols (kg)	0.0000E+00	1.2737E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0963E+22
Elemental I (atoms)	0.0000E+00	1.4350E+18
Organic I (atoms)	0.0000E+00	1.3072E+18
Aerosols (kg)	0.0000E+00	1.2737E-03

RB Compartment Nuclide Inventory:

Time (h) = 4.0000	Ci	kg	Atoms	Decay
Kr-83m	4.4463E+03	2.1904E-07	1.5892E+18	1.4746E+18
Kr-85m	2.3941E+04	2.9091E-06	2.0611E+19	6.0918E+18
Kr-85	2.2472E+03	5.7332E-03	4.0619E+22	4.8241E+17
Kr-87	1.0136E+04	3.5783E-07	2.4769E+18	4.2410E+18
Kr-88	4.5906E+04	3.6610E-06	2.5054E+19	1.2973E+19
Rb-86	2.7964E+00	3.4367E-08	2.4066E+17	1.6060E+15
Rb-88	5.6607E+04	4.6893E-07	3.2090E+18	1.1648E+19
Sr-89	5.7856E+01	1.9914E-06	1.3475E+19	2.3878E+16
Sr-90	6.2033E+00	4.5477E-05	3.0430E+20	2.5581E+15
Sr-91	5.3383E+01	1.4726E-08	9.7454E+16	2.4536E+16
Sr-92	2.6603E+01	2.1165E-09	1.3854E+16	1.6318E+16
Y-90	2.4160E-01	4.4407E-10	2.9714E+15	6.1932E+13
Y-91	7.5848E-01	3.0928E-08	2.0468E+17	3.0619E+14
Y-92	1.5914E+01	1.6538E-09	1.0826E+16	4.1604E+15
Y-93	6.1618E-01	1.8469E-10	1.1959E+15	2.8136E+14
Zr-95	8.5648E-01	3.9868E-08	2.5273E+17	3.5342E+14
Zr-97	7.0245E-01	3.6745E-10	2.2813E+15	3.0774E+14
Nb-95	8.4623E-01	2.1641E-08	1.3718E+17	3.4895E+14
Mo-99	1.0385E+01	2.1653E-08	1.3171E+17	4.3489E+15
Tc-99m	9.4774E+00	1.8024E-09	1.0964E+16	3.9023E+15
Ru-103	9.3492E+00	2.8968E-07	1.6937E+18	3.8595E+15
Ru-105	3.5773E+00	5.3218E-10	3.0522E+15	1.8693E+15
Ru-106	3.8970E+00	1.1648E-06	6.6176E+18	1.6072E+15
Rh-105	6.1207E+00	7.2515E-09	4.1590E+16	2.5455E+15
Sb-127	1.0470E+01	3.9204E-08	1.8590E+17	4.3651E+15
Sb-129	1.7546E+01	3.1201E-09	1.4566E+16	9.2313E+15
Te-127	1.0628E+01	4.0270E-09	1.9095E+16	4.3747E+15
Te-127m	1.8249E+00	1.9347E-07	9.1738E+17	7.5251E+14
Te-129	2.2154E+01	1.0578E-09	4.9384E+15	1.0432E+16
Te-129m	5.9823E+00	1.9858E-07	9.2704E+17	2.4676E+15
Te-131m	2.0671E+01	2.5923E-08	1.1917E+17	8.8186E+15
Te-132	1.5700E+02	5.1716E-07	2.3594E+18	6.5590E+16
I-131	1.3764E+03	1.1102E-05	5.1039E+19	7.5469E+17
I-132	8.4168E+02	8.1541E-08	3.7201E+17	7.1783E+17

I-133	2.5329E+03	2.2359E-06	1.0124E+19	1.4698E+18
I-134	1.4048E+02	5.2659E-09	2.3666E+16	4.7801E+17
I-135	1.7980E+03	5.1197E-07	2.2838E+18	1.2004E+18
Xe-133	2.7073E+05	1.4464E-03	6.5490E+21	5.8423E+19
Xe-133m	8.1184E+03	1.8440E-05	8.3496E+19	1.7652E+18
Xe-135	1.0294E+05	4.0310E-05	1.7982E+20	2.3703E+19
Xe-135m	3.5016E+02	3.8466E-09	1.7159E+16	4.9586E+17
Xe-138	2.0148E+00	2.0998E-11	9.1633E+13	1.8687E+17
Cs-134	2.8133E+02	2.1744E-04	9.7720E+20	1.6111E+17
Cs-136	8.5097E+01	1.1611E-06	5.1413E+18	4.8936E+16
Cs-137	2.1844E+02	2.5114E-03	1.1039E+22	1.2509E+17
Ba-139	1.1727E+01	7.1693E-10	3.1061E+15	1.1037E+16
Ba-140	8.4527E+01	1.1546E-06	4.9666E+18	3.4972E+16
La-140	4.6829E+00	8.4251E-09	3.6241E+16	1.1221E+15
La-141	3.9544E-01	6.9924E-11	2.9865E+14	2.1336E+14
La-142	1.3005E-01	9.0850E-12	3.8529E+13	1.1120E+14
Ce-141	2.0105E+00	7.0561E-08	3.0137E+17	8.2987E+14
Ce-143	1.8056E+00	2.7189E-09	1.1450E+16	7.6790E+14
Ce-144	1.6134E+00	5.0585E-07	2.1155E+18	6.6543E+14
Pr-143	7.7497E-01	1.1509E-08	4.8466E+16	3.1823E+14
Nd-147	3.1026E-01	3.8352E-09	1.5712E+16	1.2844E+14
Np-239	2.1868E+01	9.4263E-08	2.3752E+17	9.1814E+15
Pu-238	5.0151E-03	2.9295E-07	7.4124E+17	2.0681E+12
Pu-239	5.0601E-04	8.1409E-06	2.0513E+19	2.0862E+11
Pu-240	8.9343E-04	3.9226E-07	9.8428E+17	3.6843E+11
Pu-241	1.9849E-01	2.0071E-06	5.0154E+18	8.1852E+13
Am-241	1.1239E-04	3.2805E-08	8.1974E+16	4.6323E+10
Cm-242	3.0827E-02	9.3126E-09	2.3174E+16	1.2715E+13
Cm-244	2.0397E-03	2.4919E-08	6.1503E+16	8.4111E+11

RB Transport Group Inventory:

Time (h) = 4.0000	Atmosphere	Sump	
Noble gases (atoms)	4.7481E+22	0.0000E+00	
Elemental I (atoms)	2.8947E+18	0.0000E+00	
Organic I (atoms)	2.8468E+18	0.0000E+00	
Aerosols (kg)	2.8060E-03	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.3772E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		4.0698E-08
Total I (Ci)			6.6894E+03

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 4.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.2909E+22
Elemental I (atoms)	0.0000E+00	4.7004E+18
Organic I (atoms)	0.0000E+00	2.7140E+18
Aerosols (kg)	0.0000E+00	4.2775E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 4.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4628E+22
Elemental I (atoms)	0.0000E+00	8.1990E+16
Organic I (atoms)	0.0000E+00	8.5332E+17
Aerosols (kg)	0.0000E+00	9.1772E-05

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0013E+22
Elemental I (atoms)	1.3790E+18	1.3929E+16
Organic I (atoms)	6.3558E+17	6.4200E+15
Aerosols (kg)	1.2933E-03	1.3063E-05

Environment Integral Nuclide Release:

Time (h) = 4.0000	Ci	kg	Atoms	Bq
Kr-83m	1.4153E+03	6.9721E-08	5.0587E+17	5.2366E+13
Kr-85m	5.9489E+03	7.2287E-07	5.1215E+18	2.2011E+14
Kr-85	4.7648E+02	1.2156E-03	8.6125E+21	1.7630E+13
Kr-87	4.0099E+03	1.4157E-07	9.7991E+17	1.4837E+14
Kr-88	1.2581E+04	1.0034E-06	6.8663E+18	4.6551E+14
Rb-86	2.1425E-01	2.6331E-09	1.8439E+16	7.9273E+09
Rb-88	3.1139E+03	2.5795E-08	1.7653E+17	1.1522E+14
Sr-89	6.5769E-01	2.2638E-08	1.5318E+17	2.4334E+10
Sr-90	7.0417E-02	5.1623E-07	3.4542E+18	2.6054E+09
Sr-91	7.2935E-01	2.0120E-10	1.3315E+15	2.6986E+10
Sr-92	5.8997E-01	4.6937E-11	3.0724E+14	2.1829E+10
Y-90	1.2160E-03	2.2350E-12	1.4955E+13	4.4992E+07
Y-91	8.3385E-03	3.4002E-10	2.2501E+15	3.0853E+08
Y-92	6.7390E-02	7.0035E-12	4.5844E+13	2.4934E+09
Y-93	8.3254E-03	2.4954E-12	1.6159E+13	3.0804E+08
Zr-95	9.7332E-03	4.5307E-10	2.8720E+15	3.6013E+08
Zr-97	8.8439E-03	4.6262E-12	2.8722E+13	3.2722E+08
Nb-95	9.6059E-03	2.4565E-10	1.5572E+15	3.5542E+08
Mo-99	1.2103E-01	2.5236E-10	1.5351E+15	4.4783E+09
Tc-99m	1.0818E-01	2.0574E-11	1.2515E+14	4.0027E+09
Ru-103	1.0632E-01	3.2944E-09	1.9261E+16	3.9339E+09
Ru-105	6.0721E-02	9.0332E-12	5.1809E+13	2.2467E+09
Ru-106	4.4245E-02	1.3225E-08	7.5134E+16	1.6371E+09
Rh-105	7.0393E-02	8.3399E-11	4.7832E+14	2.6045E+09
Sb-127	1.2110E-01	4.5348E-10	2.1503E+15	4.4808E+09
Sb-129	3.0126E-01	5.3572E-11	2.5009E+14	1.1147E+10
Te-127	1.2094E-01	4.5824E-11	2.1729E+14	4.4746E+09
Te-127m	2.0714E-02	2.1960E-09	1.0413E+16	7.6643E+08
Te-129	3.2183E-01	1.5367E-11	7.1739E+13	1.1908E+10
Te-129m	6.7933E-02	2.2550E-09	1.0527E+16	2.5135E+09
Te-131m	2.4870E-01	3.1188E-10	1.4337E+15	9.2017E+09
Te-132	1.8223E+00	6.0025E-09	2.7385E+16	6.7425E+10
I-131	9.4471E+01	7.6201E-07	3.5030E+18	3.4954E+12
I-132	1.1690E+02	1.1325E-08	5.1668E+16	4.3253E+12
I-133	1.9184E+02	1.6935E-07	7.6681E+17	7.0982E+12

I-134	1.3890E+02	5.2066E-09	2.3399E+16	5.1391E+12
I-135	1.7265E+02	4.9163E-08	2.1931E+17	6.3881E+12
Xe-133	5.7684E+04	3.0817E-04	1.3954E+21	2.1343E+15
Xe-133m	1.7419E+03	3.9566E-06	1.7915E+19	6.4451E+13
Xe-135	2.3289E+04	9.1198E-06	4.0682E+19	8.6171E+14
Xe-135m	3.9584E+02	4.3483E-09	1.9397E+16	1.4646E+13
Xe-138	1.3095E+02	1.3648E-09	5.9558E+15	4.8453E+12
Cs-134	2.1448E+01	1.6577E-05	7.4498E+19	7.9356E+11
Cs-136	6.5341E+00	8.9153E-08	3.9477E+17	2.4176E+11
Cs-137	1.6651E+01	1.9144E-04	8.4150E+20	6.1610E+11
Ba-139	5.1900E-01	3.1730E-11	1.3747E+14	1.9203E+10
Ba-140	9.6497E-01	1.3181E-08	5.6698E+16	3.5704E+10
La-140	2.0330E-02	3.6577E-11	1.5734E+14	7.5223E+08
La-141	7.0829E-03	1.2524E-12	5.3491E+12	2.6207E+08
La-142	4.9448E-03	3.4543E-13	1.4649E+12	1.8296E+08
Ce-141	2.2856E-02	8.0214E-10	3.4259E+15	8.4566E+08
Ce-143	2.1608E-02	3.2538E-11	1.3703E+14	7.9950E+08
Ce-144	1.8319E-02	5.7436E-09	2.4020E+16	6.7781E+08
Pr-143	8.7434E-03	1.2984E-10	5.4680E+14	3.2351E+08
Nd-147	3.5452E-03	4.3823E-11	1.7953E+14	1.3117E+08
Np-239	2.5600E-01	1.1035E-09	2.7805E+15	9.4720E+09
Pu-238	5.6928E-05	3.3253E-09	8.4140E+15	2.1063E+06
Pu-239	5.7418E-06	9.2377E-08	2.3276E+17	2.1245E+05
Pu-240	1.0142E-05	4.4527E-09	1.1173E+16	3.7524E+05
Pu-241	2.2531E-03	2.2784E-08	5.6933E+16	8.3366E+07
Am-241	1.2748E-06	3.7212E-10	9.2985E+14	4.7168E+04
Cm-242	3.5008E-04	1.0576E-10	2.6318E+14	1.2953E+07
Cm-244	2.3153E-05	2.8287E-10	6.9815E+14	8.5667E+05

Environment Transport Group Inventory:

Time (h) = 4.0000	Total Release	Release Rate/s	
Noble gases (atoms)	1.0080E+22	7.0000E+17	
Elemental I (atoms)	2.2080E+17	1.5333E+13	
Organic I (atoms)	1.6791E+16	1.1661E+12	
Aerosols (kg)	2.0979E-04	1.4569E-08	
Dose Effective (Ci) I-131 (Thyroid)			1.3224E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.6670E+02
Total I (Ci)			7.1476E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.7611E+17
Elemental I (atoms)	1.9234E+14	1.9605E+12
Organic I (atoms)	9.8277E+12	9.9815E+10
Aerosols (kg)	1.8282E-07	1.8634E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.9650E+16
Elemental I (atoms)	0.0000E+00	3.5985E+13
Organic I (atoms)	0.0000E+00	1.8385E+12

Aerosols (kg) 0.0000E+00 3.4204E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.2876E+17	0.0000E+00
Elemental I (atoms)	1.8409E+13	0.0000E+00
Organic I (atoms)	9.1847E+11	0.0000E+00
Aerosols (kg)	1.7923E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0013E+22
Elemental I (atoms)	1.3790E+18	1.3929E+16
Organic I (atoms)	6.3558E+17	6.4200E+15
Aerosols (kg)	1.2933E-03	1.3063E-05

CR Compartment Nuclide Inventory:

Time (h) = 4.0000	Ci	kg	Atoms	Decay
Kr-83m	2.9621E-02	1.4592E-12	1.0588E+13	1.0843E+13
Kr-85m	1.5949E-01	1.9381E-11	1.3731E+14	4.2738E+13
Kr-85	1.4971E-02	3.8195E-08	2.7060E+17	3.2968E+12
Kr-87	6.7524E-02	2.3839E-12	1.6501E+13	3.2643E+13
Kr-88	3.0583E-01	2.4390E-11	1.6691E+14	9.2647E+13
Rb-86	1.0838E-05	1.3319E-13	9.3268E+11	9.5568E+09
Rb-88	2.8616E-01	2.3705E-12	1.6222E+13	6.6134E+13
Sr-89	2.5997E-05	8.9484E-13	6.0549E+12	1.9457E+10
Sr-90	2.7874E-06	2.0435E-11	1.3673E+14	2.0840E+09
Sr-91	2.3987E-05	6.6171E-15	4.3790E+10	2.0589E+10
Sr-92	1.1954E-05	9.5101E-16	6.2251E+09	1.4762E+10
Y-90	1.2660E-07	2.3269E-16	1.5570E+09	5.3319E+07
Y-91	3.4460E-07	1.4051E-14	9.2989E+10	2.5021E+08
Y-92	8.8762E-06	9.2246E-16	6.0382E+09	4.0390E+09
Y-93	2.7687E-07	8.2988E-17	5.3738E+08	2.3568E+08
Zr-95	3.8485E-07	1.7914E-14	1.1356E+11	2.8797E+08
Zr-97	3.1564E-07	1.6511E-16	1.0251E+09	2.5490E+08
Nb-95	3.8025E-07	9.7242E-15	6.1643E+10	2.8428E+08
Mo-99	4.6665E-06	9.7296E-15	5.9185E+10	3.5580E+09
Tc-99m	4.2586E-06	8.0989E-16	4.9265E+09	3.1823E+09
Ru-103	4.2010E-06	1.3017E-13	7.6105E+11	3.1451E+09
Ru-105	1.6074E-06	2.3913E-16	1.3715E+09	1.6229E+09
Ru-106	1.7511E-06	5.2340E-13	2.9736E+12	1.3094E+09
Rh-105	2.7503E-06	3.2584E-15	1.8688E+10	2.0775E+09
Sb-127	4.7044E-06	1.7616E-14	8.3533E+10	3.5668E+09

Sb-129	7.8839E-06	1.4020E-15	6.5449E+09	8.0289E+09
Te-127	4.7754E-06	1.8095E-15	8.5803E+09	3.5657E+09
Te-127m	8.1999E-07	8.6932E-14	4.1222E+11	6.1304E+08
Te-129	9.9545E-06	4.7533E-16	2.2190E+09	8.8310E+09
Te-129m	2.6881E-06	8.9230E-14	4.1656E+11	2.0104E+09
Te-131m	9.2884E-06	1.1648E-14	5.3548E+10	7.2515E+09
Te-132	7.0548E-05	2.3238E-13	1.0602E+12	5.3625E+10
I-131	4.7271E-03	3.8129E-11	1.7528E+14	4.1785E+12
I-132	2.1994E-03	2.1308E-13	9.7211E+11	3.6831E+12
I-133	8.7020E-03	7.6818E-12	3.4783E+13	8.1851E+12
I-134	4.8263E-04	1.8092E-14	8.1307E+10	2.8378E+12
I-135	6.1772E-03	1.7590E-12	7.8464E+12	6.7698E+12
Xe-133	1.8026E+00	9.6304E-09	4.3606E+16	3.9920E+14
Xe-133m	5.4018E-02	1.2270E-10	5.5556E+14	1.2060E+13
Xe-135	6.7577E-01	2.6462E-10	1.1804E+15	1.5948E+14
Xe-135m	1.7558E-03	1.9287E-14	8.6037E+10	3.9853E+12
Xe-138	1.3423E-05	1.3989E-16	6.1047E+08	2.9978E+12
Cs-134	1.0903E-03	8.4271E-10	3.7873E+15	9.5846E+11
Cs-136	3.2980E-04	4.4999E-12	1.9926E+13	2.9122E+11
Cs-137	8.4660E-04	9.7331E-09	4.2784E+16	7.4416E+11
Ba-139	5.2693E-06	3.2215E-16	1.3957E+09	1.1044E+10
Ba-140	3.7981E-05	5.1881E-13	2.2317E+12	2.8517E+10
La-140	2.4903E-06	4.4803E-15	1.9272E+10	9.7631E+08
La-141	1.7769E-07	3.1420E-17	1.3419E+08	1.8679E+08
La-142	5.8438E-08	4.0823E-18	1.7313E+07	1.0891E+08
Ce-141	9.0317E-07	3.1697E-14	1.3538E+11	6.7608E+08
Ce-143	8.1133E-07	1.2217E-15	5.1450E+09	6.3091E+08
Ce-144	7.2497E-07	2.2730E-13	9.5058E+11	5.4212E+08
Pr-143	3.4891E-07	5.1814E-15	2.1820E+10	2.5938E+08
Nd-147	1.3941E-07	1.7233E-15	7.0598E+09	1.0474E+08
Np-239	9.8263E-06	4.2356E-14	1.0673E+11	7.5169E+09
Pu-238	2.2535E-09	1.3163E-13	3.3307E+11	1.6848E+06
Pu-239	2.2737E-10	3.6580E-12	9.2172E+12	1.6994E+05
Pu-240	4.0145E-10	1.7626E-13	4.4227E+11	3.0014E+05
Pu-241	8.9189E-08	9.0188E-13	2.2536E+12	6.6682E+07
Am-241	5.0505E-11	1.4742E-14	3.6839E+10	3.7737E+04
Cm-242	1.3852E-08	4.1845E-15	1.0413E+10	1.0360E+07
Cm-244	9.1651E-10	1.1197E-14	2.7636E+10	6.8523E+05

CR Transport Group Inventory:

Time (h) = 4.0000	Atmosphere	Sump	
Noble gases (atoms)	3.1628E+17	0.0000E+00	
Elemental I (atoms)	1.0607E+13	0.0000E+00	
Organic I (atoms)	5.7517E+11	0.0000E+00	
Aerosols (kg)	1.0656E-08	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		5.9024E-13
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		7.0949E-13
Total I (Ci)			2.2288E-02

Time (h) = 4.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	7.6885E+12
Organic I (atoms)	0.0000E+00	3.8360E+11
Aerosols (kg)	0.0000E+00	7.4857E-09

CR Filtered Intake Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.7611E+17
Elemental I (atoms)	1.9234E+14	1.9605E+12
Organic I (atoms)	9.8277E+12	9.9815E+10
Aerosols (kg)	1.8282E-07	1.8634E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.9650E+16
Elemental I (atoms)	0.0000E+00	3.5985E+13
Organic I (atoms)	0.0000E+00	1.8385E+12
Aerosols (kg)	0.0000E+00	3.4204E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.2876E+17	0.0000E+00
Elemental I (atoms)	1.8409E+13	0.0000E+00
Organic I (atoms)	9.1847E+11	0.0000E+00
Aerosols (kg)	1.7923E-08	0.0000E+00

EAB Doses:

Time (h) = 6.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.1397E-01	5.2190E-02	2.1648E-01
Accumulated dose (rem)	4.5924E-01	5.7848E+00	7.0708E-01

LPZ Doses:

Time (h) = 6.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0265E-01	2.5037E-02	1.0385E-01
Accumulated dose (rem)	2.0772E-01	8.3927E-01	2.4390E-01

CR Doses:

Time (h) = 6.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0895E-02	1.1537E+00	6.7010E-02
Accumulated dose (rem)	2.1894E-02	6.7483E+00	3.2261E-01

DW Compartment Nuclide Inventory:

Time (h) = 6.0000	Ci	kg	Atoms	Decay
Kr-83m	1.0801E+06	5.3207E-05	3.8605E+20	2.4041E+21
Kr-85m	8.9927E+06	1.0927E-03	7.7419E+21	9.9366E+21
Kr-85	1.1503E+06	2.9346E+00	2.0791E+25	8.2191E+20
Kr-87	1.7440E+06	6.1571E-05	4.2619E+20	7.1946E+21
Kr-88	1.4422E+07	1.1501E-03	7.8708E+21	2.0989E+22
Rb-86	5.7514E+01	7.0685E-07	4.9497E+18	6.3964E+17
Rb-88	1.8062E+07	1.4962E-04	1.0239E+21	1.1962E+22
Sr-89	3.1791E+03	1.0943E-04	7.4043E+20	2.0127E+19
Sr-90	3.4125E+02	2.5017E-03	1.6740E+22	2.1549E+18
Sr-91	2.5379E+03	7.0011E-07	4.6332E+18	2.2286E+19

Sr-92	8.7743E+02	6.9807E-08	4.5694E+17	1.7880E+19
Y-90	1.8263E+01	3.3568E-08	2.2461E+17	2.6771E+16
Y-91	4.2387E+01	1.7284E-06	1.1438E+19	2.5308E+17
Y-92	8.2701E+02	8.5947E-08	5.6259E+17	6.2577E+17
Y-93	2.9549E+01	8.8569E-09	5.7352E+16	2.5442E+17
Zr-95	4.7073E+01	2.1912E-06	1.3890E+19	2.9786E+17
Zr-97	3.5599E+01	1.8622E-08	1.1561E+17	2.7044E+17
Nb-95	4.6553E+01	1.1905E-06	7.5467E+18	2.9396E+17
Mo-99	5.5942E+02	1.1664E-06	7.0952E+18	3.7034E+18
Tc-99m	5.1701E+02	9.8323E-08	5.9810E+17	3.2969E+18
Ru-103	5.1356E+02	1.5912E-05	9.3036E+19	3.2537E+18
Ru-105	1.4401E+02	2.1424E-08	1.2288E+17	1.8501E+18
Ru-106	2.1434E+02	6.4068E-05	3.6399E+20	1.3540E+18
Rh-105	3.3026E+02	3.9128E-07	2.2441E+18	2.1533E+18
Sb-127	5.6737E+02	2.1246E-06	1.0074E+19	3.7056E+18
Sb-129	7.0025E+02	1.2452E-07	5.8132E+17	9.1771E+18
Te-127	5.8250E+02	2.2072E-07	1.0466E+18	3.6909E+18
Te-127m	1.0039E+02	1.0643E-05	5.0467E+19	6.3391E+17
Te-129	9.6506E+02	4.6082E-08	2.1513E+17	9.6811E+18
Te-129m	3.2884E+02	1.0916E-05	5.0958E+19	2.0789E+18
Te-131m	1.0858E+03	1.3617E-06	6.2597E+18	7.6078E+18
Te-132	8.4852E+03	2.7949E-05	1.2751E+20	5.5760E+19
I-131	5.9464E+04	4.7964E-04	2.2049E+21	3.3831E+20
I-132	3.1599E+04	3.0613E-06	1.3966E+19	4.6204E+20
I-133	1.0303E+05	9.0947E-05	4.1180E+20	6.7722E+20
I-134	1.2564E+03	4.7097E-08	2.1166E+17	4.0480E+20
I-135	6.3384E+04	1.8049E-05	8.0512E+19	5.9121E+20
Xe-133	1.3713E+08	7.3260E-01	3.3171E+24	9.9350E+22
Xe-133m	4.0510E+06	9.2015E-03	4.1664E+22	2.9938E+21
Xe-135	4.5484E+07	1.7811E-02	7.9452E+22	3.9560E+22
Xe-135m	1.1374E+04	1.2495E-07	5.5738E+17	1.5762E+21
Xe-138	2.9476E+00	3.0719E-11	1.3405E+14	7.2173E+20
Cs-134	5.8037E+03	4.4857E-03	2.0159E+22	6.4059E+19
Cs-136	1.7479E+03	2.3849E-05	1.0560E+20	1.9504E+19
Cs-137	4.5068E+03	5.1813E-02	2.2775E+23	4.9734E+19
Ba-139	2.3595E+02	1.4425E-08	6.2497E+16	1.5389E+19
Ba-140	4.6289E+03	6.3229E-05	2.7198E+20	2.9529E+19
La-140	3.6244E+02	6.5208E-07	2.8049E+18	3.9548E+17
La-141	1.5288E+01	2.7032E-09	1.1545E+16	2.1561E+17
La-142	2.9110E+00	2.0335E-10	8.6241E+14	1.4745E+17
Ce-141	1.1046E+02	3.8769E-06	1.6558E+19	6.9956E+17
Ce-143	9.5242E+01	1.4342E-07	6.0398E+17	6.6103E+17
Ce-144	8.8738E+01	2.7822E-05	1.1635E+20	5.6061E+17
Pr-143	4.2786E+01	6.3538E-07	2.6758E+18	2.6717E+17
Nd-147	1.6978E+01	2.0987E-07	8.5978E+17	1.0849E+17
Np-239	1.1739E+03	5.0599E-06	1.2750E+19	7.8327E+18
Pu-238	2.7589E-01	1.6116E-05	4.0777E+19	1.7422E+15
Pu-239	2.7844E-02	4.4796E-04	1.1287E+21	1.7571E+14
Pu-240	4.9149E-02	2.1579E-05	5.4146E+19	3.1036E+14
Pu-241	1.0919E+01	1.1041E-04	2.7590E+20	6.8952E+16
Am-241	6.1857E-03	1.8056E-06	4.5119E+18	3.9009E+13
Cm-242	1.6952E+00	5.1211E-07	1.2744E+18	1.0713E+16
Cm-244	1.1220E-01	1.3708E-06	3.3833E+18	7.0856E+14

DW Transport Group Inventory:

Time (h) = 6.0000	Atmosphere	Sump
Noble gases (atoms)	2.4246E+25	0.0000E+00

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Elemental I (atoms)    1.2714E+19  7.8120E+22
Organic I (atoms)      1.3604E+21  0.0000E+00
Aerosols (kg)          6.0218E-02  6.5809E+01
Dose Effective (Ci/cc) I-131 (Thyroid)          9.0694E-06
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)    1.0776E-05
Total I (Ci)                                    2.5873E+05

DW to WW Transport Group Inventory:
Time (h) =   6.0000  Leakage Transport

Noble gases (atoms)      3.5862E+27
Elemental I (atoms)      7.5557E+21
Organic I (atoms)        2.0630E+23
Aerosols (kg)            1.3149E+01

WW to DW Transport Group Inventory:
Time (h) =   6.0000  Leakage Transport

Noble gases (atoms)      3.7281E+27
Elemental I (atoms)      1.1679E+22
Organic I (atoms)        2.1469E+23
Aerosols (kg)            1.6503E+01

DW to RB Transport Group Inventory:

                         Pathway
Time (h) =   6.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  6.9094E+22
Elemental I (atoms)    0.0000E+00  4.7143E+18
Organic I (atoms)      0.0000E+00  4.2013E+18
Aerosols (kg)          0.0000E+00  4.3425E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

                         Pathway
Time (h) =   6.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  6.2392E+21
Elemental I (atoms)    0.0000E+00  2.6586E+17
Organic I (atoms)      0.0000E+00  3.7587E+17
Aerosols (kg)          0.0000E+00  2.4075E-04

DW to  Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

                         Pathway
Time (h) =   6.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  3.3836E+22
Elemental I (atoms)    0.0000E+00  1.4418E+18
Organic I (atoms)      0.0000E+00  2.0384E+18
Aerosols (kg)          0.0000E+00  1.3056E-03

DW to  Dummy (Intact MSIV Pathway  8) Transport Group Inventory:

                         Pathway
Time (h) =   6.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  3.3836E+22
Elemental I (atoms)    0.0000E+00  1.4418E+18
Organic I (atoms)      0.0000E+00  2.0384E+18
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Aerosols (kg) 0.0000E+00 1.3056E-03

RB Compartment Nuclide Inventory:

Time (h) = 6.0000	Ci	kg	Atoms	Decay
Kr-83m	3.1686E+03	1.5609E-07	1.1326E+18	2.5135E+18
Kr-85m	2.6382E+04	3.2058E-06	2.2713E+19	1.3014E+19
Kr-85	3.3745E+03	8.6092E-03	6.0995E+22	1.2456E+18
Kr-87	5.1165E+03	1.8063E-07	1.2503E+18	6.2640E+18
Kr-88	4.2310E+04	3.3742E-06	2.3091E+19	2.5113E+19
Rb-86	2.2066E+00	2.7119E-08	1.8990E+17	2.2650E+15
Rb-88	5.2989E+04	4.3896E-07	3.0039E+18	2.5308E+19
Sr-89	4.8616E+01	1.6734E-06	1.1323E+19	3.7944E+16
Sr-90	5.2185E+00	3.8257E-05	2.5599E+20	4.0670E+15
Sr-91	3.8810E+01	1.0706E-08	7.0852E+16	3.6643E+16
Sr-92	1.3418E+01	1.0675E-09	6.9877E+15	2.1421E+16
Y-90	3.0780E-01	5.6574E-10	3.7855E+15	1.3460E+14
Y-91	6.5414E-01	2.6674E-08	1.7652E+17	4.9287E+14
Y-92	1.4494E+01	1.5063E-09	9.8601E+15	8.2280E+15
Y-93	4.5188E-01	1.3544E-10	8.7705E+14	4.2169E+14
Zr-95	7.1986E-01	3.3509E-08	2.1241E+17	5.6166E+14
Zr-97	5.4440E-01	2.8477E-10	1.7680E+15	4.7198E+14
Nb-95	7.1190E-01	1.8206E-08	1.1541E+17	5.5478E+14
Mo-99	8.5549E+00	1.7837E-08	1.0850E+17	6.8495E+15
Tc-99m	7.9062E+00	1.5036E-09	9.1463E+15	6.1861E+15
Ru-103	7.8535E+00	2.4334E-07	1.4227E+18	6.1320E+15
Ru-105	2.2023E+00	3.2763E-10	1.8791E+15	2.6201E+15
Ru-106	3.2778E+00	9.7975E-07	5.5662E+18	2.5550E+15
Rh-105	5.0504E+00	5.9835E-09	3.4318E+16	4.0204E+15
Sb-127	8.6764E+00	3.2490E-08	1.5406E+17	6.8933E+15
Sb-129	1.0708E+01	1.9043E-09	8.8897E+15	1.2899E+16
Te-127	8.9078E+00	3.3753E-09	1.6005E+16	6.9461E+15
Te-127m	1.5352E+00	1.6275E-07	7.7176E+17	1.1964E+15
Te-129	1.4758E+01	7.0470E-10	3.2898E+15	1.5142E+16
Te-129m	5.0287E+00	1.6693E-07	7.7927E+17	3.9222E+15
Te-131m	1.6604E+01	2.0823E-08	9.5725E+16	1.3736E+16
Te-132	1.2976E+02	4.2741E-07	1.9499E+18	1.0345E+17
I-131	1.1270E+03	9.0906E-06	4.1790E+19	1.0850E+18
I-132	4.5100E+02	4.3693E-08	1.9934E+17	8.8230E+17
I-133	1.9539E+03	1.7248E-06	7.8098E+18	2.0605E+18
I-134	2.3827E+01	8.9319E-10	4.0141E+15	4.9541E+17
I-135	1.2021E+03	3.4229E-07	1.5269E+18	1.5923E+18
Xe-133	4.0227E+05	2.1491E-03	9.7310E+21	1.4985E+20
Xe-133m	1.1883E+04	2.6991E-05	1.2222E+20	4.4852E+18
Xe-135	1.3325E+05	5.2178E-05	2.3276E+20	5.6047E+19
Xe-135m	2.1445E+02	2.3558E-09	1.0509E+16	5.5899E+17
Xe-138	8.6473E-03	9.0121E-14	3.9328E+11	1.8697E+17
Cs-134	2.2267E+02	1.7210E-04	7.7345E+20	2.2750E+17
Cs-136	6.7062E+01	9.1501E-07	4.0517E+18	6.8975E+16
Cs-137	1.7291E+02	1.9879E-03	8.7381E+21	1.7664E+17
Ba-139	3.6083E+00	2.2060E-10	9.5573E+14	1.2861E+16
Ba-140	7.0787E+01	9.6691E-07	4.1592E+18	5.5488E+16
La-140	6.1459E+00	1.1057E-08	4.7563E+16	2.5551E+15
La-141	2.3378E-01	4.1338E-11	1.7656E+14	2.9483E+14
La-142	4.4516E-02	3.1097E-12	1.3188E+13	1.3234E+14
Ce-141	1.6889E+00	5.9273E-08	2.5316E+17	1.3186E+15
Ce-143	1.4565E+00	2.1932E-09	9.2362E+15	1.1983E+15

Ce-144	1.3570E+00	4.2546E-07	1.7793E+18	1.0578E+15
Pr-143	6.5538E-01	9.7326E-09	4.0987E+16	5.0718E+14
Nd-147	2.5964E-01	3.2094E-09	1.3148E+16	2.0371E+14
Np-239	1.7951E+01	7.7378E-08	1.9497E+17	1.4438E+16
Pu-238	4.2190E-03	2.4644E-07	6.2358E+17	3.2880E+12
Pu-239	4.2580E-04	6.8504E-06	1.7261E+19	3.3172E+11
Pu-240	7.5159E-04	3.2999E-07	8.2802E+17	5.8575E+11
Pu-241	1.6698E-01	1.6885E-06	4.2192E+18	1.3013E+14
Am-241	9.4604E-05	2.7615E-08	6.9004E+16	7.3668E+10
Cm-242	2.5924E-02	7.8314E-09	1.9488E+16	2.0213E+13
Cm-244	1.7159E-03	2.0963E-08	5.1739E+16	1.3373E+12

RB Transport Group Inventory:

Time (h) = 6.0000	Atmosphere	Sump	
Noble gases (atoms)	7.1129E+22	0.0000E+00	
Elemental I (atoms)	2.1680E+18	0.0000E+00	
Organic I (atoms)	4.0811E+18	0.0000E+00	
Aerosols (kg)	2.2240E-03	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.7118E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.2146E-08
Total I (Ci)			4.7578E+03

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 6.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.9094E+22
Elemental I (atoms)	0.0000E+00	4.7143E+18
Organic I (atoms)	0.0000E+00	4.2013E+18
Aerosols (kg)	0.0000E+00	4.3425E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 6.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.8527E+22
Elemental I (atoms)	0.0000E+00	8.9369E+16
Organic I (atoms)	0.0000E+00	1.6428E+18
Aerosols (kg)	0.0000E+00	1.2628E-04

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 6.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 6.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6305E+22
Elemental I (atoms)	2.0565E+18	2.0772E+16
Organic I (atoms)	1.5789E+18	1.5949E+16
Aerosols (kg)	1.9674E-03	1.9872E-05

Environment Integral Nuclide Release:

Time (h) = 6.0000	Ci	kg	Atoms	Bq
Kr-83m	2.4464E+03	1.2051E-07	8.7440E+17	9.0515E+13
Kr-85m	1.2897E+04	1.5671E-06	1.1103E+19	4.7718E+14
Kr-85	1.2485E+03	3.1853E-03	2.2567E+22	4.6196E+13
Kr-87	5.9999E+03	2.1182E-07	1.4662E+18	2.2200E+14
Kr-88	2.4710E+04	1.9706E-06	1.3486E+19	9.1428E+14
Rb-86	2.2102E-01	2.7164E-09	1.9021E+16	8.1778E+09
Rb-88	6.1214E+03	5.0709E-08	3.4702E+17	2.2649E+14
Sr-89	8.0200E-01	2.7606E-08	1.8679E+17	2.9674E+10
Sr-90	8.5900E-02	6.2973E-07	4.2137E+18	3.1783E+09
Sr-91	8.5313E-01	2.3535E-10	1.5575E+15	3.1566E+10
Sr-92	6.4166E-01	5.1050E-11	3.3416E+14	2.3742E+10
Y-90	1.9782E-03	3.6360E-12	2.4329E+13	7.3193E+07
Y-91	1.0257E-02	4.1823E-10	2.7677E+15	3.7950E+08
Y-92	1.0976E-01	1.1407E-11	7.4668E+13	4.0612E+09
Y-93	9.7603E-03	2.9255E-12	1.8944E+13	3.6113E+08
Zr-95	1.1870E-02	5.5253E-10	3.5025E+15	4.3919E+08
Zr-97	1.0526E-02	5.5060E-12	3.4183E+13	3.8945E+08
Nb-95	1.1718E-02	2.9967E-10	1.8996E+15	4.3356E+08
Mo-99	1.4668E-01	3.0583E-10	1.8603E+15	5.4271E+09
Tc-99m	1.3174E-01	2.5054E-11	1.5240E+14	4.8744E+09
Ru-103	1.2964E-01	4.0168E-09	2.3485E+16	4.7967E+09
Ru-105	6.8365E-02	1.0170E-11	5.8330E+13	2.5295E+09
Ru-106	5.3970E-02	1.6132E-08	9.1649E+16	1.9969E+09
Rh-105	8.5527E-02	1.0133E-10	5.8116E+14	3.1645E+09
Sb-127	1.4703E-01	5.5058E-10	2.6108E+15	5.4403E+09
Sb-129	3.3859E-01	6.0211E-11	2.8108E+14	1.2528E+10
Te-127	1.4741E-01	5.5857E-11	2.6487E+14	5.4543E+09
Te-127m	2.5269E-02	2.6789E-09	1.2703E+16	9.3495E+08
Te-129	3.7104E-01	1.7717E-11	8.2711E+13	1.3729E+10
Te-129m	8.2859E-02	2.7505E-09	1.2840E+16	3.0658E+09
Te-131m	2.9909E-01	3.7508E-10	1.7243E+15	1.1066E+10
Te-132	2.2106E+00	7.2816E-09	3.3220E+16	8.1794E+10
I-131	9.7861E+01	7.8936E-07	3.6287E+18	3.6209E+12
I-132	1.1857E+02	1.1487E-08	5.2408E+16	4.3873E+12
I-133	1.9790E+02	1.7470E-07	7.9101E+17	7.3222E+12
I-134	1.3907E+02	5.2130E-09	2.3428E+16	5.1455E+12
I-135	1.7665E+02	5.0302E-08	2.2439E+17	6.5362E+12
Xe-133	1.5015E+05	8.0217E-04	3.6321E+21	5.5556E+15
Xe-133m	4.4917E+03	1.0202E-05	4.6196E+19	1.6619E+14
Xe-135	5.5881E+04	2.1882E-05	9.7612E+19	2.0676E+15
Xe-135m	4.5237E+02	4.9693E-09	2.2167E+16	1.6738E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	2.2130E+01	1.7104E-05	7.6868E+19	8.1880E+11
Cs-136	6.7400E+00	9.1963E-08	4.0721E+17	2.4938E+11
Cs-137	1.7181E+01	1.9753E-04	8.6827E+20	6.3570E+11
Ba-139	5.3725E-01	3.2846E-11	1.4230E+14	1.9878E+10
Ba-140	1.1754E+00	1.6056E-08	6.9066E+16	4.3491E+10
La-140	3.5388E-02	6.3667E-11	2.7387E+14	1.3094E+09
La-141	7.9115E-03	1.3989E-12	5.9749E+12	2.9272E+08
La-142	5.1568E-03	3.6024E-13	1.5277E+12	1.9080E+08
Ce-141	2.7870E-02	9.7812E-10	4.1776E+15	1.0312E+09
Ce-143	2.6019E-02	3.9181E-11	1.6500E+14	9.6271E+08
Ce-144	2.2346E-02	7.0060E-09	2.9299E+16	8.2679E+08

Pr-143	1.0683E-02	1.5864E-10	6.6810E+14	3.9527E+08
Nd-147	4.3175E-03	5.3369E-11	2.1864E+14	1.5975E+08
Np-239	3.0990E-01	1.3358E-09	3.3659E+15	1.1466E+10
Pu-238	6.9445E-05	4.0564E-09	1.0264E+16	2.5695E+06
Pu-239	7.0049E-06	1.1270E-07	2.8397E+17	2.5918E+05
Pu-240	1.2372E-05	5.4318E-09	1.3630E+16	4.5775E+05
Pu-241	2.7485E-03	2.7793E-08	6.9450E+16	1.0170E+08
Am-241	1.5554E-06	4.5402E-10	1.1345E+15	5.7550E+04
Cm-242	4.2701E-04	1.2900E-10	3.2100E+14	1.5799E+07
Cm-244	2.8244E-05	3.4506E-10	8.5165E+14	1.0450E+06

Environment Transport Group Inventory:

Time (h) = 6.0000	Total Release	Release Rate/s	
Noble gases (atoms)	2.6370E+22	1.2208E+18	
Elemental I (atoms)	2.2763E+17	1.0539E+13	
Organic I (atoms)	2.6308E+16	1.2180E+12	
Aerosols (kg)	2.1662E-04	1.0029E-08	
Dose Effective (Ci) I-131 (Thyroid)			1.3676E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.7210E+02
Total I (Ci)			7.3005E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 6.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.4114E+17
Elemental I (atoms)	1.9254E+14	1.9624E+12
Organic I (atoms)	1.0097E+13	1.0253E+11
Aerosols (kg)	1.8302E-07	1.8653E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 6.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5577E+17
Elemental I (atoms)	0.0000E+00	3.6021E+13
Organic I (atoms)	0.0000E+00	1.8889E+12
Aerosols (kg)	0.0000E+00	3.4240E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 6.0000	Pathway Filtered	Transported
Noble gases (atoms)	3.6483E+17	0.0000E+00
Elemental I (atoms)	2.2196E+13	0.0000E+00
Organic I (atoms)	1.1334E+12	0.0000E+00
Aerosols (kg)	2.1769E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 6.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16

Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 6.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6305E+22
Elemental I (atoms)	2.0565E+18	2.0772E+16
Organic I (atoms)	1.5789E+18	1.5949E+16
Aerosols (kg)	1.9674E-03	1.9872E-05

CR Compartment Nuclide Inventory:

Time (h) = 6.0000	Ci	kg	Atoms	Decay
Kr-83m	2.8076E-02	1.3831E-12	1.0035E+13	1.8889E+13
Kr-85m	2.3376E-01	2.8405E-11	2.0125E+14	9.6900E+13
Kr-85	2.9901E-02	7.6283E-08	5.4046E+17	9.3110E+12
Kr-87	4.5336E-02	1.6005E-12	1.1079E+13	4.8184E+13
Kr-88	3.7489E-01	2.9898E-11	2.0460E+14	1.8724E+14
Rb-86	5.3150E-06	6.5320E-14	4.5741E+11	1.1585E+10
Rb-88	3.7031E-01	3.0676E-12	2.0992E+13	1.4271E+14
Sr-89	1.3279E-05	4.5707E-13	3.0927E+12	2.4407E+10
Sr-90	1.4254E-06	1.0450E-11	6.9921E+13	2.6150E+09
Sr-91	1.0601E-05	2.9243E-15	1.9353E+10	2.4875E+10
Sr-92	3.6650E-06	2.9158E-16	1.9086E+09	1.6595E+10
Y-90	9.3505E-08	1.7186E-16	1.1500E+09	8.1937E+07
Y-91	1.8069E-07	7.3677E-15	4.8758E+10	3.1658E+08
Y-92	4.5814E-06	4.7612E-16	3.1166E+09	5.7492E+09
Y-93	1.2343E-07	3.6995E-17	2.3956E+08	2.8535E+08
Zr-95	1.9662E-07	9.1525E-15	5.8019E+10	3.6126E+08
Zr-97	1.4870E-07	7.7783E-17	4.8291E+08	3.1290E+08
Nb-95	1.9445E-07	4.9727E-15	3.1522E+10	3.5672E+08
Mo-99	2.3367E-06	4.8720E-15	2.9636E+10	4.4387E+09
Tc-99m	2.1595E-06	4.1069E-16	2.4982E+09	3.9863E+09
Ru-103	2.1451E-06	6.6465E-14	3.8861E+11	3.9450E+09
Ru-105	6.0154E-07	8.9488E-17	5.1325E+08	1.8905E+09
Ru-106	8.9530E-07	2.6761E-13	1.5204E+12	1.6429E+09
Rh-105	1.3795E-06	1.6343E-15	9.3736E+09	2.5970E+09
Sb-127	2.3699E-06	8.8742E-15	4.2080E+10	4.4571E+09
Sb-129	2.9249E-06	5.2013E-16	2.4281E+09	9.3366E+09
Te-127	2.4331E-06	9.2194E-16	4.3717E+09	4.4708E+09
Te-127m	4.1932E-07	4.4455E-14	2.1080E+11	7.6926E+08
Te-129	4.0310E-06	1.9248E-16	8.9857E+08	1.0505E+10
Te-129m	1.3735E-06	4.5595E-14	2.1285E+11	2.5223E+09
Te-131m	4.5353E-06	5.6876E-15	2.6146E+10	8.9853E+09
Te-132	3.5442E-05	1.1674E-13	5.3261E+11	6.6960E+10
I-131	2.3106E-03	1.8637E-11	8.5677E+13	5.0617E+12
I-132	6.1019E-04	5.9115E-14	2.6970E+11	4.0067E+12
I-133	4.0079E-03	3.5380E-12	1.6020E+13	9.7693E+12
I-134	4.8876E-05	1.8322E-15	8.2340E+09	2.8874E+12
I-135	2.4658E-03	7.0212E-13	3.1321E+12	7.8272E+12
Xe-133	3.5636E+00	1.9038E-08	8.6204E+16	1.1193E+15
Xe-133m	1.0524E-01	2.3904E-10	1.0823E+15	3.3466E+13
Xe-135	1.1734E+00	4.5948E-10	2.0497E+15	4.1121E+14
Xe-135m	7.6802E-04	8.4367E-15	3.7635E+10	4.2845E+12
Xe-138	7.6622E-08	7.9854E-19	3.4847E+06	2.9985E+12
Cs-134	5.3633E-04	4.1453E-10	1.8630E+15	1.1628E+12

Cs-136	1.6153E-04	2.2039E-12	9.7591E+12	3.5290E+11
Cs-137	4.1647E-04	4.7881E-09	2.1047E+16	9.0281E+11
Ba-139	9.8557E-07	6.0254E-17	2.6105E+08	1.1712E+10
Ba-140	1.9335E-05	2.6410E-13	1.1360E+12	3.5738E+10
La-140	1.8781E-06	3.3789E-15	1.4534E+10	1.5455E+09
La-141	6.3856E-08	1.1291E-17	4.8225E+07	2.1588E+08
La-142	1.2159E-08	8.4940E-19	3.6022E+06	1.1662E+08
Ce-141	4.6117E-07	1.6185E-14	6.9128E+10	8.4803E+08
Ce-143	3.9782E-07	5.9905E-16	2.5228E+09	7.8263E+08
Ce-144	3.7065E-07	1.1621E-13	4.8600E+11	6.8023E+08
Pr-143	1.7937E-07	2.6637E-15	1.1218E+10	3.2599E+08
Nd-147	7.0917E-08	8.7662E-16	3.5912E+09	1.3124E+08
Np-239	4.9031E-06	2.1135E-14	5.3254E+10	9.3686E+09
Pu-238	1.1524E-09	6.7313E-14	1.7032E+11	2.1141E+06
Pu-239	1.1630E-10	1.8711E-12	4.7147E+12	2.1327E+05
Pu-240	2.0529E-10	9.0134E-14	2.2617E+11	3.7662E+05
Pu-241	4.5608E-08	4.6119E-13	1.1524E+12	8.3673E+07
Am-241	2.5843E-11	7.5437E-15	1.8850E+10	4.7361E+04
Cm-242	7.0808E-09	2.1391E-15	5.3230E+09	1.2998E+07
Cm-244	4.6867E-10	5.7258E-15	1.4132E+10	8.5983E+05

CR Transport Group Inventory:

Time (h) = 6.0000	Atmosphere	Sump		
Noble gases (atoms)	6.3022E+17	0.0000E+00		
Elemental I (atoms)	5.0889E+12	0.0000E+00		
Organic I (atoms)	3.1281E+11	0.0000E+00		
Aerosols (kg)	5.2441E-09	0.0000E+00		
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.8296E-13	
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.3459E-13	
Total I (Ci)			9.4433E-03	

Time (h) = 6.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	9.2702E+12
Organic I (atoms)	0.0000E+00	4.7339E+11
Aerosols (kg)	0.0000E+00	9.0918E-09

CR Filtered Intake Transport Group Inventory:

Time (h) = 6.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.4114E+17
Elemental I (atoms)	1.9254E+14	1.9624E+12
Organic I (atoms)	1.0097E+13	1.0253E+11
Aerosols (kg)	1.8302E-07	1.8653E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 6.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5577E+17
Elemental I (atoms)	0.0000E+00	3.6021E+13
Organic I (atoms)	0.0000E+00	1.8889E+12
Aerosols (kg)	0.0000E+00	3.4240E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 6.0000	Pathway Filtered	Transported
Noble gases (atoms)	3.6483E+17	0.0000E+00
Elemental I (atoms)	2.2196E+13	0.0000E+00
Organic I (atoms)	1.1334E+12	0.0000E+00
Aerosols (kg)	2.1769E-08	0.0000E+00

EAB Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.9777E-01	4.2279E-02	1.9981E-01
Accumulated dose (rem)	6.5701E-01	5.8271E+00	9.0688E-01

LPZ Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.4875E-02	2.0282E-02	9.5853E-02
Accumulated dose (rem)	3.0260E-01	8.5955E-01	3.3975E-01

CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2614E-02	5.5484E-01	4.3791E-02
Accumulated dose (rem)	3.4508E-02	7.3032E+00	3.6640E-01

DW Compartment Nuclide Inventory:

Time (h) = 8.0000	Ci	kg	Atoms	Decay
Kr-83m	5.1170E+05	2.5208E-05	1.8290E+20	2.6068E+21
Kr-85m	6.5879E+06	8.0053E-04	5.6716E+21	1.1995E+22
Kr-85	1.1483E+06	2.9295E+00	2.0755E+25	1.1281E+21
Kr-87	5.8528E+05	2.0662E-05	1.4303E+20	7.4773E+21
Kr-88	8.8364E+06	7.0470E-04	4.8225E+21	2.4026E+22
Rb-86	5.7237E+01	7.0344E-07	4.9258E+18	6.5492E+17
Rb-88	1.1070E+07	9.1700E-05	6.2753E+20	1.5394E+22
Sr-89	3.1700E+03	1.0911E-04	7.3830E+20	2.0972E+19
Sr-90	3.4066E+02	2.4974E-03	1.6711E+22	2.2458E+18
Sr-91	2.1895E+03	6.0401E-07	3.9972E+18	2.2915E+19
Sr-92	5.2517E+02	4.1781E-08	2.7349E+17	1.8063E+19
Y-90	2.5144E+01	4.6216E-08	3.0924E+17	3.2508E+16
Y-91	4.3249E+01	1.7636E-06	1.1671E+19	2.6448E+17
Y-92	7.7872E+02	8.0929E-08	5.2974E+17	8.4048E+17
Y-93	2.5715E+01	7.7076E-09	4.9910E+16	2.6177E+17
Zr-95	4.6950E+01	2.1854E-06	1.3854E+19	3.1038E+17
Zr-97	3.2739E+01	1.7126E-08	1.0632E+17	2.7954E+17
Nb-95	4.6472E+01	1.1884E-06	7.5337E+18	3.0635E+17
Mo-99	5.4685E+02	1.1402E-06	6.9357E+18	3.8507E+18
Tc-99m	5.1052E+02	9.7089E-08	5.9059E+17	3.4330E+18
Ru-103	5.1191E+02	1.5862E-05	9.2738E+19	3.3903E+18
Ru-105	1.0521E+02	1.5651E-08	8.9767E+16	1.8830E+18
Ru-106	2.1394E+02	6.3947E-05	3.6330E+20	1.4111E+18
Rh-105	3.2176E+02	3.8121E-07	2.1864E+18	2.2401E+18
Sb-127	5.5795E+02	2.0893E-06	9.9072E+18	3.8555E+18
Sb-129	5.0715E+02	9.0186E-08	4.2102E+17	9.3366E+18
Te-127	5.7869E+02	2.1928E-07	1.0398E+18	3.8450E+18
Te-127m	1.0022E+02	1.0625E-05	5.0380E+19	6.6062E+17

Te-129	7.6533E+02	3.6545E-08	1.7060E+17	9.9049E+18
Te-129m	3.2793E+02	1.0886E-05	5.0818E+19	2.1664E+18
Te-131m	1.0350E+03	1.2979E-06	5.9666E+18	7.8902E+18
Te-132	8.3217E+03	2.7411E-05	1.2505E+20	5.7998E+19
I-131	5.8942E+04	4.7543E-04	2.1856E+21	3.5408E+20
I-132	2.1120E+04	2.0460E-06	9.3345E+18	4.6889E+20
I-133	9.6216E+04	8.4936E-05	3.8458E+20	7.0375E+20
I-134	2.5799E+02	9.6711E-09	4.3463E+16	4.0497E+20
I-135	5.1303E+04	1.4609E-05	6.5166E+19	6.0642E+20
Xe-133	1.3544E+08	7.2356E-01	3.2762E+24	1.3565E+23
Xe-133m	3.9407E+06	8.9509E-03	4.0529E+22	4.0582E+21
Xe-135	3.8991E+07	1.5268E-02	6.8110E+22	5.0789E+22
Xe-135m	9.1438E+03	1.0045E-07	4.4807E+17	1.5786E+21
Xe-138	8.4100E-03	8.7648E-14	3.8248E+11	7.2173E+20
Cs-134	5.7933E+03	4.4776E-03	2.0123E+22	6.5603E+19
Cs-136	1.7372E+03	2.3703E-05	1.0496E+20	1.9968E+19
Cs-137	4.4989E+03	5.1723E-02	2.2736E+23	5.0934E+19
Ba-139	8.6154E+01	5.2671E-09	2.2820E+16	1.5428E+19
Ba-140	4.6000E+03	6.2834E-05	2.7028E+20	3.0759E+19
La-140	5.0571E+02	9.0983E-07	3.9137E+18	5.1019E+17
La-141	1.0725E+01	1.8964E-09	8.0996E+15	2.1904E+17
La-142	1.1824E+00	8.2599E-11	3.5030E+14	1.4796E+17
Ce-141	1.1010E+02	3.8641E-06	1.6504E+19	7.2894E+17
Ce-143	9.1166E+01	1.3728E-07	5.7813E+17	6.8586E+17
Ce-144	8.8566E+01	2.7768E-05	1.1613E+20	5.8423E+17
Pr-143	4.2926E+01	6.3746E-07	2.6845E+18	2.7858E+17
Nd-147	1.6860E+01	2.0841E-07	8.5378E+17	1.1299E+17
Np-239	1.1434E+03	4.9288E-06	1.2419E+19	8.1414E+18
Pu-238	2.7542E-01	1.6088E-05	4.0707E+19	1.8156E+15
Pu-239	2.7803E-02	4.4731E-04	1.1271E+21	1.8313E+14
Pu-240	4.9064E-02	2.1542E-05	5.4053E+19	3.2344E+14
Pu-241	1.0900E+01	1.1022E-04	2.7542E+20	7.1858E+16
Am-241	6.1790E-03	1.8036E-06	4.5070E+18	4.0656E+13
Cm-242	1.6917E+00	5.1105E-07	1.2717E+18	1.1164E+16
Cm-244	1.1201E-01	1.3684E-06	3.3774E+18	7.3842E+14

DW Transport Group Inventory:

Time (h) = 8.0000	Atmosphere	Sump	
Noble gases (atoms)	2.4151E+25	0.0000E+00	
Elemental I (atoms)	1.2401E+19	7.8120E+22	
Organic I (atoms)	1.3269E+21	0.0000E+00	
Aerosols (kg)	6.0048E-02	6.5809E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		8.8308E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.0345E-05
Total I (Ci)			2.2784E+05

DW to WW Transport Group Inventory:
Time (h) = 8.0000 Leakage Transport

Noble gases (atoms)	5.3953E+27
Elemental I (atoms)	8.4947E+21
Organic I (atoms)	3.0677E+23
Aerosols (kg)	1.7644E+01

WW to DW Transport Group Inventory:
Time (h) = 8.0000 Leakage Transport

Noble gases (atoms) 5.5372E+27
Elemental I (atoms) 1.2618E+22
Organic I (atoms) 3.1517E+23
Aerosols (kg) 2.0998E+01

DW to RB Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.5174E+22
Elemental I (atoms)	0.0000E+00	4.7278E+18
Organic I (atoms)	0.0000E+00	5.6498E+18
Aerosols (kg)	0.0000E+00	4.4073E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.6035E+21
Elemental I (atoms)	0.0000E+00	2.6709E+17
Organic I (atoms)	0.0000E+00	5.0719E+17
Aerosols (kg)	0.0000E+00	2.4662E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.6658E+22
Elemental I (atoms)	0.0000E+00	1.4485E+18
Organic I (atoms)	0.0000E+00	2.7506E+18
Aerosols (kg)	0.0000E+00	1.3375E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.6658E+22
Elemental I (atoms)	0.0000E+00	1.4485E+18
Organic I (atoms)	0.0000E+00	2.7506E+18
Aerosols (kg)	0.0000E+00	1.3375E-03

RB Compartment Nuclide Inventory:

Time (h) = 8.0000	Ci	kg	Atoms	Decay
Kr-83m	1.8851E+03	9.2867E-08	6.7380E+17	3.1821E+18
Kr-85m	2.4271E+04	2.9492E-06	2.0895E+19	1.9860E+19
Kr-85	4.2303E+03	1.0793E-02	7.6464E+22	2.2695E+18
Kr-87	2.1562E+03	7.6122E-08	5.2692E+17	7.1907E+18
Kr-88	3.2554E+04	2.5962E-06	1.7767E+19	3.5180E+19
Rb-86	1.7584E+00	2.1611E-08	1.5133E+17	2.7875E+15
Rb-88	4.0782E+04	3.3783E-07	2.3119E+18	3.6684E+19
Sr-89	4.1572E+01	1.4309E-06	9.6823E+18	4.9868E+16
Sr-90	4.4675E+00	3.2751E-05	2.1915E+20	5.3477E+15
Sr-91	2.8714E+01	7.9211E-09	5.2420E+16	4.5522E+16
Sr-92	6.8872E+00	5.4793E-10	3.5867E+15	2.4015E+16
Y-90	3.5100E-01	6.4515E-10	4.3169E+15	2.2169E+14
Y-91	5.7170E-01	2.3312E-08	1.5427E+17	6.5499E+14

Y-92	1.1164E+01	1.1602E-09	7.5943E+15	1.1615E+16
Y-93	3.3724E-01	1.0108E-10	6.5454E+14	5.2550E+14
Zr-95	6.1571E-01	2.8661E-08	1.8168E+17	7.3825E+14
Zr-97	4.2935E-01	2.2459E-10	1.3944E+15	6.0039E+14
Nb-95	6.0945E-01	1.5586E-08	9.8799E+16	7.2948E+14
Mo-99	7.1715E+00	1.4953E-08	9.0957E+16	8.9276E+15
Tc-99m	6.6951E+00	1.2733E-09	7.7452E+15	8.1059E+15
Ru-103	6.7134E+00	2.0801E-07	1.2162E+18	8.0580E+15
Ru-105	1.3797E+00	2.0526E-10	1.1772E+15	3.0862E+15
Ru-106	2.8057E+00	8.3862E-07	4.7644E+18	3.3594E+15
Rh-105	4.2197E+00	4.9993E-09	2.8673E+16	5.2452E+15
Sb-127	7.3172E+00	2.7400E-08	1.2993E+17	9.0071E+15
Sb-129	6.6509E+00	1.1827E-09	5.5213E+15	1.5156E+16
Te-127	7.5892E+00	2.8757E-09	1.3636E+16	9.1195E+15
Te-127m	1.3143E+00	1.3933E-07	6.6070E+17	1.5731E+15
Te-129	1.0037E+01	4.7926E-10	2.2373E+15	1.8307E+16
Te-129m	4.3006E+00	1.4276E-07	6.6644E+17	5.1557E+15
Te-131m	1.3573E+01	1.7021E-08	7.8248E+16	1.7720E+16
Te-132	1.0913E+02	3.5947E-07	1.6400E+18	1.3502E+17
I-131	9.3759E+02	7.5628E-06	3.4767E+19	1.3577E+18
I-132	2.6353E+02	2.5531E-08	1.1648E+17	9.7371E+17
I-133	1.5314E+03	1.3519E-06	6.1213E+18	2.5198E+18
I-134	4.1064E+00	1.5393E-10	6.9180E+14	4.9838E+17
I-135	8.1658E+02	2.3252E-07	1.0372E+18	1.8563E+18
Xe-133	4.9896E+05	2.6656E-03	1.2070E+22	2.7124E+20
Xe-133m	1.4518E+04	3.2976E-05	1.4931E+20	8.0430E+18
Xe-135	1.4362E+05	5.6240E-05	2.5088E+20	9.3470E+19
Xe-135m	1.4554E+02	1.5987E-09	7.1316E+15	6.0043E+17
Xe-138	3.0983E-05	3.2290E-16	1.4091E+09	1.8697E+17
Cs-134	1.7798E+02	1.3756E-04	6.1820E+20	2.8030E+17
Cs-136	5.3369E+01	7.2819E-07	3.2244E+18	8.4844E+16
Cs-137	1.3821E+02	1.5890E-03	6.9847E+21	2.1764E+17
Ba-139	1.1298E+00	6.9074E-11	2.9926E+14	1.3427E+16
Ba-140	6.0326E+01	8.2402E-07	3.5445E+18	7.2821E+16
La-140	7.0761E+00	1.2731E-08	5.4761E+16	4.3031E+15
La-141	1.4065E-01	2.4870E-11	1.0622E+14	3.4339E+14
La-142	1.5506E-02	1.0832E-12	4.5939E+12	1.3962E+14
Ce-141	1.4436E+00	5.0665E-08	2.1639E+17	1.7327E+15
Ce-143	1.1956E+00	1.8003E-09	7.5817E+15	1.5485E+15
Ce-144	1.1615E+00	3.6416E-07	1.5229E+18	1.3908E+15
Pr-143	5.6377E-01	8.3721E-09	3.5257E+16	6.6837E+14
Nd-147	2.2111E-01	2.7331E-09	1.1197E+16	2.6727E+14
Np-239	1.4995E+01	6.4637E-08	1.6287E+17	1.8791E+16
Pu-238	3.6119E-03	2.1098E-07	5.3384E+17	4.3234E+12
Pu-239	3.6462E-04	5.8662E-06	1.4781E+19	4.3623E+11
Pu-240	6.4343E-04	2.8250E-07	7.0886E+17	7.7020E+11
Pu-241	1.4295E-01	1.4455E-06	3.6119E+18	1.7111E+14
Am-241	8.1041E-05	2.3656E-08	5.9111E+16	9.6892E+10
Cm-242	2.2185E-02	6.7020E-09	1.6678E+16	2.6573E+13
Cm-244	1.4689E-03	1.7946E-08	4.4293E+16	1.7583E+12

RB Transport Group Inventory:

Time (h) = 8.0000	Atmosphere	Sump
Noble gases (atoms)	8.8974E+22	0.0000E+00
Elemental I (atoms)	1.6321E+18	0.0000E+00
Organic I (atoms)	4.9571E+18	0.0000E+00
Aerosols (kg)	1.7806E-03	0.0000E+00

Dose Effective (Ci/cc) I-131 (Thyroid) 2.2167E-08
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid) 2.5930E-08
Total I (Ci) 3.5533E+03

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 8.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.5174E+22
Elemental I (atoms)	0.0000E+00	4.7278E+18
Organic I (atoms)	0.0000E+00	5.6498E+18
Aerosols (kg)	0.0000E+00	4.4073E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 8.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.2370E+22
Elemental I (atoms)	0.0000E+00	9.6554E+16
Organic I (atoms)	0.0000E+00	2.4116E+18
Aerosols (kg)	0.0000E+00	1.6068E-04

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 8.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 8.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.8207E+22
Elemental I (atoms)	2.5651E+18	2.5910E+16
Organic I (atoms)	2.8041E+18	2.8324E+16
Aerosols (kg)	2.5042E-03	2.5295E-05

Environment Integral Nuclide Release:

Time (h) = 8.0000	Ci	kg	Atoms	Bq
Kr-83m	3.1129E+03	1.5335E-07	1.1126E+18	1.1518E+14
Kr-85m	1.9797E+04	2.4057E-06	1.7044E+19	7.3251E+14
Kr-85	2.2888E+03	5.8392E-03	4.1370E+22	8.4684E+13
Kr-87	6.9158E+03	2.4415E-07	1.6900E+18	2.5588E+14
Kr-88	3.4812E+04	2.7763E-06	1.8999E+19	1.2880E+15
Rb-86	2.2639E-01	2.7823E-09	1.9483E+16	8.3764E+09
Rb-88	8.6268E+03	7.1463E-08	4.8904E+17	3.1919E+14
Sr-89	9.2430E-01	3.1815E-08	2.1527E+17	3.4199E+10
Sr-90	9.9035E-02	7.2602E-07	4.8580E+18	3.6643E+09
Sr-91	9.4386E-01	2.6038E-10	1.7231E+15	3.4923E+10
Sr-92	6.6794E-01	5.3140E-11	3.4784E+14	2.4714E+10
Y-90	2.8853E-03	5.3033E-12	3.5486E+13	1.0676E+08
Y-91	1.1921E-02	4.8611E-10	3.2169E+15	4.4109E+08
Y-92	1.4469E-01	1.5037E-11	9.8429E+13	5.3536E+09

Y-93	1.0821E-02	3.2435E-12	2.1003E+13	4.0039E+08
Zr-95	1.3681E-02	6.3683E-10	4.0369E+15	5.0619E+08
Zr-97	1.1840E-02	6.1935E-12	3.8451E+13	4.3808E+08
Nb-95	1.3510E-02	3.4549E-10	2.1901E+15	4.9986E+08
Mo-99	1.6798E-01	3.5024E-10	2.1305E+15	6.2153E+09
Tc-99m	1.5153E-01	2.8818E-11	1.7530E+14	5.6067E+09
Ru-103	1.4939E-01	4.6289E-09	2.7064E+16	5.5275E+09
Ru-105	7.3108E-02	1.0876E-11	6.2377E+13	2.7050E+09
Ru-106	6.2220E-02	1.8598E-08	1.0566E+17	2.3021E+09
Rh-105	9.8086E-02	1.1621E-10	6.6650E+14	3.6292E+09
Sb-127	1.6871E-01	6.3173E-10	2.9956E+15	6.2421E+09
Sb-129	3.6156E-01	6.4295E-11	3.0015E+14	1.3378E+10
Te-127	1.6978E-01	6.4333E-11	3.0506E+14	6.2819E+09
Te-127m	2.9133E-02	3.0886E-09	1.4645E+16	1.0779E+09
Te-129	4.0410E-01	1.9296E-11	9.0080E+13	1.4952E+10
Te-129m	9.5510E-02	3.1704E-09	1.4801E+16	3.5339E+09
Te-131m	3.3991E-01	4.2627E-10	1.9596E+15	1.2577E+10
Te-132	2.5343E+00	8.3477E-09	3.8084E+16	9.3769E+10
I-131	1.0066E+02	8.1193E-07	3.7325E+18	3.7244E+12
I-132	1.1951E+02	1.1578E-08	5.2820E+16	4.4218E+12
I-133	2.0260E+02	1.7885E-07	8.0981E+17	7.4963E+12
I-134	1.3910E+02	5.2141E-09	2.3433E+16	5.1466E+12
I-135	1.7935E+02	5.1070E-08	2.2781E+17	6.6359E+12
Xe-133	2.7344E+05	1.4608E-03	6.6146E+21	1.0117E+16
Xe-133m	8.1039E+03	1.8407E-05	8.3347E+19	2.9984E+14
Xe-135	9.3755E+04	3.6713E-05	1.6377E+20	3.4689E+15
Xe-135m	4.8948E+02	5.3770E-09	2.3986E+16	1.8111E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	2.2672E+01	1.7523E-05	7.8752E+19	8.3887E+11
Cs-136	6.9030E+00	9.4187E-08	4.1706E+17	2.5541E+11
Cs-137	1.7602E+01	2.0237E-04	8.8956E+20	6.5129E+11
Ba-139	5.4291E-01	3.3191E-11	1.4380E+14	2.0088E+10
Ba-140	1.3532E+00	1.8484E-08	7.9510E+16	5.0068E+10
La-140	5.3611E-02	9.6452E-11	4.1489E+14	1.9836E+09
La-141	8.4052E-03	1.4862E-12	6.3477E+12	3.1099E+08
La-142	5.2299E-03	3.6534E-13	1.5494E+12	1.9351E+08
Ce-141	3.2117E-02	1.1272E-09	4.8142E+15	1.1883E+09
Ce-143	2.9607E-02	4.4584E-11	1.8776E+14	1.0955E+09
Ce-144	2.5761E-02	8.0768E-09	3.3777E+16	9.5315E+08
Pr-143	1.2337E-02	1.8320E-10	7.7152E+14	4.5646E+08
Nd-147	4.9692E-03	6.1425E-11	2.5164E+14	1.8386E+08
Np-239	3.5452E-01	1.5282E-09	3.8506E+15	1.3117E+10
Pu-238	8.0064E-05	4.6767E-09	1.1834E+16	2.9624E+06
Pu-239	8.0768E-06	1.2994E-07	3.2742E+17	2.9884E+05
Pu-240	1.4263E-05	6.2624E-09	1.5714E+16	5.2774E+05
Pu-241	3.1688E-03	3.2043E-08	8.0070E+16	1.1725E+08
Am-241	1.7936E-06	5.2355E-10	1.3083E+15	6.6363E+04
Cm-242	4.9224E-04	1.4870E-10	3.7005E+14	1.8213E+07
Cm-244	3.2563E-05	3.9783E-10	9.8187E+14	1.2048E+06

Environment Transport Group Inventory:

Time (h) = 8.0000	Total Release	Release Rate/s
Noble gases (atoms)	4.8270E+22	1.6760E+18
Elemental I (atoms)	2.3276E+17	8.0821E+12
Organic I (atoms)	3.8669E+16	1.3427E+12

```
Aerosols (kg)          2.2206E-04  7.7105E-09
Dose Effective (Ci) I-131 (Thyroid)            1.4042E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)      1.7642E+02
Total I  (Ci)                                  7.4121E+02
```

CR Filtered Intake Transport Group Inventory:

```
                          Pathway
Time (h) =   8.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  1.4663E+18
Elemental I (atoms)    1.9268E+14  1.9639E+12
Organic I (atoms)      1.0447E+13  1.0607E+11
Aerosols (kg)          1.8317E-07  1.8669E-09
```

CR Unfiltered Inleakage Transport Group Inventory:

```
                          Pathway
Time (h) =   8.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  2.7154E+17
Elemental I (atoms)    0.0000E+00  3.6048E+13
Organic I (atoms)      0.0000E+00  1.9543E+12
Aerosols (kg)          0.0000E+00  3.4268E-08
```

CR Exhaust to Environment Transport Group Inventory:

```
                          Pathway
Time (h) =   8.0000      Filtered   Transported
Noble gases (atoms)    7.6751E+17  0.0000E+00
Elemental I (atoms)    2.4017E+13  0.0000E+00
Organic I (atoms)      1.2584E+12  0.0000E+00
Aerosols (kg)          2.3664E-08  0.0000E+00
```

Drawdown Release from RB to Environment Transport Group Inventory:

```
                          Pathway
Time (h) =   8.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  6.8635E+19
Elemental I (atoms)    0.0000E+00  2.0694E+17
Organic I (atoms)      0.0000E+00  1.0383E+16
Aerosols (kg)          0.0000E+00  1.9670E-04
```

RB Exhaust to Environment Transport Group Inventory:

```
                          Pathway
Time (h) =   8.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  4.8207E+22
Elemental I (atoms)    2.5651E+18  2.5910E+16
Organic I (atoms)      2.8041E+18  2.8324E+16
Aerosols (kg)          2.5042E-03  2.5295E-05
```

CR Compartment Nuclide Inventory:

```
Time (h) =   8.0000        Ci           kg         Atoms       Decay
Kr-83m                 2.0483E-02  1.0091E-12  7.3213E+12  2.5478E+13
Kr-85m                 2.6372E-01  3.2045E-11  2.2703E+14  1.6486E+14
Kr-85                  4.5965E-02  1.1727E-07  8.3083E+17  1.9529E+13
Kr-87                  2.3429E-02  8.2711E-13  5.7253E+12  5.7266E+13
```

Kr-88	3.5372E-01	2.8209E-11	1.9305E+14	2.8688E+14
Rb-86	2.6146E-06	3.2133E-14	2.2501E+11	1.2581E+10
Rb-88	3.6158E-01	2.9953E-12	2.0498E+13	2.2806E+14
Sr-89	6.9745E-06	2.4007E-13	1.6244E+12	2.6967E+10
Sr-90	7.4951E-07	5.4947E-12	3.6766E+13	2.8899E+09
Sr-91	4.8173E-06	1.3289E-15	8.7945E+09	2.6792E+10
Sr-92	1.1555E-06	9.1927E-17	6.0173E+08	1.7163E+10
Y-90	6.3832E-08	1.1732E-16	7.8504E+08	1.0223E+08
Y-91	9.6989E-08	3.9549E-15	2.6172E+10	3.5173E+08
Y-92	2.0979E-06	2.1802E-16	1.4271E+09	6.5814E+09
Y-93	5.6578E-08	1.6958E-17	1.0981E+08	3.0775E+08
Zr-95	1.0330E-07	4.8084E-15	3.0481E+10	3.9916E+08
Zr-97	7.2032E-08	3.7680E-17	2.3393E+08	3.4054E+08
Nb-95	1.0225E-07	2.6148E-15	1.6575E+10	3.9421E+08
Mo-99	1.2032E-06	2.5086E-15	1.5260E+10	4.8851E+09
Tc-99m	1.1232E-06	2.1361E-16	1.2994E+09	4.3985E+09
Ru-103	1.1263E-06	3.4898E-14	2.0404E+11	4.3583E+09
Ru-105	2.3148E-07	3.4436E-17	1.9750E+08	1.9918E+09
Ru-106	4.7071E-07	1.4070E-13	7.9933E+11	1.8156E+09
Rh-105	7.0793E-07	8.3873E-16	4.8104E+09	2.8601E+09
Sb-127	1.2276E-06	4.5969E-15	2.1798E+10	4.9110E+09
Sb-129	1.1158E-06	1.9842E-16	9.2631E+08	9.8273E+09
Te-127	1.2732E-06	4.8245E-16	2.2877E+09	4.9373E+09
Te-127m	2.2050E-07	2.3376E-14	1.1084E+11	8.5011E+08
Te-129	1.6839E-06	8.0405E-17	3.7536E+08	1.1190E+10
Te-129m	7.2151E-07	2.3950E-14	1.1181E+11	2.7870E+09
Te-131m	2.2771E-06	2.8557E-15	1.3128E+10	9.8420E+09
Te-132	1.8309E-05	6.0309E-14	2.7514E+11	7.3740E+10
I-131	1.1339E-03	9.1460E-12	4.2045E+13	5.4942E+12
I-132	1.7441E-04	1.6897E-14	7.7088E+10	4.0974E+12
I-133	1.8532E-03	1.6360E-12	7.4075E+12	1.0500E+13
I-134	4.9693E-06	1.8628E-16	8.3716E+08	2.8924E+12
I-135	9.8816E-04	2.8138E-13	1.2552E+12	8.2499E+12
Xe-133	5.4208E+00	2.8960E-08	1.3113E+17	2.3302E+15
Xe-133m	1.5770E-01	3.5820E-10	1.6219E+15	6.8942E+13
Xe-135	1.5555E+00	6.0912E-10	2.7172E+15	7.8213E+14
Xe-135m	3.9307E-04	4.3179E-15	1.9261E+10	4.4320E+12
Xe-138	3.3665E-10	3.5085E-21	1.5311E+04	2.9985E+12
Cs-134	2.6463E-04	2.0454E-10	9.1921E+14	1.2634E+12
Cs-136	7.9356E-05	1.0828E-12	4.7945E+12	3.8315E+11
Cs-137	2.0551E-04	2.3627E-09	1.0386E+16	9.8095E+11
Ba-139	1.8955E-07	1.1589E-17	5.0207E+07	1.1838E+10
Ba-140	1.0121E-05	1.3825E-13	5.9467E+11	3.9459E+10
La-140	1.2903E-06	2.3214E-15	9.9857E+09	1.9544E+09
La-141	2.3597E-08	4.1724E-18	1.7821E+07	2.2645E+08
La-142	2.6015E-09	1.8173E-19	7.7072E+05	1.1824E+08
Ce-141	2.4212E-07	8.4976E-15	3.6293E+10	9.3690E+08
Ce-143	2.0058E-07	3.0204E-16	1.2720E+09	8.5791E+08
Ce-144	1.9486E-07	6.1095E-14	2.5550E+11	7.5169E+08
Pr-143	9.4776E-08	1.4075E-15	5.9272E+09	3.6064E+08
Nd-147	3.7095E-08	4.5854E-16	1.8785E+09	1.4488E+08
Np-239	2.5158E-06	1.0844E-14	2.7324E+10	1.0304E+10
Pu-238	6.0596E-10	3.5396E-14	8.9562E+10	2.3363E+06
Pu-239	6.1172E-11	9.8417E-13	2.4798E+12	2.3569E+05
Pu-240	1.0795E-10	4.7395E-14	1.1893E+11	4.1621E+05
Pu-241	2.3982E-08	2.4251E-13	6.0597E+11	9.2468E+07
Am-241	1.3598E-11	3.9692E-15	9.9184E+09	5.2346E+04

Cm-242	3.7220E-09	1.1244E-15	2.7980E+09	1.4363E+07
Cm-244	2.4644E-10	3.0108E-15	7.4309E+09	9.5020E+05

CR Transport Group Inventory:

Time (h) = 8.0000	Atmosphere	Sump	
Noble gases (atoms)	9.6673E+17	0.0000E+00	
Elemental I (atoms)	2.4549E+12	0.0000E+00	
Organic I (atoms)	1.9900E+11	0.0000E+00	
Aerosols (kg)	2.5894E-09	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.3644E-13
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.5922E-13
Total I (Ci)			4.1547E-03

Time (h) = 8.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.0031E+13
Organic I (atoms)	0.0000E+00	5.2558E+11
Aerosols (kg)	0.0000E+00	9.8833E-09

CR Filtered Intake Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4663E+18
Elemental I (atoms)	1.9268E+14	1.9639E+12
Organic I (atoms)	1.0447E+13	1.0607E+11
Aerosols (kg)	1.8317E-07	1.8669E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7154E+17
Elemental I (atoms)	0.0000E+00	3.6048E+13
Organic I (atoms)	0.0000E+00	1.9543E+12
Aerosols (kg)	0.0000E+00	3.4268E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	7.6751E+17	0.0000E+00
Elemental I (atoms)	2.4017E+13	0.0000E+00
Organic I (atoms)	1.2584E+12	0.0000E+00
Aerosols (kg)	2.3664E-08	0.0000E+00

EAB Doses:

Time (h) = 16.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.4080E-01	1.1149E-01	5.4610E-01
Accumulated dose (rem)	1.1978E+00	5.9385E+00	1.4530E+00

LPZ Doses:

Time (h) = 16.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.8841E-03	1.0480E-03	9.9340E-03

Accumulated dose (rem) 3.1248E-01 8.6060E-01 3.4969E-01

CR Doses:

Time (h) = 16.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.6691E-02	4.9141E-01	6.1762E-02
Accumulated dose (rem)	6.1198E-02	7.7946E+00	4.2816E-01

DW Compartment Nuclide Inventory:

Time (h) = 16.0000	Ci	kg	Atoms	Decay
Kr-83m	2.5778E+04	1.2699E-06	9.2138E+18	2.7801E+21
Kr-85m	1.8975E+06	2.3058E-04	1.6336E+21	1.6010E+22
Kr-85	1.1403E+06	2.9092E+00	2.0611E+25	2.3472E+21
Kr-87	7.4231E+03	2.6206E-07	1.8140E+18	7.6183E+21
Kr-88	1.2454E+06	9.9317E-05	6.7966E+20	2.8154E+22
Rb-86	5.6143E+01	6.8999E-07	4.8316E+18	7.1532E+17
Rb-88	3.7703E+06	3.1233E-05	2.1374E+20	1.9933E+22
Sr-89	3.1337E+03	1.0786E-04	7.2986E+20	2.4330E+19
Sr-90	3.3830E+02	2.4801E-03	1.6595E+22	2.6075E+18
Sr-91	1.2129E+03	3.3461E-07	2.2143E+18	2.4677E+19
Sr-92	6.7397E+01	5.3620E-09	3.5098E+16	1.8300E+19
Y-90	5.1046E+01	9.3824E-08	6.2780E+17	7.2422E+16
Y-91	4.5508E+01	1.8556E-06	1.2280E+19	3.1183E+17
Y-92	3.0264E+02	3.1452E-08	2.0588E+17	1.3994E+18
Y-93	1.4748E+01	4.4205E-09	2.8625E+16	2.8279E+17
Zr-95	4.6457E+01	2.1625E-06	1.3708E+19	3.6014E+17
Zr-97	2.3418E+01	1.2250E-08	7.6054E+16	3.0918E+17
Nb-95	4.6151E+01	1.1802E-06	7.4816E+18	3.5568E+17
Mo-99	4.9931E+02	1.0411E-06	6.3327E+18	4.4076E+18
Tc-99m	4.8472E+02	9.2183E-08	5.6074E+17	3.9490E+18
Ru-103	5.0540E+02	1.5660E-05	9.1558E+19	3.9322E+18
Ru-105	2.9967E+01	4.4581E-09	2.5569E+16	1.9468E+18
Ru-106	2.1233E+02	6.3466E-05	3.6056E+20	1.6381E+18
Rh-105	2.8171E+02	3.3376E-07	1.9142E+18	2.5618E+18
Sb-127	5.2183E+02	1.9540E-06	9.2657E+18	4.4305E+18
Sb-129	1.3953E+02	2.4812E-08	1.1583E+17	9.6401E+18
Te-127	5.6254E+02	2.1316E-07	1.0108E+18	4.4427E+18
Te-127m	9.9519E+01	1.0551E-05	5.0029E+19	7.6702E+17
Te-129	4.5521E+02	2.1736E-08	1.0147E+17	1.0433E+19
Te-129m	3.2386E+02	1.0751E-05	5.0187E+19	2.5136E+18
Te-131m	8.5437E+02	1.0714E-06	4.9254E+18	8.8936E+18
Te-132	7.6985E+03	2.5358E-05	1.1569E+20	6.6528E+19
I-131	5.6897E+04	4.5894E-04	2.1098E+21	4.1578E+20
I-132	9.8395E+03	9.5324E-07	4.3489E+18	4.8236E+20
I-133	7.3191E+04	6.4610E-05	2.9255E+20	7.9344E+20
I-134	4.5873E-01	1.7196E-11	7.7281E+13	4.0501E+20
I-135	2.2019E+04	6.2699E-06	2.7969E+19	6.4331E+20
Xe-133	1.2887E+08	6.8847E-01	3.1173E+24	2.7642E+23
Xe-133m	3.5285E+06	8.0147E-03	3.6290E+22	8.0329E+21
Xe-135	2.1054E+07	8.2445E-03	3.6778E+22	8.1800E+22
Xe-135m	1.0212E+04	1.1218E-07	5.0042E+17	1.5841E+21
Cs-134	5.7515E+03	4.4453E-03	1.9978E+22	7.1753E+19
Cs-136	1.6951E+03	2.3128E-05	1.0241E+20	2.1796E+19
Cs-137	4.4678E+03	5.1364E-02	2.2578E+23	5.5710E+19
Ba-139	1.5313E+00	9.3616E-11	4.0559E+14	1.5451E+19
Ba-140	4.4861E+03	6.1278E-05	2.6359E+20	3.5599E+19

La-140	1.0222E+03	1.8390E-06	7.9105E+18	1.3127E+18
La-141	2.5978E+00	4.5934E-10	1.9619E+15	2.2514E+17
La-142	3.2185E-02	2.2483E-12	9.5351E+12	1.4830E+17
Ce-141	1.0861E+02	3.8116E-06	1.6280E+19	8.4545E+17
Ce-143	7.6532E+01	1.1525E-07	4.8533E+17	7.7496E+17
Ce-144	8.7883E+01	2.7554E-05	1.1523E+20	6.7822E+17
Pr-143	4.3318E+01	6.4328E-07	2.7090E+18	3.2450E+17
Nd-147	1.6395E+01	2.0266E-07	8.3023E+17	1.3071E+17
Np-239	1.0294E+03	4.4373E-06	1.1181E+19	9.2978E+18
Pu-238	2.7353E-01	1.5977E-05	4.0427E+19	2.1080E+15
Pu-239	2.7640E-02	4.4468E-04	1.1205E+21	2.1266E+14
Pu-240	4.8725E-02	2.1393E-05	5.3679E+19	3.7553E+14
Pu-241	1.0824E+01	1.0945E-04	2.7351E+20	8.3431E+16
Am-241	6.1521E-03	1.7958E-06	4.4874E+18	4.7224E+13
Cm-242	1.6776E+00	5.0680E-07	1.2612E+18	1.2959E+16
Cm-244	1.1123E-01	1.3589E-06	3.3540E+18	8.5734E+14

DW Transport Group Inventory:

Time (h) = 16.0000	Atmosphere	Sump	
Noble gases (atoms)	2.3804E+25	0.0000E+00	
Elemental I (atoms)	1.1416E+19	7.8120E+22	
Organic I (atoms)	1.2215E+21	0.0000E+00	
Aerosols (kg)	5.9546E-02	6.5809E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		8.0474E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		9.0706E-06
Total I (Ci)			1.6195E+05

DW to WW Transport Group Inventory:

Time (h) = 16.0000	Leakage Transport
Noble gases (atoms)	1.2566E+28
Elemental I (atoms)	1.2054E+22
Organic I (atoms)	6.8766E+23
Aerosols (kg)	3.5522E+01

WW to DW Transport Group Inventory:

Time (h) = 16.0000	Leakage Transport
Noble gases (atoms)	1.2708E+28
Elemental I (atoms)	1.6178E+22
Organic I (atoms)	6.9606E+23
Aerosols (kg)	3.8876E+01

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9855E+23
Elemental I (atoms)	0.0000E+00	4.7791E+18
Organic I (atoms)	0.0000E+00	1.1141E+19
Aerosols (kg)	0.0000E+00	4.6651E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7975E+22

Elemental I (atoms)	0.0000E+00	2.7174E+17
Organic I (atoms)	0.0000E+00	1.0050E+18
Aerosols (kg)	0.0000E+00	2.6999E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.7479E+22
Elemental I (atoms)	0.0000E+00	1.4737E+18
Organic I (atoms)	0.0000E+00	5.4501E+18
Aerosols (kg)	0.0000E+00	1.4642E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.7479E+22
Elemental I (atoms)	0.0000E+00	1.4737E+18
Organic I (atoms)	0.0000E+00	5.4501E+18
Aerosols (kg)	0.0000E+00	1.4642E-03

RB Compartment Nuclide Inventory:

Time (h) = 16.0000	Ci	kg	Atoms	Decay
Kr-83m	1.3614E+02	6.7067E-09	4.8661E+16	3.9244E+18
Kr-85m	1.0021E+04	1.2177E-06	8.6276E+18	3.7884E+19
Kr-85	6.0224E+03	1.5365E-02	1.0886E+23	7.9465E+18
Kr-87	3.9204E+01	1.3840E-09	9.5803E+15	7.7779E+18
Kr-88	6.5772E+03	5.2453E-07	3.5895E+18	5.3337E+19
Rb-86	8.1110E-01	9.9683E-09	6.9803E+16	4.0454E+15
Rb-88	1.9912E+04	1.6495E-07	1.1288E+18	5.6590E+19
Sr-89	2.6568E+01	9.1450E-07	6.1879E+18	8.4431E+16
Sr-90	2.8682E+00	2.1027E-05	1.4070E+20	9.0699E+15
Sr-91	1.0284E+01	2.8369E-09	1.8774E+16	6.4059E+16
Sr-92	5.7141E-01	4.5460E-11	2.9757E+14	2.6646E+16
Y-90	4.3935E-01	8.0753E-10	5.4034E+15	6.3545E+14
Y-91	3.8734E-01	1.5794E-08	1.0452E+17	1.1442E+15
Y-92	2.6327E+00	2.7360E-10	1.7909E+15	1.7927E+16
Y-93	1.2504E-01	3.7478E-11	2.4269E+14	7.4636E+14
Zr-95	3.9388E-01	1.8334E-08	1.1622E+17	1.2504E+15
Zr-97	1.9855E-01	1.0386E-10	6.4480E+14	9.0926E+14
Nb-95	3.9128E-01	1.0006E-08	6.3431E+16	1.2372E+15
Mo-99	4.2333E+00	8.8264E-09	5.3691E+16	1.4677E+16
Tc-99m	4.1096E+00	7.8155E-10	4.7541E+15	1.3439E+16
Ru-103	4.2849E+00	1.3277E-07	7.7625E+17	1.3636E+16
Ru-105	2.5407E-01	3.7797E-11	2.1678E+14	3.7744E+15
Ru-106	1.8002E+00	5.3808E-07	3.0570E+18	5.6963E+15
Rh-105	2.3884E+00	2.8297E-09	1.6229E+16	8.5721E+15
Sb-127	4.4242E+00	1.6567E-08	7.8557E+16	1.4938E+16
Sb-129	1.1830E+00	2.1036E-10	9.8205E+14	1.8433E+16
Te-127	4.7694E+00	1.8072E-09	8.5695E+15	1.5286E+16
Te-127m	8.4375E-01	8.9450E-08	4.2416E+17	2.6681E+15
Te-129	3.8594E+00	1.8429E-10	8.6031E+14	2.3923E+16
Te-129m	2.7458E+00	9.1146E-08	4.2550E+17	8.7301E+15
Te-131m	7.2436E+00	9.0839E-09	4.1759E+16	2.8120E+16
Te-132	6.5270E+01	2.1499E-07	9.8084E+17	2.2305E+17

I-131	5.3624E+02	4.3254E-06	1.9884E+19	2.0966E+18
I-132	8.3016E+01	8.0425E-09	3.6692E+16	1.1136E+18
I-133	6.9007E+02	6.0916E-07	2.7582E+18	3.6062E+18
I-134	4.3251E-03	1.6213E-13	7.2863E+11	4.9901E+17
I-135	2.0760E+02	5.9115E-08	2.6370E+17	2.3148E+18
Xe-133	6.8061E+05	3.6361E-03	1.6464E+22	9.2591E+20
Xe-133m	1.8636E+04	4.2331E-05	1.9167E+20	2.6497E+19
Xe-135	1.1125E+05	4.3565E-05	1.9434E+20	2.3535E+20
Xe-135m	9.6283E+01	1.0577E-09	4.7181E+15	6.6904E+17
Cs-134	8.3092E+01	6.4222E-05	2.8862E+20	4.0829E+17
Cs-136	2.4489E+01	3.3413E-07	1.4795E+18	1.2294E+17
Cs-137	6.4546E+01	7.4207E-04	3.2619E+21	3.1705E+17
Ba-139	1.2983E-02	7.9370E-13	3.4387E+12	1.3687E+16
Ba-140	3.8034E+01	5.1953E-07	2.2348E+18	1.2267E+17
La-140	8.7964E+00	1.5826E-08	6.8075E+16	1.2629E+16
La-141	2.2024E-02	3.8944E-12	1.6633E+13	4.0961E+14
La-142	2.7287E-04	1.9062E-14	8.0841E+10	1.4355E+14
Ce-141	9.2070E-01	3.2313E-08	1.3801E+17	2.9319E+15
Ce-143	6.4886E-01	9.7708E-10	4.1148E+15	2.4714E+15
Ce-144	7.4510E-01	2.3361E-07	9.7696E+17	2.3582E+15
Pr-143	3.6753E-01	5.4579E-09	2.2985E+16	1.1413E+15
Nd-147	1.3900E-01	1.7182E-09	7.0389E+15	4.4971E+14
Np-239	8.7277E+00	3.7621E-08	9.4794E+16	3.0737E+16
Pu-238	2.3190E-03	1.3546E-07	3.4275E+17	7.3328E+12
Pu-239	2.3434E-04	3.7701E-06	9.4996E+18	7.4016E+11
Pu-240	4.1310E-04	1.8137E-07	4.5511E+17	1.3063E+12
Pu-241	9.1771E-02	9.2799E-07	2.3189E+18	2.9021E+14
Am-241	5.2162E-05	1.5226E-08	3.8047E+16	1.6449E+11
Cm-242	1.4223E-02	4.2968E-09	1.0692E+16	4.5045E+13
Cm-244	9.4305E-04	1.1521E-08	2.8436E+16	2.9822E+12

RB Transport Group Inventory:

Time (h) = 16.0000	Atmosphere	Sump	
Noble gases (atoms)	1.2572E+23	0.0000E+00	
Elemental I (atoms)	5.5555E+17	0.0000E+00	
Organic I (atoms)	6.4733E+18	0.0000E+00	
Aerosols (kg)	8.3926E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.1971E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.3488E-08
Total I (Ci)			1.5169E+03

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9855E+23
Elemental I (atoms)	0.0000E+00	4.7791E+18
Organic I (atoms)	0.0000E+00	1.1141E+19
Aerosols (kg)	0.0000E+00	4.6651E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.7239E+22
Elemental I (atoms)	0.0000E+00	1.2379E+17
Organic I (atoms)	0.0000E+00	5.3262E+18

Aerosols (kg)	0.0000E+00	2.9748E-04

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6887E+23
Elemental I (atoms)	3.6343E+18	3.6710E+16
Organic I (atoms)	9.1826E+18	9.2753E+16
Aerosols (kg)	3.8259E-03	3.8645E-05

Environment Integral Nuclide Release:

Time (h) = 16.0000	Ci	kg	Atoms	Bq
Kr-83m	3.8373E+03	1.8904E-07	1.3716E+18	1.4198E+14
Kr-85m	3.7605E+04	4.5695E-06	3.2375E+19	1.3914E+15
Kr-85	8.0479E+03	2.0532E-02	1.4547E+23	2.9777E+14
Kr-87	7.4877E+03	2.6434E-07	1.8298E+18	2.7704E+14
Kr-88	5.2616E+04	4.1961E-06	2.8715E+19	1.9468E+15
Rb-86	2.3945E-01	2.9428E-09	2.0607E+16	8.8597E+09
Rb-88	2.1668E+04	1.7950E-07	1.2284E+18	8.0172E+14
Sr-89	1.2808E+00	4.4086E-08	2.9830E+17	4.7389E+10
Sr-90	1.3743E-01	1.0075E-06	6.7414E+18	5.0849E+09
Sr-91	1.1324E+00	3.1240E-10	2.0674E+15	4.1900E+10
Sr-92	6.9419E-01	5.5228E-11	3.6151E+14	2.5685E+10
Y-90	7.3189E-03	1.3452E-11	9.0013E+13	2.7080E+08
Y-91	1.6981E-02	6.9245E-10	4.5824E+15	6.2832E+08
Y-92	2.0905E-01	2.1725E-11	1.4221E+14	7.7347E+09
Y-93	1.3070E-02	3.9174E-12	2.5367E+13	4.8358E+08
Zr-95	1.8963E-02	8.8271E-10	5.5956E+15	7.0164E+08
Zr-97	1.5000E-02	7.8463E-12	4.8713E+13	5.5498E+08
Nb-95	1.8748E-02	4.7944E-10	3.0392E+15	6.9366E+08
Mo-99	2.2716E-01	4.7363E-10	2.8810E+15	8.4048E+09
Tc-99m	2.0770E-01	3.9501E-11	2.4028E+14	7.6850E+09
Ru-103	2.0692E-01	6.4115E-09	3.7486E+16	7.6562E+09
Ru-105	8.0033E-02	1.1906E-11	6.8286E+13	2.9612E+09
Ru-106	8.6325E-02	2.5803E-08	1.4659E+17	3.1940E+09
Rh-105	1.3230E-01	1.5675E-10	8.9900E+14	4.8952E+09
Sb-127	2.2979E-01	8.6045E-10	4.0801E+15	8.5021E+09
Sb-129	3.9451E-01	7.0155E-11	3.2750E+14	1.4597E+10
Te-127	2.3428E-01	8.8771E-11	4.2094E+14	8.6682E+09
Te-127m	4.0428E-02	4.2860E-09	2.0324E+16	1.4958E+09
Te-129	4.6715E-01	2.2307E-11	1.0413E+14	1.7285E+10
Te-129m	1.3238E-01	4.3942E-09	2.0513E+16	4.8979E+09
Te-131m	4.4666E-01	5.6015E-10	2.5750E+15	1.6527E+10
Te-132	3.4405E+00	1.1333E-08	5.1702E+16	1.2730E+11
I-131	1.0829E+02	8.7348E-07	4.0154E+18	4.0067E+12
I-132	1.2099E+02	1.1721E-08	5.3476E+16	4.4766E+12

I-133	2.1375E+02	1.8869E-07	8.5439E+17	7.9089E+12
I-134	1.3910E+02	5.2144E-09	2.3434E+16	5.1468E+12
I-135	1.8400E+02	5.2394E-08	2.3372E+17	6.8080E+12
Xe-133	9.3678E+05	5.0047E-03	2.2661E+22	3.4661E+16
Xe-133m	2.6769E+04	6.0804E-05	2.7532E+20	9.9046E+14
Xe-135	2.3549E+05	9.2213E-05	4.1135E+20	8.7130E+15
Xe-135m	5.4121E+02	5.9452E-09	2.6521E+16	2.0025E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	2.4002E+01	1.8551E-05	8.3370E+19	8.8806E+11
Cs-136	7.2985E+00	9.9583E-08	4.4096E+17	2.7005E+11
Cs-137	1.8635E+01	2.1424E-04	9.4173E+20	6.8949E+11
Ba-139	5.4549E-01	3.3349E-11	1.4448E+14	2.0183E+10
Ba-140	1.8671E+00	2.5504E-08	1.0970E+17	6.9083E+10
La-140	1.4288E-01	2.5706E-10	1.1057E+15	5.2865E+09
La-141	9.0701E-03	1.6038E-12	6.8499E+12	3.3559E+08
La-142	5.2688E-03	3.6806E-13	1.5609E+12	1.9494E+08
Ce-141	4.4485E-02	1.5612E-09	6.6680E+15	1.6459E+09
Ce-143	3.9086E-02	5.8857E-11	2.4786E+14	1.4462E+09
Ce-144	3.5739E-02	1.1205E-08	4.6861E+16	1.3223E+09
Pr-143	1.7221E-02	2.5573E-10	1.0770E+15	6.3716E+08
Nd-147	6.8501E-03	8.4675E-11	3.4689E+14	2.5345E+08
Np-239	4.7742E-01	2.0579E-09	5.1854E+15	1.7665E+10
Pu-238	1.1111E-04	6.4900E-09	1.6422E+16	4.1110E+06
Pu-239	1.1212E-05	1.8038E-07	4.5452E+17	4.1485E+05
Pu-240	1.9793E-05	8.6903E-09	2.1806E+16	7.3235E+05
Pu-241	4.3973E-03	4.4466E-08	1.1111E+17	1.6270E+08
Am-241	2.4909E-06	7.2711E-10	1.8169E+15	9.2165E+04
Cm-242	6.8278E-04	2.0626E-10	5.1328E+14	2.5263E+07
Cm-244	4.5187E-05	5.5206E-10	1.3625E+15	1.6719E+06

Environment Transport Group Inventory:

Time (h) = 16.0000	Total Release	Release Rate/s	
Noble gases (atoms)	1.6888E+23	2.9319E+18	
Elemental I (atoms)	2.4353E+17	4.2280E+12	
Organic I (atoms)	1.0283E+17	1.7852E+12	
Aerosols (kg)	2.3552E-04	4.0889E-09	
Dose Effective (Ci) I-131 (Thyroid)			1.5005E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.8747E+02
Total I (Ci)			7.6614E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7578E+18
Elemental I (atoms)	1.9280E+14	1.9650E+12
Organic I (atoms)	1.1129E+13	1.1296E+11
Aerosols (kg)	1.8331E-07	1.8683E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.1071E+17
Elemental I (atoms)	0.0000E+00	3.6069E+13

Organic I (atoms)	0.0000E+00	2.0820E+12
Aerosols (kg)	0.0000E+00	3.4295E-08

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	2.4419E+18	0.0000E+00
Elemental I (atoms)	2.5625E+13	0.0000E+00
Organic I (atoms)	1.4490E+12	0.0000E+00
Aerosols (kg)	2.5400E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6887E+23
Elemental I (atoms)	3.6343E+18	3.6710E+16
Organic I (atoms)	9.1826E+18	9.2753E+16
Aerosols (kg)	3.8259E-03	3.8645E-05

CR Compartment Nuclide Inventory:

Time (h) = 16.0000	Ci	kg	Atoms	Decay
Kr-83m	8.8445E-04	4.3571E-14	3.1613E+11	3.1687E+13
Kr-85m	6.5105E-02	7.9111E-12	5.6049E+13	3.0588E+14
Kr-85	3.9125E-02	9.9817E-08	7.0719E+17	6.1788E+13
Kr-87	2.5469E-04	8.9915E-15	6.2239E+10	6.2392E+13
Kr-88	4.2729E-02	3.4076E-12	2.3319E+13	4.3307E+14
Rb-86	1.5581E-07	1.9149E-15	1.3409E+10	1.3470E+10
Rb-88	1.2413E-01	1.0282E-12	7.0366E+12	3.5962E+14
Sr-89	6.2171E-07	2.1400E-14	1.4480E+11	2.9521E+10
Sr-90	6.7117E-08	4.9204E-13	3.2924E+12	3.1647E+09
Sr-91	2.4064E-07	6.6385E-17	4.3932E+08	2.8287E+10
Sr-92	1.3371E-08	1.0638E-18	6.9634E+06	1.7417E+10
Y-90	1.0645E-08	1.9566E-17	1.3092E+08	1.3162E+08
Y-91	9.1495E-09	3.7309E-16	2.4690E+09	3.8796E+08
Y-92	6.5364E-08	6.7930E-18	4.4465E+07	7.1771E+09
Y-93	2.9260E-09	8.7701E-19	5.6790E+06	3.2547E+08
Zr-95	9.2170E-09	4.2904E-16	2.7197E+09	4.3700E+08
Zr-97	4.6461E-09	2.4304E-18	1.5089E+07	3.6453E+08
Nb-95	9.1561E-09	2.3415E-16	1.4843E+09	4.3170E+08
Mo-99	9.9061E-08	2.0654E-16	1.2564E+09	5.3153E+09
Tc-99m	9.6166E-08	1.8289E-17	1.1125E+08	4.7992E+09
Ru-103	1.0027E-07	3.1068E-15	1.8165E+10	4.7706E+09
Ru-105	5.9454E-09	8.8447E-19	5.0728E+06	2.0526E+09
Ru-106	4.2125E-08	1.2591E-14	7.1535E+10	1.9881E+09
Rh-105	5.5891E-08	6.6217E-17	3.7978E+08	3.1107E+09

Sb-127	1.0353E-07	3.8767E-16	1.8383E+09	5.3531E+09
Sb-129	2.7682E-08	4.9226E-18	2.2981E+07	1.0118E+10
Te-127	1.1161E-07	4.2290E-17	2.0053E+08	5.3972E+09
Te-127m	1.9744E-08	2.0932E-15	9.9256E+09	9.3096E+08
Te-129	9.0312E-08	4.3124E-18	2.0132E+07	1.1663E+10
Te-129m	6.4254E-08	2.1329E-15	9.9570E+09	3.0512E+09
Te-131m	1.6950E-07	2.1257E-16	9.7719E+08	1.0632E+10
Te-132	1.5274E-06	5.0310E-15	2.2952E+10	8.0313E+10
I-131	6.7875E-05	5.4749E-13	2.5168E+12	5.8792E+12
I-132	2.6068E-06	2.5255E-16	1.1522E+09	4.1348E+12
I-133	8.7442E-05	7.7191E-14	3.4951E+11	1.1090E+13
I-134	5.4806E-10	2.0544E-20	9.2329E+04	2.8930E+12
I-135	2.6307E-05	7.4908E-15	3.3415E+10	8.5216E+12
Xe-133	4.4215E+00	2.3621E-08	1.0696E+17	7.2112E+15
Xe-133m	1.2106E-01	2.7498E-10	1.2451E+15	2.0684E+14
Xe-135	7.2208E-01	2.8276E-10	1.2613E+15	1.8618E+15
Xe-135m	2.3951E-05	2.6310E-16	1.1736E+09	4.5443E+12
Cs-134	1.5962E-05	1.2337E-11	5.5445E+13	1.3537E+12
Cs-136	4.7043E-06	6.4187E-14	2.8422E+11	4.1011E+11
Cs-137	1.2399E-05	1.4255E-10	6.2662E+14	1.0511E+12
Ba-139	3.0380E-10	1.8573E-20	8.0467E+04	1.1868E+10
Ba-140	8.9003E-07	1.2157E-14	5.2295E+10	4.3150E+10
La-140	2.1307E-07	3.8334E-16	1.6489E+09	2.5474E+09
La-141	5.1539E-10	9.1132E-20	3.8923E+05	2.3241E+08
Ce-141	2.1539E-08	7.5594E-16	3.2286E+09	1.0255E+09
Ce-143	1.5184E-08	2.2864E-17	9.6288E+07	9.2788E+08
Ce-144	1.7436E-08	5.4666E-15	2.2862E+10	8.2313E+08
Pr-143	8.6157E-09	1.2795E-16	5.3881E+08	3.9556E+08
Nd-147	3.2527E-09	4.0207E-17	1.6472E+08	1.5840E+08
Np-239	2.0423E-07	8.8035E-16	2.2182E+09	1.1200E+10
Pu-238	5.4266E-11	3.1698E-15	8.0206E+09	2.5585E+06
Pu-239	5.4836E-12	8.8223E-14	2.2230E+11	2.5813E+05
Pu-240	9.6668E-12	4.2443E-15	1.0650E+10	4.5579E+05
Pu-241	2.1475E-09	2.1715E-14	5.4263E+10	1.0126E+08
Am-241	1.2208E-12	3.5634E-16	8.9043E+08	5.7336E+04
Cm-242	3.3283E-10	1.0055E-16	2.5021E+08	1.5727E+07
Cm-244	2.2068E-11	2.6961E-16	6.6542E+08	1.0406E+06

CR Transport Group Inventory:

Time (h) = 16.0000	Atmosphere	Sump	
Noble gases (atoms)	8.1673E+17	0.0000E+00	
Elemental I (atoms)	1.3636E+11	0.0000E+00	
Organic I (atoms)	5.6169E+10	0.0000E+00	
Aerosols (kg)	1.5725E-10	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		7.7123E-15
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		8.6693E-15
Total I (Ci)			1.8423E-04

Time (h) = 16.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.0702E+13
Organic I (atoms)	0.0000E+00	6.0519E+11
Aerosols (kg)	0.0000E+00	1.0609E-08

CR Filtered Intake Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7578E+18
Elemental I (atoms)	1.9280E+14	1.9650E+12
Organic I (atoms)	1.1129E+13	1.1296E+11
Aerosols (kg)	1.8331E-07	1.8683E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.1071E+17
Elemental I (atoms)	0.0000E+00	3.6069E+13
Organic I (atoms)	0.0000E+00	2.0820E+12
Aerosols (kg)	0.0000E+00	3.4295E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	2.4419E+18	0.0000E+00
Elemental I (atoms)	2.5625E+13	0.0000E+00
Organic I (atoms)	1.4490E+12	0.0000E+00
Aerosols (kg)	2.5400E-08	0.0000E+00

EAB Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.1129E-01	6.8900E-02	3.1447E-01
Accumulated dose (rem)	1.5091E+00	6.0074E+00	1.7675E+00

LPZ Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.6894E-03	6.4764E-04	5.7193E-03
Accumulated dose (rem)	3.1817E-01	8.6125E-01	3.5540E-01

CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2161E-02	3.1304E-02	1.7772E-02
Accumulated dose (rem)	7.3360E-02	7.8259E+00	4.4594E-01

DW Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
Kr-83m	1.2986E+03	6.3974E-08	4.6417E+17	2.7888E+21
Kr-85m	5.4654E+05	6.6412E-05	4.7052E+20	1.7166E+22
Kr-85	1.1324E+06	2.8890E+00	2.0468E+25	3.5576E+21
Kr-87	9.4147E+01	3.3238E-09	2.3007E+16	7.6201E+21
Kr-88	1.7552E+05	1.3997E-05	9.5788E+19	2.8736E+22
Rb-86	5.5069E+01	6.7679E-07	4.7392E+18	7.7454E+17
Rb-88	5.3185E+05	4.4058E-06	3.0150E+19	2.0698E+22
Sr-89	3.0979E+03	1.0663E-04	7.2151E+20	2.7649E+19
Sr-90	3.3596E+02	2.4629E-03	1.6480E+22	2.9665E+18
Sr-91	6.7194E+02	1.8536E-07	1.2267E+18	2.5652E+19
Sr-92	8.6493E+00	6.8812E-10	4.5043E+15	1.8331E+19

Y-90	7.4521E+01	1.3697E-07	9.1651E+17	1.3756E+17
Y-91	4.6526E+01	1.8972E-06	1.2555E+19	3.6083E+17
Y-92	8.1976E+01	8.5193E-09	5.5766E+16	1.5791E+18
Y-93	8.4584E+00	2.5353E-09	1.6417E+16	2.9484E+17
Zr-95	4.5970E+01	2.1398E-06	1.3565E+19	4.0936E+17
Zr-97	1.6751E+01	8.7626E-09	5.4402E+16	3.3037E+17
Nb-95	4.5831E+01	1.1720E-06	7.4297E+18	4.0464E+17
Mo-99	4.5590E+02	9.5056E-07	5.7822E+18	4.9160E+18
Tc-99m	4.5666E+02	8.6846E-08	5.2828E+17	4.4250E+18
Ru-103	4.9896E+02	1.5460E-05	9.0392E+19	4.4671E+18
Ru-105	8.5358E+00	1.2698E-09	7.2829E+15	1.9650E+18
Ru-106	2.1073E+02	6.2988E-05	3.5785E+20	1.8634E+18
Rh-105	2.4161E+02	2.8625E-07	1.6418E+18	2.8401E+18
Sb-127	4.8804E+02	1.8275E-06	8.6657E+18	4.9681E+18
Sb-129	3.8388E+01	6.8264E-09	3.1868E+16	9.7236E+18
Te-127	5.4456E+02	2.0634E-07	9.7845E+17	5.0125E+18
Te-127m	9.8814E+01	1.0476E-05	4.9675E+19	8.7263E+17
Te-129	3.3022E+02	1.5768E-08	7.3610E+16	1.0747E+19
Te-129m	3.1954E+02	1.0607E-05	4.9517E+19	2.8563E+18
Te-131m	7.0528E+02	8.8447E-07	4.0659E+18	9.7217E+18
Te-132	7.1220E+03	2.3459E-05	1.0703E+20	7.4417E+19
I-131	5.4921E+04	4.4300E-04	2.0365E+21	4.7532E+20
I-132	8.5588E+03	8.2917E-07	3.7829E+18	4.9079E+20
I-133	5.5676E+04	4.9148E-05	2.2254E+20	8.6164E+20
I-134	8.1566E-04	3.0576E-14	1.3741E+11	4.0501E+20
I-135	9.4506E+03	2.6910E-06	1.2004E+19	6.5914E+20
Xe-133	1.2261E+08	6.5503E-01	2.9659E+24	4.1031E+23
Xe-133m	3.1595E+06	7.1764E-03	3.2494E+22	1.1591E+22
Xe-135	1.1367E+07	4.4513E-03	1.9857E+22	9.8540E+22
Xe-135m	4.3839E+03	4.8157E-08	2.1482E+17	1.5868E+21
Cs-134	5.7100E+03	4.4133E-03	1.9834E+22	7.7857E+19
Cs-136	1.6539E+03	2.2567E-05	9.9926E+19	2.3579E+19
Cs-137	4.4368E+03	5.1009E-02	2.2422E+23	6.0452E+19
Ba-139	2.7216E-02	1.6639E-12	7.2088E+12	1.5451E+19
Ba-140	4.3751E+03	5.9762E-05	2.5707E+20	4.0318E+19
La-140	1.4572E+03	2.6217E-06	1.1277E+19	2.5993E+18
La-141	6.2922E-01	1.1126E-10	4.7520E+14	2.2662E+17
La-142	8.7608E-04	6.1200E-14	2.5955E+11	1.4831E+17
Ce-141	1.0710E+02	3.7588E-06	1.6054E+19	9.6033E+17
Ce-143	6.4248E+01	9.6747E-08	4.0743E+17	8.4975E+17
Ce-144	8.7205E+01	2.7341E-05	1.1434E+20	7.7147E+17
Pr-143	4.3475E+01	6.4561E-07	2.7189E+18	3.7067E+17
Nd-147	1.5943E+01	1.9707E-07	8.0733E+17	1.4793E+17
Np-239	9.2677E+02	3.9949E-06	1.0066E+19	1.0339E+19
Pu-238	2.7165E-01	1.5868E-05	4.0150E+19	2.3983E+15
Pu-239	2.7474E-02	4.4202E-04	1.1138E+21	2.4201E+14
Pu-240	4.8388E-02	2.1245E-05	5.3309E+19	4.2725E+14
Pu-241	1.0749E+01	1.0869E-04	2.7161E+20	9.4920E+16
Am-241	6.1253E-03	1.7880E-06	4.4678E+18	5.3762E+13
Cm-242	1.6637E+00	5.0259E-07	1.2507E+18	1.4739E+16
Cm-244	1.1046E-01	1.3495E-06	3.3307E+18	9.7540E+14

DW Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump
Noble gases (atoms)	2.3487E+25	0.0000E+00
Elemental I (atoms)	1.0666E+19	7.8120E+22
Organic I (atoms)	1.1413E+21	0.0000E+00

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Aerosols (kg)          5.9086E-02  6.5809E+01
Dose Effective (Ci/cc) I-131 (Thyroid)         7.4403E-06
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   8.1768E-06
Total I (Ci)                                   1.2861E+05

DW to WW Transport Group Inventory:
Time (h) =  24.0000  Leakage Transport

Noble gases (atoms)      1.9639E+28
Elemental I (atoms)      1.5365E+22
Organic I (atoms)        1.0418E+24
Aerosols (kg)            5.3259E+01

WW to DW Transport Group Inventory:
Time (h) =  24.0000  Leakage Transport

Noble gases (atoms)      1.9781E+28
Elemental I (atoms)      1.9488E+22
Organic I (atoms)        1.0502E+24
Aerosols (kg)            5.6613E+01

DW to RB Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  3.0051E+23
Elemental I (atoms)    0.0000E+00  4.8269E+18
Organic I (atoms)      0.0000E+00  1.6247E+19
Aerosols (kg)          0.0000E+00  4.9208E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  2.7218E+22
Elemental I (atoms)    0.0000E+00  2.7607E+17
Organic I (atoms)      0.0000E+00  1.4678E+18
Aerosols (kg)          0.0000E+00  2.9317E-04

DW to  Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  1.4761E+23
Elemental I (atoms)    0.0000E+00  1.4972E+18
Organic I (atoms)      0.0000E+00  7.9604E+18
Aerosols (kg)          0.0000E+00  1.5899E-03

DW to  Dummy (Intact MSIV Pathway  8) Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  1.4761E+23
Elemental I (atoms)    0.0000E+00  1.4972E+18
Organic I (atoms)      0.0000E+00  7.9604E+18
Aerosols (kg)          0.0000E+00  1.5899E-03
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RB Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
Kr-83m	7.5617E+00	3.7251E-10	2.7028E+15	3.9726E+18
Kr-85m	3.1824E+03	3.8671E-07	2.7398E+18	4.4338E+19
Kr-85	6.5937E+03	1.6822E-02	1.1918E+23	1.4764E+19
Kr-87	5.4820E-01	1.9354E-11	1.3397E+14	7.7877E+18
Kr-88	1.0220E+03	8.1504E-08	5.5776E+17	5.6567E+19
Rb-86	4.9177E-01	6.0438E-09	4.2322E+16	4.6893E+15
Rb-88	3.0969E+03	2.5654E-08	1.7556E+17	6.0837E+19
Sr-89	2.1396E+01	7.3645E-07	4.9832E+18	1.0918E+17
Sr-90	2.3203E+00	1.7010E-05	1.1382E+20	1.1748E+16
Sr-91	4.6408E+00	1.2802E-09	8.4722E+15	7.1403E+16
Sr-92	5.9737E-02	4.7526E-12	3.1109E+13	2.6880E+16
Y-90	5.1671E-01	9.4973E-10	6.3549E+15	1.1221E+15
Y-91	3.2184E-01	1.3124E-08	8.6849E+16	1.5103E+15
Y-92	5.7087E-01	5.9328E-11	3.8835E+14	1.9318E+16
Y-93	5.8419E-02	1.7510E-11	1.1338E+14	8.3702E+14
Zr-95	3.1750E-01	1.4779E-08	9.3686E+16	1.6175E+15
Zr-97	1.1569E-01	6.0520E-11	3.7573E+14	1.0682E+15
Nb-95	3.1653E-01	8.0948E-09	5.1314E+16	1.6024E+15
Mo-99	3.1487E+00	6.5651E-09	3.9935E+16	1.8474E+16
Tc-99m	3.1540E+00	5.9981E-10	3.6486E+15	1.6993E+16
Ru-103	3.4461E+00	1.0678E-07	6.2430E+17	1.7626E+16
Ru-105	5.8953E-02	8.7702E-12	5.0300E+13	3.9127E+15
Ru-106	1.4554E+00	4.3503E-07	2.4715E+18	7.3767E+15
Rh-105	1.6687E+00	1.9770E-09	1.1339E+16	1.0652E+16
Sb-127	3.3707E+00	1.2622E-08	5.9851E+16	1.8952E+16
Sb-129	2.6513E-01	4.7147E-11	2.2010E+14	1.9068E+16
Te-127	3.7611E+00	1.4251E-09	6.7577E+15	1.9537E+16
Te-127m	6.8247E-01	7.2352E-08	3.4308E+17	3.4558E+15
Te-129	2.2807E+00	1.0890E-10	5.0840E+14	2.6279E+16
Te-129m	2.2069E+00	7.3259E-08	3.4200E+17	1.1286E+16
Te-131m	4.8711E+00	6.1087E-09	2.8082E+16	3.4314E+16
Te-132	4.9189E+01	1.6202E-07	7.3918E+17	2.8195E+17
I-131	3.9693E+02	3.2017E-06	1.4718E+19	2.5731E+18
I-132	5.9100E+01	5.7256E-09	2.6121E+16	1.1765E+18
I-133	4.0246E+02	3.5528E-07	1.6087E+18	4.1549E+18
I-134	5.8961E-06	2.2102E-16	9.9330E+08	4.9901E+17
I-135	6.8315E+01	1.9453E-08	8.6775E+16	2.4437E+18
Xe-133	7.1395E+05	3.8142E-03	1.7270E+22	1.6799E+21
Xe-133m	1.8397E+04	4.1788E-05	1.8921E+20	4.6525E+19
Xe-135	6.6210E+04	2.5927E-05	1.1566E+20	3.2926E+20
Xe-135m	3.1690E+01	3.4811E-10	1.5529E+15	6.9067E+17
Cs-134	5.0991E+01	3.9411E-05	1.7712E+20	4.7462E+17
Cs-136	1.4770E+01	2.0152E-07	8.9235E+17	1.4233E+17
Cs-137	3.9621E+01	4.5551E-04	2.0023E+21	3.6858E+17
Ba-139	1.8797E-04	1.1492E-14	4.9788E+10	1.3690E+16
Ba-140	3.0217E+01	4.1275E-07	1.7754E+18	1.5787E+17
La-140	1.0103E+01	1.8176E-08	7.8184E+16	2.2244E+16
La-141	4.3458E-03	7.6844E-13	3.2820E+12	4.2088E+14
La-142	6.0507E-06	4.2268E-16	1.7926E+09	1.4362E+14
Ce-141	7.3968E-01	2.5960E-08	1.1087E+17	3.7887E+15
Ce-143	4.4373E-01	6.6819E-10	2.8139E+15	3.0307E+15
Ce-144	6.0229E-01	1.8884E-07	7.8972E+17	3.0536E+15
Pr-143	3.0035E-01	4.4603E-09	1.8784E+16	1.4856E+15
Nd-147	1.1011E-01	1.3611E-09	5.5759E+15	5.7819E+14

Np-239	6.4009E+00	2.7591E-08	6.9521E+16	3.8512E+16
Pu-238	1.8762E-03	1.0959E-07	2.7730E+17	9.4982E+12
Pu-239	1.8976E-04	3.0529E-06	7.6924E+18	9.5906E+11
Pu-240	3.3420E-04	1.4673E-07	3.6818E+17	1.6920E+12
Pu-241	7.4239E-02	7.5071E-07	1.8759E+18	3.7590E+14
Am-241	4.2306E-05	1.2349E-08	3.0858E+16	2.1325E+11
Cm-242	1.1490E-02	3.4712E-09	8.6379E+15	5.8317E+13
Cm-244	7.6290E-04	9.3205E-09	2.3004E+16	3.8627E+12

RB Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump	
Noble gases (atoms)	1.3676E+23	0.0000E+00	
Elemental I (atoms)	2.1898E+17	0.0000E+00	
Organic I (atoms)	6.6526E+18	0.0000E+00	
Aerosols (kg)	5.2067E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		8.4873E-09
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		9.3261E-09
Total I (Ci)			9.2681E+02

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 24.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0051E+23
Elemental I (atoms)	0.0000E+00	4.8269E+18
Organic I (atoms)	0.0000E+00	1.6247E+19
Aerosols (kg)	0.0000E+00	4.9208E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 24.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5136E+23
Elemental I (atoms)	0.0000E+00	1.4912E+17
Organic I (atoms)	0.0000E+00	8.0365E+18
Aerosols (kg)	0.0000E+00	4.3320E-04

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 24.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 24.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.1306E+23
Elemental I (atoms)	4.0192E+18	4.0598E+16
Organic I (atoms)	1.6342E+19	1.6507E+17
Aerosols (kg)	4.5284E-03	4.5742E-05

Environment Integral Nuclide Release:

Time (h) = 24.0000	Ci	kg	Atoms	Bq
Kr-83m	3.8776E+03	1.9102E-07	1.3860E+18	1.4347E+14
Kr-85m	4.3664E+04	5.3058E-06	3.7591E+19	1.6156E+15
Kr-85	1.4975E+04	3.8205E-02	2.7068E+23	5.5409E+14
Kr-87	7.4951E+03	2.6461E-07	1.8316E+18	2.7732E+14
Kr-88	5.5511E+04	4.4270E-06	3.0296E+19	2.0539E+15
Rb-86	2.4623E-01	3.0262E-09	2.1191E+16	9.1106E+09
Rb-88	2.9384E+04	2.4341E-07	1.6658E+18	1.0872E+15
Sr-89	1.5370E+00	5.2904E-08	3.5797E+17	5.6868E+10
Sr-90	1.6516E-01	1.2108E-06	8.1015E+18	6.1107E+09
Sr-91	1.2058E+00	3.3263E-10	2.2012E+15	4.4614E+10
Sr-92	6.9632E-01	5.5398E-11	3.6262E+14	2.5764E+10
Y-90	1.2630E-02	2.3215E-11	1.5534E+14	4.6733E+08
Y-91	2.0787E-02	8.4763E-10	5.6094E+15	7.6913E+08
Y-92	2.2258E-01	2.3132E-11	1.5142E+14	8.2355E+09
Y-93	1.3977E-02	4.1893E-12	2.7128E+13	5.1715E+08
Zr-95	2.2763E-02	1.0596E-09	6.7169E+15	8.4224E+08
Zr-97	1.6612E-02	8.6896E-12	5.3948E+13	6.1463E+08
Nb-95	2.2530E-02	5.7617E-10	3.6524E+15	8.3361E+08
Mo-99	2.6626E-01	5.5515E-10	3.3770E+15	9.8516E+09
Tc-99m	2.4639E-01	4.6859E-11	2.8504E+14	9.1166E+09
Ru-103	2.4821E-01	7.6908E-09	4.4966E+16	9.1838E+09
Ru-105	8.1357E-02	1.2103E-11	6.9415E+13	3.0102E+09
Ru-106	1.0372E-01	3.1003E-08	1.7613E+17	3.8377E+09
Rh-105	1.5366E-01	1.8204E-10	1.0441E+15	5.6853E+09
Sb-127	2.7118E-01	1.0155E-09	4.8152E+15	1.0034E+10
Sb-129	4.0058E-01	7.1234E-11	3.3254E+14	1.4821E+10
Te-127	2.7979E-01	1.0602E-10	5.0272E+14	1.0352E+10
Te-127m	4.8584E-02	5.1506E-09	2.4423E+16	1.7976E+09
Te-129	4.9829E-01	2.3793E-11	1.1108E+14	1.8437E+10
Te-129m	1.5883E-01	5.2722E-09	2.4612E+16	5.8765E+09
Te-131m	5.1006E-01	6.3965E-10	2.9405E+15	1.8872E+10
Te-132	4.0477E+00	1.3333E-08	6.0826E+16	1.4976E+11
I-131	1.1323E+02	9.1335E-07	4.1987E+18	4.1896E+12
I-132	1.2173E+02	1.1793E-08	5.3804E+16	4.5041E+12
I-133	2.1936E+02	1.9365E-07	8.7681E+17	8.1164E+12
I-134	1.3910E+02	5.2144E-09	2.3434E+16	5.1468E+12
I-135	1.8527E+02	5.2756E-08	2.3534E+17	6.8551E+12
Xe-133	1.7009E+06	9.0866E-03	4.1144E+22	6.2932E+16
Xe-133m	4.6987E+04	1.0673E-04	4.8325E+20	1.7385E+15
Xe-135	3.2729E+05	1.2816E-04	5.7171E+20	1.2110E+16
Xe-135m	5.4608E+02	5.9987E-09	2.6759E+16	2.0205E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	2.4701E+01	1.9091E-05	8.5798E+19	9.1392E+11
Cs-136	7.5027E+00	1.0237E-07	4.5329E+17	2.7760E+11
Cs-137	1.9178E+01	2.2048E-04	9.6918E+20	7.0958E+11
Ba-139	5.4551E-01	3.3350E-11	1.4449E+14	2.0184E+10
Ba-140	2.2312E+00	3.0477E-08	1.3110E+17	8.2553E+10
La-140	2.4785E-01	4.4591E-10	1.9181E+15	9.1703E+09
La-141	9.1769E-03	1.6227E-12	6.9306E+12	3.3955E+08
La-142	5.2693E-03	3.6810E-13	1.5611E+12	1.9497E+08
Ce-141	5.3351E-02	1.8724E-09	7.9971E+15	1.9740E+09
Ce-143	4.4816E-02	6.7485E-11	2.8420E+14	1.6582E+09
Ce-144	4.2938E-02	1.3462E-08	5.6301E+16	1.5887E+09
Pr-143	2.0794E-02	3.0880E-10	1.3005E+15	7.6939E+08
Nd-147	8.1785E-03	1.0110E-10	4.1416E+14	3.0260E+08
Np-239	5.5743E-01	2.4028E-09	6.0544E+15	2.0625E+10

Pu-238	1.3352E-04	7.7995E-09	1.9735E+16	4.9404E+06
Pu-239	1.3479E-05	2.1685E-07	5.4640E+17	4.9870E+05
Pu-240	2.3786E-05	1.0444E-08	2.6205E+16	8.8010E+05
Pu-241	5.2844E-03	5.3436E-08	1.3353E+17	1.9552E+08
Am-241	2.9959E-06	8.7450E-10	2.1852E+15	1.1085E+05
Cm-242	8.2016E-04	2.4777E-10	6.1656E+14	3.0346E+07
Cm-244	5.4303E-05	6.6343E-10	1.6374E+15	2.0092E+06

Environment Transport Group Inventory:

Time (h) = 24.0000	Total Release	Release Rate/s	
Noble gases (atoms)	3.1295E+23	3.6221E+18	
Elemental I (atoms)	2.4739E+17	2.8633E+12	
Organic I (atoms)	1.7459E+17	2.0207E+12	
Aerosols (kg)	2.4268E-04	2.8088E-09	
Dose Effective (Ci) I-131 (Thyroid)			1.5597E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.9404E+02
Total I (Ci)			7.7870E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.3012E+18
Elemental I (atoms)	1.9284E+14	1.9655E+12
Organic I (atoms)	1.1896E+13	1.2070E+11
Aerosols (kg)	1.8339E-07	1.8690E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.9652E+17
Elemental I (atoms)	0.0000E+00	3.6077E+13
Organic I (atoms)	0.0000E+00	2.2253E+12
Aerosols (kg)	0.0000E+00	3.4309E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	4.1798E+18	0.0000E+00
Elemental I (atoms)	2.5718E+13	0.0000E+00
Organic I (atoms)	1.5562E+12	0.0000E+00
Aerosols (kg)	2.5512E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.1306E+23
Elemental I (atoms)	4.0192E+18	4.0598E+16
Organic I (atoms)	1.6342E+19	1.6507E+17
Aerosols (kg)	4.5284E-03	4.5742E-05

CR Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
Kr-83m	4.9890E-05	2.4577E-15	1.7832E+10	3.2000E+13
Kr-85m	2.0997E-02	2.5514E-12	1.8076E+13	3.4784E+14
Kr-85	4.3504E-02	1.1099E-07	7.8634E+17	1.0622E+14
Kr-87	3.6169E-06	1.2769E-16	8.8387E+08	6.2455E+13
Kr-88	6.7429E-03	5.3774E-13	3.6800E+12	4.5405E+14
Rb-86	1.3022E-08	1.6003E-16	1.1206E+09	1.3520E+10
Rb-88	1.9598E-02	1.6234E-13	1.1110E+12	3.7788E+14
Sr-89	2.0422E-07	7.0296E-15	4.7565E+10	2.9849E+10
Sr-90	2.2148E-08	1.6237E-13	1.0864E+12	3.2003E+09
Sr-91	4.4298E-08	1.2220E-17	8.0869E+07	2.8388E+10
Sr-92	5.7020E-10	4.5364E-20	2.9694E+05	1.7421E+10
Y-90	4.9616E-09	9.1196E-18	6.1022E+07	1.3803E+08
Y-91	3.0795E-09	1.2557E-16	8.3101E+08	3.9284E+08
Y-92	5.5181E-09	5.7347E-19	3.7538E+06	7.1980E+09
Y-93	5.5762E-10	1.6714E-19	1.0823E+06	3.2672E+08
Zr-95	3.0306E-09	1.4107E-16	8.9425E+08	4.4187E+08
Zr-97	1.1043E-09	5.7767E-19	3.5864E+06	3.6669E+08
Nb-95	3.0214E-09	7.7266E-17	4.8980E+08	4.3654E+08
Mo-99	3.0055E-08	6.2665E-17	3.8119E+08	5.3659E+09
Tc-99m	3.0105E-08	5.7253E-18	3.4827E+07	4.8465E+09
Ru-103	3.2894E-08	1.0192E-15	5.9591E+09	4.8235E+09
Ru-105	5.6272E-10	8.3713E-20	4.8012E+05	2.0545E+09
Ru-106	1.3892E-08	4.1524E-15	2.3591E+10	2.0104E+09
Rh-105	1.5928E-08	1.8871E-17	1.0823E+08	3.1385E+09
Sb-127	3.2174E-08	1.2048E-16	5.7128E+08	5.4066E+09
Sb-129	2.5307E-09	4.5003E-19	2.1009E+06	1.0127E+10
Te-127	3.5900E-08	1.3603E-17	6.4504E+07	5.4537E+09
Te-127m	6.5143E-09	6.9062E-16	3.2748E+09	9.4141E+08
Te-129	2.1770E-08	1.0395E-18	4.8527E+06	1.1695E+10
Te-129m	2.1066E-08	6.9927E-16	3.2644E+09	3.0851E+09
Te-131m	4.6495E-08	5.8308E-17	2.6805E+08	1.0716E+10
Te-132	4.6952E-07	1.5465E-15	7.0556E+09	8.1098E+10
I-131	6.9648E-06	5.6179E-14	2.5826E+11	5.9018E+12
I-132	5.6748E-07	5.4977E-17	2.5082E+08	4.1357E+12
I-133	7.0681E-06	6.2394E-15	2.8252E+10	1.1116E+13
I-135	1.1998E-06	3.4163E-16	1.5240E+09	8.5284E+12
Xe-133	4.7104E+00	2.5165E-08	1.1394E+17	1.2124E+16
Xe-133m	1.2138E-01	2.7570E-10	1.2484E+15	3.3733E+14
Xe-135	4.3672E-01	1.7101E-10	7.6285E+14	2.4729E+15
Xe-135m	4.3600E-06	4.7895E-17	2.1365E+08	4.5812E+12
Cs-134	1.3502E-06	1.0436E-12	4.6899E+12	1.3588E+12
Cs-136	3.9109E-07	5.3361E-15	2.3629E+10	4.1160E+11
Cs-137	1.0491E-06	1.2062E-11	5.3019E+13	1.0551E+12
Ba-140	2.8842E-07	3.9398E-15	1.6947E+10	4.3617E+10
La-140	9.6989E-08	1.7449E-16	7.5059E+08	2.6742E+09
La-141	4.1481E-11	7.3349E-21	3.1327E+04	2.3257E+08

Ce-141	7.0599E-09	2.4777E-16	1.0582E+09	1.0369E+09
Ce-143	4.2355E-09	6.3780E-18	2.6860E+07	9.3538E+08
Ce-144	5.7490E-09	1.8025E-15	7.5380E+09	8.3235E+08
Pr-143	2.8682E-09	4.2594E-17	1.7938E+08	4.0013E+08
Nd-147	1.0510E-09	1.2992E-17	5.3223E+07	1.6011E+08
Np-239	6.1097E-08	2.6336E-16	6.6359E+08	1.1303E+10
Pu-238	1.7908E-11	1.0461E-15	2.6469E+09	2.5873E+06
Pu-239	1.8112E-12	2.9140E-14	7.3425E+10	2.6104E+05
Pu-240	3.1900E-12	1.4006E-15	3.5144E+09	4.6091E+05
Pu-241	7.0862E-10	7.1656E-15	1.7906E+10	1.0240E+08
Am-241	4.0383E-13	1.1788E-16	2.9456E+08	5.7982E+04
Cm-242	1.0968E-10	3.3133E-17	8.2450E+07	1.5903E+07
Cm-244	7.2820E-12	8.8966E-17	2.1958E+08	1.0523E+06

CR Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump	
Noble gases (atoms)	9.0231E+17	0.0000E+00	
Elemental I (atoms)	9.4937E+09	0.0000E+00	
Organic I (atoms)	5.2064E+10	0.0000E+00	
Aerosols (kg)	1.3546E-11	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		7.5814E-16
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		8.3183E-16
Total I (Ci)			1.5800E-05

Time (h) = 24.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.0741E+13
Organic I (atoms)	0.0000E+00	6.4995E+11
Aerosols (kg)	0.0000E+00	1.0655E-08

CR Filtered Intake Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.3012E+18
Elemental I (atoms)	1.9284E+14	1.9655E+12
Organic I (atoms)	1.1896E+13	1.2070E+11
Aerosols (kg)	1.8339E-07	1.8690E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.9652E+17
Elemental I (atoms)	0.0000E+00	3.6077E+13
Organic I (atoms)	0.0000E+00	2.2253E+12
Aerosols (kg)	0.0000E+00	3.4309E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	4.1798E+18	0.0000E+00
Elemental I (atoms)	2.5718E+13	0.0000E+00
Organic I (atoms)	1.5562E+12	0.0000E+00
Aerosols (kg)	2.5512E-08	0.0000E+00

EAB Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.6003E-01	9.6456E-02	3.6439E-01
Accumulated dose (rem)	1.8691E+00	6.1039E+00	2.1318E+00

LPZ Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.8097E-03	4.9466E-04	2.8321E-03
Accumulated dose (rem)	3.2098E-01	8.6174E-01	3.5824E-01

CR Doses:

Time (h) = 48.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.0943E-03	4.2313E-03	7.6592E-03
Accumulated dose (rem)	8.0454E-02	7.8301E+00	4.5360E-01

DW Compartment Nuclide Inventory:

Time (h) = 48.0000	Ci	kg	Atoms	Decay
Kr-83m	1.6777E-01	8.2647E-12	5.9965E+13	2.7892E+21
Kr-85m	1.3196E+04	1.6035E-06	1.1361E+19	1.7624E+22
Kr-85	1.1205E+06	2.8586E+00	2.0253E+25	7.1577E+21
Kr-87	1.9408E-04	6.8519E-15	4.7429E+10	7.6201E+21
Kr-88	4.9645E+02	3.9592E-08	2.7094E+17	2.8831E+22
Rb-86	5.2511E+01	6.4536E-07	4.5191E+18	9.4643E+17
Rb-88	1.5044E+03	1.2462E-08	8.5281E+16	2.0823E+22
Sr-89	3.0240E+03	1.0409E-04	7.0431E+20	3.7432E+19
Sr-90	3.3246E+02	2.4372E-03	1.6308E+22	4.0347E+18
Sr-91	1.1543E+02	3.1843E-08	2.1073E+17	2.6662E+19
Sr-92	1.8472E-02	1.4696E-12	9.6196E+12	1.8335E+19
Y-90	1.3338E+02	2.4516E-07	1.6404E+18	4.6848E+17
Y-91	4.7052E+01	1.9186E-06	1.2697E+19	5.1097E+17
Y-92	9.5296E-01	9.9036E-11	6.4827E+14	1.6385E+18
Y-93	1.6123E+00	4.8326E-10	3.1293E+15	3.0804E+17
Zr-95	4.5004E+01	2.0949E-06	1.3280E+19	5.5474E+17
Zr-97	6.1948E+00	3.2405E-09	2.0118E+16	3.6429E+17
Nb-95	4.5345E+01	1.1596E-06	7.3510E+18	5.5029E+17
Mo-99	3.5066E+02	7.3113E-07	4.4474E+18	6.1976E+18
Tc-99m	3.5884E+02	6.8243E-08	4.1512E+17	5.6610E+18
Ru-103	4.8516E+02	1.5033E-05	8.7892E+19	6.0397E+18
Ru-105	1.9931E-01	2.9651E-11	1.7006E+14	1.9721E+18
Ru-106	2.0816E+02	6.2218E-05	3.5348E+20	2.5328E+18
Rh-105	1.5011E+02	1.7785E-07	1.0200E+18	3.4552E+18
Sb-127	4.0341E+02	1.5106E-06	7.1630E+18	6.3884E+18
Sb-129	8.0776E-01	1.4364E-10	6.7057E+14	9.7547E+18
Te-127	4.7824E+02	1.8121E-07	8.5929E+17	6.5944E+18
Te-127m	9.7676E+01	1.0355E-05	4.9102E+19	1.1866E+18
Te-129	2.6904E+02	1.2847E-08	5.9973E+16	1.1437E+19
Te-129m	3.0982E+02	1.0284E-05	4.8011E+19	3.8620E+18
Te-131m	4.0088E+02	5.0273E-07	2.3111E+18	1.1444E+19
Te-132	5.6976E+03	1.8767E-05	8.5621E+19	9.4819E+19
I-131	4.9897E+04	4.0248E-04	1.8502E+21	6.4270E+20
I-132	6.8008E+03	6.5885E-07	3.0058E+18	5.1193E+20
I-133	2.4763E+04	2.1860E-05	9.8980E+19	9.8359E+20

I-135	7.5499E+02	2.1498E-07	9.5900E+17	6.7014E+20
Xe-133	1.0666E+08	5.6980E-01	2.5800E+24	7.7609E+23
Xe-133m	2.2917E+06	5.2054E-03	2.3570E+22	2.0228E+22
Xe-135	1.8065E+06	7.0741E-04	3.1557E+21	1.1515E+23
Xe-135m	3.5022E+02	3.8472E-09	1.7162E+16	1.5886E+21
Cs-134	5.6457E+03	4.3636E-03	1.9610E+22	9.6004E+19
Cs-136	1.5525E+03	2.1182E-05	9.3795E+19	2.8702E+19
Cs-137	4.3906E+03	5.0477E-02	2.2188E+23	7.4559E+19
Ba-139	1.5441E-07	9.4400E-18	4.0899E+07	1.5451E+19
Ba-140	4.1005E+03	5.6011E-05	2.4093E+20	5.3857E+19
La-140	2.3898E+03	4.2995E-06	1.8494E+19	8.7654E+18
La-141	9.0351E-03	1.5976E-12	6.8235E+12	2.2709E+17
La-142	1.7853E-08	1.2472E-18	5.2892E+06	1.4831E+17
Ce-141	1.0376E+02	3.6415E-06	1.5553E+19	1.2973E+18
Ce-143	3.8407E+01	5.7834E-08	2.4356E+17	1.0103E+18
Ce-144	8.6092E+01	2.6992E-05	1.1288E+20	1.0484E+18
Pr-143	4.3367E+01	6.4401E-07	2.7121E+18	5.0962E+17
Nd-147	1.4812E+01	1.8310E-07	7.5009E+17	1.9706E+17
Np-239	6.8333E+02	2.9455E-06	7.4218E+18	1.2892E+19
Pu-238	2.6886E-01	1.5705E-05	3.9738E+19	3.2621E+15
Pu-239	2.7253E-02	4.3845E-04	1.1048E+21	3.2947E+14
Pu-240	4.7888E-02	2.1025E-05	5.2757E+19	5.8111E+14
Pu-241	1.0636E+01	1.0756E-04	2.6876E+20	1.2909E+17
Am-241	6.1085E-03	1.7831E-06	4.4556E+18	7.3309E+13
Cm-242	1.6395E+00	4.9527E-07	1.2325E+18	2.0017E+16
Cm-244	1.0930E-01	1.3354E-06	3.2959E+18	1.3266E+15

DW Transport Group Inventory:

Time (h) = 48.0000	Atmosphere	Sump	
Noble gases (atoms)	2.2859E+25	0.0000E+00	
Elemental I (atoms)	9.1582E+18	7.8120E+22	
Organic I (atoms)	9.7992E+20	0.0000E+00	
Aerosols (kg)	5.8420E-02	6.5809E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		6.2373E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		6.5537E-06
Total I (Ci)			8.2216E+04

DW to WW Transport Group Inventory:

Time (h) = 48.0000 Leakage Transport

Noble gases (atoms)	4.0428E+28
Elemental I (atoms)	2.4234E+22
Organic I (atoms)	1.9908E+24
Aerosols (kg)	1.0596E+02

WW to DW Transport Group Inventory:

Time (h) = 48.0000 Leakage Transport

Noble gases (atoms)	4.0570E+28
Elemental I (atoms)	2.8357E+22
Organic I (atoms)	1.9992E+24
Aerosols (kg)	1.0932E+02

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported

Noble gases (atoms)	0.0000E+00	4.5091E+23
Elemental I (atoms)	0.0000E+00	4.8910E+18
Organic I (atoms)	0.0000E+00	2.3112E+19
Aerosols (kg)	0.0000E+00	5.3021E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.0809E+22
Elemental I (atoms)	0.0000E+00	2.8187E+17
Organic I (atoms)	0.0000E+00	2.0882E+18
Aerosols (kg)	0.0000E+00	3.2762E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2128E+23
Elemental I (atoms)	0.0000E+00	1.5286E+18
Organic I (atoms)	0.0000E+00	1.1323E+19
Aerosols (kg)	0.0000E+00	1.7767E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2128E+23
Elemental I (atoms)	0.0000E+00	1.5286E+18
Organic I (atoms)	0.0000E+00	1.1323E+19
Aerosols (kg)	0.0000E+00	1.7767E-03

RB Compartment Nuclide Inventory:

Time (h) = 48.0000	Ci	kg	Atoms	Decay
Kr-83m	5.2927E-04	2.6073E-14	1.8918E+11	3.9749E+18
Kr-85m	4.1630E+01	5.0587E-09	3.5840E+16	4.6380E+19
Kr-85	3.5348E+03	9.0182E-03	6.3892E+22	2.8498E+19
Kr-87	6.1229E-07	2.1616E-17	1.4963E+08	7.7878E+18
Kr-88	1.5662E+00	1.2490E-10	8.5476E+14	5.7017E+19
Rb-86	1.7195E-01	2.1133E-09	1.4798E+16	5.4951E+15
Rb-88	4.7459E+00	3.9314E-11	2.6904E+14	6.1428E+19
Sr-89	9.6663E+00	3.3272E-07	2.2513E+18	1.4947E+17
Sr-90	1.0627E+00	7.7907E-06	5.2130E+19	1.6143E+16
Sr-91	3.6897E-01	1.0179E-10	6.7360E+14	7.6012E+16
Sr-92	5.9046E-05	4.6976E-15	3.0750E+10	2.6905E+16
Y-90	4.2642E-01	7.8377E-10	5.2444E+15	2.4373E+15
Y-91	1.5042E-01	6.1337E-09	4.0591E+16	2.1276E+15
Y-92	3.0478E-03	3.1674E-13	2.0733E+12	1.9625E+16
Y-93	5.1539E-03	1.5448E-12	1.0003E+13	8.9692E+14
Zr-95	1.4386E-01	6.6964E-09	4.2449E+16	2.2161E+15
Zr-97	1.9802E-02	1.0358E-11	6.4309E+13	1.2163E+15
Nb-95	1.4495E-01	3.7068E-09	2.3498E+16	2.2016E+15
Mo-99	1.1209E+00	2.3371E-09	1.4216E+16	2.3828E+16
Tc-99m	1.1470E+00	2.1814E-10	1.3270E+15	2.2149E+16
Ru-103	1.5508E+00	4.8052E-08	2.8095E+17	2.4103E+16
Ru-105	6.3711E-04	9.4780E-14	5.4360E+11	3.9483E+15

Ru-106	6.6538E-01	1.9888E-07	1.1299E+18	1.0131E+16
Rh-105	4.7984E-01	5.6850E-10	3.2605E+15	1.3255E+16
Sb-127	1.2895E+00	4.8287E-09	2.2897E+16	2.4859E+16
Sb-129	2.5820E-03	4.5916E-13	2.1435E+12	1.9224E+16
Te-127	1.5287E+00	5.7926E-10	2.7468E+15	2.6092E+16
Te-127m	3.1222E-01	3.3101E-08	1.5696E+17	4.7477E+15
Te-129	8.6000E-01	4.1065E-11	1.9171E+14	2.9157E+16
Te-129m	9.9035E-01	3.2874E-08	1.5347E+17	1.5429E+16
Te-131m	1.2814E+00	1.6070E-09	7.3875E+15	4.1641E+16
Te-132	1.8213E+01	5.9991E-08	2.7369E+17	3.6698E+17
I-131	1.6012E+02	1.2915E-06	5.9372E+18	3.2805E+18
I-132	2.1739E+01	2.1061E-09	9.6083E+15	1.2646E+18
I-133	7.9464E+01	7.0148E-08	3.1762E+17	4.6944E+18
I-135	2.4227E+00	6.8987E-10	3.0774E+15	2.4975E+18
Xe-133	3.3648E+05	1.7976E-03	8.1394E+21	3.0837E+21
Xe-133m	7.2298E+03	1.6422E-05	7.4357E+19	7.9959E+19
Xe-135	5.6994E+03	2.2318E-06	9.9557E+18	3.9826E+20
Xe-135m	1.1238E+00	1.2345E-11	5.5071E+13	6.9970E+17
Cs-134	1.8487E+01	1.4289E-05	6.4216E+19	5.5944E+17
Cs-136	5.0836E+00	6.9362E-08	3.0714E+17	1.6637E+17
Cs-137	1.4377E+01	1.6529E-04	7.2658E+20	4.3451E+17
Ba-139	4.9358E-10	3.0176E-20	1.3073E+05	1.3690E+16
Ba-140	1.3107E+01	1.7904E-07	7.7015E+17	2.1376E+17
La-140	7.6400E+00	1.3745E-08	5.9125E+16	4.6871E+16
La-141	2.8881E-05	5.1069E-15	2.1812E+10	4.2327E+14
La-142	5.7069E-11	3.9866E-21	1.6907E+04	1.4362E+14
Ce-141	3.3167E-01	1.1640E-08	4.9716E+16	5.1768E+15
Ce-143	1.2277E-01	1.8487E-10	7.7854E+14	3.7116E+15
Ce-144	2.7520E-01	8.6283E-08	3.6084E+17	4.1932E+15
Pr-143	1.3863E-01	2.0586E-09	8.6696E+15	2.0571E+15
Nd-147	4.7348E-02	5.8528E-10	2.3977E+15	7.8109E+14
Np-239	2.1843E+00	9.4154E-09	2.3724E+16	4.9206E+16
Pu-238	8.5944E-04	5.0202E-08	1.2703E+17	1.3052E+13
Pu-239	8.7115E-05	1.4015E-06	3.5315E+18	1.3188E+12
Pu-240	1.5307E-04	6.7208E-08	1.6864E+17	2.3250E+12
Pu-241	3.4000E-02	3.4381E-07	8.5911E+17	5.1650E+14
Am-241	1.9526E-05	5.6997E-09	1.4242E+16	2.9363E+11
Cm-242	5.2406E-03	1.5832E-09	3.9397E+15	8.0041E+13
Cm-244	3.4940E-04	4.2686E-09	1.0535E+16	5.3077E+12

RB Transport Group Inventory:

Time (h) = 48.0000	Atmosphere	Sump	
Noble gases (atoms)	7.2116E+22	0.0000E+00	
Elemental I (atoms)	3.4085E+16	0.0000E+00	
Organic I (atoms)	3.0916E+18	0.0000E+00	
Aerosols (kg)	1.9104E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.1590E-09
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.3193E-09
Total I (Ci)			2.6374E+02

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.5091E+23
Elemental I (atoms)	0.0000E+00	4.8910E+18
Organic I (atoms)	0.0000E+00	2.3112E+19

Aerosols (kg)	0.0000E+00	5.3021E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.3090E+23
Elemental I (atoms)	0.0000E+00	1.8306E+17
Organic I (atoms)	0.0000E+00	1.1667E+19
Aerosols (kg)	0.0000E+00	6.3485E-04

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.0615E+23
Elemental I (atoms)	4.2877E+18	4.3310E+16
Organic I (atoms)	2.9677E+19	2.9977E+17
Aerosols (kg)	5.4316E-03	5.4865E-05

Environment Integral Nuclide Release:

Time (h) = 48.0000	Ci	kg	Atoms	Bq
Kr-83m	3.8796E+03	1.9112E-07	1.3867E+18	1.4355E+14
Kr-85m	4.5637E+04	5.5455E-06	3.9289E+19	1.6886E+15
Kr-85	2.9210E+04	7.4521E-02	5.2797E+23	1.0808E+15
Kr-87	7.4952E+03	2.6461E-07	1.8316E+18	2.7732E+14
Kr-88	5.5927E+04	4.4602E-06	3.0522E+19	2.0693E+15
Rb-86	2.5466E-01	3.1298E-09	2.1916E+16	9.4226E+09
Rb-88	3.0492E+04	2.5259E-07	1.7285E+18	1.1282E+15
Sr-89	1.9561E+00	6.7330E-08	4.5558E+17	7.2375E+10
Sr-90	2.1089E-01	1.5460E-06	1.0345E+19	7.8029E+09
Sr-91	1.2522E+00	3.4544E-10	2.2861E+15	4.6333E+10
Sr-92	6.9654E-01	5.5416E-11	3.6274E+14	2.5772E+10
Y-90	2.6714E-02	4.9101E-11	3.2854E+14	9.8841E+08
Y-91	2.7219E-02	1.1099E-09	7.3451E+15	1.0071E+09
Y-92	2.2555E-01	2.3441E-11	1.5344E+14	8.3455E+09
Y-93	1.4582E-02	4.3707E-12	2.8302E+13	5.3954E+08
Zr-95	2.8991E-02	1.3495E-09	8.5545E+15	1.0727E+09
Zr-97	1.8126E-02	9.4817E-12	5.8866E+13	6.7065E+08
Nb-95	2.8769E-02	7.3571E-10	4.6637E+15	1.0644E+09
Mo-99	3.2173E-01	6.7080E-10	4.0804E+15	1.1904E+10
Tc-99m	3.0271E-01	5.7569E-11	3.5019E+14	1.1200E+10
Ru-103	3.1560E-01	9.7787E-09	5.7173E+16	1.1677E+10
Ru-105	8.1702E-02	1.2154E-11	6.9710E+13	3.0230E+09
Ru-106	1.3239E-01	3.9570E-08	2.2481E+17	4.8983E+09
Rh-105	1.8052E-01	2.1388E-10	1.2267E+15	6.6794E+09
Sb-127	3.3246E-01	1.2449E-09	5.9033E+15	1.2301E+10

Sb-129	4.0209E-01	7.1504E-11	3.3380E+14	1.4877E+10
Te-127	3.5025E-01	1.3272E-10	6.2932E+14	1.2959E+10
Te-127m	6.2030E-02	6.5761E-09	3.1183E+16	2.2951E+09
Te-129	5.3770E-01	2.5675E-11	1.1986E+14	1.9895E+10
Te-129m	2.0192E-01	6.7028E-09	3.1291E+16	7.4712E+09
Te-131m	5.8557E-01	7.3434E-10	3.3758E+15	2.1666E+10
Te-132	4.9292E+00	1.6236E-08	7.4073E+16	1.8238E+11
I-131	1.2059E+02	9.7271E-07	4.4716E+18	4.4619E+12
I-132	1.2279E+02	1.1895E-08	5.4269E+16	4.5431E+12
I-133	2.2490E+02	1.9854E-07	8.9896E+17	8.3215E+12
I-134	1.3910E+02	5.2144E-09	2.3434E+16	5.1468E+12
I-135	1.8581E+02	5.2909E-08	2.3602E+17	6.8749E+12
Xe-133	3.1526E+06	1.6842E-02	7.6260E+22	1.1664E+17
Xe-133m	8.1444E+04	1.8499E-04	8.3763E+20	3.0134E+15
Xe-135	3.9642E+05	1.5523E-04	6.9247E+20	1.4668E+16
Xe-135m	5.4813E+02	6.0212E-09	2.6860E+16	2.0281E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	2.5589E+01	1.9778E-05	8.8883E+19	9.4678E+11
Cs-136	7.7542E+00	1.0580E-07	4.6849E+17	2.8690E+11
Cs-137	1.9868E+01	2.2842E-04	1.0041E+21	7.3513E+11
Ba-139	5.4551E-01	3.3350E-11	1.4449E+14	2.0184E+10
Ba-140	2.8122E+00	3.8414E-08	1.6524E+17	1.0405E+11
La-140	5.1155E-01	9.2035E-10	3.9589E+15	1.8928E+10
La-141	9.1999E-03	1.6268E-12	6.9479E+12	3.4040E+08
La-142	5.2694E-03	3.6810E-13	1.5611E+12	1.9497E+08
Ce-141	6.7791E-02	2.3792E-09	1.0162E+16	2.5083E+09
Ce-143	5.1838E-02	7.8060E-11	3.2873E+14	1.9180E+09
Ce-144	5.4797E-02	1.7181E-08	7.1850E+16	2.0275E+09
Pr-143	2.6750E-02	3.9725E-10	1.6729E+15	9.8975E+08
Nd-147	1.0288E-02	1.2717E-10	5.2096E+14	3.8064E+08
Np-239	6.6813E-01	2.8800E-09	7.2568E+15	2.4721E+10
Pu-238	1.7051E-04	9.9598E-09	2.5201E+16	6.3088E+06
Pu-239	1.7223E-05	2.7709E-07	6.9819E+17	6.3725E+05
Pu-240	3.0374E-05	1.3336E-08	3.3463E+16	1.1238E+06
Pu-241	6.7477E-03	6.8233E-08	1.7050E+17	2.4966E+08
Am-241	3.8327E-06	1.1188E-09	2.7956E+15	1.4181E+05
Cm-242	1.0462E-03	3.1606E-10	7.8650E+14	3.8710E+07
Cm-244	6.9340E-05	8.4714E-10	2.0908E+15	2.5656E+06

Environment Transport Group Inventory:

Time (h) = 48.0000	Total Release	Release Rate/s	
Noble gases (atoms)	6.0584E+23	3.5060E+18	
Elemental I (atoms)	2.5008E+17	1.4472E+12	
Organic I (atoms)	3.0848E+17	1.7852E+12	
Aerosols (kg)	2.5181E-04	1.4572E-09	
Dose Effective (Ci) I-131 (Thyroid)			1.6428E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			2.0297E+02
Total I (Ci)			7.9319E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.5420E+18
Elemental I (atoms)	1.9286E+14	1.9657E+12

Organic I (atoms)	1.2915E+13	1.3100E+11
Aerosols (kg)	1.8345E-07	1.8697E-09

CR Unfiltered Inleakage Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2115E+18
Elemental I (atoms)	0.0000E+00	3.6081E+13
Organic I (atoms)	0.0000E+00	2.4161E+12
Aerosols (kg)	0.0000E+00	3.4322E-08

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	7.3620E+18	0.0000E+00
Elemental I (atoms)	2.5727E+13	0.0000E+00
Organic I (atoms)	1.7193E+12	0.0000E+00
Aerosols (kg)	2.5531E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.0615E+23
Elemental I (atoms)	4.2877E+18	4.3310E+16
Organic I (atoms)	2.9677E+19	2.9977E+17
Aerosols (kg)	5.4316E-03	5.4865E-05

CR Compartment Nuclide Inventory:

Time (h) = 48.0000	Ci	kg	Atoms	Decay
Kr-83m	2.6952E-09	1.3277E-19	9.6335E+05	3.2015E+13
Kr-85m	2.1200E-04	2.5760E-14	1.8251E+11	3.6061E+14
Kr-85	1.8001E-02	4.5924E-08	3.2536E+17	1.8622E+14
Kr-88	7.9756E-06	6.3605E-16	4.3527E+09	4.5691E+14
Rb-86	1.0220E-09	1.2560E-17	8.7954E+07	1.3528E+10
Rb-88	2.3225E-05	1.9240E-16	1.3166E+09	3.8057E+14
Sr-89	5.6600E-08	1.9482E-15	1.3182E+10	3.0128E+10
Sr-90	6.2226E-09	4.5618E-14	3.0524E+11	3.2306E+09
Sr-91	2.1605E-09	5.9600E-19	3.9441E+06	2.8422E+10
Y-90	2.4970E-09	4.5896E-18	3.0710E+07	1.4692E+08
Y-91	8.8085E-10	3.5918E-17	2.3769E+08	3.9710E+08
Y-92	1.7852E-11	1.8552E-21	1.2144E+04	7.2004E+09
Y-93	3.0178E-11	9.0452E-21	5.8571E+04	3.2716E+08
Zr-95	8.4234E-10	3.9210E-17	2.4855E+08	4.4601E+08
Zr-97	1.1595E-10	6.0653E-20	3.7656E+05	3.6775E+08

Nb-95	8.4873E-10	2.1705E-17	1.3759E+08	4.4068E+08
Mo-99	6.5633E-09	1.3684E-17	8.3242E+07	5.4033E+09
Tc-99m	6.7164E-09	1.2773E-18	7.7698E+06	4.8824E+09
Ru-103	9.0807E-09	2.8136E-16	1.6451E+09	4.8683E+09
Ru-106	3.8961E-09	1.1645E-15	6.6161E+09	2.0295E+09
Rh-105	2.8096E-09	3.3287E-18	1.9092E+07	3.1568E+09
Sb-127	7.5506E-09	2.8274E-17	1.3407E+08	5.4477E+09
Sb-129	1.5119E-11	2.6886E-21	1.2551E+04	1.0128E+10
Te-127	8.9513E-09	3.3918E-18	1.6083E+07	5.4992E+09
Te-127m	1.8282E-09	1.9382E-16	9.1905E+08	9.5034E+08
Te-129	5.0356E-09	2.4045E-19	1.1225E+06	1.1715E+10
Te-129m	5.7989E-09	1.9249E-16	8.9862E+08	3.1138E+09
Te-131m	7.5033E-09	9.4096E-18	4.3257E+07	1.0767E+10
Te-132	1.0664E-07	3.5127E-16	1.6026E+09	8.1690E+10
I-131	9.4014E-07	7.5833E-15	3.4861E+10	5.9077E+12
I-132	1.2729E-07	1.2332E-17	5.6260E+07	4.1363E+12
I-133	4.6659E-07	4.1189E-16	1.8650E+09	1.1121E+13
I-135	1.4226E-08	4.0507E-18	1.8070E+07	8.5290E+12
Xe-133	1.7134E+00	9.1539E-09	4.1448E+16	2.0328E+16
Xe-133m	3.6816E-02	8.3624E-11	3.7864E+14	5.3359E+14
Xe-135	2.9019E-02	1.1363E-11	5.0691E+13	2.8918E+15
Xe-135m	1.0208E-07	1.1214E-18	5.0023E+06	4.5921E+12
Cs-134	1.0988E-07	8.4926E-14	3.8167E+11	1.3597E+12
Cs-136	3.0215E-08	4.1226E-16	1.8255E+09	4.1185E+11
Cs-137	8.5452E-08	9.8242E-13	4.3184E+12	1.0557E+12
Ba-140	7.6749E-08	1.0484E-15	4.5095E+09	4.4004E+10
La-140	4.4738E-08	8.0489E-17	3.4623E+08	2.8413E+09
Ce-141	1.9421E-09	6.8158E-17	2.9110E+08	1.0465E+09
Ce-143	7.1886E-10	1.0825E-18	4.5586E+06	9.4017E+08
Ce-144	1.6114E-09	5.0522E-16	2.1128E+09	8.4023E+08
Pr-143	8.1172E-10	1.2054E-17	5.0764E+07	4.0408E+08
Nd-147	2.7724E-10	3.4270E-18	1.4039E+07	1.6151E+08
Np-239	1.2790E-08	5.5130E-17	1.3891E+08	1.1378E+10
Pu-238	5.0323E-12	2.9395E-16	7.4378E+08	2.6118E+06
Pu-239	5.1009E-13	8.2065E-15	2.0678E+10	2.6352E+05
Pu-240	8.9631E-13	3.9353E-16	9.8745E+08	4.6528E+05
Pu-241	1.9908E-10	2.0131E-15	5.0304E+09	1.0337E+08
Am-241	1.1433E-13	3.3374E-17	8.3395E+07	5.8538E+04
Cm-242	3.0686E-11	9.2700E-18	2.3068E+07	1.6054E+07
Cm-244	2.0458E-12	2.4994E-17	6.1689E+07	1.0622E+06

CR Transport Group Inventory:

Time (h) = 48.0000	Atmosphere	Sump	
Noble gases (atoms)	3.6724E+17	0.0000E+00	
Elemental I (atoms)	2.1682E+08	0.0000E+00	
Organic I (atoms)	1.7965E+10	0.0000E+00	
Aerosols (kg)	1.1347E-12	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		9.4448E-17
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		9.9237E-17
Total I (Ci)			1.5482E-06

Time (h) = 48.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.0745E+13
Organic I (atoms)	0.0000E+00	7.1808E+11
Aerosols (kg)	0.0000E+00	1.0663E-08

CR Filtered Intake Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.5420E+18
Elemental I (atoms)	1.9286E+14	1.9657E+12
Organic I (atoms)	1.2915E+13	1.3100E+11
Aerosols (kg)	1.8345E-07	1.8697E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2115E+18
Elemental I (atoms)	0.0000E+00	3.6081E+13
Organic I (atoms)	0.0000E+00	2.4161E+12
Aerosols (kg)	0.0000E+00	3.4322E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	7.3620E+18	0.0000E+00
Elemental I (atoms)	2.5727E+13	0.0000E+00
Organic I (atoms)	1.7193E+12	0.0000E+00
Aerosols (kg)	2.5531E-08	0.0000E+00

EAB Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.3772E-01	1.1005E-01	3.4295E-01
Accumulated dose (rem)	2.2068E+00	6.2139E+00	2.4748E+00

LPZ Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.6356E-03	5.6436E-04	2.6624E-03
Accumulated dose (rem)	3.2362E-01	8.6230E-01	3.6090E-01

CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.4376E-03	3.1304E-03	5.5869E-03
Accumulated dose (rem)	8.5891E-02	7.8332E+00	4.5918E-01

DW Compartment Nuclide Inventory:

Time (h) = 96.0000	Ci	kg	Atoms	Decay
Kr-83m	2.8000E-09	1.3793E-19	1.0008E+06	2.7892E+21
Kr-85m	7.6927E+00	9.3477E-10	6.6227E+15	1.7635E+22
Kr-85	1.0970E+06	2.7987E+00	1.9828E+25	1.4245E+22
Kr-88	3.9720E-03	3.1676E-13	2.1677E+12	2.8831E+22
Rb-86	4.7747E+01	5.8681E-07	4.1091E+18	1.2666E+18
Rb-88	1.2036E-02	9.9704E-14	6.8231E+11	2.0824E+22
Sr-89	2.8815E+03	9.9183E-05	6.7112E+20	5.6302E+19
Sr-90	3.2556E+02	2.3867E-03	1.5970E+22	6.1377E+18

Sr-91	3.4063E+00	9.3967E-10	6.2185E+15	2.6865E+19
Sr-92	8.4251E-08	6.7028E-18	4.3875E+07	1.8335E+19
Y-90	2.1038E+02	3.8669E-07	2.5874E+18	1.5798E+18
Y-91	4.5310E+01	1.8476E-06	1.2227E+19	8.0660E+17
Y-92	8.2422E-05	8.5657E-15	5.6070E+10	1.6392E+18
Y-93	5.8583E-02	1.7559E-11	1.1370E+14	3.1104E+17
Zr-95	4.3132E+01	2.0077E-06	1.2727E+19	8.3639E+17
Zr-97	8.4721E-01	4.4318E-10	2.7514E+15	3.8147E+17
Nb-95	4.4364E+01	1.1345E-06	7.1919E+18	8.3690E+17
Mo-99	2.0745E+02	4.3253E-07	2.6311E+18	7.9415E+18
Tc-99m	2.1268E+02	4.0448E-08	2.4604E+17	7.3580E+18
Ru-103	4.5869E+02	1.4212E-05	8.3096E+19	9.0555E+18
Ru-105	1.0867E-04	1.6166E-14	9.2721E+10	1.9723E+18
Ru-106	2.0310E+02	6.0708E-05	3.4490E+20	3.8472E+18
Rh-105	5.7388E+01	6.7991E-08	3.8995E+17	4.0716E+18
Sb-127	2.7563E+02	1.0321E-06	4.8941E+18	8.5328E+18
Sb-129	3.5765E-04	6.3601E-14	2.9691E+11	9.7553E+18
Te-127	3.5777E+02	1.3556E-07	6.4283E+17	9.1579E+18
Te-127m	9.5209E+01	1.0094E-05	4.7862E+19	1.8032E+18
Te-129	2.5178E+02	1.2023E-08	5.6125E+16	1.2689E+19
Te-129m	2.9117E+02	9.6654E-06	4.5121E+19	5.7822E+18
Te-131m	1.2952E+02	1.6242E-07	7.4667E+17	1.2979E+19
Te-132	3.6465E+03	1.2011E-05	5.4798E+19	1.2420E+20
I-131	4.1158E+04	3.3199E-04	1.5262E+21	9.3284E+20
I-132	4.3525E+03	4.2167E-07	1.9237E+18	5.4234E+20
I-133	4.8987E+03	4.3244E-06	1.9580E+19	1.0620E+21
I-135	4.8184E+00	1.3720E-09	6.1204E+15	6.7108E+20
Xe-133	8.0584E+07	4.3051E-01	1.9493E+24	1.3707E+24
Xe-133m	1.2056E+06	2.7383E-03	1.2399E+22	3.1037E+22
Xe-135	4.5561E+04	1.7841E-05	7.9585E+19	1.1821E+23
Xe-135m	2.2351E+00	2.4553E-11	1.0953E+14	1.5888E+21
Cs-134	5.5192E+03	4.2658E-03	1.9171E+22	1.3169E+20
Cs-136	1.3678E+03	1.8662E-05	8.2638E+19	3.8023E+19
Cs-137	4.2996E+03	4.9431E-02	2.1729E+23	1.0233E+20
Ba-140	3.6020E+03	4.9201E-05	2.1164E+20	7.8441E+19
La-140	3.1666E+03	5.6971E-06	2.4506E+19	2.6877E+19
La-141	1.8629E-06	3.2941E-16	1.4069E+09	2.2710E+17
Ce-141	9.7379E+01	3.4176E-06	1.4597E+19	1.9399E+18
Ce-143	1.3725E+01	2.0667E-08	8.7036E+16	1.1636E+18
Ce-144	8.3908E+01	2.6308E-05	1.1002E+20	1.5917E+18
Pr-143	4.0631E+01	6.0339E-07	2.5410E+18	7.7906E+17
Nd-147	1.2786E+01	1.5806E-07	6.4750E+17	2.8511E+17
Np-239	3.7148E+02	1.6013E-06	4.0347E+18	1.6163E+19
Pu-238	2.6338E-01	1.5385E-05	3.8928E+19	4.9632E+15
Pu-239	2.6771E-02	4.3070E-04	1.0853E+21	5.0215E+14
Pu-240	4.6901E-02	2.0592E-05	5.1671E+19	8.8405E+14
Pu-241	1.0415E+01	1.0531E-04	2.6316E+20	1.9637E+17
Am-241	6.0739E-03	1.7730E-06	4.4303E+18	1.1224E+14
Cm-242	1.5921E+00	4.8096E-07	1.1969E+18	3.0345E+16
Cm-244	1.0703E-01	1.3076E-06	3.2273E+18	2.0180E+15

DW Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump
Noble gases (atoms)	2.1790E+25	0.0000E+00
Elemental I (atoms)	7.2570E+18	7.8120E+22
Organic I (atoms)	7.7649E+20	0.0000E+00
Aerosols (kg)	5.7145E-02	6.5809E+01

Dose Effective (Ci/cc) I-131 (Thyroid) 4.8439E-06
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid) 4.9160E-06
Total I (Ci) 5.0414E+04

DW to WW Transport Group Inventory:
Time (h) = 96.0000 Leakage Transport

Noble gases (atoms) 8.0465E+28
Elemental I (atoms) 3.8860E+22
Organic I (atoms) 3.5558E+24
Aerosols (kg) 2.0963E+02

WW to DW Transport Group Inventory:
Time (h) = 96.0000 Leakage Transport

Noble gases (atoms) 8.0607E+28
Elemental I (atoms) 4.2983E+22
Organic I (atoms) 3.5642E+24
Aerosols (kg) 2.1299E+02

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4055E+23
Elemental I (atoms)	0.0000E+00	4.9968E+18
Organic I (atoms)	0.0000E+00	3.4433E+19
Aerosols (kg)	0.0000E+00	6.0520E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.6981E+22
Elemental I (atoms)	0.0000E+00	2.9143E+17
Organic I (atoms)	0.0000E+00	3.1112E+18
Aerosols (kg)	0.0000E+00	3.9539E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6316E+23
Elemental I (atoms)	0.0000E+00	1.5804E+18
Organic I (atoms)	0.0000E+00	1.6869E+19
Aerosols (kg)	0.0000E+00	2.1440E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6316E+23
Elemental I (atoms)	0.0000E+00	1.5804E+18
Organic I (atoms)	0.0000E+00	1.6869E+19
Aerosols (kg)	0.0000E+00	2.1440E-03

RB Compartment Nuclide Inventory:

Time (h) = 96.0000	Ci	kg	Atoms	Decay
Kr-85m	2.3447E-02	2.8491E-12	2.0186E+13	4.6415E+19
Kr-85	3.3436E+03	8.5302E-03	6.0435E+22	5.0207E+19
Kr-88	1.2106E-05	9.6547E-16	6.6071E+09	5.7018E+19
Rb-86	1.4554E-01	1.7886E-09	1.2525E+16	6.4817E+15
Rb-88	3.6685E-05	3.0389E-16	2.0796E+09	6.1429E+19
Sr-89	8.7827E+00	3.0231E-07	2.0455E+18	2.0739E+17
Sr-90	9.9231E-01	7.2747E-06	4.8677E+19	2.2597E+16
Sr-91	1.0382E-02	2.8641E-12	1.8954E+13	7.6641E+16
Sr-92	2.5679E-10	2.0430E-20	1.3373E+05	2.6905E+16
Y-90	6.4124E-01	1.1786E-09	7.8864E+15	5.8441E+15
Y-91	1.3810E-01	5.6314E-09	3.7267E+16	3.0350E+15
Y-92	2.5122E-07	2.6108E-17	1.7090E+08	1.9627E+16
Y-93	1.7856E-04	5.3520E-14	3.4656E+11	9.0620E+14
Zr-95	1.3147E-01	6.1195E-09	3.8792E+16	3.0805E+15
Zr-97	2.5823E-03	1.3508E-12	8.3863E+12	1.2693E+15
Nb-95	1.3522E-01	3.4580E-09	2.1921E+16	3.0813E+15
Mo-99	6.3230E-01	1.3184E-09	8.0195E+15	2.9187E+16
Tc-99m	6.4826E-01	1.2328E-10	7.4993E+14	2.7364E+16
Ru-103	1.3981E+00	4.3319E-08	2.5327E+17	3.3360E+16
Ru-105	3.3123E-07	4.9275E-17	2.8261E+08	3.9488E+15
Ru-106	6.1905E-01	1.8504E-07	1.0512E+18	1.4165E+16
Rh-105	1.7492E-01	2.0723E-10	1.1886E+15	1.5152E+16
Sb-127	8.4011E-01	3.1459E-09	1.4917E+16	3.1447E+16
Sb-129	1.0901E-06	1.9385E-16	9.0498E+08	1.9227E+16
Te-127	1.0905E+00	4.1320E-10	1.9593E+15	3.3965E+16
Te-127m	2.9019E-01	3.0765E-08	1.4588E+17	6.6401E+15
Te-129	7.6742E-01	3.6645E-11	1.7107E+14	3.2998E+16
Te-129m	8.8749E-01	2.9460E-08	1.3753E+17	2.1323E+16
Te-131m	3.9477E-01	4.9506E-10	2.2758E+15	4.6367E+16
Te-132	1.1115E+01	3.6610E-08	1.6702E+17	4.5724E+17
I-131	1.2545E+02	1.0119E-06	4.6518E+18	4.1719E+18
I-132	1.3266E+01	1.2852E-09	5.8635E+15	1.3581E+18
I-133	1.4931E+01	1.3181E-08	5.9681E+16	4.9362E+18
I-135	1.4686E-02	4.1820E-12	1.8655E+13	2.5004E+18
Xe-133	2.4561E+05	1.3122E-03	5.9414E+21	4.9060E+21
Xe-133m	3.6744E+03	8.3462E-06	3.7791E+19	1.1311E+20
Xe-135	1.3887E+02	5.4377E-08	2.4257E+17	4.0769E+20
Xe-135m	6.8127E-03	7.4838E-14	3.3384E+11	7.0020E+17
Cs-134	1.6823E+01	1.3003E-05	5.8435E+19	6.6936E+17
Cs-136	4.1691E+00	5.6885E-08	2.5189E+17	1.9510E+17
Cs-137	1.3106E+01	1.5067E-04	6.6231E+20	5.2007E+17
Ba-140	1.0979E+01	1.4996E-07	6.4507E+17	2.8923E+17
La-140	9.6517E+00	1.7365E-08	7.4694E+16	1.0242E+17
La-141	5.6781E-09	1.0040E-18	4.2882E+06	4.2329E+14
Ce-141	2.9681E-01	1.0417E-08	4.4490E+16	7.1494E+15
Ce-143	4.1833E-02	6.2993E-11	2.6528E+14	4.1834E+15
Ce-144	2.5575E-01	8.0186E-08	3.3534E+17	5.8608E+15
Pr-143	1.2384E-01	1.8391E-09	7.7450E+15	2.8842E+15
Nd-147	3.8973E-02	4.8175E-10	1.9736E+15	1.0514E+15
Np-239	1.1323E+00	4.8806E-09	1.2298E+16	5.9259E+16
Pu-238	8.0279E-04	4.6893E-08	1.1865E+17	1.8273E+13
Pu-239	8.1597E-05	1.3128E-06	3.3078E+18	1.8488E+12
Pu-240	1.4295E-04	6.2765E-08	1.5749E+17	3.2548E+12
Pu-241	3.1744E-02	3.2099E-07	8.0210E+17	7.2300E+14
Am-241	1.8513E-05	5.4040E-09	1.3504E+16	4.1312E+11

Cm-242	4.8526E-03	1.4660E-09	3.6480E+15	1.1174E+14
Cm-244	3.2622E-04	3.9855E-09	9.8367E+15	7.4297E+12

RB Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump	
Noble gases (atoms)	6.6415E+22	0.0000E+00	
Elemental I (atoms)	2.2125E+16	0.0000E+00	
Organic I (atoms)	2.3667E+18	0.0000E+00	
Aerosols (kg)	1.7418E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.3303E-09
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.3650E-09
Total I (Ci)			1.5366E+02

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4055E+23
Elemental I (atoms)	0.0000E+00	4.9968E+18
Organic I (atoms)	0.0000E+00	3.4433E+19
Aerosols (kg)	0.0000E+00	6.0520E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.8409E+23
Elemental I (atoms)	0.0000E+00	2.3902E+17
Organic I (atoms)	0.0000E+00	1.7655E+19
Aerosols (kg)	0.0000E+00	1.0315E-03

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0528E+24
Elemental I (atoms)	4.4542E+18	4.4992E+16
Organic I (atoms)	4.6968E+19	4.7443E+17
Aerosols (kg)	6.5832E-03	6.6497E-05

Environment Integral Nuclide Release:

Time (h) = 96.0000	Ci	kg	Atoms	Bq
Kr-83m	3.8796E+03	1.9112E-07	1.3867E+18	1.4355E+14
Kr-85m	4.5670E+04	5.5496E-06	3.9318E+19	1.6898E+15
Kr-85	5.1401E+04	1.3114E-01	9.2908E+23	1.9019E+15
Kr-87	7.4952E+03	2.6461E-07	1.8316E+18	2.7732E+14
Kr-88	5.5928E+04	4.4602E-06	3.0523E+19	2.0693E+15

Rb-86	2.6475E-01	3.2537E-09	2.2784E+16	9.7956E+09
Rb-88	3.0494E+04	2.5261E-07	1.7287E+18	1.1283E+15
Sr-89	2.5481E+00	8.7707E-08	5.9347E+17	9.4279E+10
Sr-90	2.7688E-01	2.0298E-06	1.3582E+19	1.0245E+10
Sr-91	1.2584E+00	3.4716E-10	2.2974E+15	4.6562E+10
Sr-92	6.9654E-01	5.5416E-11	3.6274E+14	2.5772E+10
Y-90	6.2067E-02	1.1408E-10	7.6335E+14	2.2965E+09
Y-91	3.6495E-02	1.4882E-09	9.8482E+15	1.3503E+09
Y-92	2.2557E-01	2.3443E-11	1.5345E+14	8.3462E+09
Y-93	1.4674E-02	4.3982E-12	2.8480E+13	5.4293E+08
Zr-95	3.7827E-02	1.7608E-09	1.1162E+16	1.3996E+09
Zr-97	1.8657E-02	9.7595E-12	6.0591E+13	6.9031E+08
Nb-95	3.7766E-02	9.6580E-10	6.1223E+15	1.3973E+09
Mo-99	3.7623E-01	7.8445E-10	4.7718E+15	1.3921E+10
Tc-99m	3.5857E-01	6.8192E-11	4.1481E+14	1.3267E+10
Ru-103	4.1020E-01	1.2710E-08	7.4312E+16	1.5178E+10
Ru-105	8.1707E-02	1.2155E-11	6.9714E+13	3.0232E+09
Ru-106	1.7363E-01	5.1897E-08	2.9484E+17	6.4242E+09
Rh-105	1.9973E-01	2.3663E-10	1.3572E+15	7.3900E+09
Sb-127	3.9956E-01	1.4962E-09	7.0948E+15	1.4784E+10
Sb-129	4.0211E-01	7.1507E-11	3.3382E+14	1.4878E+10
Te-127	4.3330E-01	1.6419E-10	7.7854E+14	1.6032E+10
Te-127m	8.1377E-02	8.6272E-09	4.0909E+16	3.0109E+09
Te-129	5.8981E-01	2.8164E-11	1.3148E+14	2.1823E+10
Te-129m	2.6216E-01	8.7023E-09	4.0625E+16	9.6999E+09
Te-131m	6.3333E-01	7.9424E-10	3.6512E+15	2.3433E+10
Te-132	5.8480E+00	1.9263E-08	8.7881E+16	2.1638E+11
I-131	1.2969E+02	1.0461E-06	4.8089E+18	4.7985E+12
I-132	1.2388E+02	1.2002E-08	5.4754E+16	4.5836E+12
I-133	2.2734E+02	2.0068E-07	9.0868E+17	8.4114E+12
I-134	1.3910E+02	5.2144E-09	2.3434E+16	5.1468E+12
I-135	1.8584E+02	5.2917E-08	2.3605E+17	6.8760E+12
Xe-133	5.0104E+06	2.6768E-02	1.2120E+23	1.8539E+17
Xe-133m	1.1511E+05	2.6146E-04	1.1839E+21	4.2591E+15
Xe-135	4.0571E+05	1.5887E-04	7.0869E+20	1.5011E+16
Xe-135m	5.4824E+02	6.0224E-09	2.6865E+16	2.0285E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	2.6713E+01	2.0646E-05	9.2787E+19	9.8837E+11
Cs-136	8.0476E+00	1.0980E-07	4.8621E+17	2.9776E+11
Cs-137	2.0743E+01	2.3848E-04	1.0483E+21	7.6750E+11
Ba-139	5.4551E-01	3.3350E-11	1.4449E+14	2.0184E+10
Ba-140	3.5830E+00	4.8942E-08	2.1052E+17	1.3257E+11
La-140	1.0878E+00	1.9571E-09	8.4184E+15	4.0249E+10
La-141	9.2001E-03	1.6268E-12	6.9480E+12	3.4040E+08
La-142	5.2694E-03	3.6810E-13	1.5611E+12	1.9497E+08
Ce-141	8.7949E-02	3.0867E-09	1.3183E+16	3.2541E+09
Ce-143	5.6612E-02	8.5249E-11	3.5901E+14	2.0947E+09
Ce-144	7.1845E-02	2.2526E-08	9.4203E+16	2.6583E+09
Pr-143	3.5207E-02	5.2283E-10	2.2018E+15	1.3027E+09
Nd-147	1.3048E-02	1.6129E-10	6.6074E+14	4.8277E+08
Np-239	7.7030E-01	3.3204E-09	8.3664E+15	2.8501E+10
Pu-238	2.2389E-04	1.3078E-08	3.3090E+16	8.2838E+06
Pu-239	2.2642E-05	3.6427E-07	9.1786E+17	8.3775E+05
Pu-240	3.9880E-05	1.7510E-08	4.3935E+16	1.4756E+06
Pu-241	8.8588E-03	8.9580E-08	2.2384E+17	3.2778E+08
Am-241	5.0546E-06	1.4755E-09	3.6869E+15	1.8702E+05
Cm-242	1.3703E-03	4.1395E-10	1.0301E+15	5.0700E+07

Cm-244 9.1035E-05 1.1122E-09 2.7450E+15 3.3683E+06

Environment Transport Group Inventory:

Time (h) = 96.0000	Total Release	Release Rate/s	
Noble gases (atoms)	1.0523E+24	3.0447E+18	
Elemental I (atoms)	2.5176E+17	7.2847E+11	
Organic I (atoms)	4.8237E+17	1.3957E+12	
Aerosols (kg)	2.6344E-04	7.6227E-10	
Dose Effective (Ci) I-131 (Thyroid)			1.7379E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			2.1276E+02
Total I (Ci)			8.0585E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.9571E+18
Elemental I (atoms)	1.9287E+14	1.9658E+12
Organic I (atoms)	1.4237E+13	1.4436E+11
Aerosols (kg)	1.8354E-07	1.8706E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8439E+18
Elemental I (atoms)	0.0000E+00	3.6083E+13
Organic I (atoms)	0.0000E+00	2.6634E+12
Aerosols (kg)	0.0000E+00	3.4338E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.1442E+19	0.0000E+00
Elemental I (atoms)	2.5729E+13	0.0000E+00
Organic I (atoms)	1.9041E+12	0.0000E+00
Aerosols (kg)	2.5543E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0528E+24
Elemental I (atoms)	4.4542E+18	4.4992E+16
Organic I (atoms)	4.6968E+19	4.7443E+17

Aerosols (kg) 6.5832E-03 6.6497E-05

CR Compartment Nuclide Inventory:

Time (h) = 96.0000	Ci	kg	Atoms	Decay
Kr-85m	1.1495E-07	1.3968E-17	9.8962E+07	3.6079E+14
Kr-85	1.6392E-02	4.1820E-08	2.9629E+17	2.9326E+14
Kr-88	5.9352E-11	4.7333E-21	3.2392E+04	4.5692E+14
Rb-86	8.2846E-10	1.0182E-17	7.1298E+07	1.3534E+10
Sr-89	4.9994E-08	1.7208E-15	1.1644E+10	3.0459E+10
Sr-90	5.6485E-09	4.1409E-14	2.7708E+11	3.2675E+09
Sr-91	5.9099E-11	1.6303E-20	1.0789E+05	2.8426E+10
Y-90	3.6501E-09	6.7090E-18	4.4892E+07	1.6638E+08
Y-91	7.8612E-10	3.2055E-17	2.1213E+08	4.0229E+08
Zr-95	7.4834E-10	3.4834E-17	2.2082E+08	4.5095E+08
Zr-97	1.4699E-11	7.6891E-21	4.7737E+04	3.6805E+08
Nb-95	7.6971E-10	1.9684E-17	1.2478E+08	4.4571E+08
Mo-99	3.5993E-09	7.5045E-18	4.5649E+07	5.4339E+09
Tc-99m	3.6901E-09	7.0177E-19	4.2688E+06	4.9122E+09
Ru-103	7.9582E-09	2.4658E-16	1.4417E+09	4.9212E+09
Ru-106	3.5238E-09	1.0533E-15	5.9839E+09	2.0525E+09
Rh-105	9.9568E-10	1.1796E-18	6.7657E+06	3.1677E+09
Sb-127	4.7821E-09	1.7907E-17	8.4913E+07	5.4854E+09
Te-127	6.2073E-09	2.3520E-18	1.1153E+07	5.5442E+09
Te-127m	1.6519E-09	1.7512E-16	8.3041E+08	9.6116E+08
Te-129	4.3684E-09	2.0859E-19	9.7377E+05	1.1737E+10
Te-129m	5.0519E-09	1.6769E-16	7.8285E+08	3.1475E+09
Te-131m	2.2471E-09	2.8180E-18	1.2955E+07	1.0794E+10
Te-132	6.3267E-08	2.0839E-16	9.5074E+08	8.2206E+10
I-131	7.1410E-07	5.7601E-15	2.6479E+10	5.9128E+12
I-132	7.5516E-08	7.3159E-18	3.3377E+07	4.1369E+12
I-133	8.4993E-08	7.5028E-17	3.3972E+08	1.1123E+13
I-135	8.3600E-11	2.3805E-20	1.0619E+05	8.5290E+12
Xe-133	1.2041E+00	6.4330E-09	2.9128E+16	2.9318E+16
Xe-133m	1.8014E-02	4.0917E-11	1.8527E+14	6.9724E+14
Xe-135	6.8077E-04	2.6658E-13	1.1892E+12	2.9387E+15
Xe-135m	6.1535E-10	6.7597E-21	3.0154E+04	4.5927E+12
Cs-134	9.5764E-08	7.4016E-14	3.3264E+11	1.3603E+12
Cs-136	2.3733E-08	3.2381E-16	1.4339E+09	4.1201E+11
Cs-137	7.4603E-08	8.5768E-13	3.7701E+12	1.0562E+12
Ba-140	6.2494E-08	8.5364E-16	3.6719E+09	4.4436E+10
La-140	5.4941E-08	9.8845E-17	4.2518E+08	3.1586E+09
Ce-141	1.6895E-09	5.9295E-17	2.5325E+08	1.0578E+09
Ce-143	2.3812E-10	3.5858E-19	1.5101E+06	9.4287E+08
Ce-144	1.4558E-09	4.5644E-16	1.9089E+09	8.4976E+08
Pr-143	7.0495E-10	1.0469E-17	4.4087E+07	4.0881E+08
Nd-147	2.2185E-10	2.7423E-18	1.1234E+07	1.6306E+08
Np-239	6.4452E-09	2.7782E-17	7.0003E+07	1.1436E+10
Pu-238	4.5697E-12	2.6693E-16	6.7541E+08	2.6416E+06
Pu-239	4.6448E-13	7.4727E-15	1.8829E+10	2.6655E+05
Pu-240	8.1374E-13	3.5728E-16	8.9648E+08	4.7060E+05
Pu-241	1.8069E-10	1.8272E-15	4.5658E+09	1.0455E+08
Am-241	1.0538E-13	3.0761E-17	7.6866E+07	5.9221E+04
Cm-242	2.7623E-11	8.3446E-18	2.0766E+07	1.6235E+07
Cm-244	1.8570E-12	2.2687E-17	5.5993E+07	1.0744E+06

CR Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump	
Noble gases (atoms)	3.2560E+17	0.0000E+00	
Elemental I (atoms)	1.2596E+08	0.0000E+00	
Organic I (atoms)	1.3472E+10	0.0000E+00	
Aerosols (kg)	9.9152E-13	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		6.7543E-17
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		6.8549E-17
Total I (Ci)			8.7470E-07

Time (h) = 96.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.0746E+13
Organic I (atoms)	0.0000E+00	7.9524E+11
Aerosols (kg)	0.0000E+00	1.0668E-08

CR Filtered Intake Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.9571E+18
Elemental I (atoms)	1.9287E+14	1.9658E+12
Organic I (atoms)	1.4237E+13	1.4436E+11
Aerosols (kg)	1.8354E-07	1.8706E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8439E+18
Elemental I (atoms)	0.0000E+00	3.6083E+13
Organic I (atoms)	0.0000E+00	2.6634E+12
Aerosols (kg)	0.0000E+00	3.4338E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.1442E+19	0.0000E+00
Elemental I (atoms)	2.5729E+13	0.0000E+00
Organic I (atoms)	1.9041E+12	0.0000E+00
Aerosols (kg)	2.5543E-08	0.0000E+00

EAB Doses:

Time (h) = 240.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.6234E-01	2.1559E-01	5.7415E-01
Accumulated dose (rem)	2.7692E+00	6.4295E+00	3.0489E+00

LPZ Doses:

Time (h) = 240.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.4533E-03	3.6615E-04	1.4734E-03
Accumulated dose (rem)	3.2507E-01	8.6267E-01	3.6237E-01

CR Doses:

Time (h) = 240.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.4739E-03	3.0201E-03	4.6392E-03
Accumulated dose (rem)	9.0365E-02	7.8363E+00	4.6382E-01

DW Compartment Nuclide Inventory:

Time (h) = 240.0000	Ci	kg	Atoms	Decay
Kr-85m	1.5240E-09	1.8519E-19	1.3121E+06	1.7635E+22
Kr-85	1.0295E+06	2.6265E+00	1.8608E+25	3.4628E+22
Rb-86	3.5895E+01	4.4114E-07	3.0891E+18	2.0632E+18
Sr-89	2.4930E+03	8.5812E-05	5.8064E+20	1.0775E+20
Sr-90	3.0573E+02	2.2413E-03	1.4997E+22	1.2189E+19
Sr-91	8.7534E-05	2.4147E-14	1.5980E+11	2.6871E+19
Y-90	2.8436E+02	5.2265E-07	3.4972E+18	6.5220E+18
Y-91	3.9654E+01	1.6170E-06	1.0701E+19	1.6201E+18
Y-93	2.8102E-06	8.4230E-16	5.4543E+09	3.1115E+17
Zr-95	3.7971E+01	1.7675E-06	1.1204E+19	1.6130E+18
Zr-97	2.1671E-03	1.1336E-12	7.0379E+12	3.8419E+17
Nb-95	4.1360E+01	1.0577E-06	6.7050E+18	1.6586E+18
Mo-99	4.2953E+01	8.9558E-08	5.4478E+17	9.9446E+18
Tc-99m	4.4038E+01	8.3750E-09	5.0945E+16	9.3080E+18
Ru-103	3.8763E+02	1.2010E-05	7.0222E+19	1.7151E+19
Ru-106	1.8866E+02	5.6392E-05	3.2038E+20	7.6018E+18
Rh-105	3.2047E+00	3.7968E-09	2.1776E+16	4.4317E+18
Sb-127	8.7915E+01	3.2921E-07	1.5610E+18	1.1683E+19
Te-127	1.7209E+02	6.5209E-08	3.0921E+17	1.3761E+19
Te-127m	8.7160E+01	9.2403E-06	4.3816E+19	3.5524E+18
Te-129	2.0900E+02	9.9797E-09	4.6589E+16	1.6007E+19
Te-129m	2.4170E+02	8.0231E-06	3.7454E+19	1.0877E+19
Te-131m	4.3678E+00	5.4775E-09	2.5180E+16	1.3687E+19
Te-132	9.5594E+02	3.1488E-06	1.4365E+19	1.6274E+20
I-131	2.3061E+04	1.8601E-04	8.5510E+20	1.5320E+21
I-132	1.1410E+03	1.1054E-07	5.0431E+17	5.8223E+20
I-133	3.7923E+01	3.3477E-08	1.5158E+17	1.0811E+21
I-135	1.2525E-06	3.5666E-16	1.5910E+09	6.7109E+20
Xe-133	3.4509E+07	1.8436E-01	8.3476E+23	2.4132E+24
Xe-133m	1.7545E+05	3.9852E-04	1.8044E+21	4.1286E+22
Xe-135	7.2913E-01	2.8551E-10	1.2736E+15	1.1829E+23
Xe-135m	5.8102E-07	6.3825E-18	2.8471E+07	1.5888E+21
Cs-134	5.1565E+03	3.9855E-03	1.7911E+22	2.3401E+20
Cs-136	9.3545E+02	1.2763E-05	5.6517E+19	5.9845E+19
Cs-137	4.0378E+03	4.6421E-02	2.0405E+23	1.8225E+20
Ba-140	2.4414E+03	3.3349E-05	1.4345E+20	1.3567E+20
La-140	2.7559E+03	4.9581E-06	2.1327E+19	8.5784E+19
Ce-141	8.0495E+01	2.8250E-06	1.2066E+19	3.6403E+18
Ce-143	6.2632E-01	9.4314E-10	3.9718E+15	1.2450E+18
Ce-144	7.7684E+01	2.4356E-05	1.0186E+20	3.1403E+18
Pr-143	2.9090E+01	4.3200E-07	1.8193E+18	1.4462E+18
Nd-147	8.2249E+00	1.0167E-07	4.1651E+17	4.8336E+17
Np-239	5.9684E+01	2.5727E-07	6.4824E+17	1.9433E+19
Pu-238	2.4760E-01	1.4463E-05	3.6595E+19	9.8610E+15
Pu-239	2.5228E-02	4.0587E-04	1.0227E+21	1.0008E+15
Pu-240	4.4063E-02	1.9346E-05	4.8543E+19	1.7560E+15
Pu-241	9.7767E+00	9.8862E-05	2.4704E+20	3.8991E+17
Am-241	5.9632E-03	1.7407E-06	4.3496E+18	2.2765E+14
Cm-242	1.4580E+00	4.4046E-07	1.0961E+18	5.9571E+16
Cm-244	1.0049E-01	1.2277E-06	3.0300E+18	4.0071E+15

DW Transport Group Inventory:

Time (h) = 240.0000	Atmosphere	Sump	
Noble gases (atoms)	1.9445E+25	0.0000E+00	
Elemental I (atoms)	4.0126E+18	7.8120E+22	
Organic I (atoms)	4.2934E+20	0.0000E+00	
Aerosols (kg)	5.3541E-02	6.5809E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.6611E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.6655E-06
Total I (Ci)			2.4240E+04

DW to WW Transport Group Inventory:

Time (h) = 240.0000	Leakage Transport
Noble gases (atoms)	1.9100E+29
Elemental I (atoms)	6.8281E+22
Organic I (atoms)	6.7039E+24
Aerosols (kg)	5.0739E+02

WW to DW Transport Group Inventory:

Time (h) = 240.0000	Leakage Transport
Noble gases (atoms)	1.9115E+29
Elemental I (atoms)	7.2405E+22
Organic I (atoms)	6.7123E+24
Aerosols (kg)	5.1075E+02

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 240.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5402E+24
Elemental I (atoms)	0.0000E+00	5.2097E+18
Organic I (atoms)	0.0000E+00	5.7207E+19
Aerosols (kg)	0.0000E+00	8.2061E-03

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 240.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3924E+23
Elemental I (atoms)	0.0000E+00	3.1066E+17
Organic I (atoms)	0.0000E+00	5.1692E+18
Aerosols (kg)	0.0000E+00	5.9004E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 240.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5488E+23
Elemental I (atoms)	0.0000E+00	1.6847E+18
Organic I (atoms)	0.0000E+00	2.8025E+19
Aerosols (kg)	0.0000E+00	3.1992E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

	Pathway

Time (h) = 240.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5488E+23
Elemental I (atoms)	0.0000E+00	1.6847E+18
Organic I (atoms)	0.0000E+00	2.8025E+19
Aerosols (kg)	0.0000E+00	3.1992E-03

RB Compartment Nuclide Inventory:

Time (h) = 240.0000	Ci	kg	Atoms	Decay
Kr-85	3.1377E+03	8.0049E-03	5.6713E+22	1.1233E+20
Rb-86	1.0940E-01	1.3445E-09	9.4148E+15	8.9095E+15
Sr-89	7.5982E+00	2.6153E-07	1.7697E+18	3.6418E+17
Sr-90	9.3180E-01	6.8311E-06	4.5708E+19	4.1040E+16
Sr-91	2.6678E-07	7.3595E-17	4.8703E+08	7.6660E+16
Y-90	8.6665E-01	1.5929E-09	1.0659E+16	2.0907E+16
Y-91	1.2086E-01	4.9281E-09	3.2613E+16	5.5145E+15
Y-93	8.5648E-09	2.5671E-18	1.6623E+07	9.0654E+14
Zr-95	1.1573E-01	5.3868E-09	3.4148E+16	5.4474E+15
Zr-97	6.6048E-06	3.4550E-15	2.1450E+10	1.2775E+15
Nb-95	1.2606E-01	3.2237E-09	2.0435E+16	5.5857E+15
Mo-99	1.3091E-01	2.7295E-10	1.6604E+15	3.5292E+16
Tc-99m	1.3422E-01	2.5525E-11	1.5527E+14	3.3307E+16
Ru-103	1.1814E+00	3.6605E-08	2.1402E+17	5.8034E+16
Ru-106	5.7500E-01	1.7187E-07	9.7643E+17	2.5609E+16
Rh-105	9.7671E-03	1.1572E-11	6.6367E+13	1.6249E+16
Sb-127	2.6794E-01	1.0033E-09	4.7577E+15	4.1048E+16
Te-127	5.2450E-01	1.9874E-10	9.4240E+14	4.7995E+16
Te-127m	2.6564E-01	2.8162E-08	1.3354E+17	1.1971E+16
Te-129	6.3698E-01	3.0416E-11	1.4199E+14	4.3110E+16
Te-129m	7.3664E-01	2.4452E-08	1.1415E+17	3.6850E+16
Te-131m	1.3312E-02	1.6694E-11	7.6744E+13	4.8525E+16
Te-132	2.9135E+00	9.5966E-09	4.3782E+16	5.7470E+17
I-131	7.0283E+01	5.6691E-07	2.6061E+18	5.9979E+18
I-132	3.4775E+00	3.3690E-10	1.5370E+15	1.4797E+18
I-133	1.1558E-01	1.0203E-10	4.6198E+14	4.9946E+18
I-135	3.8174E-09	1.0870E-18	4.8490E+06	2.5004E+18
Xe-133	1.0517E+05	5.6188E-04	2.5441E+21	8.0832E+21
Xe-133m	5.3472E+02	1.2146E-06	5.4995E+18	1.4434E+20
Xe-135	2.2222E-03	8.7018E-13	3.8817E+12	4.0793E+20
Xe-135m	1.7708E-09	1.9452E-20	8.6774E+04	7.0020E+17
Cs-134	1.5716E+01	1.2147E-05	5.4589E+19	9.8122E+17
Cs-136	2.8510E+00	3.8900E-08	1.7225E+17	2.6161E+17
Cs-137	1.2306E+01	1.4148E-04	6.2190E+20	7.6363E+17
Ba-140	7.4409E+00	1.0164E-07	4.3720E+17	4.6365E+17
La-140	8.3992E+00	1.5111E-08	6.5001E+16	2.8195E+17
Ce-141	2.4533E-01	8.6100E-09	3.6773E+16	1.2332E+16
Ce-143	1.9089E-03	2.8745E-12	1.2105E+13	4.4314E+15
Ce-144	2.3676E-01	7.4232E-08	3.1044E+17	1.0581E+16
Pr-143	8.8660E-02	1.3166E-09	5.5447E+15	4.9174E+15
Nd-147	2.5067E-02	3.0986E-10	1.2694E+15	1.6557E+15
Np-239	1.8190E-01	7.8409E-10	1.9757E+15	6.9226E+16
Pu-238	7.5461E-04	4.4079E-08	1.1153E+17	3.3200E+13
Pu-239	7.6888E-05	1.2370E-06	3.1169E+18	3.3686E+12
Pu-240	1.3429E-04	5.8962E-08	1.4795E+17	5.9122E+12
Pu-241	2.9797E-02	3.0131E-07	7.5291E+17	1.3129E+15
Am-241	1.8174E-05	5.3051E-09	1.3257E+16	7.6487E+11
Cm-242	4.4437E-03	1.3424E-09	3.3406E+15	2.0081E+14

Cm-244	3.0626E-04	3.7416E-09	9.2346E+15	1.3492E+13

RB Transport Group Inventory:

Time (h) = 240.0000	Atmosphere	Sump		
Noble gases (atoms)	5.9263E+22	0.0000E+00		
Elemental I (atoms)	1.2229E+16	0.0000E+00		
Organic I (atoms)	1.3085E+18	0.0000E+00		
Aerosols (kg)	1.6318E-04	0.0000E+00		
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.2801E-09	
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.2822E-09	
Total I (Ci)			7.3876E+01	

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 240.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5402E+24
Elemental I (atoms)	0.0000E+00	5.2097E+18
Organic I (atoms)	0.0000E+00	5.7207E+19
Aerosols (kg)	0.0000E+00	8.2061E-03

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 240.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.0700E+23
Elemental I (atoms)	0.0000E+00	3.5158E+17
Organic I (atoms)	0.0000E+00	2.9699E+19
Aerosols (kg)	0.0000E+00	2.1707E-03

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 240.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 240.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2793E+24
Elemental I (atoms)	4.7774E+18	4.8257E+16
Organic I (atoms)	8.1549E+19	8.2373E+17
Aerosols (kg)	9.8540E-03	9.9536E-05

Environment Integral Nuclide Release:

Time (h) = 240.0000	Ci	kg	Atoms	Bq
Kr-83m	3.8796E+03	1.9112E-07	1.3867E+18	1.4355E+14
Kr-85m	4.5670E+04	5.5496E-06	3.9318E+19	1.6898E+15
Kr-85	1.1488E+05	2.9309E-01	2.0765E+24	4.2506E+15
Kr-87	7.4952E+03	2.6461E-07	1.8316E+18	2.7732E+14
Kr-88	5.5928E+04	4.4602E-06	3.0523E+19	2.0693E+15
Rb-86	2.8954E-01	3.5584E-09	2.4917E+16	1.0713E+10

Rb-88	3.0494E+04	2.5261E-07	1.7287E+18	1.1283E+15
Sr-89	4.1498E+00	1.4284E-07	9.6651E+17	1.5354E+11
Sr-90	4.6534E-01	3.4114E-06	2.2826E+19	1.7217E+10
Sr-91	1.2586E+00	3.4721E-10	2.2977E+15	4.6569E+10
Sr-92	6.9654E-01	5.5416E-11	3.6274E+14	2.5772E+10
Y-90	2.1720E-01	3.9922E-10	2.6713E+15	8.0364E+09
Y-91	6.1826E-02	2.5210E-09	1.6684E+16	2.2876E+09
Y-92	2.2557E-01	2.3443E-11	1.5345E+14	8.3462E+09
Y-93	1.4677E-02	4.3992E-12	2.8487E+13	5.4305E+08
Zr-95	6.2008E-02	2.8864E-09	1.8297E+16	2.2943E+09
Zr-97	1.8740E-02	9.8028E-12	6.0860E+13	6.9337E+08
Nb-95	6.3367E-02	1.6205E-09	1.0273E+16	2.3446E+09
Mo-99	4.3829E-01	9.1384E-10	5.5589E+15	1.6217E+10
Tc-99m	4.2220E-01	8.0292E-11	4.8842E+14	1.5621E+10
Ru-103	6.6224E-01	2.0519E-08	1.1997E+17	2.4503E+10
Ru-105	8.1707E-02	1.2155E-11	6.9714E+13	3.0232E+09
Ru-106	2.9056E-01	8.6848E-08	4.9341E+17	1.0751E+10
Rh-105	2.1084E-01	2.4979E-10	1.4326E+15	7.8009E+09
Sb-127	4.9731E-01	1.8622E-09	8.8303E+15	1.8400E+10
Sb-129	4.0211E-01	7.1507E-11	3.3382E+14	1.4878E+10
Te-127	5.8134E-01	2.2028E-10	1.0445E+15	2.1509E+10
Te-127m	1.3585E-01	1.4403E-08	6.8295E+16	5.0266E+09
Te-129	7.2695E-01	3.4712E-11	1.6205E+14	2.6897E+10
Te-129m	4.2076E-01	1.3967E-08	6.5202E+16	1.5568E+10
Te-131m	6.5513E-01	8.2158E-10	3.7768E+15	2.4240E+10
Te-132	7.0429E+00	2.3199E-08	1.0584E+17	2.6059E+11
I-131	1.4832E+02	1.1963E-06	5.4996E+18	5.4877E+12
I-132	1.2531E+02	1.2140E-08	5.5384E+16	4.6364E+12
I-133	2.2792E+02	2.0120E-07	9.1103E+17	8.4332E+12
I-134	1.3910E+02	5.2144E-09	2.3434E+16	5.1468E+12
I-135	1.8584E+02	5.2917E-08	2.3605E+17	6.8760E+12
Xe-133	8.2484E+06	4.4066E-02	1.9953E+23	3.0519E+17
Xe-133m	1.4683E+05	3.3350E-04	1.5101E+21	5.4325E+15
Xe-135	4.0595E+05	1.5896E-04	7.0911E+20	1.5020E+16
Xe-135m	5.4824E+02	6.0224E-09	2.6865E+16	2.0285E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	2.9899E+01	2.3109E-05	1.0386E+20	1.1063E+12
Cs-136	8.7265E+00	1.1907E-07	5.2723E+17	3.2288E+11
Cs-137	2.3232E+01	2.6709E-04	1.1741E+21	8.5959E+11
Ba-139	5.4551E-01	3.3350E-11	1.4449E+14	2.0184E+10
Ba-140	5.3632E+00	7.3259E-08	3.1513E+17	1.9844E+11
La-140	2.9373E+00	5.2846E-09	2.2732E+16	1.0868E+11
La-141	9.2001E-03	1.6268E-12	6.9480E+12	3.4040E+08
La-142	5.2694E-03	3.6810E-13	1.5611E+12	1.9497E+08
Ce-141	1.4088E-01	4.9444E-09	2.1118E+16	5.2126E+09
Ce-143	5.9120E-02	8.9025E-11	3.7491E+14	2.1874E+09
Ce-144	1.2007E-01	3.7646E-08	1.5744E+17	4.4427E+09
Pr-143	5.5967E-02	8.3113E-10	3.5001E+15	2.0708E+09
Nd-147	1.9214E-02	2.3751E-10	9.7300E+14	7.1092E+08
Np-239	8.7152E-01	3.7567E-09	9.4658E+15	3.2246E+10
Pu-238	3.7643E-04	2.1988E-08	5.5636E+16	1.3928E+07
Pu-239	3.8172E-05	6.1413E-07	1.5474E+18	1.4124E+06
Pu-240	6.7035E-05	2.9432E-08	7.3851E+16	2.4803E+06
Pu-241	1.4886E-02	1.5053E-07	3.7615E+17	5.5079E+08
Am-241	8.6502E-06	2.5250E-09	6.3095E+15	3.2006E+05
Cm-242	2.2804E-03	6.8890E-10	1.7143E+15	8.4375E+07
Cm-244	1.5298E-04	1.8690E-09	4.6129E+15	5.6604E+06

Environment Transport Group Inventory:

Time (h) = 240.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.2783E+24	2.6369E+18
Elemental I (atoms)	2.5501E+17	2.9515E+11
Organic I (atoms)	8.3038E+17	9.6109E+11
Aerosols (kg)	2.9648E-04	3.4315E-10
Dose Effective (Ci) I-131 (Thyroid)		1.9252E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)		2.3159E+02
Total I (Ci)		8.2649E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6857E+19
Elemental I (atoms)	1.9289E+14	1.9660E+12
Organic I (atoms)	1.6183E+13	1.6401E+11
Aerosols (kg)	1.8373E-07	1.8725E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.1217E+18
Elemental I (atoms)	0.0000E+00	3.6087E+13
Organic I (atoms)	0.0000E+00	3.0273E+12
Aerosols (kg)	0.0000E+00	3.4373E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.9720E+19	0.0000E+00
Elemental I (atoms)	2.5732E+13	0.0000E+00
Organic I (atoms)	2.1774E+12	0.0000E+00
Aerosols (kg)	2.5569E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2793E+24
Elemental I (atoms)	4.7774E+18	4.8257E+16
Organic I (atoms)	8.1549E+19	8.2373E+17
Aerosols (kg)	9.8540E-03	9.9536E-05

CR Compartment Nuclide Inventory:

Time (h) = 240.0000	Ci	kg	Atoms	Decay
Kr-85	1.1318E-02	2.8876E-08	2.0458E+17	5.1936E+14
Rb-86	4.5820E-10	5.6313E-18	3.9433E+07	1.3544E+10
Sr-89	3.1824E-08	1.0954E-15	7.4120E+09	3.1119E+10
Sr-90	3.9028E-09	2.8611E-14	1.9145E+11	3.3452E+09
Y-90	3.6299E-09	6.6718E-18	4.4643E+07	2.2977E+08
Y-91	5.0620E-10	2.0641E-17	1.3660E+08	4.1274E+08
Zr-95	4.8470E-10	2.2562E-17	1.4302E+08	4.6092E+08
Nb-95	5.2797E-10	1.3502E-17	8.5590E+07	4.5627E+08
Mo-99	5.4831E-10	1.1432E-18	6.9542E+06	5.4598E+09
Tc-99m	5.6215E-10	1.0691E-19	6.5032E+05	4.9374E+09
Ru-103	4.9481E-09	1.5332E-16	8.9640E+08	5.0252E+09
Ru-106	2.4083E-09	7.1985E-16	4.0897E+09	2.1007E+09
Rh-105	4.0908E-11	4.8466E-20	2.7797E+05	3.1724E+09
Sb-127	1.1223E-09	4.2024E-18	1.9927E+07	5.5260E+09
Te-127	2.1968E-09	8.3241E-19	3.9471E+06	5.6034E+09
Te-127m	1.1126E-09	1.1795E-16	5.5932E+08	9.8362E+08
Te-129	2.6679E-09	1.2739E-19	5.9471E+05	1.1780E+10
Te-129m	3.0853E-09	1.0242E-16	4.7811E+08	3.2129E+09
Te-131m	5.5756E-11	6.9921E-20	3.2143E+05	1.0803E+10
Te-132	1.2203E-08	4.0194E-17	1.8338E+08	8.2703E+10
I-131	2.9437E-07	2.3745E-15	1.0916E+10	5.9205E+12
I-132	1.4565E-08	1.4111E-18	6.4376E+06	4.1374E+12
I-133	4.8409E-10	4.2734E-19	1.9350E+06	1.1123E+13
Xe-133	3.7939E-01	2.0269E-09	9.1774E+15	4.0924E+16
Xe-133m	1.9289E-03	4.3813E-12	1.9838E+13	8.1203E+14
Xe-135	8.0161E-09	3.1390E-18	1.4002E+07	2.9397E+15
Cs-134	6.5824E-08	5.0875E-14	2.2864E+11	1.3616E+12
Cs-136	1.1941E-08	1.6293E-16	7.2145E+08	4.1229E+11
Cs-137	5.1543E-08	5.9257E-13	2.6048E+12	1.0573E+12
Ba-140	3.1165E-08	4.2570E-16	1.8312E+09	4.5171E+10
La-140	3.5179E-08	6.3291E-17	2.7225E+08	3.9151E+09
Ce-141	1.0275E-09	3.6062E-17	1.5402E+08	1.0796E+09
Ce-143	7.9951E-12	1.2039E-20	5.0701E+04	9.4393E+08
Ce-144	9.9165E-10	3.1091E-16	1.3002E+09	8.6965E+08
Pr-143	3.7134E-10	5.5146E-18	2.3223E+07	4.1738E+08
Nd-147	1.0499E-10	1.2978E-18	5.3168E+06	1.6561E+08
Np-239	7.6188E-10	3.2841E-18	8.2750E+06	1.1478E+10
Pu-238	3.1606E-12	1.8462E-16	4.6714E+08	2.7045E+06
Pu-239	3.2204E-13	5.1811E-15	1.3055E+10	2.7296E+05
Pu-240	5.6247E-13	2.4696E-16	6.1967E+08	4.8180E+05
Pu-241	1.2480E-10	1.2620E-15	3.1535E+09	1.0704E+08
Am-241	7.6122E-14	2.2220E-17	5.5524E+07	6.0703E+04
Cm-242	1.8612E-11	5.6225E-18	1.3992E+07	1.6610E+07
Cm-244	1.2827E-12	1.5671E-17	3.8678E+07	1.0999E+06

CR Transport Group Inventory:

Time (h) = 240.0000	Atmosphere	Sump	
Noble gases (atoms)	2.1378E+17	0.0000E+00	
Elemental I (atoms)	5.1221E+07	0.0000E+00	
Organic I (atoms)	5.4806E+09	0.0000E+00	
Aerosols (kg)	6.8346E-13	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.7301E-17
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.7346E-17

Total I (Ci) 3.0942E-07

Time (h) = 240.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.0747E+13
Organic I (atoms)	0.0000E+00	9.0942E+11
Aerosols (kg)	0.0000E+00	1.0679E-08

CR Filtered Intake Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6857E+19
Elemental I (atoms)	1.9289E+14	1.9660E+12
Organic I (atoms)	1.6183E+13	1.6401E+11
Aerosols (kg)	1.8373E-07	1.8725E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.1217E+18
Elemental I (atoms)	0.0000E+00	3.6087E+13
Organic I (atoms)	0.0000E+00	3.0273E+12
Aerosols (kg)	0.0000E+00	3.4373E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.9720E+19	0.0000E+00
Elemental I (atoms)	2.5732E+13	0.0000E+00
Organic I (atoms)	2.1774E+12	0.0000E+00
Aerosols (kg)	2.5569E-08	0.0000E+00

EAB Doses:

Time (h) = 480.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.1627E-01	1.6930E-01	3.2923E-01
Accumulated dose (rem)	3.0855E+00	6.5988E+00	3.3782E+00

LPZ Doses:

Time (h) = 480.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	8.1738E-04	2.8754E-04	8.3940E-04
Accumulated dose (rem)	3.2589E-01	8.6296E-01	3.6321E-01

CR Doses:

Time (h) = 480.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.4798E-03	2.3497E-03	2.6597E-03
Accumulated dose (rem)	9.2845E-02	7.8386E+00	4.6648E-01

DW Compartment Nuclide Inventory:

Time (h) = 480.0000	Ci	kg	Atoms	Decay

Kr-85	9.2609E+05	2.3627E+00	1.6739E+25	6.5850E+22
Rb-86	2.2310E+01	2.7419E-07	1.9200E+18	2.9762E+18
Sr-89	1.9585E+03	6.7412E-05	4.5614E+20	1.7854E+20
Sr-90	2.7533E+02	2.0185E-03	1.3506E+22	2.1466E+19
Y-90	2.7535E+02	5.0609E-07	3.3864E+18	1.5547E+19
Y-91	3.1742E+01	1.2943E-06	8.5656E+18	2.7564E+18
Zr-95	3.0704E+01	1.4292E-06	9.0600E+18	2.7063E+18
Zr-97	1.0368E-07	5.4235E-17	3.3671E+08	3.8420E+17
Nb-95	3.6339E+01	9.2931E-07	5.8910E+18	2.8996E+18
Mo-99	3.1127E+00	6.4900E-09	3.9479E+16	1.0430E+19
Tc-99m	3.1913E+00	6.0691E-10	3.6918E+15	9.7804E+18
Ru-103	2.9280E+02	9.0723E-06	5.3044E+19	2.7954E+19
Ru-106	1.6684E+02	4.9869E-05	2.8332E+20	1.3276E+19
Rh-105	2.6145E-02	3.0976E-11	1.7766E+14	4.4529E+18
Sb-127	1.3091E+01	4.9019E-08	2.3244E+17	1.2939E+19
Te-127	8.8003E+01	3.3346E-08	1.5812E+17	1.7441E+19
Te-127m	7.4108E+01	7.8566E-06	3.7255E+19	6.1258E+18
Te-129	1.5323E+02	7.3168E-09	3.4157E+16	2.0332E+19
Te-129m	1.7721E+02	5.8823E-06	2.7460E+19	1.7518E+19
Te-131m	1.5375E-02	1.9281E-11	8.8638E+13	1.3712E+19
Te-132	1.0265E+02	3.3811E-07	1.5425E+18	1.7496E+20
I-131	8.7753E+03	7.0783E-05	3.2539E+20	2.0045E+21
I-132	1.2252E+02	1.1870E-08	5.4152E+16	5.9489E+20
I-133	1.1489E-02	1.0142E-11	4.5922E+13	1.0813E+21
Xe-133	8.3204E+06	4.4451E-02	2.0127E+23	3.0018E+24
Xe-133m	7.0638E+03	1.6045E-05	7.2649E+19	4.2962E+22
Xe-135	7.4065E-09	2.9003E-18	1.2938E+07	1.1829E+23
Cs-134	4.6042E+03	3.5586E-03	1.5993E+22	3.8983E+20
Cs-136	4.9662E+02	6.7760E-06	3.0004E+19	8.1995E+19
Cs-137	3.6363E+03	4.1806E-02	1.8377E+23	3.0477E+20
Ba-140	1.2769E+03	1.7442E-05	7.5026E+19	1.9309E+20
La-140	1.4821E+03	2.6665E-06	1.1470E+19	1.5140E+20
Ce-141	5.8606E+01	2.0568E-06	8.7847E+18	5.8447E+18
Ce-143	3.6499E-03	5.4962E-12	2.3146E+13	1.2488E+18
Ce-144	6.8318E+01	2.1420E-05	8.9579E+19	5.4703E+18
Pr-143	1.5761E+01	2.3406E-07	9.8569E+17	2.1418E+18
Nd-147	3.9424E+00	4.8733E-08	1.9964E+17	6.6949E+17
Np-239	2.8340E+00	1.2216E-08	3.0780E+16	2.0029E+19
Pu-238	2.2335E-01	1.3046E-05	3.3012E+19	1.7380E+16
Pu-239	2.2748E-02	3.6597E-04	9.2215E+20	1.7669E+15
Pu-240	3.9709E-02	1.7434E-05	4.3746E+19	3.0935E+15
Pu-241	8.7991E+00	8.8977E-05	2.2234E+20	6.8649E+17
Am-241	5.7594E-03	1.6812E-06	4.2009E+18	4.1502E+14
Cm-242	1.2592E+00	3.8039E-07	9.4660E+17	1.0292E+17
Cm-244	9.0457E-02	1.1051E-06	2.7276E+18	7.0556E+15

DW Transport Group Inventory:

Time (h) = 480.0000	Atmosphere	Sump	
Noble gases (atoms)	1.6940E+25	0.0000E+00	
Elemental I (atoms)	1.5260E+18	7.8120E+22	
Organic I (atoms)	1.6328E+20	0.0000E+00	
Aerosols (kg)	4.8102E-02	6.5809E+01	
Dose Effective (Ci/cc) I-131 (Thyroid)			1.0122E-06
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			1.0126E-06
Total I (Ci)			8.8978E+03

DW to WW Transport Group Inventory:

Time (h) = 480.0000 Leakage Transport

Noble gases (atoms)	3.5342E+29
Elemental I (atoms)	9.1394E+22
Organic I (atoms)	9.1769E+24
Aerosols (kg)	9.6283E+02

WW to DW Transport Group Inventory:
Time (h) = 480.0000 Leakage Transport

Noble gases (atoms)	3.5356E+29
Elemental I (atoms)	9.5518E+22
Organic I (atoms)	9.1853E+24
Aerosols (kg)	9.6619E+02

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.7152E+24
Elemental I (atoms)	0.0000E+00	5.3769E+18
Organic I (atoms)	0.0000E+00	7.5098E+19
Aerosols (kg)	0.0000E+00	1.1501E-02

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4541E+23
Elemental I (atoms)	0.0000E+00	3.2577E+17
Organic I (atoms)	0.0000E+00	6.7858E+18
Aerosols (kg)	0.0000E+00	8.8776E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3304E+24
Elemental I (atoms)	0.0000E+00	1.7666E+18
Organic I (atoms)	0.0000E+00	3.6789E+19
Aerosols (kg)	0.0000E+00	4.8132E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3304E+24
Elemental I (atoms)	0.0000E+00	1.7666E+18
Organic I (atoms)	0.0000E+00	3.6789E+19
Aerosols (kg)	0.0000E+00	4.8132E-03

RB Compartment Nuclide Inventory:

Time (h) = 480.0000	Ci	kg	Atoms	Decay
Kr-85	2.8225E+03	7.2008E-03	5.1017E+22	2.0749E+20
Rb-86	6.7996E-02	8.3567E-10	5.8517E+15	1.1692E+16
Sr-89	5.9689E+00	2.0545E-07	1.3902E+18	5.7994E+17

Sr-90	8.3915E-01	6.1518E-06	4.1163E+19	6.9315E+16
Y-90	8.3919E-01	1.5425E-09	1.0321E+16	4.8412E+16
Y-91	9.6743E-02	3.9448E-09	2.6106E+16	8.9775E+15
Zr-95	9.3578E-02	4.3559E-09	2.7613E+16	8.7796E+15
Zr-97	3.1599E-10	1.6529E-19	1.0262E+06	1.2776E+15
Nb-95	1.1075E-01	2.8323E-09	1.7954E+16	9.3679E+15
Mo-99	9.4868E-03	1.9780E-11	1.2032E+14	3.6771E+16
Tc-99m	9.7263E-03	1.8497E-12	1.1252E+13	3.4747E+16
Ru-103	8.9238E-01	2.7650E-08	1.6166E+17	9.0958E+16
Ru-106	5.0849E-01	1.5199E-07	8.6350E+17	4.2902E+16
Rh-105	7.9684E-05	9.4406E-14	5.4145E+11	1.6314E+16
Sb-127	3.9897E-02	1.4940E-10	7.0843E+14	4.4875E+16
Te-127	2.6821E-01	1.0163E-10	4.8191E+14	5.9212E+16
Te-127m	2.2586E-01	2.3945E-08	1.1354E+17	1.9815E+16
Te-129	4.6701E-01	2.2300E-11	1.0410E+14	5.6291E+16
Te-129m	5.4008E-01	1.7928E-08	8.3692E+16	5.7091E+16
Te-131m	4.6860E-05	5.8765E-14	2.7015E+11	4.8600E+16
Te-132	3.1284E-01	1.0305E-09	4.7013E+15	6.1195E+17
I-131	2.6745E+01	2.1573E-07	9.9172E+17	7.4382E+18
I-132	3.7341E-01	3.6176E-11	1.6504E+14	1.5182E+18
I-133	3.5015E-05	3.0910E-14	1.3996E+11	4.9951E+18
Xe-133	2.5359E+04	1.3548E-04	6.1343E+20	9.8773E+21
Xe-133m	2.1529E+01	4.8900E-08	2.2142E+17	1.4945E+20
Xe-135	2.2573E-11	8.8393E-21	3.9431E+04	4.0793E+20
Cs-134	1.4033E+01	1.0846E-05	4.8742E+19	1.4561E+18
Cs-136	1.5136E+00	2.0651E-08	9.1446E+16	3.2912E+17
Cs-137	1.1083E+01	1.2741E-04	5.6007E+20	1.1371E+18
Ba-140	3.8916E+00	5.3158E-08	2.2866E+17	6.3866E+17
La-140	4.5171E+00	8.1268E-09	3.4958E+16	4.8193E+17
Ce-141	1.7862E-01	6.2687E-09	2.6774E+16	1.9050E+16
Ce-143	1.1124E-05	1.6751E-14	7.0543E+10	4.4432E+15
Ce-144	2.0822E-01	6.5282E-08	2.7301E+17	1.7682E+16
Pr-143	4.8036E-02	7.1335E-10	3.0041E+15	7.0375E+15
Nd-147	1.2016E-02	1.4853E-10	6.0847E+14	2.2229E+15
Np-239	8.6372E-03	3.7231E-11	9.3811E+13	7.1043E+16
Pu-238	6.8072E-04	3.9762E-08	1.0061E+17	5.6118E+13
Pu-239	6.9329E-05	1.1154E-06	2.8105E+18	5.7034E+12
Pu-240	1.2102E-04	5.3135E-08	1.3333E+17	9.9886E+12
Pu-241	2.6817E-02	2.7118E-07	6.7762E+17	2.2167E+15
Am-241	1.7553E-05	5.1238E-09	1.2803E+16	1.3359E+12
Cm-242	3.8377E-03	1.1593E-09	2.8850E+15	3.3292E+14
Cm-244	2.7569E-04	3.3682E-09	8.3129E+15	2.2783E+13

RB Transport Group Inventory:

Time (h) = 480.0000	Atmosphere	Sump	
Noble gases (atoms)	5.1630E+22	0.0000E+00	
Elemental I (atoms)	4.6509E+15	0.0000E+00	
Organic I (atoms)	4.9764E+17	0.0000E+00	
Aerosols (kg)	1.4660E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		4.8689E-10
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		4.8710E-10
Total I (Ci)			2.7118E+01

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported

Noble gases (atoms)	0.0000E+00	2.7152E+24
Elemental I (atoms)	0.0000E+00	5.3769E+18
Organic I (atoms)	0.0000E+00	7.5098E+19
Aerosols (kg)	0.0000E+00	1.1501E-02

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4284E+24
Elemental I (atoms)	0.0000E+00	4.4001E+17
Organic I (atoms)	0.0000E+00	3.9161E+19
Aerosols (kg)	0.0000E+00	3.9132E-03

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.0814E+24
Elemental I (atoms)	5.0313E+18	5.0821E+16
Organic I (atoms)	1.0871E+20	1.0981E+18
Aerosols (kg)	1.4857E-02	1.5007E-04

Environment Integral Nuclide Release:

Time (h) = 480.0000	Ci	kg	Atoms	Bq
Kr-83m	3.8796E+03	1.9112E-07	1.3867E+18	1.4355E+14
Kr-85m	4.5670E+04	5.5496E-06	3.9318E+19	1.6898E+15
Kr-85	2.1212E+05	5.4116E-01	3.8341E+24	7.8484E+15
Kr-87	7.4952E+03	2.6461E-07	1.8316E+18	2.7732E+14
Kr-88	5.5928E+04	4.4602E-06	3.0523E+19	2.0693E+15
Rb-86	3.1795E-01	3.9076E-09	2.7363E+16	1.1764E+10
Rb-88	3.0494E+04	2.5261E-07	1.7287E+18	1.1283E+15
Sr-89	6.3539E+00	2.1871E-07	1.4799E+18	2.3510E+11
Sr-90	7.5427E-01	5.5295E-06	3.7000E+19	2.7908E+10
Sr-91	1.2586E+00	3.4721E-10	2.2977E+15	4.6569E+10
Sr-92	6.9654E-01	5.5416E-11	3.6274E+14	2.5772E+10
Y-90	4.9987E-01	9.1877E-10	6.1478E+15	1.8495E+10
Y-91	9.7205E-02	3.9637E-09	2.6231E+16	3.5966E+09
Y-92	2.2557E-01	2.3443E-11	1.5345E+14	8.3462E+09
Y-93	1.4677E-02	4.3992E-12	2.8487E+13	5.4305E+08
Zr-95	9.6051E-02	4.4710E-09	2.8342E+16	3.5539E+09
Zr-97	1.8740E-02	9.8029E-12	6.0860E+13	6.9338E+08
Nb-95	1.0203E-01	2.6092E-09	1.6540E+16	3.7750E+09
Mo-99	4.5332E-01	9.4518E-10	5.7495E+15	1.6773E+10
Tc-99m	4.3761E-01	8.3223E-11	5.0624E+14	1.6191E+10
Ru-103	9.9856E-01	3.0940E-08	1.8090E+17	3.6947E+10
Ru-105	8.1707E-02	1.2155E-11	6.9714E+13	3.0232E+09

Ru-106	4.6726E-01	1.3967E-07	7.9348E+17	1.7289E+10
Rh-105	2.1149E-01	2.5056E-10	1.4371E+15	7.8250E+09
Sb-127	5.3627E-01	2.0081E-09	9.5221E+15	1.9842E+10
Sb-129	4.0211E-01	7.1507E-11	3.3382E+14	1.4878E+10
Te-127	6.9996E-01	2.6523E-10	1.2577E+15	2.5899E+10
Te-127m	2.1599E-01	2.2898E-08	1.0858E+17	7.9917E+09
Te-129	9.0572E-01	4.3248E-11	2.0190E+14	3.3512E+10
Te-129m	6.2750E-01	2.0830E-08	9.7239E+16	2.3217E+10
Te-131m	6.5589E-01	8.2253E-10	3.7812E+15	2.4268E+10
Te-132	7.4219E+00	2.4447E-08	1.1153E+17	2.7461E+11
I-131	1.6301E+02	1.3148E-06	6.0444E+18	6.0312E+12
I-132	1.2576E+02	1.2184E-08	5.5584E+16	4.6531E+12
I-133	2.2793E+02	2.0121E-07	9.1105E+17	8.4333E+12
I-134	1.3910E+02	5.2144E-09	2.3434E+16	5.1468E+12
I-135	1.8584E+02	5.2917E-08	2.3605E+17	6.8760E+12
Xe-133	1.0077E+07	5.3834E-02	2.4375E+23	3.7284E+17
Xe-133m	1.5201E+05	3.4527E-04	1.5634E+21	5.6243E+15
Xe-135	4.0595E+05	1.5896E-04	7.0911E+20	1.5020E+16
Xe-135m	5.4824E+02	6.0224E-09	2.6865E+16	2.0285E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	3.4752E+01	2.6860E-05	1.2071E+20	1.2858E+12
Cs-136	9.4156E+00	1.2847E-07	5.6886E+17	3.4838E+11
Cs-137	2.7048E+01	3.1096E-04	1.3669E+21	1.0008E+12
Ba-139	5.4551E-01	3.3350E-11	1.4449E+14	2.0184E+10
Ba-140	7.1496E+00	9.7660E-08	4.2009E+17	2.6453E+11
La-140	4.9941E+00	8.9849E-09	3.8649E+16	1.8478E+11
La-141	9.2001E-03	1.6268E-12	6.9480E+12	3.4040E+08
La-142	5.2694E-03	3.6810E-13	1.5611E+12	1.9497E+08
Ce-141	2.0951E-01	7.3528E-09	3.1404E+16	7.7517E+09
Ce-143	5.9239E-02	8.9204E-11	3.7566E+14	2.1918E+09
Ce-144	1.9263E-01	6.0397E-08	2.5258E+17	7.1275E+09
Pr-143	7.7609E-02	1.1525E-09	4.8536E+15	2.8715E+09
Nd-147	2.5003E-02	3.0907E-10	1.2662E+15	9.2512E+08
Np-239	8.8998E-01	3.8362E-09	9.6663E+15	3.2929E+10
Pu-238	6.1061E-04	3.5667E-08	9.0249E+16	2.2593E+07
Pu-239	6.2031E-05	9.9798E-07	2.5146E+18	2.2951E+06
Pu-240	1.0869E-04	4.7721E-08	1.1974E+17	4.0215E+06
Pu-241	2.4123E-02	2.4393E-07	6.0954E+17	8.9254E+08
Am-241	1.4487E-05	4.2288E-09	1.0567E+16	5.3602E+05
Cm-242	3.6302E-03	1.0967E-09	2.7290E+15	1.3432E+08
Cm-244	2.4793E-04	3.0290E-09	7.4758E+15	9.1733E+06

Environment Transport Group Inventory:

Time (h) = 480.0000	Total Release	Release Rate/s	
Noble gases (atoms)	4.0802E+24	2.3612E+18	
Elemental I (atoms)	2.5757E+17	1.4906E+11	
Organic I (atoms)	1.1038E+18	6.3877E+11	
Aerosols (kg)	3.4701E-04	2.0082E-10	
Dose Effective (Ci) I-131 (Thyroid)			2.0721E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			2.4630E+02
Total I (Ci)			8.4163E+02

CR Filtered Intake Transport Group Inventory:

Pathway

Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6996E+19
Elemental I (atoms)	1.9290E+14	1.9661E+12
Organic I (atoms)	1.7711E+13	1.7944E+11
Aerosols (kg)	1.8401E-07	1.8753E-09

CR Unfiltered Inleakage Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.9992E+18
Elemental I (atoms)	0.0000E+00	3.6089E+13
Organic I (atoms)	0.0000E+00	3.3131E+12
Aerosols (kg)	0.0000E+00	3.4425E-08

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	3.1756E+19	0.0000E+00
Elemental I (atoms)	2.5734E+13	0.0000E+00
Organic I (atoms)	2.3902E+12	0.0000E+00
Aerosols (kg)	2.5608E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.0814E+24
Elemental I (atoms)	5.0313E+18	5.0821E+16
Organic I (atoms)	1.0871E+20	1.0981E+18
Aerosols (kg)	1.4857E-02	1.5007E-04

CR Compartment Nuclide Inventory:

Time (h) = 480.0000	Ci	kg	Atoms	Decay
Kr-85	1.0182E-02	2.5975E-08	1.8403E+17	8.6262E+14
Rb-86	2.8479E-10	3.5001E-18	2.4509E+07	1.3556E+10
Sr-89	2.5000E-08	8.6052E-16	5.8227E+09	3.2023E+10
Sr-90	3.5147E-09	2.5766E-14	1.7241E+11	3.4636E+09
Y-90	3.5149E-09	6.4604E-18	4.3228E+07	3.4497E+08
Y-91	4.0520E-10	1.6523E-17	1.0934E+08	4.2724E+08
Zr-95	3.9194E-10	1.8244E-17	1.1565E+08	4.7488E+08
Nb-95	4.6387E-10	1.1863E-17	7.5200E+07	4.7211E+08
Mo-99	3.9734E-11	8.2847E-20	5.0395E+05	5.4660E+09
Tc-99m	4.0737E-11	7.7474E-21	4.7127E+04	4.9434E+09
Ru-103	3.7377E-09	1.1581E-16	6.7711E+08	5.1631E+09
Ru-106	2.1298E-09	6.3659E-16	3.6167E+09	2.1732E+09

Sb-127	1.6711E-10	6.2574E-19	2.9672E+06	5.5420E+09
Te-127	1.1234E-09	4.2567E-19	2.0184E+06	5.6504E+09
Te-127m	9.4601E-10	1.0029E-16	4.7557E+08	1.0165E+09
Te-129	1.9560E-09	9.3401E-20	4.3602E+05	1.1835E+10
Te-129m	2.2621E-09	7.5088E-17	3.5054E+08	3.2977E+09
Te-132	1.3103E-09	4.3160E-18	1.9691E+07	8.2859E+10
I-131	1.1202E-07	9.0356E-16	4.1537E+09	5.9265E+12
I-132	1.5640E-09	1.5152E-19	6.9126E+05	4.1376E+12
Xe-133	9.1476E-02	4.8870E-10	2.2128E+15	4.7396E+16
Xe-133m	7.7660E-05	1.7640E-13	7.9871E+11	8.3045E+14
Cs-134	5.8774E-08	4.5426E-14	2.0415E+11	1.3636E+12
Cs-136	6.3394E-09	8.6497E-17	3.8301E+08	4.1258E+11
Cs-137	4.6418E-08	5.3366E-13	2.3458E+12	1.0588E+12
Ba-140	1.6300E-08	2.2265E-16	9.5772E+08	4.5904E+10
La-140	1.8919E-08	3.4038E-17	1.4642E+08	4.7527E+09
Ce-141	7.4812E-10	2.6256E-17	1.1214E+08	1.1077E+09
Ce-144	8.7210E-10	2.7343E-16	1.1435E+09	8.9939E+08
Pr-143	2.0120E-10	2.9878E-18	1.2583E+07	4.2626E+08
Nd-147	5.0326E-11	6.2209E-19	2.5485E+06	1.6798E+08
Np-239	3.6176E-11	1.5594E-19	3.9292E+05	1.1485E+10
Pu-238	2.8511E-12	1.6654E-16	4.2140E+08	2.8005E+06
Pu-239	2.9038E-13	4.6717E-15	1.1771E+10	2.8273E+05
Pu-240	5.0689E-13	2.2255E-16	5.5843E+08	4.9887E+05
Pu-241	1.1232E-10	1.1358E-15	2.8382E+09	1.1082E+08
Am-241	7.3520E-14	2.1460E-17	5.3626E+07	6.3094E+04
Cm-242	1.6074E-11	4.8558E-18	1.2084E+07	1.7163E+07
Cm-244	1.1547E-12	1.4107E-17	3.4818E+07	1.1388E+06

CR Transport Group Inventory:

Time (h) = 480.0000	Atmosphere	Sump	
Noble gases (atoms)	1.8624E+17	0.0000E+00	
Elemental I (atoms)	1.9480E+07	0.0000E+00	
Organic I (atoms)	2.0843E+09	0.0000E+00	
Aerosols (kg)	6.1403E-13	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.0384E-17
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.0388E-17
Total I (Ci)			1.1358E-07

Time (h) = 480.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.0748E+13
Organic I (atoms)	0.0000E+00	9.9829E+11
Aerosols (kg)	0.0000E+00	1.0695E-08

CR Filtered Intake Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6996E+19
Elemental I (atoms)	1.9290E+14	1.9661E+12
Organic I (atoms)	1.7711E+13	1.7944E+11
Aerosols (kg)	1.8401E-07	1.8753E-09

CR Unfiltered Inleakage Transport Group Inventory:

Pathway

Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.9992E+18
Elemental I (atoms)	0.0000E+00	3.6089E+13
Organic I (atoms)	0.0000E+00	3.3131E+12
Aerosols (kg)	0.0000E+00	3.4425E-08

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	3.1756E+19	0.0000E+00
Elemental I (atoms)	2.5734E+13	0.0000E+00
Organic I (atoms)	2.3902E+12	0.0000E+00
Aerosols (kg)	2.5608E-08	0.0000E+00

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.6877E-02	6.5844E-02	8.5737E-02
Accumulated dose (rem)	3.1623E+00	6.6647E+00	3.4639E+00

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.9869E-04	1.1183E-04	2.1373E-04
Accumulated dose (rem)	3.2609E-01	8.6307E-01	3.6343E-01

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.0245E-04	9.1382E-04	7.2541E-04
Accumulated dose (rem)	9.3448E-02	7.8395E+00	4.6721E-01

DW Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	8.3307E+05	2.1253E+00	1.5058E+25	9.3936E+22
Rb-86	1.3867E+01	1.7042E-07	1.1934E+18	3.5437E+18
Sr-89	1.5385E+03	5.2957E-05	3.5833E+20	2.3415E+20
Sr-90	2.4795E+02	1.8177E-03	1.2163E+22	2.9821E+19
Y-90	2.4926E+02	4.5814E-07	3.0655E+18	2.3886E+19
Y-91	2.5409E+01	1.0361E-06	6.8565E+18	3.6660E+18
Zr-95	2.4828E+01	1.1557E-06	7.3261E+18	3.5904E+18
Zr-97	4.9603E-12	2.5947E-21	1.6109E+04	3.8420E+17
Nb-95	3.1526E+01	8.0622E-07	5.1107E+18	3.9829E+18
Mo-99	2.2557E-01	4.7031E-10	2.8609E+15	1.0465E+19
Tc-99m	2.3126E-01	4.3981E-11	2.6754E+14	9.8146E+18
Ru-103	2.2117E+02	6.8530E-06	4.0067E+19	3.6114E+19
Ru-106	1.4755E+02	4.4102E-05	2.5055E+20	1.8294E+19
Rh-105	2.1330E-04	2.5271E-13	1.4494E+12	4.4530E+18
Sb-127	1.9492E+00	7.2991E-09	3.4611E+16	1.3126E+19
Te-127	6.5853E+01	2.4953E-08	1.1832E+17	1.9759E+19
Te-127m	6.2728E+01	6.6501E-06	3.1534E+19	8.3078E+18
Te-129	1.1234E+02	5.3645E-09	2.5043E+16	2.3503E+19
Te-129m	1.2992E+02	4.3127E-06	2.0133E+19	2.2387E+19
Te-131m	5.4122E-05	6.7873E-14	3.1201E+11	1.3712E+19
Te-132	1.1022E+01	3.6306E-08	1.6564E+17	1.7627E+20

I-131	3.3392E+03	2.6935E-05	1.2382E+20	2.1844E+21
I-132	1.3156E+01	1.2746E-09	5.8148E+15	5.9624E+20
I-133	3.4805E-06	3.0725E-15	1.3912E+10	1.0813E+21
Xe-133	2.0009E+06	1.0690E-02	4.8403E+22	3.1436E+24
Xe-133m	2.8440E+02	6.4598E-07	2.9249E+18	4.3029E+22
Cs-134	4.1111E+03	3.1774E-03	1.4280E+22	5.2895E+20
Cs-136	2.6365E+02	3.5973E-06	1.5929E+19	9.3754E+19
Cs-137	3.2748E+03	3.7649E-02	1.6549E+23	4.1511E+20
Ba-140	6.6782E+02	9.1221E-06	3.9239E+19	2.2312E+20
La-140	7.7575E+02	1.3957E-06	6.0035E+18	1.8602E+20
Ce-141	4.2669E+01	1.4975E-06	6.3959E+18	7.4497E+18
Ce-143	2.1270E-05	3.2029E-14	1.3488E+11	1.2488E+18
Ce-144	6.0082E+01	1.8838E-05	7.8779E+19	7.5194E+18
Pr-143	8.5192E+00	1.2651E-07	5.3278E+17	2.5180E+18
Nd-147	1.8897E+00	2.3359E-08	9.5695E+16	7.5871E+17
Np-239	1.3456E-01	5.8004E-10	1.4615E+15	2.0057E+19
Pu-238	2.0147E-01	1.1768E-05	2.9777E+19	2.4163E+16
Pu-239	2.0500E-02	3.2980E-04	8.3102E+20	2.4574E+15
Pu-240	3.5785E-02	1.5711E-05	3.9423E+19	4.2988E+15
Pu-241	7.9192E+00	8.0080E-05	2.0010E+20	9.5341E+17
Am-241	5.5371E-03	1.6163E-06	4.0388E+18	5.9556E+14
Cm-242	1.0875E+00	3.2852E-07	8.1751E+17	1.4035E+17
Cm-244	8.1428E-02	9.9483E-07	2.4553E+18	9.7999E+15

DW Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump	
Noble gases (atoms)	1.5106E+25	0.0000E+00	
Elemental I (atoms)	5.8061E+17	7.8120E+22	
Organic I (atoms)	6.2124E+19	0.0000E+00	
Aerosols (kg)	4.3251E-02	6.5809E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.8513E-07
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.8517E-07
Total I (Ci)			3.3524E+03

DW to WW Transport Group Inventory:

Time (h) = 720.0000	Leakage Transport
Noble gases (atoms)	4.9688E+29
Elemental I (atoms)	1.0019E+23
Organic I (atoms)	1.0118E+25
Aerosols (kg)	1.3722E+03

WW to DW Transport Group Inventory:

Time (h) = 720.0000	Leakage Transport
Noble gases (atoms)	4.9702E+29
Elemental I (atoms)	1.0431E+23
Organic I (atoms)	1.0126E+25
Aerosols (kg)	1.3756E+03

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.7530E+24
Elemental I (atoms)	0.0000E+00	5.4405E+18
Organic I (atoms)	0.0000E+00	8.1904E+19

Aerosols (kg) 0.0000E+00 1.4462E-02

DW to Dummy (Bypass Pathway 5) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.3919E+23
Elemental I (atoms)	0.0000E+00	3.3152E+17
Organic I (atoms)	0.0000E+00	7.4008E+18
Aerosols (kg)	0.0000E+00	1.1554E-03

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8388E+24
Elemental I (atoms)	0.0000E+00	1.7978E+18
Organic I (atoms)	0.0000E+00	4.0123E+19
Aerosols (kg)	0.0000E+00	6.2639E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8388E+24
Elemental I (atoms)	0.0000E+00	1.7978E+18
Organic I (atoms)	0.0000E+00	4.0123E+19
Aerosols (kg)	0.0000E+00	6.2639E-03

RB Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	2.5390E+03	6.4775E-03	4.5892E+22	2.9309E+20
Rb-86	4.2262E-02	5.1940E-10	3.6371E+15	1.3422E+16
Sr-89	4.6890E+00	1.6140E-07	1.0921E+18	7.4944E+17
Sr-90	7.5570E-01	5.5401E-06	3.7070E+19	9.4778E+16
Y-90	7.5968E-01	1.3963E-09	9.3430E+15	7.3830E+16
Y-91	7.7440E-02	3.1577E-09	2.0897E+16	1.1750E+16
Zr-95	7.5669E-02	3.5223E-09	2.2328E+16	1.1474E+16
Nb-95	9.6083E-02	2.4572E-09	1.5576E+16	1.2670E+16
Mo-99	6.8748E-04	1.4334E-12	8.7193E+12	3.6878E+16
Tc-99m	7.0484E-04	1.3404E-13	8.1539E+11	3.4851E+16
Ru-103	6.7408E-01	2.0886E-08	1.2212E+17	1.1583E+17
Ru-106	4.4968E-01	1.3441E-07	7.6362E+17	5.8195E+16
Rh-105	6.5009E-07	7.7020E-16	4.4174E+09	1.6314E+16
Sb-127	5.9408E-03	2.2246E-11	1.0549E+14	4.5445E+16
Te-127	2.0070E-01	7.6050E-11	3.6062E+14	6.6274E+16
Te-127m	1.9118E-01	2.0268E-08	9.6108E+16	2.6465E+16
Te-129	3.4240E-01	1.6350E-11	7.6325E+13	6.5956E+16
Te-129m	3.9597E-01	1.3144E-08	6.1361E+16	7.1930E+16
Te-131m	1.6495E-07	2.0686E-16	9.5094E+08	4.8600E+16
Te-132	3.3593E-02	1.1065E-10	5.0482E+14	6.1595E+17
I-131	1.0177E+01	8.2090E-08	3.7737E+17	7.9862E+18
I-132	4.0097E-02	3.8845E-12	1.7722E+13	1.5224E+18
I-133	1.0608E-08	9.3642E-18	4.2400E+07	4.9951E+18
Xe-133	6.0984E+03	3.2580E-05	1.4752E+20	1.0309E+22
Xe-133m	8.6677E-01	1.9688E-09	8.9145E+15	1.4965E+20

Cs-134	1.2530E+01	9.6841E-06	4.3521E+19	1.8801E+18
Cs-136	8.0353E-01	1.0964E-08	4.8547E+16	3.6495E+17
Cs-137	9.9808E+00	1.1475E-04	5.0439E+20	1.4734E+18
Ba-140	2.0354E+00	2.7802E-08	1.1959E+17	7.3019E+17
La-140	2.3643E+00	4.2536E-09	1.8297E+16	5.8744E+17
Ce-141	1.3005E-01	4.5641E-09	1.9493E+16	2.3942E+16
Ce-143	6.4826E-08	9.7618E-17	4.1110E+08	4.4432E+15
Ce-144	1.8312E-01	5.7412E-08	2.4010E+17	2.3927E+16
Pr-143	2.5964E-02	3.8558E-10	1.6238E+15	8.1841E+15
Nd-147	5.7594E-03	7.1193E-11	2.9166E+14	2.4948E+15
Np-239	4.1012E-04	1.7678E-12	4.4544E+12	7.1129E+16
Pu-238	6.1403E-04	3.5867E-08	9.0754E+16	7.6790E+13
Pu-239	6.2478E-05	1.0052E-06	2.5327E+18	7.8079E+12
Pu-240	1.0906E-04	4.7884E-08	1.2015E+17	1.3662E+13
Pu-241	2.4136E-02	2.4406E-07	6.0987E+17	3.0303E+15
Am-241	1.6876E-05	4.9260E-09	1.2309E+16	1.8862E+12
Cm-242	3.3143E-03	1.0012E-09	2.4916E+15	4.4701E+14
Cm-244	2.4817E-04	3.0320E-09	7.4832E+15	3.1147E+13

RB Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump	
Noble gases (atoms)	4.6040E+22	0.0000E+00	
Elemental I (atoms)	1.7696E+15	0.0000E+00	
Organic I (atoms)	1.8934E+17	0.0000E+00	
Aerosols (kg)	1.3182E-04	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.8526E-10
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.8528E-10
Total I (Ci)			1.0217E+01

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.7530E+24
Elemental I (atoms)	0.0000E+00	5.4405E+18
Organic I (atoms)	0.0000E+00	8.1904E+19
Aerosols (kg)	0.0000E+00	1.4462E-02

WW to RB Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9773E+24
Elemental I (atoms)	0.0000E+00	4.7365E+17
Organic I (atoms)	0.0000E+00	4.2761E+19
Aerosols (kg)	0.0000E+00	5.4795E-03

Drawdown Release from RB to Environment Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.6732E+24
Elemental I (atoms)	5.1279E+18	5.1797E+16
Organic I (atoms)	1.1905E+20	1.2025E+18
Aerosols (kg)	1.9354E-02	1.9549E-04

Environment Integral Nuclide Release:

Time (h) = 720.0000	Ci	kg	Atoms	Bq
Kr-83m	3.8796E+03	1.9112E-07	1.3867E+18	1.4355E+14
Kr-85m	4.5670E+04	5.5496E-06	3.9318E+19	1.6898E+15
Kr-85	2.9959E+05	7.6432E-01	5.4151E+24	1.1085E+16
Kr-87	7.4952E+03	2.6461E-07	1.8316E+18	2.7732E+14
Kr-88	5.5928E+04	4.4602E-06	3.0523E+19	2.0693E+15
Rb-86	3.3561E-01	4.1246E-09	2.8882E+16	1.2417E+10
Rb-88	3.0494E+04	2.5261E-07	1.7287E+18	1.1283E+15
Sr-89	8.0855E+00	2.7831E-07	1.8832E+18	2.9916E+11
Sr-90	1.0145E+00	7.4370E-06	4.9763E+19	3.7535E+10
Sr-91	1.2586E+00	3.4721E-10	2.2977E+15	4.6569E+10
Sr-92	6.9654E-01	5.5416E-11	3.6274E+14	2.5772E+10
Y-90	7.6102E-01	1.3988E-09	9.3595E+15	2.8158E+10
Y-91	1.2553E-01	5.1185E-09	3.3873E+16	4.6444E+09
Y-92	2.2557E-01	2.3443E-11	1.5345E+14	8.3462E+09
Y-93	1.4677E-02	4.3992E-12	2.8487E+13	5.4305E+08
Zr-95	1.2358E-01	5.7524E-09	3.6465E+16	4.5724E+09
Zr-97	1.8740E-02	9.8029E-12	6.0860E+13	6.9338E+08
Nb-95	1.3578E-01	3.4722E-09	2.2011E+16	5.0237E+09
Mo-99	4.5441E-01	9.4745E-10	5.7633E+15	1.6813E+10
Tc-99m	4.3872E-01	8.3435E-11	5.0753E+14	1.6233E+10
Ru-103	1.2526E+00	3.8812E-08	2.2692E+17	4.6346E+10
Ru-105	8.1707E-02	1.2155E-11	6.9714E+13	3.0232E+09
Ru-106	6.2353E-01	1.8637E-07	1.0588E+18	2.3071E+10
Rh-105	2.1149E-01	2.5057E-10	1.4371E+15	7.8252E+09
Sb-127	5.4207E-01	2.0298E-09	9.6251E+15	2.0057E+10
Sb-129	4.0211E-01	7.1507E-11	3.3382E+14	1.4878E+10
Te-127	7.7478E-01	2.9358E-10	1.3921E+15	2.8667E+10
Te-127m	2.8394E-01	3.0102E-08	1.4274E+17	1.0506E+10
Te-129	1.0368E+00	4.9507E-11	2.3111E+14	3.8361E+10
Te-129m	7.7907E-01	2.5861E-08	1.2073E+17	2.8826E+10
Te-131m	6.5589E-01	8.2253E-10	3.7812E+15	2.4268E+10
Te-132	7.4626E+00	2.4581E-08	1.1214E+17	2.7612E+11
I-131	1.6860E+02	1.3599E-06	6.2517E+18	6.2381E+12
I-132	1.2581E+02	1.2188E-08	5.5606E+16	4.6549E+12
I-133	2.2793E+02	2.0121E-07	9.1105E+17	8.4333E+12
I-134	1.3910E+02	5.2144E-09	2.3434E+16	5.1468E+12
I-135	1.8584E+02	5.2917E-08	2.3605E+17	6.8760E+12
Xe-133	1.0517E+07	5.6186E-02	2.5440E+23	3.8913E+17
Xe-133m	1.5222E+05	3.4575E-04	1.5655E+21	5.6321E+15
Xe-135	4.0595E+05	1.5896E-04	7.0911E+20	1.5020E+16
Xe-135m	5.4824E+02	6.0224E-09	2.6865E+16	2.0285E+13
Xe-138	1.3104E+02	1.3657E-09	5.9598E+15	4.8486E+12
Cs-134	3.9085E+01	3.0209E-05	1.3576E+20	1.4461E+12
Cs-136	9.7814E+00	1.3346E-07	5.9097E+17	3.6191E+11
Cs-137	3.0484E+01	3.5047E-04	1.5406E+21	1.1279E+12
Ba-139	5.4551E-01	3.3350E-11	1.4449E+14	2.0184E+10

Ba-140	8.0839E+00	1.1042E-07	4.7498E+17	2.9910E+11
La-140	6.0791E+00	1.0937E-08	4.7046E+16	2.2493E+11
La-141	9.2001E-03	1.6268E-12	6.9480E+12	3.4040E+08
La-142	5.2694E-03	3.6810E-13	1.5611E+12	1.9497E+08
Ce-141	2.5947E-01	9.1063E-09	3.8893E+16	9.6004E+09
Ce-143	5.9240E-02	8.9205E-11	3.7567E+14	2.1919E+09
Ce-144	2.5645E-01	8.0404E-08	3.3625E+17	9.4886E+09
Pr-143	8.9313E-02	1.3263E-09	5.5855E+15	3.3046E+09
Nd-147	2.7778E-02	3.4337E-10	1.4067E+15	1.0278E+09
Np-239	8.9085E-01	3.8400E-09	9.6758E+15	3.2962E+10
Pu-238	8.2185E-04	4.8006E-08	1.2147E+17	3.0409E+07
Pu-239	8.3535E-05	1.3440E-06	3.3864E+18	3.0908E+06
Pu-240	1.4623E-04	6.4202E-08	1.6110E+17	5.4105E+06
Pu-241	3.2436E-02	3.2799E-07	8.1959E+17	1.2001E+09
Am-241	2.0111E-05	5.8705E-09	1.4669E+16	7.4412E+05
Cm-242	4.7959E-03	1.4488E-09	3.6054E+15	1.7745E+08
Cm-244	3.3339E-04	4.0731E-09	1.0053E+16	1.2336E+07

Environment Transport Group Inventory:

Time (h) = 720.0000	Total Release	Release Rate/s	
Noble gases (atoms)	5.6718E+24	2.1882E+18	
Elemental I (atoms)	2.5854E+17	9.9745E+10	
Organic I (atoms)	1.2078E+18	4.6597E+11	
Aerosols (kg)	3.9243E-04	1.5140E-10	
Dose Effective (Ci) I-131 (Thyroid)			2.1280E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			2.5189E+02
Total I (Ci)			8.4727E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.5951E+19
Elemental I (atoms)	1.9291E+14	1.9662E+12
Organic I (atoms)	1.8292E+13	1.8532E+11
Aerosols (kg)	1.8426E-07	1.8779E-09

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.6575E+18
Elemental I (atoms)	0.0000E+00	3.6090E+13
Organic I (atoms)	0.0000E+00	3.4219E+12
Aerosols (kg)	0.0000E+00	3.4473E-08

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	4.2388E+19	0.0000E+00
Elemental I (atoms)	2.5734E+13	0.0000E+00
Organic I (atoms)	2.4712E+12	0.0000E+00
Aerosols (kg)	2.5643E-08	0.0000E+00

Drawdown Release from RB to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.8635E+19
Elemental I (atoms)	0.0000E+00	2.0694E+17
Organic I (atoms)	0.0000E+00	1.0383E+16
Aerosols (kg)	0.0000E+00	1.9670E-04

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.6732E+24
Elemental I (atoms)	5.1279E+18	5.1797E+16
Organic I (atoms)	1.1905E+20	1.2025E+18
Aerosols (kg)	1.9354E-02	1.9549E-04

CR Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	9.1588E-03	2.3366E-08	1.6555E+17	1.1714E+15
Rb-86	1.7701E-10	2.1755E-18	1.5234E+07	1.3563E+10
Sr-89	1.9639E-08	6.7600E-16	4.5741E+09	3.2733E+10
Sr-90	3.1652E-09	2.3204E-14	1.5526E+11	3.5703E+09
Y-90	3.1818E-09	5.8483E-18	3.9132E+07	4.5143E+08
Y-91	3.2435E-10	1.3226E-17	8.7525E+07	4.3885E+08
Zr-95	3.1693E-10	1.4753E-17	9.3519E+07	4.8617E+08
Nb-95	4.0243E-10	1.0292E-17	6.5239E+07	4.8594E+08
Mo-99	2.8794E-12	6.0037E-21	3.6520E+04	5.4664E+09
Ru-103	2.8233E-09	8.7480E-17	5.1147E+08	5.2673E+09
Ru-106	1.8834E-09	5.6297E-16	3.1984E+09	2.2372E+09
Sb-127	2.4882E-11	9.3174E-20	4.4182E+05	5.5444E+09
Te-127	8.4062E-10	3.1853E-19	1.5104E+06	5.6800E+09
Te-127m	8.0073E-10	8.4890E-17	4.0254E+08	1.0443E+09
Te-129	1.4341E-09	6.8478E-20	3.1968E+05	1.1875E+10
Te-129m	1.6585E-09	5.5052E-17	2.5700E+08	3.3598E+09
Te-132	1.4070E-10	4.6345E-19	2.1144E+06	8.2876E+10
I-131	4.2626E-08	3.4382E-16	1.5806E+09	5.9288E+12
I-132	1.6794E-10	1.6270E-20	7.4227E+04	4.1376E+12
Xe-133	2.1998E-02	1.1752E-10	5.3214E+14	4.8954E+16
Xe-133m	3.1267E-06	7.1019E-15	3.2157E+10	8.3119E+14
Cs-134	5.2479E-08	4.0561E-14	1.8229E+11	1.3654E+12
Cs-136	3.3655E-09	4.5920E-17	2.0333E+08	4.1273E+11
Cs-137	4.1803E-08	4.8060E-13	2.1126E+12	1.0602E+12
Ba-140	8.5249E-09	1.1645E-16	5.0090E+08	4.6288E+10
La-140	9.9026E-09	1.7816E-17	7.6635E+07	5.1946E+09
Ce-141	5.4468E-10	1.9116E-17	8.1645E+07	1.1282E+09
Ce-144	7.6696E-10	2.4046E-16	1.0056E+09	9.2555E+08
Pr-143	1.0875E-10	1.6150E-18	6.8010E+06	4.3106E+08
Nd-147	2.4123E-11	2.9818E-19	1.2216E+06	1.6912E+08
Np-239	1.7177E-12	7.4043E-21	1.8657E+04	1.1486E+10
Pu-238	2.5718E-12	1.5022E-16	3.8011E+08	2.8871E+06
Pu-239	2.6168E-13	4.2100E-15	1.0608E+10	2.9155E+05
Pu-240	4.5680E-13	2.0056E-16	5.0325E+08	5.1426E+05
Pu-241	1.0109E-10	1.0222E-15	2.5544E+09	1.1423E+08
Am-241	7.0682E-14	2.0632E-17	5.1556E+07	6.5399E+04

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Cm-242                 1.3882E-11  4.1936E-18  1.0436E+07  1.7641E+07
Cm-244                 1.0394E-12  1.2699E-17  3.1343E+07  1.1739E+06

CR Transport Group Inventory:
Time (h) = 720.0000    Atmosphere     Sump
Noble gases (atoms)    1.6608E+17  0.0000E+00
Elemental I (atoms)    7.4116E+06  0.0000E+00
Organic I (atoms)      7.9303E+08  0.0000E+00
Aerosols (kg)          5.5211E-13  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)         3.9510E-18
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   3.9515E-18
Total I (Ci)                                   4.2794E-08

                       Deposition Recirculating
Time (h) = 720.0000     Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  1.0748E+13
Organic I (atoms)      0.0000E+00  1.0321E+12
Aerosols (kg)          0.0000E+00  1.0710E-08

CR Filtered Intake Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  3.5951E+19
Elemental I (atoms)    1.9291E+14  1.9662E+12
Organic I (atoms)      1.8292E+13  1.8532E+11
Aerosols (kg)          1.8426E-07  1.8779E-09

CR Unfiltered Inleakage Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  6.6575E+18
Elemental I (atoms)    0.0000E+00  3.6090E+13
Organic I (atoms)      0.0000E+00  3.4219E+12
Aerosols (kg)          0.0000E+00  3.4473E-08

CR Exhaust to Environment Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    4.2388E+19  0.0000E+00
Elemental I (atoms)    2.5734E+13  0.0000E+00
Organic I (atoms)      2.4712E+12  0.0000E+00
Aerosols (kg)          2.5643E-08  0.0000E+00

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####################################################################
                             I-131 Summary
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                     DW                      WW                   Dummy
Time (hr)    I-131 (Curies)         I-131 (Curies)        I-131 (Curies)
   0.000       6.1456E+03             0.0000E+00            9.8791E-04
   0.017       1.8470E+05             0.0000E+00            8.9253E-01
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0.083	9.2043E+05	0.0000E+00	2.2191E+01
0.333	3.6815E+06	0.0000E+00	3.5501E+02
0.500	6.8011E+05	0.0000E+00	4.9693E+02
0.750	9.4091E+05	0.0000E+00	6.2493E+02
1.000	9.4887E+05	0.0000E+00	7.6109E+02
1.400	9.5868E+05	0.0000E+00	9.8064E+02
1.700	9.6601E+05	0.0000E+00	1.1466E+03
2.000	9.7331E+05	0.0000E+00	1.3136E+03
2.250	5.9152E+04	4.0977E+04	1.3426E+03
2.400	6.0391E+04	3.7661E+04	1.3471E+03
2.700	6.0335E+04	3.7588E+04	1.3562E+03
3.000	6.0255E+04	3.7538E+04	1.3653E+03
3.300	6.0175E+04	3.7489E+04	1.3743E+03
3.600	6.0096E+04	3.7439E+04	1.3834E+03
3.900	6.0017E+04	3.7390E+04	1.3924E+03
4.000	5.9990E+04	3.7373E+04	1.3954E+03
4.300	5.9911E+04	3.7324E+04	1.4043E+03
4.600	5.9832E+04	3.7275E+04	1.4133E+03
4.900	5.9753E+04	3.7225E+04	1.4222E+03
5.200	5.9674E+04	3.7176E+04	1.4311E+03
5.500	5.9595E+04	3.7127E+04	1.4399E+03
5.800	5.9516E+04	3.7078E+04	1.4488E+03
6.000	5.9464E+04	3.7045E+04	1.4547E+03
6.300	5.9385E+04	3.6996E+04	1.4635E+03
6.600	5.9307E+04	3.6948E+04	1.4723E+03
6.900	5.9228E+04	3.6899E+04	1.4810E+03
7.200	5.9150E+04	3.6850E+04	1.4898E+03
7.500	5.9072E+04	3.6801E+04	1.4985E+03
7.800	5.8994E+04	3.6753E+04	1.5072E+03
8.000	5.8942E+04	3.6720E+04	1.5130E+03
8.300	5.8864E+04	3.6672E+04	1.5216E+03
8.600	5.8786E+04	3.6623E+04	1.5303E+03
8.900	5.8708E+04	3.6575E+04	1.5389E+03
9.200	5.8631E+04	3.6526E+04	1.5474E+03
9.500	5.8553E+04	3.6478E+04	1.5560E+03
9.800	5.8476E+04	3.6430E+04	1.5646E+03
10.100	5.8398E+04	3.6382E+04	1.5731E+03
10.400	5.8321E+04	3.6334E+04	1.5816E+03
16.000	5.6897E+04	3.5447E+04	1.7360E+03
24.000	5.4921E+04	3.4215E+04	1.9436E+03
48.000	4.9897E+04	3.1085E+04	2.1340E+03
96.000	4.1158E+04	2.5641E+04	2.3772E+03
240.000	2.3061E+04	1.4366E+04	2.4131E+03
480.000	8.7753E+03	5.4669E+03	1.6637E+03
720.000	3.3392E+03	2.0803E+03	9.4784E+02

Time (hr)	RB I-131 (Curies)	Environment I-131 (Curies)	CR I-131 (Curies)
0.000	3.4387E-02	5.2586E-07	3.6481E-10
0.017	3.1053E+01	1.4277E-02	9.8981E-06
0.083	7.7068E+02	1.7684E+00	3.2799E-04
0.333	1.0616E+03	2.0052E+01	3.5038E-03
0.500	1.1777E+03	3.5731E+01	6.0823E-03
0.750	1.2710E+03	6.0965E+01	9.9713E-03
1.000	1.3699E+03	8.8226E+01	1.3879E-02
1.400	1.4955E+03	8.9006E+01	1.2021E-02
1.700	1.5865E+03	8.9635E+01	1.0794E-02

2.000	1.6749E+03	9.0301E+01	9.6932E-03
2.250	1.6589E+03	9.0870E+01	8.8602E-03
2.400	1.6320E+03	9.1206E+01	8.3953E-03
2.700	1.5797E+03	9.1862E+01	7.5375E-03
3.000	1.5295E+03	9.2496E+01	6.7676E-03
3.300	1.4813E+03	9.3111E+01	6.0766E-03
3.600	1.4351E+03	9.3706E+01	5.4564E-03
3.900	1.3908E+03	9.4282E+01	4.8997E-03
4.000	1.3764E+03	9.4471E+01	4.7271E-03
4.300	1.3345E+03	9.5024E+01	4.2451E-03
4.600	1.2943E+03	9.5560E+01	3.8124E-03
4.900	1.2556E+03	9.6081E+01	3.4241E-03
5.200	1.2186E+03	9.6585E+01	3.0755E-03
5.500	1.1831E+03	9.7076E+01	2.7626E-03
5.800	1.1490E+03	9.7551E+01	2.4817E-03
6.000	1.1270E+03	9.7861E+01	2.3106E-03
6.300	1.0952E+03	9.8315E+01	2.0759E-03
6.600	1.0646E+03	9.8755E+01	1.8653E-03
6.900	1.0353E+03	9.9184E+01	1.6762E-03
7.200	1.0072E+03	9.9601E+01	1.5065E-03
7.500	9.8019E+02	1.0001E+02	1.3541E-03
7.800	9.5428E+02	1.0040E+02	1.2172E-03
8.000	9.3759E+02	1.0066E+02	1.1339E-03
8.300	9.1341E+02	1.0104E+02	1.0183E-03
8.600	8.9019E+02	1.0140E+02	9.1457E-04
8.900	8.6791E+02	1.0176E+02	8.2146E-04
9.200	8.4652E+02	1.0211E+02	7.3788E-04
9.500	8.2599E+02	1.0245E+02	6.6286E-04
9.800	8.0629E+02	1.0279E+02	5.9552E-04
10.100	7.8737E+02	1.0311E+02	5.3507E-04
10.400	7.6921E+02	1.0343E+02	4.8081E-04
16.000	5.3624E+02	1.0829E+02	6.7875E-05
24.000	3.9693E+02	1.1323E+02	6.9648E-06
48.000	1.6012E+02	1.2059E+02	9.4014E-07
96.000	1.2545E+02	1.2969E+02	7.1410E-07
240.000	7.0283E+01	1.4832E+02	2.9437E-07
480.000	2.6745E+01	1.6301E+02	1.1202E-07
720.000	1.0177E+01	1.6860E+02	4.2626E-08

##
Cumulative Dose Summary
##

	EAB		LPZ		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
0.017	9.1664E-04	4.5228E-05	1.2479E-04	6.1570E-06	8.9558E-06	3.8315E-07
0.083	1.1347E-01	5.5753E-03	1.5447E-02	7.5899E-04	1.3129E-03	5.6799E-05
0.333	1.2841E+00	6.2469E-02	1.7481E-01	8.5041E-03	8.4229E-02	3.6405E-03
0.500	2.2852E+00	1.1065E-01	3.1110E-01	1.5064E-02	2.2700E-01	9.8037E-03
0.750	3.8944E+00	1.8896E-01	5.3017E-01	2.5723E-02	5.8529E-01	2.5298E-02
1.000	5.6341E+00	2.7738E-01	7.6700E-01	3.7761E-02	1.1165E+00	4.8517E-02
1.400	5.6465E+00	2.8603E-01	7.7295E-01	4.1910E-02	2.0360E+00	8.9172E-02
1.700	5.6565E+00	2.9691E-01	7.7774E-01	4.7129E-02	2.6414E+00	1.1618E-01
2.000	5.6671E+00	3.1219E-01	7.8281E-01	5.4461E-02	3.1830E+00	1.4061E-01
2.250	5.6761E+00	3.2829E-01	7.8714E-01	6.2183E-02	3.5905E+00	1.5921E-01

2.400	5.6814E+00	3.3917E-01	7.8969E-01	6.7401E-02	3.8175E+00	1.6965E-01
2.700	5.6918E+00	3.6329E-01	7.9465E-01	7.8973E-02	4.2353E+00	1.8907E-01
3.000	5.7017E+00	3.8996E-01	7.9944E-01	9.1765E-02	4.6092E+00	2.0676E-01
3.300	5.7114E+00	4.1860E-01	8.0406E-01	1.0551E-01	4.9439E+00	2.2290E-01
3.600	5.7207E+00	4.4875E-01	8.0852E-01	1.1997E-01	5.2435E+00	2.3770E-01
3.900	5.7297E+00	4.7999E-01	8.1283E-01	1.3496E-01	5.5117E+00	2.5131E-01
4.000	5.7326E+00	4.9059E-01	8.1423E-01	1.4004E-01	5.5947E+00	2.5560E-01
4.300	5.7412E+00	5.2279E-01	8.1835E-01	1.5549E-01	5.8261E+00	2.6783E-01
4.600	5.7495E+00	5.5537E-01	8.2233E-01	1.7112E-01	6.0333E+00	2.7916E-01
4.900	5.7575E+00	5.8813E-01	8.2618E-01	1.8684E-01	6.2188E+00	2.8968E-01
5.200	5.7653E+00	6.2088E-01	8.2990E-01	2.0255E-01	6.3850E+00	2.9948E-01
5.500	5.7728E+00	6.5346E-01	8.3351E-01	2.1818E-01	6.5339E+00	3.0863E-01
5.800	5.7801E+00	6.8576E-01	8.3700E-01	2.3367E-01	6.6672E+00	3.1720E-01
6.000	5.7848E+00	7.0708E-01	8.3927E-01	2.4390E-01	6.7483E+00	3.2261E-01
6.300	5.7917E+00	7.3868E-01	8.4258E-01	2.5906E-01	6.8594E+00	3.3032E-01
6.600	5.7984E+00	7.6978E-01	8.4579E-01	2.7398E-01	6.9589E+00	3.3757E-01
6.900	5.8049E+00	8.0031E-01	8.4890E-01	2.8862E-01	7.0481E+00	3.4440E-01
7.200	5.8112E+00	8.3023E-01	8.5192E-01	3.0298E-01	7.1281E+00	3.5085E-01
7.500	5.8173E+00	8.5953E-01	8.5485E-01	3.1703E-01	7.1997E+00	3.5695E-01
7.800	5.8232E+00	8.8816E-01	8.5770E-01	3.3077E-01	7.2640E+00	3.6272E-01
8.000	5.8271E+00	9.0688E-01	8.5955E-01	3.3975E-01	7.3032E+00	3.6640E-01
8.300	5.8327E+00	9.3440E-01	8.5960E-01	3.4025E-01	7.3568E+00	3.7161E-01
8.600	5.8382E+00	9.6125E-01	8.5965E-01	3.4074E-01	7.4048E+00	3.7639E-01
8.900	5.8435E+00	9.8742E-01	8.5970E-01	3.4122E-01	7.4478E+00	3.8076E-01
9.200	5.8487E+00	1.0129E+00	8.5975E-01	3.4168E-01	7.4864E+00	3.8475E-01
9.500	5.8538E+00	1.0378E+00	8.5980E-01	3.4213E-01	7.5209E+00	3.8839E-01
9.800	5.8587E+00	1.0620E+00	8.5985E-01	3.4257E-01	7.5519E+00	3.9173E-01
10.100	5.8635E+00	1.0855E+00	8.5989E-01	3.4300E-01	7.5797E+00	3.9479E-01
10.400	5.8682E+00	1.1085E+00	8.5994E-01	3.4342E-01	7.6045E+00	3.9761E-01
16.000	5.9385E+00	1.4530E+00	8.6060E-01	3.4969E-01	7.7946E+00	4.2816E-01
24.000	6.0074E+00	1.7675E+00	8.6125E-01	3.5540E-01	7.8259E+00	4.4594E-01
48.000	6.1039E+00	2.1318E+00	8.6174E-01	3.5824E-01	7.8301E+00	4.5360E-01
96.000	6.2139E+00	2.4748E+00	8.6230E-01	3.6090E-01	7.8332E+00	4.5918E-01
240.000	6.4295E+00	3.0489E+00	8.6267E-01	3.6237E-01	7.8363E+00	4.6382E-01
480.000	6.5988E+00	3.3782E+00	8.6296E-01	3.6321E-01	7.8386E+00	4.6648E-01
720.000	6.6647E+00	3.4639E+00	8.6307E-01	3.6343E-01	7.8395E+00	4.6721E-01

##
Worst Two-Hour Doses
##

EAB

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
0.0	6.9961E-02	5.6671E+00	3.1219E-01

Attachment 13.3 - RADTRAD Partial Output File "NP2ES400.o0"

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:22:32
 ##########################################################################

 ##########################################################################
                    File information
 ##########################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2ES400.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_I.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




     #####    ####   #####    #  #     #  #####   #     #  #####
     #    #  #       #        #  ##    #  #    #  #     #     #
     #    #  #       #        #  # #   #  #    #  #     #     #
     #####    ####   ####     #  #  #  #  #####   #     #     #
     #            #  #        #  #   # #  #       #     #     #
     #            #  #        #  #    ##  #       #     #     #
     #         ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Post-LOCA ESF Leakage - CAVEX Core Inventory
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   4
 Compartment 1:
 Pool
   3
  1.4500E+05
   0
   0
   0
   0
   0
 Compartment 2:
 RB
   3
  1.9400E+06
   0
   0
   0
   0
   0
 Compartment 3:
 Environment
   2
```

```
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 4:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Pathways:
  6
Pathway 1:
CR Filtered Intake
  3
  4
  2
Pathway 2:
CR Unfiltered Inleakage
  3
  4
  2
Pathway 3:
CR Exhaust to Environment
  4
  3
  2
Pathway 4:
RB Drawdown Release to Environment
  2
  3
  2
Pathway 5:
RB Exhaust to Environment
  2
  3
  2
Pathway 6:
ESF leakage to RB
  1
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_I.RFT
```

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```
  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:
  4
Compartment 1:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 2:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 4:
  1
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
```

```
Pathways:
  6
Pathway 1:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  8
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.8000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+02   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.8000E+02   2.5000E+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 3:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  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   2.6700E+03   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   4.4000E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   8.2900E+00   0.0000E+00   9.0000E+01   9.0000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  3
  1
  3
```

```
  0.0000E+00   1.1900E-04
  1.0000E+00   2.9600E-05
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ
  3
  1
  6
  0.0000E+00   1.6200E-05
  1.0000E+00   1.4200E-05
  8.0000E+00   5.4100E-07
  2.4000E+01   2.3100E-07
  9.6000E+01   7.6500E-08
  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 3:
CR
  4
  0
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  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
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
```

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```
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2ES400.o0
  1
  1
  1
  0
  0
End of Scenario File
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:22:32
 ##########################################################################

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

 Number of Nuclides =  63

 Inventory Power =   1.0000E+00 MWth
 Plant Power Level =   4.0670E+03 MWth

 Number of compartments    =   4

 Compartment information

 Compartment number  1  (Source term fraction =   1.0000E+00
 )
 Name: Pool
 Compartment volume =   1.4500E+05 (Cubic feet)
 Compartment type is Normal
 Pathways into and out of compartment  1
    Exit Pathway Number    6: ESF leakage to RB

 Compartment number  2
 Name: RB
 Compartment volume =   1.9400E+06 (Cubic feet)
 Compartment type is Normal
 Pathways into and out of compartment  2
    Inlet Pathway Number   6: ESF leakage to RB
    Exit Pathway Number    4: RB Drawdown Release to Environment
    Exit Pathway Number    5: RB Exhaust to Environment

 Compartment number  3
 Name: Environment
 Compartment type is Environment
 Pathways into and out of compartment  3
    Inlet Pathway Number   3: CR Exhaust to Environment
    Inlet Pathway Number   4: RB Drawdown Release to Environment
    Inlet Pathway Number   5: RB Exhaust to Environment
    Exit Pathway Number    1: CR Filtered Intake
    Exit Pathway Number    2: CR Unfiltered Inleakage

 Compartment number  4
 Name: CR
 Compartment volume =   3.8100E+05 (Cubic feet)
 Compartment type is Control Room
 Removal devices within compartment:
      Filter(s)
 Pathways into and out of compartment  4
    Inlet Pathway Number   1: CR Filtered Intake
    Inlet Pathway Number   2: CR Unfiltered Inleakage
    Exit Pathway Number    3: CR Exhaust to Environment

 Total number of pathways =   6
 ##########################################################################
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RADTRAD Version 3.03 (Spring 2001) run on 3/27/2019 at 16:22:32

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Scenario Description

Radioactive Decay is enabled
Calculation of Daughters is enabled

Release Fractions and Timings

	GAP	EARLY IN-VESSEL	LATE RELEASE	RELEASE MASS
	0.500000 hr	1.5000 hrs	0.0000 hrs	(gm)
NOBLES	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00
IODINE	5.0000E-02	2.5000E-01	0.0000E+00	3.546E+02
CESIUM	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00
TELLURIUM	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00
STRONTIUM	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00
BARIUM	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00
RUTHENIUM	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00
CERIUM	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00
LANTHANUM	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00

Inventory Power = 4067. 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)
I-131	2	2.720E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.960E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.640E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.470E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.330E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10

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-133m	Xe-133	1.00	none	0.00	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Xe-135m	Xe-135	0.99	Cs-135	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	Am-241	1.00	none	0.00	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

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

COMPARTMENT DATA

Compartment number 1: Pool

Compartment number 2: RB

Compartment number 3: Environment

Compartment number 4: CR

Compartment Filter Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.7500E+02	0.0000E+00	0.0000E+00	0.0000E+00
1.6700E-02	6.7500E+02	9.9000E+01	9.9000E+01	9.9000E+01
7.2000E+02	6.7500E+02	0.0000E+00	0.0000E+00	0.0000E+00

PATHWAY DATA

Pathway number 1: CR Filtered Intake

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	7.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
1.6700E-02	1.3500E+03	9.9000E+01	9.9000E+01	9.9000E+01
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 2: CR Unfiltered Inleakage
Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
2.0000E+00	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
4.0000E+00	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
1.6000E+01	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
4.8000E+01	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+02	2.5000E+02	0.0000E+00	0.0000E+00	0.0000E+00
4.8000E+02	2.5000E+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 3: CR Exhaust to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.0000E+03	1.0000E+02	1.0000E+02	1.0000E+02
1.6700E-02	1.6000E+03	1.0000E+02	1.0000E+02	1.0000E+02
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 4: RB Drawdown Release to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	2.6700E+03	0.0000E+00	0.0000E+00	0.0000E+00
1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 5: RB Exhaust to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.0000E+00	4.4000E+03	9.9000E+01	9.9000E+01	9.9000E+01
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 6: ESF leakage to RB

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	8.2900E+00	0.0000E+00	9.0000E+01	9.0000E+01
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

LOCATION DATA

Location EAB is in compartment 3

Location X/Q Data

Time (hr)	X/Q (s * m^-3)
0.0000E+00	1.1900E-04
1.0000E+00	2.9600E-05

```
  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 LPZ     is in compartment   3

 Location X/Q Data
  Time (hr)          X/Q (s * m^-3)
   0.0000E+00            1.6200E-05
   1.0000E+00            1.4200E-05
   8.0000E+00            5.4100E-07
   2.4000E+01            2.3100E-07
   9.6000E+01            7.6500E-08
   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 CR     is in compartment   4

 Location X/Q Data
  Time (hr)          X/Q (s * m^-3)
   0.0000E+00            1.4700E-03
   1.0000E+00            8.0300E-05
   2.0000E+00            4.4800E-05
   8.0000E+00            1.6800E-05
   2.4000E+01            1.2000E-05
   9.6000E+01            8.8300E-06
   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                 3.5000E-04

 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       1.0000E-02
  1.0000E+00       1.0000E-01
  2.0000E+00       5.0000E-01
  8.0000E+00       1.0000E+00
  2.4000E+01       2.0000E+00
  9.6000E+01       5.0000E+00
  7.2000E+02       0.0000E+00
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:22:32
##########################################################################


     ####   #     #  #####  #####   #     #  #####
    #    #  #     #    #    #    #  #     #    #
    #    #  #     #    #    #    #  #     #    #
    #    #  #     #    #    #####   #     #    #
    #    #  #     #    #    #       #     #    #
    #    #  #     #    #    #       #     #    #
     ####    ####     #    #        ####     #


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

EAB Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.6236E-08  1.5457E-05  5.6519E-07
Accumulated dose (rem)  7.6236E-08  1.5457E-05  5.6519E-07

LPZ Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0378E-08  2.1043E-06  7.6941E-08
Accumulated dose (rem)  1.0378E-08  2.1043E-06  7.6941E-08

CR Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.8862E-11  1.5102E-07  4.8260E-09
Accumulated dose (rem)  4.8862E-11  1.5102E-07  4.8260E-09

RB Compartment Nuclide Inventory:

Time (h) =   0.0167       Ci           kg          Atoms       Decay
I-131                  5.2887E-01  4.2660E-09  1.9611E+16  6.9679E+11
I-132                  7.6670E-01  7.4278E-11  3.3887E+14  1.0118E+12
I-133                  1.0961E+00  9.6758E-10  4.3811E+15  1.4443E+12
I-134                  1.2416E+00  4.6542E-11  2.0917E+14  1.6434E+12
I-135                  1.0346E+00  2.9460E-10  1.3142E+15  1.3639E+12
Xe-133                 3.1420E-04  1.6786E-12  7.6006E+12  2.4961E+08
Xe-133m                2.2093E-05  5.0183E-14  2.2722E+11  1.7552E+07
Xe-135                 3.6104E-03  1.4138E-12  6.3066E+12  2.8610E+09
Xe-135m                2.2289E-02  2.4484E-13  1.0922E+12  1.7827E+10

RB Transport Group Inventory:
Time (h) =   0.0167    Atmosphere     Sump
Noble gases (atoms)    1.5227E+13  0.0000E+00
Elemental I (atoms)    2.5079E+16  0.0000E+00
Organic I (atoms)      7.7563E+14  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)         1.3599E-11
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   1.7416E-11
```

Total I (Ci) 4.6678E+00

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.0503E+09
Elemental I (atoms)	0.0000E+00	1.1532E+13
Organic I (atoms)	0.0000E+00	3.5665E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

Time (h) = 0.0167	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2427E+13
Elemental I (atoms)	2.2586E+17	2.5096E+16
Organic I (atoms)	6.9855E+15	7.7617E+14
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 0.0167	Ci	kg	Atoms	Bq
I-131	2.4314E-04	1.9612E-12	9.0158E+12	8.9963E+06
I-132	3.5254E-04	3.4154E-14	1.5582E+11	1.3044E+07
I-133	5.0393E-04	4.4485E-13	2.0143E+12	1.8646E+07
I-134	5.7145E-04	2.1421E-14	9.6271E+10	2.1144E+07
I-135	4.7572E-04	1.3546E-13	6.0427E+11	1.7601E+07
Xe-133	1.0285E-07	5.4948E-16	2.4880E+09	3.8055E+03
Xe-133m	7.2320E-09	1.6427E-17	7.4380E+07	2.6759E+02
Xe-135	1.1817E-06	4.6272E-16	2.0641E+09	4.3722E+04
Xe-135m	7.3027E-06	8.0220E-17	3.5785E+08	2.7020E+05

Environment Transport Group Inventory:

Time (h) = 0.0167	Total Release	Release Rate/s
Noble gases (atoms)	4.9844E+09	8.2907E+07
Elemental I (atoms)	1.1530E+13	1.9178E+11
Organic I (atoms)	3.5659E+11	5.9314E+09
Aerosols (kg)	0.0000E+00	0.0000E+00

Dose Effective (Ci) I-131 (Thyroid) 3.4346E-04
Dose Effective (Ci) I-131 (ICRP2 Thyroid) 4.3988E-04
Total I (Ci) 2.1468E-03

CR Filtered Intake Transport Group Inventory:

Pathway

Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.1074E+06
Elemental I (atoms)	0.0000E+00	6.0003E+09
Organic I (atoms)	0.0000E+00	1.8558E+08
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.0248E+05
Elemental I (atoms)	0.0000E+00	2.0001E+09
Organic I (atoms)	0.0000E+00	6.1859E+07
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	1.2959E+03	0.0000E+00
Elemental I (atoms)	5.4435E+06	0.0000E+00
Organic I (atoms)	1.6836E+05	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.0503E+09
Elemental I (atoms)	0.0000E+00	1.1532E+13
Organic I (atoms)	0.0000E+00	3.5665E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.0167	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 0.0167	Ci	kg	Atoms	Decay
I-131	1.6857E-07	1.3597E-15	6.2507E+09	1.9332E+05
I-132	2.4431E-07	2.3669E-17	1.0798E+08	2.8059E+05
I-133	3.4936E-07	3.0840E-16	1.3964E+09	4.0071E+05
I-134	3.9574E-07	1.4835E-17	6.6669E+07	4.5566E+05
I-135	3.2977E-07	9.3901E-17	4.1888E+08	3.7837E+05
Xe-133	7.4010E-11	3.9539E-19	1.7903E+06	5.5990E+01
Xe-133m	5.2040E-12	1.1820E-20	5.3522E+04	3.9370E+00
Xe-135	8.5035E-10	3.3299E-19	1.4854E+06	6.4180E+02
Xe-135m	5.2519E-09	5.7693E-20	2.5736E+05	3.9966E+03

CR Transport Group Inventory:

Time (h) = 0.0167	Atmosphere	Sump

```
Noble gases (atoms)    3.5866E+06  0.0000E+00
Elemental I (atoms)    7.9935E+09  0.0000E+00
Organic I (atoms)      2.4722E+08  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)         2.2071E-17
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   2.8266E-17
Total I (Ci)                                   1.4878E-06

                       Deposition Recirculating
Time (h) =   0.0167     Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  0.0000E+00
Organic I (atoms)      0.0000E+00  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Filtered Intake Transport Group Inventory:

                         Pathway
Time (h) =   0.0167     Filtered   Transported
Noble gases (atoms)    0.0000E+00  2.1074E+06
Elemental I (atoms)    0.0000E+00  6.0003E+09
Organic I (atoms)      0.0000E+00  1.8558E+08
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

                         Pathway
Time (h) =   0.0167     Filtered   Transported
Noble gases (atoms)    0.0000E+00  7.0248E+05
Elemental I (atoms)    0.0000E+00  2.0001E+09
Organic I (atoms)      0.0000E+00  6.1859E+07
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

                         Pathway
Time (h) =   0.0167     Filtered   Transported
Noble gases (atoms)    1.2959E+03  0.0000E+00
Elemental I (atoms)    5.4435E+06  0.0000E+00
Organic I (atoms)      1.6836E+05  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00

EAB Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.8012E-03  4.0805E-01  1.4683E-02
Accumulated dose (rem)  1.8012E-03  4.0806E-01  1.4684E-02

LPZ Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.4520E-04  5.5549E-02  1.9989E-03
Accumulated dose (rem)  2.4521E-04  5.5551E-02  1.9990E-03

CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
```

Delta dose (rem)	7.8865E-06	2.5300E-02	8.0646E-04
Accumulated dose (rem)	7.8866E-06	2.5300E-02	8.0647E-04

RB Compartment Nuclide Inventory:

Time (h) = 0.5000	Ci	kg	Atoms	Decay
I-131	4.6681E+02	3.7654E-06	1.7310E+19	1.0718E+16
I-132	6.1458E+02	5.9540E-08	2.7164E+17	1.4478E+16
I-133	9.5358E+02	8.4179E-07	3.8115E+18	2.1977E+16
I-134	7.4908E+02	2.8080E-08	1.2620E+17	1.9058E+16
I-135	8.6951E+02	2.4759E-07	1.1045E+18	2.0222E+16
Xe-133	9.4394E+00	5.0429E-08	2.2834E+17	1.6303E+14
Xe-133m	6.6252E-01	1.5049E-09	6.8139E+15	1.1447E+13
Xe-135	1.1281E+02	4.4175E-08	1.9706E+17	1.9363E+15
Xe-135m	3.6757E+02	4.0378E-09	1.8012E+16	7.2135E+15

RB Transport Group Inventory:

Time (h) = 0.5000	Atmosphere	Sump	
Noble gases (atoms)	4.5022E+17	0.0000E+00	
Elemental I (atoms)	2.1945E+19	0.0000E+00	
Organic I (atoms)	6.7871E+17	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.1925E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.5090E-08
Total I (Ci)			3.6536E+03

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.6685E+15
Elemental I (atoms)	0.0000E+00	3.0392E+17
Organic I (atoms)	0.0000E+00	9.3997E+15
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 0.5000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.1486E+17
Elemental I (atoms)	2.0099E+20	2.2333E+19
Organic I (atoms)	6.2163E+18	6.9070E+17
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 0.5000	Ci	kg	Atoms	Bq
I-131	6.4503E+00	5.2029E-08	2.3918E+17	2.3866E+11

I-132	8.6938E+00	8.4225E-10	3.8425E+15	3.2167E+11
I-133	1.3224E+01	1.1674E-08	5.2857E+16	4.8929E+11
I-134	1.1413E+01	4.2783E-10	1.9227E+15	4.2229E+11
I-135	1.2163E+01	3.4634E-09	1.5450E+16	4.5002E+11
Xe-133	9.8240E-02	5.2484E-10	2.3764E+15	3.6349E+09
Xe-133m	6.8976E-03	1.5667E-11	7.0940E+13	2.5521E+08
Xe-135	1.1699E+00	4.5810E-10	2.0435E+15	4.3285E+10
Xe-135m	4.2792E+00	4.7007E-11	2.0969E+14	1.5833E+11

Environment Transport Group Inventory:

Time (h) = 0.5000	Total Release	Release Rate/s	
Noble gases (atoms)	4.7006E+15	2.6114E+12	
Elemental I (atoms)	3.0386E+17	1.6881E+14	
Organic I (atoms)	9.3976E+15	5.2209E+12	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci) I-131 (Thyroid)			9.0668E+00
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.1505E+01
Total I (Ci)			5.1944E+01

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.3724E+12
Elemental I (atoms)	2.8179E+14	2.8524E+12
Organic I (atoms)	8.7152E+12	8.8218E+10
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.0970E+11
Elemental I (atoms)	0.0000E+00	5.2713E+13
Organic I (atoms)	0.0000E+00	1.6303E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	1.2988E+11	0.0000E+00
Elemental I (atoms)	1.6923E+12	0.0000E+00
Organic I (atoms)	5.2339E+10	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.6685E+15
Elemental I (atoms)	0.0000E+00	3.0392E+17
Organic I (atoms)	0.0000E+00	9.3997E+15
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 0.5000	Ci	kg	Atoms	Decay
I-131	1.1278E-03	9.0974E-12	4.1821E+13	1.9756E+10
I-132	1.4669E-03	1.4211E-13	6.4834E+11	2.6297E+10
I-133	2.3040E-03	2.0338E-12	9.2091E+12	4.0481E+10
I-134	1.8099E-03	6.7844E-14	3.0490E+11	3.4426E+10
I-135	2.1008E-03	5.9821E-13	2.6685E+12	3.7183E+10
Xe-133	1.0712E-04	5.7228E-13	2.5913E+12	1.5063E+09
Xe-133m	7.5156E-06	1.7071E-14	7.7297E+10	1.0572E+08
Xe-135	1.2955E-03	5.0731E-13	2.2630E+12	1.8104E+10
Xe-135m	3.6387E-03	3.9971E-14	1.7831E+11	5.8476E+10

CR Transport Group Inventory:

Time (h) = 0.5000	Atmosphere	Sump	
Noble gases (atoms)	5.1099E+12	0.0000E+00	
Elemental I (atoms)	5.3012E+13	0.0000E+00	
Organic I (atoms)	1.6396E+12	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.4670E-13
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.8559E-13
Total I (Ci)			8.8094E-03

Time (h) = 0.5000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	7.0680E+11
Organic I (atoms)	0.0000E+00	2.1860E+10
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.3724E+12
Elemental I (atoms)	2.8179E+14	2.8524E+12
Organic I (atoms)	8.7152E+12	8.8218E+10
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.0970E+11
Elemental I (atoms)	0.0000E+00	5.2713E+13
Organic I (atoms)	0.0000E+00	1.6303E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	1.2988E+11	0.0000E+00
Elemental I (atoms)	1.6923E+12	0.0000E+00
Organic I (atoms)	5.2339E+10	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1939E-02	3.0721E+00	1.0874E-01
Accumulated dose (rem)	1.3741E-02	3.4801E+00	1.2342E-01

LPZ Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.6253E-03	4.1821E-01	1.4803E-02
Accumulated dose (rem)	1.8706E-03	4.7376E-01	1.6802E-02

CR Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0696E-04	3.7635E-01	1.1963E-02
Accumulated dose (rem)	1.1485E-04	4.0165E-01	1.2770E-02

RB Compartment Nuclide Inventory:

Time (h) = 1.0000	Ci	kg	Atoms	Decay
I-131	2.1485E+03	1.7330E-05	7.9669E+19	9.0614E+16
I-132	2.6027E+03	2.5214E-07	1.1503E+18	1.1446E+17
I-133	4.3236E+03	3.8167E-06	1.7282E+19	1.8368E+17
I-134	2.3258E+03	8.7184E-08	3.9181E+17	1.2016E+17
I-135	3.8039E+03	1.0832E-06	4.8318E+18	1.6446E+17
Xe-133	8.0025E+01	4.2753E-07	1.9358E+18	2.6283E+15
Xe-133m	5.6071E+00	1.2736E-08	5.7668E+16	1.8428E+14
Xe-135	9.5392E+02	3.7354E-07	1.6663E+18	3.1373E+16
Xe-135m	1.9251E+03	2.1147E-08	9.4333E+16	7.7223E+16

RB Transport Group Inventory:

Time (h) = 1.0000	Atmosphere	Sump	
Noble gases (atoms)	3.7541E+18	0.0000E+00	
Elemental I (atoms)	1.0022E+20	0.0000E+00	
Organic I (atoms)	3.0997E+18	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		5.4541E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		6.8339E-08
Total I (Ci)			1.5205E+04

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16

Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	0.0000E+00
Organic I (atoms)	0.0000E+00	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.5162E+18
Elemental I (atoms)	9.3120E+20	1.0347E+20
Organic I (atoms)	2.8800E+19	3.2000E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 1.0000	Ci	kg	Atoms	Bq
I-131	5.5284E+01	4.4593E-07	2.0500E+18	2.0455E+12
I-132	6.9669E+01	6.7495E-09	3.0793E+16	2.5778E+12
I-133	1.1205E+02	9.8909E-08	4.4785E+17	4.1457E+12
I-134	7.2951E+01	2.7346E-09	1.2290E+16	2.6992E+12
I-135	1.0028E+02	2.8553E-08	1.2737E+17	3.7102E+12
Xe-133	1.6053E+00	8.5763E-09	3.8833E+16	5.9397E+10
Xe-133m	1.1255E-01	2.5565E-10	1.1576E+15	4.1644E+09
Xe-135	1.9193E+01	7.5156E-09	3.3526E+16	7.1013E+11
Xe-135m	4.6431E+01	5.1005E-10	2.2752E+15	1.7180E+12

Environment Transport Group Inventory:

Time (h) = 1.0000	Total Release	Release Rate/s	
Noble gases (atoms)	7.5791E+16	2.1053E+13	
Elemental I (atoms)	2.5882E+18	7.1895E+14	
Organic I (atoms)	8.0048E+16	2.2236E+13	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci)	I-131 (Thyroid)		7.7325E+01
Dose Effective (Ci)	I-131 (ICRP2 Thyroid)		9.7332E+01
Total I (Ci)			4.1022E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.0746E+13
Elemental I (atoms)	2.4003E+15	2.4252E+13
Organic I (atoms)	7.4237E+13	7.5005E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Pathway

Time (h) = 1.0000 Filtered Transported
Noble gases (atoms) 0.0000E+00 1.3101E+13
Elemental I (atoms) 0.0000E+00 4.4900E+14
Organic I (atoms) 0.0000E+00 1.3886E+13
Aerosols (kg) 0.0000E+00 0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Pathway
Time (h) = 1.0000 Filtered Transported
Noble gases (atoms) 4.0453E+12 0.0000E+00
Elemental I (atoms) 2.6837E+13 0.0000E+00
Organic I (atoms) 8.3002E+11 0.0000E+00
Aerosols (kg) 0.0000E+00 0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Pathway
Time (h) = 1.0000 Filtered Transported
Noble gases (atoms) 0.0000E+00 7.5537E+16
Elemental I (atoms) 0.0000E+00 2.5888E+18
Organic I (atoms) 0.0000E+00 8.0065E+16
Aerosols (kg) 0.0000E+00 0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Pathway
Time (h) = 1.0000 Filtered Transported
Noble gases (atoms) 0.0000E+00 0.0000E+00
Elemental I (atoms) 0.0000E+00 0.0000E+00
Organic I (atoms) 0.0000E+00 0.0000E+00
Aerosols (kg) 0.0000E+00 0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 1.0000	Ci	kg	Atoms	Decay
I-131	9.2852E-03	7.4896E-11	3.4430E+14	3.0949E+11
I-132	1.0920E-02	1.0580E-12	4.8266E+12	3.7898E+11
I-133	1.8686E-02	1.6495E-11	7.4690E+13	6.2657E+11
I-134	1.0052E-02	3.7679E-13	1.6934E+12	3.9553E+11
I-135	1.6440E-02	4.6813E-12	2.0882E+13	5.5926E+11
Xe-133	1.7130E-03	9.1515E-12	4.1437E+13	4.6451E+10
Xe-133m	1.1993E-04	2.7240E-13	1.2334E+12	3.2544E+09
Xe-135	2.0717E-02	8.1124E-12	3.6188E+13	5.6239E+11
Xe-135m	3.0873E-02	3.3914E-13	1.5129E+12	1.0480E+12

CR Transport Group Inventory:
Time (h) = 1.0000 Atmosphere Sump
Noble gases (atoms) 8.0372E+13 0.0000E+00
Elemental I (atoms) 4.3300E+14 0.0000E+00
Organic I (atoms) 1.3392E+13 0.0000E+00
Aerosols (kg) 0.0000E+00 0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid) 1.2000E-12
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid) 1.5027E-12
Total I (Ci) 6.5383E-02

Deposition Recirculating

Time (h) = 1.0000	Surfaces	Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.1209E+13
Organic I (atoms)	0.0000E+00	3.4666E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.0746E+13
Elemental I (atoms)	2.4003E+15	2.4252E+13
Organic I (atoms)	7.4237E+13	7.5005E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3101E+13
Elemental I (atoms)	0.0000E+00	4.4900E+14
Organic I (atoms)	0.0000E+00	1.3886E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 1.0000	Pathway Filtered	Transported
Noble gases (atoms)	4.0453E+12	0.0000E+00
Elemental I (atoms)	2.6837E+13	0.0000E+00
Organic I (atoms)	8.3002E+11	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.5541E-03	1.1430E-01	6.1462E-03
Accumulated dose (rem)	1.6295E-02	3.5944E+00	1.2957E-01

LPZ Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2253E-03	5.4831E-02	2.9485E-03
Accumulated dose (rem)	3.0958E-03	5.2859E-01	1.9750E-02

CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.3972E-04	1.3690E+00	4.3369E-02
Accumulated dose (rem)	4.5457E-04	1.7707E+00	5.6138E-02

RB Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
I-131	9.5518E+03	7.7047E-05	3.5419E+20	8.6213E+17
I-132	9.6496E+03	9.3484E-07	4.2649E+18	9.5773E+17
I-133	1.8655E+04	1.6468E-05	7.4565E+19	1.7082E+18

I-134	4.7055E+03	1.7639E-07	7.9271E+17	6.4938E+17
I-135	1.5279E+04	4.3508E-06	1.9408E+19	1.4490E+18
Xe-133	6.8758E+02	3.6733E-06	1.6632E+19	4.7598E+16
Xe-133m	4.8014E+01	1.0906E-07	4.9381E+17	3.3285E+15
Xe-135	7.8647E+03	3.0797E-06	1.3738E+19	5.5091E+17
Xe-135m	7.8887E+03	8.6658E-08	3.8657E+17	7.6917E+17

RB Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	3.1251E+19	0.0000E+00	
Elemental I (atoms)	4.3962E+20	0.0000E+00	
Organic I (atoms)	1.3597E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.3959E-07
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.9558E-07
Total I (Ci)			5.7841E+04

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9435E+18
Elemental I (atoms)	3.3786E+19	3.4127E+17
Organic I (atoms)	1.0449E+18	1.0555E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0718E+19
Elemental I (atoms)	4.3362E+21	4.8179E+20
Organic I (atoms)	1.3411E+20	1.4901E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 2.0000	Ci	kg	Atoms	Bq
I-131	6.2654E+01	5.0538E-07	2.3232E+18	2.3182E+12
I-132	7.7555E+01	7.5135E-09	3.4278E+16	2.8695E+12
I-133	1.2658E+02	1.1174E-07	5.0597E+17	4.6836E+12
I-134	7.7796E+01	2.9162E-09	1.3106E+16	2.8784E+12
I-135	1.1248E+02	3.2028E-08	1.4287E+17	4.1617E+12
Xe-133	4.3826E+01	2.3413E-07	1.0601E+18	1.6215E+12
Xe-133m	3.0629E+00	6.9571E-09	3.1501E+16	1.1333E+11
Xe-135	5.1096E+02	2.0008E-07	8.9254E+17	1.8906E+13
Xe-135m	5.7857E+02	6.3556E-09	2.8351E+16	2.1407E+13

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Environment Transport Group Inventory:

Time (h) = 2.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.0125E+18	2.7952E+14
Elemental I (atoms)	2.9289E+18	4.0679E+14
Organic I (atoms)	9.0584E+16	1.2581E+13
Aerosols (kg)	0.0000E+00	0.0000E+00
Dose Effective (Ci) I-131 (Thyroid)		8.7520E+01
Dose Effective (Ci) I-131 (ICRP2 Thyroid)		1.0997E+02
Total I (Ci)		4.5707E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7018E+14
Elemental I (atoms)	2.4176E+15	2.4426E+13
Organic I (atoms)	7.4771E+13	7.5545E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.1515E+13
Elemental I (atoms)	0.0000E+00	4.5223E+14
Organic I (atoms)	0.0000E+00	1.3986E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	3.1510E+13	0.0000E+00
Elemental I (atoms)	1.1817E+14	0.0000E+00
Organic I (atoms)	3.6547E+12	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9435E+18
Elemental I (atoms)	3.3786E+19	3.4127E+17
Organic I (atoms)	1.0449E+18	1.0555E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
I-131	6.5372E-03	5.2730E-11	2.4240E+14	1.3332E+12
I-132	5.7147E-03	5.5363E-13	2.5258E+12	1.4295E+12
I-133	1.2771E-02	1.1273E-11	5.1045E+13	2.6581E+12
I-134	3.2212E-03	1.2075E-13	5.4267E+11	1.1800E+12
I-135	1.0460E-02	2.9784E-12	1.3286E+13	2.2880E+12
Xe-133	3.7475E-03	2.0021E-11	9.0653E+13	3.7455E+11
Xe-133m	2.6098E-04	5.9278E-13	2.6841E+12	2.6150E+10
Xe-135	4.3527E-02	1.7045E-11	7.6033E+13	4.4504E+12
Xe-135m	1.8547E-02	2.0374E-13	9.0885E+11	3.7251E+12

CR Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	1.7028E+14	0.0000E+00	
Elemental I (atoms)	3.0051E+14	0.0000E+00	
Organic I (atoms)	9.2941E+12	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		8.3448E-13
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.0272E-12
Total I (Ci)			3.8703E-02

Time (h) = 2.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	4.9354E+13
Organic I (atoms)	0.0000E+00	1.5264E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7018E+14
Elemental I (atoms)	2.4176E+15	2.4426E+13
Organic I (atoms)	7.4771E+13	7.5545E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.1515E+13
Elemental I (atoms)	0.0000E+00	4.5223E+14
Organic I (atoms)	0.0000E+00	1.3986E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	3.1510E+13	0.0000E+00
Elemental I (atoms)	1.1817E+14	0.0000E+00
Organic I (atoms)	3.6547E+12	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 4.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.8963E-02	7.7035E-01	4.3078E-02
Accumulated dose (rem)	3.5258E-02	4.3648E+00	1.7264E-01

LPZ Doses:

Time (h) = 4.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.0972E-03	3.6956E-01	2.0666E-02
Accumulated dose (rem)	1.2193E-02	8.9815E-01	4.0416E-02

CR Doses:

Time (h) = 4.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.1833E-04	1.6370E+00	5.1767E-02
Accumulated dose (rem)	9.7290E-04	3.4077E+00	1.0791E-01

RB Compartment Nuclide Inventory:

Time (h) = 4.0000	Ci	kg	Atoms	Decay
I-131	2.6752E+04	2.1579E-04	9.9198E+20	5.9265E+18
I-132	1.5948E+04	1.5450E-06	7.0486E+18	4.8334E+18
I-133	4.9225E+04	4.3454E-05	1.9676E+20	1.1267E+19
I-134	2.7301E+03	1.0234E-07	4.5993E+17	1.7630E+18
I-135	3.4943E+04	9.9499E-06	4.4385E+19	8.6708E+18
Xe-133	4.7976E+03	2.5631E-05	1.1605E+20	7.2043E+17
Xe-133m	3.3225E+02	7.5467E-07	3.4171E+18	5.0078E+16
Xe-135	4.8616E+04	1.9037E-05	8.4922E+19	7.6810E+18
Xe-135m	1.3587E+04	1.4926E-07	6.6582E+17	4.1217E+18

RB Transport Group Inventory:

Time (h) = 4.0000	Atmosphere	Sump	
Noble gases (atoms)	2.0506E+20	0.0000E+00	
Elemental I (atoms)	1.2034E+21	0.0000E+00	
Organic I (atoms)	3.7219E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		6.5632E-07
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		7.9072E-07
Total I (Ci)			1.2960E+05

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 4.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 4.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0913E+19
Elemental I (atoms)	2.6124E+20	2.6388E+18
Organic I (atoms)	8.0796E+18	8.1612E+16

Aerosols (kg) 0.0000E+00 0.0000E+00

ESF leakage to RB Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2455E+20
Elemental I (atoms)	1.3512E+22	1.5014E+21
Organic I (atoms)	4.1790E+20	4.6434E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 4.0000	Ci	kg	Atoms	Bq
I-131	1.1321E+02	9.1315E-07	4.1978E+18	4.1887E+12
I-132	1.1556E+02	1.1196E-08	5.1078E+16	4.2759E+12
I-133	2.2185E+02	1.9584E-07	8.8675E+17	8.2085E+12
I-134	8.8438E+01	3.3152E-09	1.4899E+16	3.2722E+12
I-135	1.8417E+02	5.2443E-08	2.3394E+17	6.8143E+12
Xe-133	7.0564E+02	3.7698E-06	1.7069E+19	2.6109E+13
Xe-133m	4.9021E+01	1.1135E-07	5.0417E+17	1.8138E+12
Xe-135	7.5262E+03	2.9472E-06	1.3147E+19	2.7847E+14
Xe-135m	3.2932E+03	3.6175E-08	1.6137E+17	1.2185E+14

Environment Transport Group Inventory:

Time (h) = 4.0000	Total Release	Release Rate/s	
Noble gases (atoms)	3.0882E+19	2.1446E+15	
Elemental I (atoms)	5.2229E+18	3.6270E+14	
Organic I (atoms)	1.6153E+17	1.1218E+13	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci) I-131 (Thyroid)			1.5624E+02
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.9350E+02
Total I (Ci)			7.2323E+02

CR Filtered Intake Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.9707E+14
Elemental I (atoms)	2.4825E+15	2.5082E+13
Organic I (atoms)	7.6779E+13	7.7573E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 4.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8464E+14
Elemental I (atoms)	0.0000E+00	4.6437E+14
Organic I (atoms)	0.0000E+00	1.4362E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Pathway

Time (h) = 4.0000	Filtered	Transported
Noble gases (atoms)	2.5180E+14	0.0000E+00
Elemental I (atoms)	2.2722E+14	0.0000E+00
Organic I (atoms)	7.0274E+12	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 4.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 4.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0913E+19
Elemental I (atoms)	2.6124E+20	2.6388E+18
Organic I (atoms)	8.0796E+18	8.1612E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 4.0000	Ci	kg	Atoms	Decay
I-131	3.3886E-03	2.7333E-11	1.2565E+14	2.5790E+12
I-132	1.6555E-03	1.6038E-13	7.3169E+11	2.2800E+12
I-133	6.2374E-03	5.5062E-12	2.4931E+13	5.0285E+12
I-134	3.4594E-04	1.2968E-14	5.8279E+10	1.5151E+12
I-135	4.4277E-03	1.2608E-12	5.6242E+12	4.1123E+12
Xe-133	2.1098E-02	1.1272E-10	5.1037E+14	3.1529E+12
Xe-133m	1.4567E-03	3.3087E-12	1.4982E+13	2.1861E+11
Xe-135	2.1488E-01	8.4144E-11	3.7535E+14	3.4138E+13
Xe-135m	2.0358E-02	2.2363E-13	9.9758E+11	9.2901E+12

CR Transport Group Inventory:

Time (h) = 4.0000	Atmosphere	Sump	
Noble gases (atoms)	9.0171E+14	0.0000E+00	
Elemental I (atoms)	1.5229E+14	0.0000E+00	
Organic I (atoms)	4.7099E+12	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		4.2315E-13
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		5.0884E-13
Total I (Ci)			1.6055E-02

	Deposition	Recirculating
Time (h) = 4.0000	Surfaces	Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	9.4899E+13
Organic I (atoms)	0.0000E+00	2.9350E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

	Pathway

Time (h) = 4.0000 Filtered Transported
Noble gases (atoms) 0.0000E+00 9.9707E+14
Elemental I (atoms) 2.4825E+15 2.5082E+13
Organic I (atoms) 7.6779E+13 7.7573E+11
Aerosols (kg) 0.0000E+00 0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Pathway
Time (h) = 4.0000 Filtered Transported
Noble gases (atoms) 0.0000E+00 1.8464E+14
Elemental I (atoms) 0.0000E+00 4.6437E+14
Organic I (atoms) 0.0000E+00 1.4362E+13
Aerosols (kg) 0.0000E+00 0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Pathway
Time (h) = 4.0000 Filtered Transported
Noble gases (atoms) 2.5180E+14 0.0000E+00
Elemental I (atoms) 2.2722E+14 0.0000E+00
Organic I (atoms) 7.0274E+12 0.0000E+00
Aerosols (kg) 0.0000E+00 0.0000E+00

EAB Doses:

Time (h) = 8.0000 Whole Body Thyroid TEDE
Delta dose (rem) 9.7159E-02 3.1318E+00 1.9470E-01
Accumulated dose (rem) 1.3242E-01 7.4966E+00 3.6734E-01

LPZ Doses:

Time (h) = 8.0000 Whole Body Thyroid TEDE
Delta dose (rem) 4.6610E-02 1.5024E+00 9.3403E-02
Accumulated dose (rem) 5.8803E-02 2.4006E+00 1.3382E-01

CR Doses:

Time (h) = 8.0000 Whole Body Thyroid TEDE
Delta dose (rem) 2.9516E-03 1.4395E+00 4.7802E-02
Accumulated dose (rem) 3.9244E-03 4.8472E+00 1.5571E-01

RB Compartment Nuclide Inventory:

Time (h) = 8.0000 Ci kg Atoms Decay
I-131 4.8851E+04 3.9404E-04 1.8114E+21 2.6817E+19
I-132 8.9975E+03 8.7167E-07 3.9768E+18 1.1785E+19
I-133 7.9806E+04 7.0450E-05 3.1899E+20 4.7309E+19
I-134 2.1399E+02 8.0217E-09 3.6051E+16 2.3268E+18
I-135 4.2553E+04 1.2117E-05 5.4052E+19 3.0686E+19
Xe-133 2.0650E+04 1.1032E-04 4.9952E+20 7.2696E+18
Xe-133m 1.4030E+03 3.1868E-06 1.4430E+19 4.9846E+17
Xe-135 1.5829E+05 6.1985E-05 2.7651E+20 6.3868E+19
Xe-135m 1.2395E+04 1.3616E-07 6.0738E+17 1.1239E+19

RB Transport Group Inventory:
Time (h) = 8.0000 Atmosphere Sump

Noble gases (atoms)	7.9106E+20	0.0000E+00	
Elemental I (atoms)	2.1228E+21	0.0000E+00	
Organic I (atoms)	6.5654E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.1545E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.3480E-06
Total I (Ci)			1.8042E+05

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 8.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 8.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.9458E+20
Elemental I (atoms)	1.1869E+21	1.1989E+19
Organic I (atoms)	3.6709E+19	3.7080E+17
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 8.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0790E+21
Elemental I (atoms)	3.0957E+22	3.4397E+21
Organic I (atoms)	9.5744E+20	1.0638E+20
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 8.0000	Ci	kg	Atoms	Bq
I-131	3.2506E+02	2.6220E-06	1.2053E+19	1.2027E+13
I-132	1.8494E+02	1.7917E-08	8.1742E+16	6.8429E+12
I-133	5.8677E+02	5.1798E-07	2.3454E+18	2.1711E+13
I-134	9.3921E+01	3.5207E-09	1.5823E+16	3.4751E+12
I-135	4.0623E+02	1.1567E-07	5.1600E+17	1.5031E+13
Xe-133	7.2957E+03	3.8977E-05	1.7648E+20	2.6994E+14
Xe-133m	4.9996E+02	1.1356E-06	5.1419E+18	1.8498E+13
Xe-135	6.3907E+04	2.5025E-05	1.1163E+20	2.3646E+15
Xe-135m	9.2331E+03	1.0143E-07	4.5245E+17	3.4162E+14

Environment Transport Group Inventory:

	Total	Release	
Time (h) = 8.0000	Release	Rate/s	
Noble gases (atoms)	2.9371E+20	1.0198E+16	
Elemental I (atoms)	1.4562E+19	5.0563E+14	
Organic I (atoms)	4.5037E+17	1.5638E+13	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci)	I-131 (Thyroid)		4.3569E+02

Dose Effective (Ci) I-131 (ICRP2 Thyroid) 5.2397E+02
Total I (Ci) 1.5969E+03

CR Filtered Intake Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.5229E+15
Elemental I (atoms)	2.7468E+15	2.7751E+13
Organic I (atoms)	8.4951E+13	8.5828E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5783E+15
Elemental I (atoms)	0.0000E+00	5.1380E+14
Organic I (atoms)	0.0000E+00	1.5891E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	3.4405E+15	0.0000E+00
Elemental I (atoms)	3.2321E+14	0.0000E+00
Organic I (atoms)	9.9961E+12	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.9458E+20
Elemental I (atoms)	1.1869E+21	1.1989E+19
Organic I (atoms)	3.6709E+19	3.7080E+17
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 8.0000	Ci	kg	Atoms	Decay
I-131	1.4655E-03	1.1821E-11	5.4342E+13	3.7122E+12
I-132	2.4089E-04	2.3338E-14	1.0647E+11	2.6416E+12
I-133	2.3947E-03	2.1139E-12	9.5717E+12	7.0116E+12
I-134	6.4212E-06	2.4070E-16	1.0817E+09	1.5576E+12
I-135	1.2769E-03	3.6359E-13	1.6219E+12	5.3648E+12
Xe-133	1.6248E-01	8.6801E-10	3.9303E+15	4.6430E+13

Xe-133m	1.0991E-02	2.4964E-11	1.1304E+14	3.1681E+12
Xe-135	1.2479E+00	4.8867E-10	2.1799E+15	4.0243E+14
Xe-135m	1.8324E-02	2.0128E-13	8.9790E+11	2.1354E+13

CR Transport Group Inventory:

Time (h) = 8.0000	Atmosphere	Sump	
Noble gases (atoms)	6.2241E+15	0.0000E+00	
Elemental I (atoms)	6.3674E+13	0.0000E+00	
Organic I (atoms)	1.9693E+12	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.7634E-13
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.0583E-13
Total I (Ci)			5.3844E-03

Time (h) = 8.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.3499E+14
Organic I (atoms)	0.0000E+00	4.1749E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.5229E+15
Elemental I (atoms)	2.7468E+15	2.7751E+13
Organic I (atoms)	8.4951E+13	8.5828E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5783E+15
Elemental I (atoms)	0.0000E+00	5.1380E+14
Organic I (atoms)	0.0000E+00	1.5891E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	3.4405E+15	0.0000E+00
Elemental I (atoms)	3.2321E+14	0.0000E+00
Organic I (atoms)	9.9961E+12	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 16.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.7847E-01	9.1560E+00	6.6205E-01
Accumulated dose (rem)	5.1089E-01	1.6653E+01	1.0294E+00

LPZ Doses:

Time (h) = 16.0000	Whole Body	Thyroid	TEDE

Delta dose (rem)	6.9173E-03	8.6063E-02	9.5829E-03
Accumulated dose (rem)	6.5720E-02	2.4866E+00	1.4340E-01

CR Doses:

Time (h) = 16.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.6750E-03	1.0075E+00	4.0897E-02
Accumulated dose (rem)	1.3599E-02	5.8546E+00	1.9660E-01

RB Compartment Nuclide Inventory:

Time (h) = 16.0000	Ci	kg	Atoms	Decay
I-131	6.6355E+04	5.3523E-04	2.4605E+21	9.0723E+19
I-132	1.1350E+03	1.0996E-07	5.0167E+17	1.6028E+19
I-133	8.5454E+04	7.5436E-05	3.4157E+20	1.3967E+20
I-134	5.3560E-01	2.0077E-11	9.0230E+13	2.3662E+18
I-135	2.5709E+04	7.3205E-06	3.2656E+19	6.8067E+19
Xe-133	6.0102E+04	3.2109E-04	1.4539E+21	5.1438E+19
Xe-133m	3.9264E+03	8.9186E-06	4.0383E+19	3.4335E+18
Xe-135	2.6140E+05	1.0236E-04	4.5661E+20	3.0966E+20
Xe-135m	1.3127E+04	1.4420E-07	6.4327E+17	2.1902E+19

RB Transport Group Inventory:

Time (h) = 16.0000	Atmosphere	Sump	
Noble gases (atoms)	1.9515E+21	0.0000E+00	
Elemental I (atoms)	2.7501E+21	0.0000E+00	
Organic I (atoms)	8.5056E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.4805E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.6634E-06
Total I (Ci)			1.7865E+05

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8289E+21
Elemental I (atoms)	3.9107E+21	3.9502E+19
Organic I (atoms)	1.2095E+20	1.2217E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.9341E+21
Elemental I (atoms)	6.3093E+22	7.0103E+21
Organic I (atoms)	1.9513E+21	2.1681E+20

Aerosols (kg) 0.0000E+00 0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 16.0000	Ci	kg	Atoms	Bq
I-131	9.7318E+02	7.8498E-06	3.6086E+19	3.6008E+13
I-132	2.2645E+02	2.1938E-08	1.0009E+17	8.3785E+12
I-133	1.5174E+03	1.3395E-06	6.0654E+18	5.6146E+13
I-134	9.4304E+01	3.5350E-09	1.5887E+16	3.4892E+12
I-135	7.7816E+02	2.2158E-07	9.8844E+17	2.8792E+13
Xe-133	5.1252E+04	2.7381E-04	1.2398E+21	1.8963E+15
Xe-133m	3.4131E+03	7.7525E-06	3.5103E+19	1.2628E+14
Xe-135	3.0512E+05	1.1948E-04	5.3298E+20	1.1289E+16
Xe-135m	1.5445E+04	1.6967E-07	7.5687E+17	5.7148E+14

Environment Transport Group Inventory:

Time (h) = 16.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.8086E+21	3.1400E+16
Elemental I (atoms)	4.1958E+19	7.2844E+14
Organic I (atoms)	1.2977E+18	2.2529E+13
Aerosols (kg)	0.0000E+00	0.0000E+00
Dose Effective (Ci) I-131 (Thyroid)		1.2497E+03
Dose Effective (Ci) I-131 (ICRP2 Thyroid)		1.4533E+03
Total I (Ci)		3.5895E+03

CR Filtered Intake Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4946E+16
Elemental I (atoms)	3.0383E+15	3.0696E+13
Organic I (atoms)	9.3968E+13	9.4936E+11
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.6196E+15
Elemental I (atoms)	0.0000E+00	5.6833E+14
Organic I (atoms)	0.0000E+00	1.7577E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 16.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.8059E+16	0.0000E+00
Elemental I (atoms)	3.9076E+14	0.0000E+00
Organic I (atoms)	1.2085E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Pathway

```
Time (h) =  16.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  7.5537E+16
Elemental I (atoms)    0.0000E+00  2.5888E+18
Organic I (atoms)      0.0000E+00  8.0065E+16
Aerosols (kg)          0.0000E+00  0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

                         Pathway
Time (h) =  16.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  1.8289E+21
Elemental I (atoms)    3.9107E+21  3.9502E+19
Organic I (atoms)      1.2095E+20  1.2217E+18
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) =  16.0000       Ci           kg         Atoms      Decay
I-131                  5.5041E-04  4.4397E-12  2.0410E+13  4.5404E+12
I-132                  9.2503E-06  8.9616E-16  4.0885E+09  2.7060E+12
I-133                  7.0887E-04  6.2576E-13  2.8334E+12  8.2400E+12
I-134                  4.4429E-09  1.6655E-19  7.4848E+05  1.5584E+12
I-135                  2.1326E-04  6.0726E-14  2.7089E+11  5.8938E+12
Xe-133                 2.9463E-01  1.5741E-09  7.1272E+15  2.7323E+14
Xe-133m                1.9093E-02  4.3368E-11  1.9637E+14  1.8144E+13
Xe-135                 1.2815E+00  5.0183E-10  2.2386E+15  1.6845E+15
Xe-135m                2.5838E-03  2.8383E-14  1.2661E+11  3.1102E+13

CR Transport Group Inventory:
Time (h) =  16.0000    Atmosphere     Sump
Noble gases (atoms)    9.5623E+15  0.0000E+00
Elemental I (atoms)    2.2812E+13  0.0000E+00
Organic I (atoms)      7.0554E+11  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)          6.2531E-14
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)    7.0256E-14
Total I (Ci)                                    1.4818E-03

                       Deposition Recirculating
Time (h) =  16.0000     Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  1.6320E+14
Organic I (atoms)      0.0000E+00  5.0475E+12
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Filtered Intake Transport Group Inventory:

                         Pathway
Time (h) =  16.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  2.4946E+16
Elemental I (atoms)    3.0383E+15  3.0696E+13
Organic I (atoms)      9.3968E+13  9.4936E+11
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

                         Pathway
```

Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.6196E+15
Elemental I (atoms)	0.0000E+00	5.6833E+14
Organic I (atoms)	0.0000E+00	1.7577E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 16.0000	Filtered	Transported
Noble gases (atoms)	1.8059E+16	0.0000E+00
Elemental I (atoms)	3.9076E+14	0.0000E+00
Organic I (atoms)	1.2085E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.3209E-01	1.0044E+01	7.4183E-01
Accumulated dose (rem)	9.4298E-01	2.6697E+01	1.7712E+00

LPZ Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.8974E-03	9.4411E-02	1.0809E-02
Accumulated dose (rem)	7.3618E-02	2.5811E+00	1.5421E-01

CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1281E-02	6.5853E-01	3.1589E-02
Accumulated dose (rem)	2.4880E-02	6.5131E+00	2.2819E-01

RB Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
I-131	6.9329E+04	5.5922E-04	2.5708E+21	1.6401E+20
I-132	1.0965E+02	1.0623E-08	4.8463E+16	1.6503E+19
I-133	7.0384E+04	6.2132E-05	2.8133E+20	2.2362E+20
I-134	1.0311E-03	3.8653E-14	1.7371E+11	2.3663E+18
I-135	1.1947E+04	3.4020E-06	1.5176E+19	8.7481E+19
Xe-133	9.4329E+04	5.0394E-04	2.2818E+21	1.3646E+20
Xe-133m	5.9316E+03	1.3473E-05	6.1005E+19	8.8821E+18
Xe-135	2.3428E+05	9.1739E-05	4.0923E+20	5.8712E+20
Xe-135m	6.0517E+03	6.6479E-08	2.9655E+17	2.9421E+19

RB Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump	
Noble gases (atoms)	2.7523E+21	0.0000E+00	
Elemental I (atoms)	2.7813E+21	0.0000E+00	
Organic I (atoms)	8.6020E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.4816E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.6227E-06
Total I (Ci)			1.5177E+05

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.4386E+21
Elemental I (atoms)	6.9288E+21	6.9988E+19
Organic I (atoms)	2.1429E+20	2.1646E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.6038E+21
Elemental I (atoms)	9.2357E+22	1.0262E+22
Organic I (atoms)	2.8564E+21	3.1738E+20
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 24.0000	Ci	kg	Atoms	Bq
I-131	1.7173E+03	1.3852E-05	6.3680E+19	6.3541E+13
I-132	2.3058E+02	2.2338E-08	1.0191E+17	8.5314E+12
I-133	2.3570E+03	2.0807E-06	9.4213E+18	8.7211E+13
I-134	9.4304E+01	3.5351E-09	1.5887E+16	3.4893E+12
I-135	9.6538E+02	2.7489E-07	1.2263E+18	3.5719E+13
Xe-133	1.3566E+05	7.2472E-04	3.2815E+21	5.0192E+15
Xe-133m	8.7934E+03	1.9973E-05	9.0438E+19	3.2535E+14
Xe-135	5.7110E+05	2.2364E-04	9.9760E+20	2.1131E+16
Xe-135m	1.6620E+04	1.8257E-07	8.1442E+17	6.1494E+14

Environment Transport Group Inventory:

Time (h) = 24.0000	Total Release	Release Rate/s	
Noble gases (atoms)	4.3704E+21	5.0583E+16	
Elemental I (atoms)	7.2212E+19	8.3578E+14	
Organic I (atoms)	2.2334E+18	2.5849E+13	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci) I-131 (Thyroid)			2.1391E+03
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			2.4376E+03
Total I (Ci)			5.3646E+03

CR Filtered Intake Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.2879E+16
Elemental I (atoms)	3.3613E+15	3.3959E+13

Organic I (atoms)	1.0396E+14	1.0503E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

	Pathway	
Time (h) = 24.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.7924E+15
Elemental I (atoms)	0.0000E+00	6.2876E+14
Organic I (atoms)	0.0000E+00	1.9446E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 24.0000	Filtered	Transported
Noble gases (atoms)	4.3502E+16	0.0000E+00
Elemental I (atoms)	4.3542E+14	0.0000E+00
Organic I (atoms)	1.3467E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 24.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 24.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.4386E+21
Elemental I (atoms)	6.9288E+21	6.9988E+19
Organic I (atoms)	2.1429E+20	2.1646E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
I-131	5.4415E-04	4.3892E-12	2.0177E+13	5.1184E+12
I-132	8.5950E-07	8.3268E-17	3.7989E+08	2.7097E+12
I-133	5.5243E-04	4.8766E-13	2.2081E+12	8.9025E+12
I-135	9.3771E-05	2.6701E-14	1.1911E+11	6.0473E+12
Xe-133	5.2475E-01	2.8034E-09	1.2694E+16	7.2646E+14
Xe-133m	3.2685E-02	7.4242E-11	3.3616E+14	4.6933E+13
Xe-135	1.3006E+00	5.0931E-10	2.2719E+15	3.1543E+15
Xe-135m	1.1664E-03	1.2813E-14	5.7158E+10	4.0276E+13

CR Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump
Noble gases (atoms)	1.5302E+16	0.0000E+00
Elemental I (atoms)	2.1830E+13	0.0000E+00
Organic I (atoms)	6.7515E+11	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

```
Dose Effective (Ci/cc) I-131 (Thyroid)         5.9211E-14
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   6.4850E-14
Total I (Ci)                                   1.1912E-03

                        Deposition Recirculating
Time (h) =  24.0000      Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  1.8186E+14
Organic I (atoms)      0.0000E+00  5.6244E+12
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Filtered Intake Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  5.2879E+16
Elemental I (atoms)    3.3613E+15  3.3959E+13
Organic I (atoms)      1.0396E+14  1.0503E+12
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  9.7924E+15
Elemental I (atoms)    0.0000E+00  6.2876E+14
Organic I (atoms)      0.0000E+00  1.9446E+13
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    4.3502E+16  0.0000E+00
Elemental I (atoms)    4.3542E+14  0.0000E+00
Organic I (atoms)      1.3467E+13  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00

EAB Doses:

Time (h) =  48.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.3741E-01  2.7208E+01  1.5724E+00
Accumulated dose (rem)  1.6804E+00  5.3905E+01  3.3436E+00

LPZ Doses:

Time (h) =  48.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.7548E-03  1.3953E-01  1.0037E-02
Accumulated dose (rem)  7.9372E-02  2.7206E+00  1.6425E-01

CR Doses:

Time (h) =  48.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0690E-02  8.0809E-01  3.5491E-02
Accumulated dose (rem)  3.5571E-02  7.3212E+00  2.6368E-01

RB Compartment Nuclide Inventory:
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Time (h) = 48.0000	Ci	kg	Atoms	Decay
I-131	6.1404E+04	4.9529E-04	2.2769E+21	3.7488E+20
I-132	7.6521E-02	7.4133E-12	3.3821E+13	1.6551E+19
I-133	3.0539E+04	2.6959E-05	1.2207E+20	3.7782E+20
I-135	9.3109E+02	2.6513E-07	1.1827E+18	1.0143E+20
Xe-133	1.4497E+05	7.7448E-04	3.5068E+21	5.4137E+20
Xe-133m	8.0946E+03	1.8386E-05	8.3251E+19	3.2848E+19
Xe-135	6.5969E+04	2.5833E-05	1.1524E+20	1.0456E+21
Xe-135m	4.6980E+02	5.1608E-09	2.3022E+16	3.4625E+19

RB Transport Group Inventory:

Time (h) = 48.0000	Atmosphere	Sump	
Noble gases (atoms)	3.7053E+21	0.0000E+00	
Elemental I (atoms)	2.3281E+21	0.0000E+00	
Organic I (atoms)	7.2004E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.2108E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.2678E-06
Total I (Ci)			9.2874E+04

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5468E+22
Elemental I (atoms)	1.5253E+22	1.5407E+20
Organic I (atoms)	4.7174E+20	4.7650E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 48.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0281E+22
Elemental I (atoms)	1.6726E+23	1.8584E+22
Organic I (atoms)	5.1730E+21	5.7478E+20
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 48.0000	Ci	kg	Atoms	Bq
I-131	3.8693E+03	3.1211E-05	1.4348E+20	1.4317E+14
I-132	2.3100E+02	2.2380E-08	1.0210E+17	8.5472E+12
I-133	3.9072E+03	3.4491E-06	1.5617E+19	1.4457E+14
I-134	9.4304E+01	3.5351E-09	1.5887E+16	3.4893E+12
I-135	1.1006E+03	3.1340E-07	1.3980E+18	4.0723E+13
Xe-133	5.4437E+05	2.9082E-03	1.3168E+22	2.0142E+16

Xe-133m	3.2855E+04	7.4626E-05	3.3790E+20	1.2156E+15
Xe-135	1.0170E+06	3.9824E-04	1.7765E+21	3.7629E+16
Xe-135m	1.7445E+04	1.9164E-07	8.5486E+17	6.4547E+14

Environment Transport Group Inventory:

Time (h) = 48.0000	Total Release	Release Rate/s	
Noble gases (atoms)	1.5284E+22	8.8447E+16	
Elemental I (atoms)	1.5579E+20	9.0157E+14	
Organic I (atoms)	4.8183E+18	2.7884E+13	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci) I-131 (Thyroid)			4.5530E+03
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			5.0152E+03
Total I (Ci)			9.2024E+03

CR Filtered Intake Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3720E+17
Elemental I (atoms)	3.9978E+15	4.0387E+13
Organic I (atoms)	1.2364E+14	1.2491E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.5408E+16
Elemental I (atoms)	0.0000E+00	7.4781E+14
Organic I (atoms)	0.0000E+00	2.3128E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.3756E+17	0.0000E+00
Elemental I (atoms)	5.2837E+14	0.0000E+00
Organic I (atoms)	1.6341E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5468E+22

Elemental I (atoms)	1.5253E+22	1.5407E+20
Organic I (atoms)	4.7174E+20	4.7650E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 48.0000	Ci	kg	Atoms	Decay
I-131	3.5208E-04	2.8399E-12	1.3055E+13	6.3671E+12
I-132	4.3875E-10	4.2506E-20	1.9392E+05	2.7100E+12
I-133	1.7511E-04	1.5458E-13	6.9991E+11	9.8244E+12
I-135	5.3387E-06	1.5202E-15	6.7814E+09	6.1328E+12
Xe-133	6.7330E-01	3.5971E-09	1.6287E+16	2.5874E+15
Xe-133m	3.7223E-02	8.4548E-11	3.8283E+14	1.5600E+14
Xe-135	3.0630E-01	1.1994E-10	5.3504E+14	5.2760E+15
Xe-135m	6.3922E-05	7.0218E-16	3.1323E+09	4.4883E+13

CR Transport Group Inventory:

Time (h) = 48.0000	Atmosphere	Sump	
Noble gases (atoms)	1.7205E+16	0.0000E+00	
Elemental I (atoms)	1.3349E+13	0.0000E+00	
Organic I (atoms)	4.1286E+11	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.5350E-14
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.7014E-14
Total I (Ci)			5.3253E-04

Time (h) = 48.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	2.2068E+14
Organic I (atoms)	0.0000E+00	6.8250E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3720E+17
Elemental I (atoms)	3.9978E+15	4.0387E+13
Organic I (atoms)	1.2364E+14	1.2491E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.5408E+16
Elemental I (atoms)	0.0000E+00	7.4781E+14
Organic I (atoms)	0.0000E+00	2.3128E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 48.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.3756E+17	0.0000E+00
Elemental I (atoms)	5.2837E+14	0.0000E+00

Organic I (atoms)	1.6341E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.4824E-01	4.0023E+01	1.5704E+00
Accumulated dose (rem)	2.0286E+00	9.3928E+01	4.9140E+00

LPZ Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.7177E-03	2.0525E-01	8.9856E-03
Accumulated dose (rem)	8.2090E-02	2.9258E+00	1.7323E-01

CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.2624E-03	1.1417E+00	4.0126E-02
Accumulated dose (rem)	4.0833E-02	8.4629E+00	3.0381E-01

RB Compartment Nuclide Inventory:

Time (h) = 96.0000	Ci	kg	Atoms	Decay
I-131	4.3920E+04	3.5427E-04	1.6286E+21	7.0813E+20
I-132	3.3945E-08	3.2886E-18	1.5003E+07	1.6551E+19
I-133	5.2423E+03	4.6277E-06	2.0954E+19	4.6951E+20
I-135	5.1564E+00	1.4683E-09	6.5498E+15	1.0257E+20
Xe-133	1.3144E+05	7.0221E-04	3.1796E+21	1.4640E+21
Xe-133m	5.5805E+03	1.2676E-05	5.7394E+19	7.8256E+19
Xe-135	1.9774E+03	7.7434E-07	3.4542E+18	1.1673E+21
Xe-135m	2.6014E+00	2.8576E-11	1.2747E+14	3.5044E+19

RB Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump	
Noble gases (atoms)	3.2404E+21	0.0000E+00	
Elemental I (atoms)	1.6001E+21	0.0000E+00	
Organic I (atoms)	4.9487E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		8.1539E-07
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		8.2502E-07
Total I (Ci)			4.9168E+04

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.9006E+22

Elemental I (atoms)	2.7786E+22	2.8067E+20
Organic I (atoms)	8.5937E+20	8.6805E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.4306E+22
Elemental I (atoms)	2.7837E+23	3.0930E+22
Organic I (atoms)	8.6094E+21	9.5659E+20
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 96.0000	Ci	kg	Atoms	Bq
I-131	7.2736E+03	5.8670E-05	2.6971E+20	2.6912E+14
I-132	2.3100E+02	2.2380E-08	1.0210E+17	8.5472E+12
I-133	4.8300E+03	4.2637E-06	1.9306E+19	1.7871E+14
I-134	9.4304E+01	3.5351E-09	1.5887E+16	3.4893E+12
I-135	1.1117E+03	3.1655E-07	1.4121E+18	4.1132E+13
Xe-133	1.4834E+06	7.9248E-03	3.5883E+22	5.4885E+16
Xe-133m	7.8840E+04	1.7908E-04	8.1085E+20	2.9171E+15
Xe-135	1.1364E+06	4.4499E-04	1.9850E+21	4.2046E+16
Xe-135m	1.7512E+04	1.9237E-07	8.5814E+17	6.4795E+14

Environment Transport Group Inventory:

Time (h) = 96.0000	Total Release	Release Rate/s	
Noble gases (atoms)	3.8679E+22	1.1192E+17	
Elemental I (atoms)	2.8183E+20	8.1548E+14	
Organic I (atoms)	8.7164E+18	2.5221E+13	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci) I-131 (Thyroid)			8.1112E+03
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			8.6672E+03
Total I (Ci)			1.3541E+04

CR Filtered Intake Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.1716E+17
Elemental I (atoms)	4.9560E+15	5.0067E+13
Organic I (atoms)	1.5328E+14	1.5485E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.8734E+16
Elemental I (atoms)	0.0000E+00	9.2706E+14
Organic I (atoms)	0.0000E+00	2.8672E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

	Pathway Filtered	Transported
Time (h) = 96.0000		
Noble gases (atoms)	3.4715E+17	0.0000E+00
Elemental I (atoms)	6.6290E+14	0.0000E+00
Organic I (atoms)	2.0502E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway Filtered	Transported
Time (h) = 96.0000		
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway Filtered	Transported
Time (h) = 96.0000		
Noble gases (atoms)	0.0000E+00	3.9006E+22
Elemental I (atoms)	2.7786E+22	2.8067E+20
Organic I (atoms)	8.5937E+20	8.6805E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 96.0000	Ci	kg	Atoms	Decay
I-131	2.5211E-04	2.0336E-12	9.3485E+12	8.2797E+12
I-133	3.0092E-05	2.6564E-14	1.2028E+11	1.0351E+13
I-135	2.9599E-08	8.4283E-18	3.7597E+07	6.1394E+12
Xe-133	6.4411E-01	3.4411E-09	1.5581E+16	7.0294E+15
Xe-133m	2.7176E-02	6.1729E-11	2.7950E+14	3.7264E+14
Xe-135	9.6924E-03	3.7954E-12	1.6931E+13	5.8548E+15
Xe-135m	3.5377E-07	3.8862E-18	1.7336E+07	4.5255E+13

CR Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump	
Noble gases (atoms)	1.5877E+16	0.0000E+00	
Elemental I (atoms)	9.1848E+12	0.0000E+00	
Organic I (atoms)	2.8407E+11	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.3833E-14
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.4114E-14
Total I (Ci)			2.8224E-04

Time (h) = 96.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	2.7686E+14
Organic I (atoms)	0.0000E+00	8.5628E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

Pathway

Time (h) = 96.0000 Filtered Transported
Noble gases (atoms) 0.0000E+00 3.1716E+17
Elemental I (atoms) 4.9560E+15 5.0067E+13
Organic I (atoms) 1.5328E+14 1.5485E+12
Aerosols (kg) 0.0000E+00 0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Pathway
Time (h) = 96.0000 Filtered Transported
Noble gases (atoms) 0.0000E+00 5.8734E+16
Elemental I (atoms) 0.0000E+00 9.2706E+14
Organic I (atoms) 0.0000E+00 2.8672E+13
Aerosols (kg) 0.0000E+00 0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Pathway
Time (h) = 96.0000 Filtered Transported
Noble gases (atoms) 3.4715E+17 0.0000E+00
Elemental I (atoms) 6.6290E+14 0.0000E+00
Organic I (atoms) 2.0502E+13 0.0000E+00
Aerosols (kg) 0.0000E+00 0.0000E+00

EAB Doses:

Time (h) = 240.0000 Whole Body Thyroid TEDE
Delta dose (rem) 2.9001E-01 6.1084E+01 2.1505E+00
Accumulated dose (rem) 2.3186E+00 1.5501E+02 7.0645E+00

LPZ Doses:

Time (h) = 240.0000 Whole Body Thyroid TEDE
Delta dose (rem) 7.4952E-04 1.0374E-01 3.9093E-03
Accumulated dose (rem) 8.2840E-02 3.0296E+00 1.7714E-01

CR Doses:

Time (h) = 240.0000 Whole Body Thyroid TEDE
Delta dose (rem) 2.2511E-03 8.6455E-01 2.8583E-02
Accumulated dose (rem) 4.3084E-02 9.3274E+00 3.3239E-01

RB Compartment Nuclide Inventory:

Time (h) = 240.0000 Ci kg Atoms Decay
I-131 1.5977E+04 1.2887E-04 5.9243E+20 1.2372E+21
I-133 2.6360E+01 2.3269E-08 1.0536E+17 4.8838E+20
I-135 8.7062E-07 2.4791E-16 1.1059E+09 1.0258E+20
Xe-133 4.0584E+04 2.1681E-04 9.8172E+20 2.9866E+21
Xe-133m 6.2970E+02 1.4303E-06 6.4764E+18 1.2359E+20
Xe-135 2.2417E-02 8.7783E-12 3.9159E+13 1.1707E+21
Xe-135m 4.3922E-07 4.8249E-18 2.1523E+07 3.5047E+19

RB Transport Group Inventory:
Time (h) = 240.0000 Atmosphere Sump
Noble gases (atoms) 9.8820E+20 0.0000E+00
Elemental I (atoms) 5.7476E+20 0.0000E+00
Organic I (atoms) 1.7776E+19 0.0000E+00
Aerosols (kg) 0.0000E+00 0.0000E+00

Dose Effective (Ci/cc) I-131 (Thyroid) 2.9091E-07
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid) 2.9096E-07
Total I (Ci) 1.6003E+04

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.7276E+22
Elemental I (atoms)	4.7178E+22	4.7655E+20
Organic I (atoms)	1.4591E+21	1.4739E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.1832E+22
Elemental I (atoms)	4.5021E+23	5.0024E+22
Organic I (atoms)	1.3924E+22	1.5471E+21
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 240.0000	Ci	kg	Atoms	Bq
I-131	1.2679E+04	1.0227E-04	4.7014E+20	4.6912E+14
I-132	2.3100E+02	2.2380E-08	1.0210E+17	8.5472E+12
I-133	5.0199E+03	4.4314E-06	2.0065E+19	1.8574E+14
I-134	9.4304E+01	3.5351E-09	1.5887E+16	3.4893E+12
I-135	1.1117E+03	3.1656E-07	1.4121E+18	4.1134E+13
Xe-133	3.0370E+06	1.6225E-02	7.3466E+22	1.1237E+17
Xe-133m	1.2490E+05	2.8369E-04	1.2845E+21	4.6212E+15
Xe-135	1.1397E+06	4.4630E-04	1.9909E+21	4.2170E+16
Xe-135m	1.7512E+04	1.9238E-07	8.5816E+17	6.4796E+14

Environment Transport Group Inventory:

Time (h) = 240.0000	Total Release	Release Rate/s
Noble gases (atoms)	7.6742E+22	8.8822E+16
Elemental I (atoms)	4.7698E+20	5.5206E+14
Organic I (atoms)	1.4752E+19	1.7074E+13
Aerosols (kg)	0.0000E+00	0.0000E+00
Dose Effective (Ci) I-131 (Thyroid)		1.3548E+04
Dose Effective (Ci) I-131 (ICRP2 Thyroid)		1.4123E+04
Total I (Ci)		1.9136E+04

CR Filtered Intake Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.3247E+17
Elemental I (atoms)	6.0470E+15	6.1087E+13
Organic I (atoms)	1.8702E+14	1.8893E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.8605E+16
Elemental I (atoms)	0.0000E+00	1.1311E+15
Organic I (atoms)	0.0000E+00	3.4983E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	6.0896E+17	0.0000E+00
Elemental I (atoms)	8.1778E+14	0.0000E+00
Organic I (atoms)	2.5292E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.7276E+22
Elemental I (atoms)	4.7178E+22	4.7655E+20
Organic I (atoms)	1.4591E+21	1.4739E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 240.0000	Ci	kg	Atoms	Decay
I-131	6.7484E-05	5.4434E-13	2.5023E+12	1.0535E+13
I-133	1.1134E-07	9.8287E-17	4.4504E+08	1.0433E+13
Xe-133	1.4813E-01	7.9138E-10	3.5833E+15	1.2645E+16
Xe-133m	2.2970E-03	5.2175E-12	2.3624E+13	5.4001E+14
Xe-135	8.1826E-08	3.2042E-17	1.4293E+08	5.8679E+15

CR Transport Group Inventory:

Time (h) = 240.0000	Atmosphere	Sump
Noble gases (atoms)	3.6069E+15	0.0000E+00
Elemental I (atoms)	2.4277E+12	0.0000E+00

```
Organic I (atoms)      7.5084E+10  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)         6.2568E-15
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   6.2578E-15
Total I (Ci)                                   6.7595E-05

                       Deposition Recirculating
Time (h) = 240.0000     Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  3.4155E+14
Organic I (atoms)      0.0000E+00  1.0563E+13
Aerosols (kg)          0.0000E+00  0.0000E+00
```

CR Filtered Intake Transport Group Inventory:

```
                         Pathway
Time (h) = 240.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  5.3247E+17
Elemental I (atoms)    6.0470E+15  6.1087E+13
Organic I (atoms)      1.8702E+14  1.8893E+12
Aerosols (kg)          0.0000E+00  0.0000E+00
```

CR Unfiltered Inleakage Transport Group Inventory:

```
                         Pathway
Time (h) = 240.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  9.8605E+16
Elemental I (atoms)    0.0000E+00  1.1311E+15
Organic I (atoms)      0.0000E+00  3.4983E+13
Aerosols (kg)          0.0000E+00  0.0000E+00
```

CR Exhaust to Environment Transport Group Inventory:

```
                         Pathway
Time (h) = 240.0000     Filtered   Transported
Noble gases (atoms)    6.0896E+17  0.0000E+00
Elemental I (atoms)    8.1778E+14  0.0000E+00
Organic I (atoms)      2.5292E+13  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00
```

EAB Doses:

```
Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.9825E-02  2.8282E+01  9.6088E-01
Accumulated dose (rem)  2.4185E+00  1.8329E+02  8.0254E+00
```

LPZ Doses:

```
Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.5799E-04  4.8033E-02  1.7204E-03
Accumulated dose (rem)  8.3098E-02  3.0776E+00  1.7886E-01
```

CR Doses:

```
Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.5700E-04  3.9584E-01  1.2809E-02
Accumulated dose (rem)  4.3841E-02  9.7233E+00  3.4520E-01
```

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RB Compartment Nuclide Inventory:

Time (h) = 480.0000	Ci	kg	Atoms	Decay
I-131	2.9616E+03	2.3889E-05	1.0982E+20	1.4837E+21
I-133	3.8902E-03	3.4341E-12	1.5549E+13	4.8847E+20
Xe-133	4.8052E+03	2.5671E-05	1.1624E+20	3.5228E+21
Xe-133m	1.2462E+01	2.8307E-08	1.2817E+17	1.2863E+20
Xe-135	1.1108E-10	4.3499E-20	1.9404E+05	1.1707E+21

RB Transport Group Inventory:

Time (h) = 480.0000	Atmosphere	Sump	
Noble gases (atoms)	1.1637E+20	0.0000E+00	
Elemental I (atoms)	1.0652E+20	0.0000E+00	
Organic I (atoms)	3.2945E+18	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		5.3911E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		5.3912E-08
Total I (Ci)			2.9616E+03

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.0640E+22
Elemental I (atoms)	5.6175E+22	5.6743E+20
Organic I (atoms)	1.7374E+21	1.7549E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 480.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.4859E+22
Elemental I (atoms)	5.2995E+23	5.8883E+22
Organic I (atoms)	1.6390E+22	1.8211E+21
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 480.0000	Ci	kg	Atoms	Bq
I-131	1.5196E+04	1.2258E-04	5.6349E+20	5.6227E+14
I-132	2.3100E+02	2.2380E-08	1.0210E+17	8.5472E+12
I-133	5.0209E+03	4.4322E-06	2.0069E+19	1.8577E+14
I-134	9.4304E+01	3.5351E-09	1.5887E+16	3.4893E+12
I-135	1.1117E+03	3.1656E-07	1.4121E+18	4.1134E+13
Xe-133	3.5843E+06	1.9149E-02	8.6704E+22	1.3262E+17
Xe-133m	1.3002E+05	2.9533E-04	1.3372E+21	4.8107E+15

Xe-135	1.1397E+06	4.4630E-04	1.9909E+21	4.2170E+16
Xe-135m	1.7512E+04	1.9238E-07	8.5816E+17	6.4796E+14

Environment Transport Group Inventory:

Time (h) = 480.0000	Total Release	Release Rate/s	
Noble gases (atoms)	9.0033E+22	5.2102E+16	
Elemental I (atoms)	5.6754E+20	3.2844E+14	
Organic I (atoms)	1.7553E+19	1.0158E+13	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci) I-131 (Thyroid)			1.6066E+04
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.6641E+04
Total I (Ci)			2.1654E+04

CR Filtered Intake Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.0765E+17
Elemental I (atoms)	6.5532E+15	6.6199E+13
Organic I (atoms)	2.0267E+14	2.0474E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1253E+17
Elemental I (atoms)	0.0000E+00	1.2258E+15
Organic I (atoms)	0.0000E+00	3.7912E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	6.9929E+17	0.0000E+00
Elemental I (atoms)	8.8886E+14	0.0000E+00
Organic I (atoms)	2.7491E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.0640E+22
Elemental I (atoms)	5.6175E+22	5.6743E+20

```
Organic I (atoms)      1.7374E+21  1.7549E+19
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 480.0000       Ci            kg          Atoms       Decay
I-131                  1.2509E-05  1.0090E-13  4.6386E+11  1.1576E+13
I-133                  1.6432E-11  1.4505E-20  6.5679E+04  1.0433E+13
Xe-133                 1.7543E-02  9.3719E-11  4.2435E+14  1.4602E+16
Xe-133m                4.5496E-05  1.0334E-13  4.6792E+11  5.5839E+14

CR Transport Group Inventory:
Time (h) = 480.0000    Atmosphere     Sump
Noble gases (atoms)    4.2482E+14  0.0000E+00
Elemental I (atoms)    4.4994E+11  0.0000E+00
Organic I (atoms)      1.3916E+10  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)          1.1595E-15
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)    1.1595E-15
Total I (Ci)                                    1.2509E-05

                       Deposition Recirculating
Time (h) = 480.0000     Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  3.7124E+14
Organic I (atoms)      0.0000E+00  1.1482E+13
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Filtered Intake Transport Group Inventory:

                         Pathway
Time (h) = 480.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  6.0765E+17
Elemental I (atoms)    6.5532E+15  6.6199E+13
Organic I (atoms)      2.0267E+14  2.0474E+12
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

                         Pathway
Time (h) = 480.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  1.1253E+17
Elemental I (atoms)    0.0000E+00  1.2258E+15
Organic I (atoms)      0.0000E+00  3.7912E+13
Aerosols (kg)          0.0000E+00  0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

                         Pathway
Time (h) = 480.0000     Filtered   Transported
Noble gases (atoms)    6.9929E+17  0.0000E+00
Elemental I (atoms)    8.8886E+14  0.0000E+00
Organic I (atoms)      2.7491E+13  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00
EAB Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
```

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Delta dose (rem)	1.2025E-02	5.2423E+00	1.7163E-01
Accumulated dose (rem)	2.4305E+00	1.8854E+02	8.1970E+00

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.1078E-05	8.9033E-03	3.0214E-04
Accumulated dose (rem)	8.3129E-02	3.0865E+00	1.7917E-01

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	8.8903E-05	7.3372E-02	2.3227E-03
Accumulated dose (rem)	4.3930E-02	9.7967E+00	3.4753E-01

RB Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
I-131	5.4899E+02	4.4282E-06	2.0357E+19	1.5294E+21
I-133	5.7412E-07	5.0681E-16	2.2948E+09	4.8847E+20
Xe-133	5.6354E+02	3.0106E-06	1.3632E+19	3.5860E+21
Xe-133m	2.4444E-01	5.5522E-10	2.5140E+15	1.2873E+20

RB Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump	
Noble gases (atoms)	1.3634E+19	0.0000E+00	
Elemental I (atoms)	1.9746E+19	0.0000E+00	
Organic I (atoms)	6.1071E+17	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		9.9935E-09
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		9.9935E-09
Total I (Ci)			5.4899E+02

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.2209E+22
Elemental I (atoms)	5.7843E+22	5.8427E+20
Organic I (atoms)	1.7890E+21	1.8070E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.6389E+22
Elemental I (atoms)	5.4472E+23	6.0525E+22

Organic I (atoms)	1.6847E+22	1.8719E+21
Aerosols (kg)	0.0000E+00	0.0000E+00

Environment Integral Nuclide Release:

Time (h) = 720.0000	Ci	kg	Atoms	Bq
I-131	1.5663E+04	1.2634E-04	5.8080E+20	5.7953E+14
I-132	2.3100E+02	2.2380E-08	1.0210E+17	8.5472E+12
I-133	5.0209E+03	4.4322E-06	2.0069E+19	1.8577E+14
I-134	9.4304E+01	3.5351E-09	1.5887E+16	3.4893E+12
I-135	1.1117E+03	3.1656E-07	1.4121E+18	4.1134E+13
Xe-133	3.6488E+06	1.9493E-02	8.8263E+22	1.3500E+17
Xe-133m	1.3012E+05	2.9555E-04	1.3382E+21	4.8144E+15
Xe-135	1.1397E+06	4.4630E-04	1.9909E+21	4.2170E+16
Xe-135m	1.7512E+04	1.9238E-07	8.5816E+17	6.4796E+14

Environment Transport Group Inventory:

Time (h) = 720.0000	Total Release	Release Rate/s	
Noble gases (atoms)	9.1593E+22	3.5337E+16	
Elemental I (atoms)	5.8432E+20	2.2543E+14	
Organic I (atoms)	1.8072E+19	6.9722E+12	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci) I-131 (Thyroid)			1.6532E+04
Dose Effective (Ci) I-131 (ICRP2 Thyroid)			1.7108E+04
Total I (Ci)			2.2121E+04

CR Filtered Intake Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.1648E+17
Elemental I (atoms)	6.6470E+15	6.7147E+13
Organic I (atoms)	2.0558E+14	2.0767E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1416E+17
Elemental I (atoms)	0.0000E+00	1.2434E+15
Organic I (atoms)	0.0000E+00	3.8454E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	7.0990E+17	0.0000E+00
Elemental I (atoms)	9.0204E+14	0.0000E+00
Organic I (atoms)	2.7898E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Drawdown Release to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.2209E+22
Elemental I (atoms)	5.7843E+22	5.8427E+20
Organic I (atoms)	1.7890E+21	1.8070E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
I-131	2.3189E-06	1.8704E-14	8.5985E+10	1.1769E+13
Xe-133	2.0573E-03	1.0991E-11	4.9767E+13	1.4833E+16
Xe-133m	8.9238E-07	2.0270E-15	9.1779E+09	5.5875E+14

CR Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump	
Noble gases (atoms)	4.9776E+13	0.0000E+00	
Elemental I (atoms)	8.3405E+10	0.0000E+00	
Organic I (atoms)	2.5795E+09	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.1493E-16
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.1493E-16
Total I (Ci)			2.3189E-06

Time (h) = 720.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	3.7674E+14
Organic I (atoms)	0.0000E+00	1.1652E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Filtered Intake Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.1648E+17
Elemental I (atoms)	6.6470E+15	6.7147E+13
Organic I (atoms)	2.0558E+14	2.0767E+12
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Unfiltered Inleakage Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1416E+17
Elemental I (atoms)	0.0000E+00	1.2434E+15
Organic I (atoms)	0.0000E+00	3.8454E+13
Aerosols (kg)	0.0000E+00	0.0000E+00

CR Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	7.0990E+17	0.0000E+00
Elemental I (atoms)	9.0204E+14	0.0000E+00
Organic I (atoms)	2.7898E+13	0.0000E+00
Aerosols (kg)	0.0000E+00	0.0000E+00

##
I-131 Summary
##

	Pool	RB	Environment
Time (hr)	I-131 (Curies)	I-131 (Curies)	I-131 (Curies)
0.000	6.1457E+03	5.8560E-04	8.9550E-09
0.017	1.8472E+05	5.2887E-01	2.4314E-04
0.270	2.9827E+06	1.3713E+02	1.0213E+00
0.500	5.5172E+06	4.6681E+02	6.4503E+00
0.750	1.0104E+07	1.1203E+03	2.2180E+01
1.000	1.4679E+07	2.1485E+03	5.5284E+01
1.400	2.1975E+07	4.4825E+03	5.7049E+01
1.700	2.7428E+07	6.7901E+03	5.9334E+01
2.000	3.2865E+07	9.5518E+03	6.2654E+01
2.300	3.2796E+07	1.2469E+04	6.7152E+01
2.600	3.2727E+07	1.5259E+04	7.2815E+01
2.900	3.2658E+07	1.7927E+04	7.9592E+01
3.200	3.2589E+07	2.0480E+04	8.7435E+01
3.500	3.2520E+07	2.2920E+04	9.6296E+01
3.800	3.2452E+07	2.5254E+04	1.0613E+02
4.000	3.2406E+07	2.6752E+04	1.1321E+02
4.300	3.2338E+07	2.8917E+04	1.2457E+02
4.600	3.2270E+07	3.0986E+04	1.3680E+02
4.900	3.2202E+07	3.2963E+04	1.4985E+02
5.200	3.2134E+07	3.4852E+04	1.6370E+02
5.500	3.2067E+07	3.6657E+04	1.7830E+02
5.800	3.1999E+07	3.8382E+04	1.9361E+02
6.100	3.1932E+07	4.0028E+04	2.0962E+02
6.400	3.1865E+07	4.1600E+04	2.2628E+02
6.700	3.1798E+07	4.3101E+04	2.4357E+02
7.000	3.1731E+07	4.4534E+04	2.6146E+02
7.300	3.1664E+07	4.5901E+04	2.7991E+02
7.600	3.1597E+07	4.7205E+04	2.9892E+02
7.900	3.1531E+07	4.8449E+04	3.1844E+02
8.000	3.1509E+07	4.8851E+04	3.2506E+02
8.300	3.1442E+07	5.0018E+04	3.4524E+02
8.600	3.1376E+07	5.1131E+04	3.6589E+02
8.900	3.1310E+07	5.2192E+04	3.8697E+02
9.200	3.1244E+07	5.3202E+04	4.0849E+02
9.500	3.1179E+07	5.4165E+04	4.3040E+02
9.800	3.1113E+07	5.5081E+04	4.5270E+02
10.100	3.1047E+07	5.5953E+04	4.7536E+02
10.400	3.0982E+07	5.6783E+04	4.9837E+02
16.000	2.9787E+07	6.6355E+04	9.7318E+02
24.000	2.8160E+07	6.9329E+04	1.7173E+03
48.000	2.3792E+07	6.1404E+04	3.8693E+03
96.000	1.6984E+07	4.3920E+04	7.2736E+03

240.000	6.1783E+06	1.5977E+04	1.2679E+04
480.000	1.1453E+06	2.9616E+03	1.5196E+04
720.000	2.1230E+05	5.4899E+02	1.5663E+04

Time (hr)	CR I-131 (Curies)
0.000	6.2125E-12
0.017	1.6857E-07
0.270	1.8235E-04
0.500	1.1278E-03
0.750	3.7980E-03
1.000	9.2852E-03
1.400	8.0539E-03
1.700	7.2494E-03
2.000	6.5372E-03
2.300	5.8904E-03
2.600	5.3161E-03
2.900	4.8066E-03
3.200	4.3549E-03
3.500	3.9550E-03
3.800	3.6013E-03
4.000	3.3886E-03
4.300	3.1011E-03
4.600	2.8476E-03
4.900	2.6244E-03
5.200	2.4283E-03
5.500	2.2563E-03
5.800	2.1058E-03
6.100	1.9743E-03
6.400	1.8598E-03
6.700	1.7604E-03
7.000	1.6743E-03
7.300	1.6000E-03
7.600	1.5363E-03
7.900	1.4818E-03
8.000	1.4655E-03
8.300	1.3551E-03
8.600	1.2570E-03
8.900	1.1698E-03
9.200	1.0924E-03
9.500	1.0238E-03
9.800	9.6292E-04
10.100	9.0902E-04
10.400	8.6134E-04
16.000	5.5041E-04
24.000	5.4415E-04
48.000	3.5208E-04
96.000	2.5211E-04
240.000	6.7484E-05
480.000	1.2509E-05
720.000	2.3189E-06

##
Cumulative Dose Summary
##

	EAB	LPZ	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
0.017	1.5457E-05	5.6519E-07	2.1043E-06	7.6941E-08	1.5102E-07	4.8260E-09
0.270	6.4760E-02	2.3476E-03	8.8161E-03	3.1959E-04	2.2085E-03	7.0487E-05
0.500	4.0806E-01	1.4684E-02	5.5551E-02	1.9990E-03	2.5300E-02	8.0647E-04
0.750	1.3997E+00	4.9986E-02	1.9054E-01	6.8048E-03	1.2593E-01	4.0088E-03
1.000	3.4801E+00	1.2342E-01	4.7376E-01	1.6802E-02	4.0165E-01	1.2770E-02
1.400	3.5076E+00	1.2487E-01	4.8696E-01	1.7500E-02	1.0097E+00	3.2058E-02
1.700	3.5431E+00	1.2678E-01	5.0397E-01	1.8414E-02	1.4107E+00	4.4754E-02
2.000	3.5944E+00	1.2957E-01	5.2859E-01	1.9750E-02	1.7707E+00	5.6138E-02
2.300	3.6637E+00	1.3335E-01	5.6185E-01	2.1567E-02	2.0940E+00	6.6357E-02
2.600	3.7507E+00	1.3814E-01	6.0357E-01	2.3864E-02	2.3845E+00	7.5534E-02
2.900	3.8544E+00	1.4389E-01	6.5333E-01	2.6620E-02	2.6461E+00	8.3795E-02
3.200	3.9740E+00	1.5055E-01	7.1071E-01	2.9817E-02	2.8820E+00	9.1251E-02
3.500	4.1088E+00	1.5811E-01	7.7534E-01	3.3443E-02	3.0953E+00	9.8000E-02
3.800	4.2578E+00	1.6654E-01	8.4684E-01	3.7489E-02	3.2887E+00	1.0413E-01
4.000	4.3648E+00	1.7264E-01	8.9815E-01	4.0416E-02	3.4077E+00	1.0791E-01
4.300	4.5361E+00	1.8250E-01	9.8034E-01	4.5146E-02	3.5729E+00	1.1317E-01
4.600	4.7199E+00	1.9320E-01	1.0685E+00	5.0278E-02	3.7239E+00	1.1799E-01
4.900	4.9154E+00	2.0472E-01	1.1623E+00	5.5804E-02	3.8623E+00	1.2244E-01
5.200	5.1222E+00	2.1704E-01	1.2615E+00	6.1716E-02	3.9898E+00	1.2656E-01
5.500	5.3397E+00	2.3016E-01	1.3658E+00	6.8007E-02	4.1077E+00	1.3040E-01
5.800	5.5672E+00	2.4404E-01	1.4750E+00	7.4667E-02	4.2171E+00	1.3400E-01
6.100	5.8042E+00	2.5867E-01	1.5887E+00	8.1687E-02	4.3192E+00	1.3739E-01
6.400	6.0503E+00	2.7403E-01	1.7067E+00	8.9056E-02	4.4149E+00	1.4060E-01
6.700	6.3049E+00	2.9010E-01	1.8289E+00	9.6764E-02	4.5049E+00	1.4366E-01
7.000	6.5677E+00	3.0686E-01	1.9550E+00	1.0480E-01	4.5902E+00	1.4659E-01
7.300	6.8381E+00	3.2427E-01	2.0847E+00	1.1316E-01	4.6712E+00	1.4942E-01
7.600	7.1157E+00	3.4232E-01	2.2179E+00	1.2182E-01	4.7487E+00	1.5216E-01
7.900	7.4003E+00	3.6099E-01	2.3544E+00	1.3077E-01	4.8230E+00	1.5483E-01
8.000	7.4966E+00	3.6734E-01	2.4006E+00	1.3382E-01	4.8472E+00	1.5571E-01
8.300	7.7897E+00	3.8679E-01	2.4033E+00	1.3409E-01	4.9164E+00	1.5824E-01
8.600	8.0888E+00	4.0680E-01	2.4061E+00	1.3438E-01	4.9803E+00	1.6059E-01
8.900	8.3935E+00	4.2734E-01	2.4090E+00	1.3467E-01	5.0396E+00	1.6278E-01
9.200	8.7037E+00	4.4839E-01	2.4119E+00	1.3497E-01	5.0947E+00	1.6484E-01
9.500	9.0188E+00	4.6992E-01	2.4149E+00	1.3527E-01	5.1461E+00	1.6678E-01
9.800	9.3388E+00	4.9192E-01	2.4179E+00	1.3559E-01	5.1943E+00	1.6861E-01
10.100	9.6631E+00	5.1436E-01	2.4209E+00	1.3591E-01	5.2395E+00	1.7035E-01
10.400	9.9917E+00	5.3721E-01	2.4240E+00	1.3624E-01	5.2823E+00	1.7201E-01
16.000	1.6653E+01	1.0294E+00	2.4866E+00	1.4340E-01	5.8546E+00	1.9660E-01
24.000	2.6697E+01	1.7712E+00	2.5811E+00	1.5421E-01	6.5131E+00	2.2819E-01
48.000	5.3905E+01	3.3436E+00	2.7206E+00	1.6425E-01	7.3212E+00	2.6368E-01
96.000	9.3928E+01	4.9140E+00	2.9258E+00	1.7323E-01	8.4629E+00	3.0381E-01
240.000	1.5501E+02	7.0645E+00	3.0296E+00	1.7714E-01	9.3274E+00	3.3239E-01
480.000	1.8329E+02	8.0254E+00	3.0776E+00	1.7886E-01	9.7233E+00	3.4520E-01
720.000	1.8854E+02	8.1970E+00	3.0865E+00	1.7917E-01	9.7967E+00	3.4753E-01

##
Worst Two-Hour Doses
##

EAB

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
16.1	1.0802E-01	2.5110E+00	1.8546E-01

Attachment 13.4 - RADTRAD Partial Output File "NMP2MS00.o0"

```
##########################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  5/29/2019  at  3:10:49
 ##########################################################################

 ##########################################################################
                     File information
 ##########################################################################

 Plant file           = NMP2MS00.psf
 Inventory file       = D:\User\Gardner\h21c-106r3\nmp2.nif
 Release file         = D:\User\Gardner\h21c-106r3\bwr_dba.rft
 Dose Conversion file = D:\User\Gardner\h21c-106r3\nmp2.inp




     #####    ####   #####    #  #     #  #####   #     #  #####
     #    #  #       #        #  ##    #  #    #  #     #     #
     #    #  #       #        #  # #   #  #    #  #     #     #
     #####    ####   ####     #  #  #  #  #####   #     #     #
     #            #  #        #  #   # #  #       #     #     #
     #            #  #        #  #    ##  #       #     #     #
     #         ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Combined Bypass Leakage Releases Without Delay Times - Total MSIV Leakage =
400 scfh and 200 scfh per MSL, MSIV Leakage Reduction After 24 hrs, Total Effective
Aerosol Removal Efficiency, and CAVEX Core Inventory
 Nuclide Inventory File:
 D:\User\Gardner\h21c-106r3\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   9
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
```

```
Dummy
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 5:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Compartment 6:
MSIV Failed Inboard Volume 1
  3
 3.9068E+02
  0
  0
  0
  0
  0
Compartment 7:
MSIV Failed Outboard Volume 2
  3
 4.2841E+02
  0
  0
  0
  0
  0
Compartment 8:
Intact Inboard Volume 3
  3
 3.3181E+02
  0
  0
  0
  0
  0
Compartment 9:
Intact Outboard Volume 4
  3
 4.8703E+02
```

```
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW Leakage to RB (Released to Dummy)
  1
  3
  2
Pathway 4:
WW Leakage to RB (Released to Dummy)
  2
  3
  2
Pathway 5:
DW Bypass Pathway 5 to Environment
  1
  4
  2
Pathway 6:
WW Bypass Pathway 6 to Environment
  2
  4
  2
Pathway 7:
DW to MSIV Failed Inboard Volume 1
  1
  6
  2
Pathway 8:
MSIV Failed Inboard Volume 1 to MSIV Failed outboard Volume 2
  6
  7
  2
Pathway 9:
MSIV Failed Outboard Volume 2 to Environment ( Pathway  7)
  7
  4
  2
Pathway 10:
DW to Intact Inboard Volume 3
  1
  8
  2
```

```
Pathway 11:
Intact Inboard Volume 3 to Intact Outboard Volume 4
  8
  9
  2
Pathway 12:
CR Filtered Intake (Pathway 9)
  4
  5
  2
Pathway 13:
CR Unfiltered Inleakage (Pathway 10)
  4
  5
  2
Pathway 14:
CR Exhaust to Environment (Pathway 11)
  5
  4
  2
Pathway 15:
Intact Outboard Volume 4 to  Environment ( Pathway  8)
  9
  4
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\User\Gardner\h21c-106r3\nmp2.inp
D:\User\Gardner\h21c-106r3\bwr_dba.rft
  0.0000E+00
  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  9
Compartment 1:
  0
  1
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
  2.4000E+00   0.0000E+00
```

CALCULATION NO. H21C-106	REV. No. 3	PAGE NO. 349

```
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+00
  2.4000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  1
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
```

```
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 7:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 8:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 9:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
```

```
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   2.4930E-01   7.3050E+01   3.6000E+00   0.0000E+00
  8.0000E+00   2.4930E-01   7.3050E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.2470E-01   7.3050E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.2470E-01   7.3050E+01   4.8890E+01   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 6:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.1200E-02   8.5610E+01   3.6000E+00   0.0000E+00
  8.0000E+00   1.1200E-02   8.5610E+01   4.8200E+00   0.0000E+00
  2.4000E+01   5.6000E-03   8.5610E+01   8.4600E+00   0.0000E+00
  9.6000E+01   5.6000E-03   8.5610E+01   4.8890E+01   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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 8:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   0.0000E+00   3.8200E+00   0.0000E+00
  8.0000E+00   1.3520E+00   0.0000E+00   5.1200E+00   0.0000E+00
  2.4000E+01   6.7600E-01   0.0000E+00   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   0.0000E+00   5.1030E+01   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 9:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8910E+01   3.5600E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8910E+01   4.7800E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8910E+01   8.3900E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8910E+01   4.8590E+01   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 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 11:
  0
```

```
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   0.0000E+00   3.8300E+00   0.0000E+00
  8.0000E+00   1.3520E+00   0.0000E+00   5.1300E+00   0.0000E+00
  2.4000E+01   6.7600E-01   0.0000E+00   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   0.0000E+00   5.1040E+01   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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 13:
  0
  0
  0
  0
  0
  1
  7
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   2.5000E+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 14:
  0
```

```
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.0000E+00   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 15:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8720E+01   3.6000E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8720E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8720E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8720E+01   4.8890E+01   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  4
  1
  2
  0.0000E+00   1.1900E-04
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ
  4
  1
  5
  0.0000E+00   1.6200E-05
  8.0000E+00   1.0900E-05
  2.4000E+01   4.5900E-06
```

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```
  9.6000E+01   1.3300E-06
  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 3:
CR
  5
  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
  6
  0.0000E+00   1.4700E-03
  2.0000E+00   9.7400E-04
  8.0000E+00   3.6300E-04
  2.4000E+01   2.4500E-04
  9.6000E+01   1.9000E-04
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
C:\Radtrad 3.o184
  1
  1
  1
  0
  0
End of Scenario File
```

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.7212E+00	6.5165E+01	4.8970E+00
Accumulated dose (rem)	9.1840E+00	1.1497E+02	1.2994E+01

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.0413E-02	4.7860E-01	4.6393E-02
Accumulated dose (rem)	6.2227E-01	2.9611E+00	7.2382E-01

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1436E-01	4.8592E+00	2.7656E-01
Accumulated dose (rem)	1.4429E+00	2.2025E+01	2.7991E+00

Environment Integral Nuclide Release:

Time (h) = 720.0000	Ci	kg	Atoms	Bq
Kr-83m	3.1829E+03	1.5680E-07	1.1377E+18	1.1777E+14
Kr-85m	3.5180E+04	4.2749E-06	3.0287E+19	1.3017E+15
Kr-85	2.0960E+05	5.3473E-01	3.7885E+24	7.7551E+15
Kr-87	6.4972E+03	2.2937E-07	1.5877E+18	2.4039E+14
Kr-88	4.4410E+04	3.5416E-06	2.4237E+19	1.6432E+15
Rb-86	3.1710E-01	3.8971E-09	2.7289E+16	1.1733E+10
Rb-88	2.4985E+04	2.0697E-07	1.4164E+18	9.2444E+14
Sr-89	1.9306E+01	6.6454E-07	4.4966E+18	7.1434E+11
Sr-90	2.4216E+00	1.7753E-05	1.1879E+20	8.9598E+10
Sr-91	3.4109E+00	9.4095E-10	6.2270E+15	1.2620E+11
Sr-92	2.0678E+00	1.6451E-10	1.0769E+15	7.6510E+10
Y-90	1.8049E+00	3.3174E-09	2.2197E+16	6.6780E+10
Y-91	2.9841E-01	1.2168E-08	8.0525E+16	1.1041E+10
Y-92	4.3488E-01	4.5195E-11	2.9584E+14	1.6091E+10
Y-93	3.9567E-02	1.1859E-11	7.6794E+13	1.4640E+09
Zr-95	2.9506E-01	1.3735E-08	8.7065E+16	1.0917E+10
Zr-97	4.8477E-02	2.5358E-11	1.5743E+14	1.7936E+09
Nb-95	3.2410E-01	8.2883E-09	5.2541E+16	1.1992E+10
Mo-99	1.1033E+00	2.3003E-09	1.3993E+16	4.0821E+10
Tc-99m	1.0572E+00	2.0106E-10	1.2230E+15	3.9116E+10
Ru-103	2.9913E+00	9.2684E-08	5.4190E+17	1.1068E+11
Ru-105	2.3584E-01	3.5084E-11	2.0122E+14	8.7260E+09
Ru-106	1.4884E+00	4.4490E-07	2.5276E+18	5.5072E+10
Rh-105	5.1928E-01	6.1522E-10	3.5285E+15	1.9213E+10
Sb-127	1.3077E+00	4.8968E-09	2.3220E+16	4.8385E+10
Sb-129	1.1629E+00	2.0680E-10	9.6542E+14	4.3028E+10
Te-127	1.8550E+00	7.0287E-10	3.3329E+15	6.8633E+10
Te-127m	6.7777E-01	7.1854E-08	3.4072E+17	2.5077E+10
Te-129	2.6584E+00	1.2694E-10	5.9259E+14	9.8361E+10
Te-129m	1.8604E+00	6.1755E-08	2.8829E+17	6.8834E+10
Te-131m	1.6378E+00	2.0540E-09	9.4422E+15	6.0600E+10
Te-132	1.8054E+01	5.9468E-08	2.7131E+17	6.6800E+11
I-131	2.3841E+03	1.9231E-05	8.8404E+19	8.8212E+13
I-132	2.5880E+02	2.5073E-08	1.1439E+17	9.5757E+12
I-133	8.5436E+02	7.5419E-07	3.4149E+18	3.1611E+13
I-134	5.5472E+01	2.0794E-09	9.3452E+15	2.0525E+12

I-135	3.0532E+02	8.6939E-08	3.8782E+17	1.1297E+13
Xe-133	7.2757E+06	3.8870E-02	1.7600E+23	2.6920E+17
Xe-133m	1.0441E+05	2.3716E-04	1.0738E+21	3.8632E+15
Xe-135	2.9443E+05	1.1530E-04	5.1432E+20	1.0894E+16
Xe-135m	7.5337E+02	8.2758E-09	3.6917E+16	2.7875E+13
Xe-138	2.6301E+02	2.7411E-09	1.1962E+16	9.7315E+12
Cs-134	4.4763E+01	3.4597E-05	1.5548E+20	1.6562E+12
Cs-136	8.5983E+00	1.1732E-07	5.1948E+17	3.1814E+11
Cs-137	3.5085E+01	4.0336E-04	1.7731E+21	1.2981E+12
Ba-139	1.6153E+00	9.8751E-11	4.2784E+14	5.9765E+10
Ba-140	1.9332E+01	2.6406E-07	1.1359E+18	7.1527E+11
La-140	1.4280E+01	2.5691E-08	1.1051E+17	5.2835E+11
La-141	2.6780E-02	4.7353E-12	2.0225E+13	9.9085E+08
La-142	1.5683E-02	1.0955E-12	4.6461E+12	5.8026E+08
Ce-141	6.1968E-01	2.1748E-08	9.2887E+16	2.2928E+10
Ce-143	1.4725E-01	2.2174E-10	9.3380E+14	5.4483E+09
Ce-144	6.1218E-01	1.9194E-07	8.0269E+17	2.2651E+10
Pr-143	2.1289E-01	3.1615E-09	1.3314E+16	7.8769E+09
Nd-147	6.6456E-02	8.2148E-10	3.3653E+15	2.4589E+09
Np-239	2.1714E+00	9.3597E-09	2.3584E+16	8.0341E+10
Pu-238	1.9618E-03	1.1459E-07	2.8995E+17	7.2586E+07
Pu-239	1.9939E-04	3.2079E-06	8.0829E+18	7.3774E+06
Pu-240	3.4905E-04	1.5325E-07	3.8455E+17	1.2915E+07
Pu-241	7.7425E-02	7.8293E-07	1.9564E+18	2.8647E+09
Am-241	4.8000E-05	1.4011E-08	3.5011E+16	1.7760E+06
Cm-242	1.1449E-02	3.4587E-09	8.6069E+15	4.2362E+08
Cm-244	7.9582E-04	9.7228E-09	2.3997E+16	2.9445E+07

Environment Transport Group Inventory:

Time (h) = 720.0000	Total Release	Release Rate/s	
Noble gases (atoms)	3.9661E+24	1.5301E+18	
Elemental I (atoms)	4.3478E+18	1.6774E+12	
Organic I (atoms)	8.3171E+19	3.2088E+13	
Aerosols (kg)	4.6334E-04	1.7876E-10	
Dose Effective (Ci)	I-131 (Thyroid)		2.5367E+03
Dose Effective (Ci)	I-131 (ICRP2 Thyroid)		2.6482E+03
Total I (Ci)			3.8581E+03

DW Bypass Pathway 5 to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.3919E+23
Elemental I (atoms)	1.0576E+17	4.6290E+17
Organic I (atoms)	0.0000E+00	7.4004E+18
Aerosols (kg)	8.4399E-04	3.1137E-04

WW Bypass Pathway 6 to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5168E+22
Elemental I (atoms)	4.3432E+15	9.9335E+15
Organic I (atoms)	0.0000E+00	3.2801E+17
Aerosols (kg)	3.5985E-05	6.0487E-06

MSIV Failed Outboard Volume 2 to Environment (Pat Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8053E+24
Elemental I (atoms)	3.2511E+17	1.9408E+18
Organic I (atoms)	0.0000E+00	3.7836E+19
Aerosols (kg)	6.1038E-03	6.7265E-05

CR Filtered Intake (Pathway 9) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.3854E+20
Elemental I (atoms)	1.7209E+15	1.7472E+13
Organic I (atoms)	1.2979E+16	1.3110E+14
Aerosols (kg)	1.2147E-07	1.2506E-09

CR Unfiltered Inleakage (Pathway 10) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.9730E+19
Elemental I (atoms)	0.0000E+00	3.2193E+14
Organic I (atoms)	0.0000E+00	2.4278E+15
Aerosols (kg)	0.0000E+00	2.2729E-08

CR Exhaust to Environment (Pathway 11) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	6.3495E+20	0.0000E+00
Elemental I (atoms)	2.3221E+14	0.0000E+00
Organic I (atoms)	1.7759E+15	0.0000E+00
Aerosols (kg)	1.7019E-08	0.0000E+00

Intact Outboard Volume 4 to Environment (Pathway Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8074E+24
Elemental I (atoms)	3.2768E+17	1.9506E+18
Organic I (atoms)	0.0000E+00	3.7969E+19
Aerosols (kg)	6.0971E-03	7.9055E-05

CR Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	1.3876E-01	3.5400E-07	2.5080E+18	1.7554E+16
Rb-86	9.0925E-09	1.1175E-16	7.8251E+08	7.4843E+09
Sr-89	1.0088E-06	3.4724E-14	2.3496E+11	3.2191E+11
Sr-90	1.6259E-07	1.1919E-12	7.9754E+12	3.7651E+10
Y-90	1.6344E-07	3.0041E-16	2.0101E+09	1.7017E+10
Y-91	1.6661E-08	6.7937E-16	4.4959E+09	4.6706E+09
Zr-95	1.6280E-08	7.5780E-16	4.8038E+09	4.8481E+09
Nb-95	2.0672E-08	5.2865E-16	3.3511E+09	5.0801E+09

Mo-99	1.4791E-10	3.0839E-19	1.8759E+06	3.6021E+10
Tc-99m	1.5164E-10	2.8839E-20	1.7543E+05	3.3072E+10
Ru-103	1.4502E-07	4.4935E-15	2.6273E+10	5.0871E+10
Ru-106	9.6747E-08	2.8918E-14	1.6429E+11	2.3360E+10
Sb-127	1.2781E-09	4.7861E-18	2.2695E+07	3.8292E+10
Te-127	4.3180E-08	1.6362E-17	7.7584E+07	4.3311E+10
Te-127m	4.1131E-08	4.3606E-15	2.0677E+10	1.0771E+10
Te-129	7.3665E-08	3.5175E-18	1.6421E+07	6.8299E+10
Te-129m	8.5191E-08	2.8279E-15	1.3201E+10	3.2079E+10
Te-132	7.2273E-09	2.3806E-17	1.0861E+08	5.5874E+11
I-131	3.3850E-05	2.7304E-13	1.2552E+12	2.9821E+13
I-132	6.6454E-08	6.4380E-18	2.9372E+07	4.8034E+12
Xe-133	3.3328E-01	1.7805E-09	8.0620E+15	7.2538E+17
Xe-133m	4.7369E-05	1.0760E-13	4.8718E+11	1.2315E+16
Cs-134	2.6957E-06	2.0835E-12	9.3634E+12	8.6807E+11
Cs-136	1.7288E-07	2.3588E-15	1.0445E+10	2.1826E+11
Cs-137	2.1473E-06	2.4687E-11	1.0852E+14	6.7695E+11
Ba-140	4.3790E-07	5.9815E-15	2.5729E+10	3.9061E+11
La-140	5.0866E-07	9.1515E-16	3.9365E+09	1.4775E+11
Ce-141	2.7979E-08	9.8193E-16	4.1939E+09	1.0729E+10
Ce-144	3.9396E-08	1.2352E-14	5.1656E+10	9.6353E+09
Pr-143	5.5861E-09	8.2955E-17	3.4935E+08	3.9246E+09
Nd-147	1.2391E-09	1.5317E-17	6.2748E+07	1.3929E+09
Np-239	8.8235E-11	3.8034E-19	9.5835E+05	7.4224E+10
Pu-238	1.3210E-10	7.7166E-15	1.9525E+10	3.0475E+07
Pu-239	1.3442E-11	2.1626E-13	5.4490E+11	3.0882E+06
Pu-240	2.3464E-11	1.0302E-14	2.5850E+10	5.4252E+06
Pu-241	5.1927E-09	5.2509E-14	1.3121E+11	1.2042E+09
Am-241	3.6307E-12	1.0598E-15	2.6483E+09	7.1881E+05
Cm-242	7.1306E-10	2.1541E-16	5.3605E+08	1.8189E+08
Cm-244	5.3393E-11	6.5232E-16	1.6100E+09	1.2376E+07

CR Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump	
Noble gases (atoms)	2.5161E+18	0.0000E+00	
Elemental I (atoms)	1.3788E+10	0.0000E+00	
Organic I (atoms)	1.2014E+12	0.0000E+00	
Aerosols (kg)	2.8360E-11	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.1376E-15
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.1378E-15
Total I (Ci)			3.3917E-05

Time (h) = 720.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	9.6984E+13
Organic I (atoms)	0.0000E+00	7.4171E+14
Aerosols (kg)	0.0000E+00	7.1081E-09

CR Filtered Intake (Pathway 9) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.3854E+20
Elemental I (atoms)	1.7209E+15	1.7472E+13
Organic I (atoms)	1.2979E+16	1.3110E+14
Aerosols (kg)	1.2147E-07	1.2506E-09

CR Unfiltered Inleakage (Pathway 10) Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.9730E+19
Elemental I (atoms)	0.0000E+00	3.2193E+14
Organic I (atoms)	0.0000E+00	2.4278E+15
Aerosols (kg)	0.0000E+00	2.2729E-08

CR Exhaust to Environment (Pathway 11) Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	6.3495E+20	0.0000E+00
Elemental I (atoms)	2.3221E+14	0.0000E+00
Organic I (atoms)	1.7759E+15	0.0000E+00
Aerosols (kg)	1.7019E-08	0.0000E+00

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##
I-131 Summary
##

	DW	WW	Dummy
Time (hr)	I-131 (Curies)	I-131 (Curies)	I-131 (Curies)
0.000	6.1456E+03	0.0000E+00	3.4388E-02
0.017	1.8470E+05	0.0000E+00	3.1068E+01
0.083	9.2043E+05	0.0000E+00	7.7245E+02
0.333	3.6815E+06	0.0000E+00	1.0817E+03
0.500	6.8011E+05	0.0000E+00	1.2134E+03
0.750	9.4091E+05	0.0000E+00	1.3319E+03
1.000	9.4887E+05	0.0000E+00	1.4580E+03
1.400	9.5868E+05	0.0000E+00	1.6614E+03
1.700	9.6601E+05	0.0000E+00	1.8151E+03
2.000	9.7331E+05	0.0000E+00	1.9698E+03
2.250	5.9152E+04	4.0977E+04	2.0105E+03
2.400	6.1392E+04	3.8263E+04	2.0171E+03
2.700	6.1321E+04	3.8202E+04	2.0301E+03
3.000	6.1240E+04	3.8152E+04	2.0431E+03
3.300	6.1159E+04	3.8101E+04	2.0560E+03
3.600	6.1078E+04	3.8051E+04	2.0690E+03
3.900	6.0997E+04	3.8001E+04	2.0819E+03
4.000	6.0971E+04	3.7984E+04	2.0861E+03
4.300	6.0890E+04	3.7934E+04	2.0990E+03
4.600	6.0810E+04	3.7884E+04	2.1118E+03
4.900	6.0729E+04	3.7834E+04	2.1246E+03
5.200	6.0649E+04	3.7784E+04	2.1373E+03
5.500	6.0569E+04	3.7734E+04	2.1500E+03
5.800	6.0489E+04	3.7684E+04	2.1627E+03
6.100	6.0409E+04	3.7634E+04	2.1754E+03
6.400	6.0329E+04	3.7584E+04	2.1880E+03
6.700	6.0249E+04	3.7535E+04	2.2006E+03
7.000	6.0170E+04	3.7485E+04	2.2131E+03
7.300	6.0090E+04	3.7436E+04	2.2256E+03
7.600	6.0011E+04	3.7386E+04	2.2381E+03

7.900	5.9931E+04	3.7337E+04	2.2506E+03
8.000	5.9905E+04	3.7320E+04	2.2547E+03
8.300	5.9826E+04	3.7271E+04	2.2671E+03
8.600	5.9747E+04	3.7222E+04	2.2795E+03
8.900	5.9668E+04	3.7172E+04	2.2918E+03
9.200	5.9589E+04	3.7123E+04	2.3041E+03
9.500	5.9510E+04	3.7074E+04	2.3164E+03
9.800	5.9431E+04	3.7025E+04	2.3286E+03
10.100	5.9353E+04	3.6976E+04	2.3408E+03
10.400	5.9274E+04	3.6927E+04	2.3530E+03
16.000	5.7827E+04	3.6026E+04	2.5744E+03
24.000	5.5818E+04	3.4774E+04	2.8717E+03
96.000	4.1829E+04	2.6059E+04	3.4845E+03
720.000	3.3936E+03	2.1142E+03	1.3759E+03

Time (hr)	Environment I-131 (Curies)	CR I-131 (Curies)	MSIV Failed Inboard V I-131 (Curies)
0.000	2.5375E-05	1.7604E-08	4.5224E-04
0.017	2.2925E-02	1.5891E-05	4.0812E-01
0.083	5.7011E-01	1.1461E-04	1.0101E+01
0.333	9.1385E+00	1.6161E-03	1.5884E+02
0.500	1.2878E+01	2.1796E-03	2.1697E+02
0.750	1.6477E+01	2.6220E-03	2.6317E+02
1.000	2.0510E+01	3.1013E-03	3.1063E+02
1.400	2.7540E+01	3.8830E-03	3.8240E+02
1.700	3.3331E+01	4.4889E-03	4.3304E+02
2.000	3.9614E+01	5.1181E-03	4.8114E+02
2.250	4.2254E+01	4.9811E-03	4.6964E+02
2.400	4.3631E+01	4.8811E-03	4.5740E+02
2.700	4.6648E+01	4.7273E-03	4.3404E+02
3.000	4.9981E+01	4.6254E-03	4.1212E+02
3.300	5.3591E+01	4.5657E-03	3.9154E+02
3.600	5.7442E+01	4.5398E-03	3.7221E+02
3.900	6.1505E+01	4.5408E-03	3.5406E+02
4.000	6.2901E+01	4.5460E-03	3.4826E+02
4.300	6.7204E+01	4.5740E-03	3.3158E+02
4.600	7.1661E+01	4.6166E-03	3.1591E+02
4.900	7.6252E+01	4.6703E-03	3.0120E+02
5.200	8.0960E+01	4.7319E-03	2.8738E+02
5.500	8.5770E+01	4.7989E-03	2.7441E+02
5.800	9.0668E+01	4.8691E-03	2.6222E+02
6.100	9.5643E+01	4.9410E-03	2.5078E+02
6.400	1.0069E+02	5.0131E-03	2.4004E+02
6.700	1.0579E+02	5.0845E-03	2.2995E+02
7.000	1.1093E+02	5.1543E-03	2.2047E+02
7.300	1.1613E+02	5.2218E-03	2.1156E+02
7.600	1.2136E+02	5.2866E-03	2.0320E+02
7.900	1.2662E+02	5.3485E-03	1.9535E+02
8.000	1.2838E+02	5.3683E-03	1.9283E+02
8.300	1.3366E+02	5.0436E-03	1.8561E+02
8.600	1.3896E+02	4.7530E-03	1.7882E+02
8.900	1.4428E+02	4.4931E-03	1.7244E+02
9.200	1.4961E+02	4.2604E-03	1.6645E+02
9.500	1.5496E+02	4.0521E-03	1.6081E+02
9.800	1.6031E+02	3.8657E-03	1.5552E+02
10.100	1.6568E+02	3.6987E-03	1.5055E+02
10.400	1.7105E+02	3.5491E-03	1.4587E+02

16.000	2.7120E+02	2.4108E-03	9.5523E+01
24.000	4.1110E+02	2.1897E-03	7.5473E+01
96.000	9.4796E+02	5.5024E-04	5.3596E+01
720.000	2.3841E+03	3.3850E-05	4.3481E+00

Time (hr)	MSIV Failed Outboard I-131 (Curies)	Intact Inboard Volume I-131 (Curies)	Intact Outboard Volum I-131 (Curies)
0.000	1.7356E-08	4.5224E-04	2.0436E-08
0.017	4.7009E-04	4.0804E-01	5.5353E-04
0.083	5.7657E-02	1.0090E+01	6.7913E-02
0.333	3.5389E+00	1.5820E+02	4.1732E+00
0.500	9.8463E+00	2.1517E+02	1.1622E+01
0.750	2.0469E+01	2.5934E+02	2.4202E+01
1.000	3.2254E+01	3.0446E+02	3.8193E+01
1.400	5.3025E+01	3.7193E+02	6.2910E+01
1.700	6.9738E+01	4.1898E+02	8.2834E+01
2.000	8.7111E+01	4.6321E+02	1.0357E+02
2.250	1.0081E+02	4.4852E+02	1.1995E+02
2.400	1.0785E+02	4.3454E+02	1.2839E+02
2.700	1.1949E+02	4.0808E+02	1.4236E+02
3.000	1.2828E+02	3.8352E+02	1.5295E+02
3.300	1.3468E+02	3.6070E+02	1.6068E+02
3.600	1.3908E+02	3.3952E+02	1.6598E+02
3.900	1.4182E+02	3.1985E+02	1.6927E+02
4.000	1.4242E+02	3.1361E+02	1.6997E+02
4.300	1.4337E+02	2.9580E+02	1.7107E+02
4.600	1.4327E+02	2.7925E+02	1.7086E+02
4.900	1.4229E+02	2.6388E+02	1.6958E+02
5.200	1.4062E+02	2.4961E+02	1.6743E+02
5.500	1.3840E+02	2.3635E+02	1.6458E+02
5.800	1.3573E+02	2.2404E+02	1.6119E+02
6.100	1.3274E+02	2.1261E+02	1.5738E+02
6.400	1.2949E+02	2.0199E+02	1.5325E+02
6.700	1.2607E+02	1.9212E+02	1.4891E+02
7.000	1.2254E+02	1.8296E+02	1.4441E+02
7.300	1.1893E+02	1.7444E+02	1.3984E+02
7.600	1.1530E+02	1.6654E+02	1.3523E+02
7.900	1.1168E+02	1.5919E+02	1.3064E+02
8.000	1.1048E+02	1.5686E+02	1.2912E+02
8.300	1.0690E+02	1.5019E+02	1.2459E+02
8.600	1.0339E+02	1.4400E+02	1.2015E+02
8.900	9.9965E+01	1.3825E+02	1.1582E+02
9.200	9.6628E+01	1.3291E+02	1.1162E+02
9.500	9.3395E+01	1.2794E+02	1.0755E+02
9.800	9.0271E+01	1.2332E+02	1.0363E+02
10.100	8.7260E+01	1.1902E+02	9.9857E+01
10.400	8.4367E+01	1.1503E+02	9.6243E+01
16.000	4.9727E+01	7.5497E+01	5.4377E+01
24.000	3.4990E+01	6.2435E+01	3.8666E+01
96.000	2.3834E+01	4.5490E+01	2.7083E+01
720.000	1.9167E+00	3.6906E+00	2.1781E+00

##

Cumulative Dose Summary

##

	EAB	LPZ	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
0.017	1.4703E-03	7.6520E-05	2.0016E-04	1.0417E-05	1.7625E-05	7.3721E-07
0.083	3.6542E-02	1.8870E-03	4.9746E-03	2.5689E-04	6.7084E-04	2.8887E-05
0.333	5.8445E-01	2.9488E-02	7.9563E-02	4.0143E-03	3.2930E-02	1.4257E-03
0.500	8.2301E-01	4.3100E-02	1.1204E-01	5.8674E-03	9.2420E-02	4.0204E-03
0.750	1.0588E+00	6.5926E-02	1.4415E-01	8.9748E-03	1.9935E-01	9.0207E-03
1.000	1.3232E+00	1.0118E-01	1.8013E-01	1.3774E-02	3.2787E-01	1.6022E-02
1.400	1.7812E+00	1.8047E-01	2.4248E-01	2.4568E-02	5.7935E-01	3.3123E-02
1.700	2.1558E+00	2.5804E-01	2.9348E-01	3.5127E-02	8.0535E-01	5.2307E-02
2.000	2.5599E+00	3.5200E-01	3.4849E-01	4.7919E-02	1.0642E+00	7.8138E-02
2.250	2.7262E+00	4.1250E-01	3.7113E-01	5.6156E-02	1.2910E+00	1.0380E-01
2.400	2.8119E+00	4.4969E-01	3.8280E-01	6.1219E-02	1.4232E+00	1.1993E-01
2.700	2.9993E+00	5.2995E-01	4.0831E-01	7.2145E-02	1.6796E+00	1.5363E-01
3.000	3.2056E+00	6.1692E-01	4.3640E-01	8.3985E-02	1.9282E+00	1.8941E-01
3.300	3.4283E+00	7.0957E-01	4.6671E-01	9.6597E-02	2.1713E+00	2.2729E-01
3.600	3.6650E+00	8.0695E-01	4.9893E-01	1.0985E-01	2.4111E+00	2.6734E-01
3.900	3.9139E+00	9.0819E-01	5.3281E-01	1.2364E-01	2.6492E+00	3.0959E-01
4.000	3.9992E+00	9.4265E-01	5.4443E-01	1.2833E-01	2.7284E+00	3.2415E-01
4.300	4.2617E+00	1.0478E+00	5.8016E-01	1.4264E-01	2.9661E+00	3.6930E-01
4.600	4.5326E+00	1.1550E+00	6.1705E-01	1.5724E-01	3.2046E+00	4.1655E-01
4.900	4.8109E+00	1.2637E+00	6.5493E-01	1.7203E-01	3.4447E+00	4.6577E-01
5.200	5.0953E+00	1.3731E+00	6.9365E-01	1.8693E-01	3.6868E+00	5.1681E-01
5.500	5.3850E+00	1.4829E+00	7.3309E-01	2.0188E-01	3.9313E+00	5.6950E-01
5.800	5.6792E+00	1.5926E+00	7.7313E-01	2.1680E-01	4.1783E+00	6.2363E-01
6.100	5.9770E+00	1.7017E+00	8.1368E-01	2.3165E-01	4.4281E+00	6.7900E-01
6.400	6.2780E+00	1.8099E+00	8.5466E-01	2.4639E-01	4.6806E+00	7.3540E-01
6.700	6.5816E+00	1.9169E+00	8.9598E-01	2.6096E-01	4.9359E+00	7.9262E-01
7.000	6.8873E+00	2.0226E+00	9.3760E-01	2.7534E-01	5.1938E+00	8.5044E-01
7.300	7.1946E+00	2.1266E+00	9.7944E-01	2.8950E-01	5.4544E+00	9.0868E-01
7.600	7.5034E+00	2.2289E+00	1.0215E+00	3.0343E-01	5.7174E+00	9.6715E-01
7.900	7.8131E+00	2.3293E+00	1.0636E+00	3.1710E-01	5.9828E+00	1.0257E+00
8.000	7.9165E+00	2.3623E+00	1.0777E+00	3.2159E-01	6.0718E+00	1.0452E+00
8.300	8.2262E+00	2.4601E+00	1.0923E+00	3.3008E-01	6.3304E+00	1.1020E+00
8.600	8.5364E+00	2.5557E+00	1.1069E+00	3.3839E-01	6.5732E+00	1.1551E+00
8.900	8.8468E+00	2.6493E+00	1.1215E+00	3.4650E-01	6.8017E+00	1.2046E+00
9.200	9.1573E+00	2.7407E+00	1.1362E+00	3.5442E-01	7.0174E+00	1.2505E+00
9.500	9.4677E+00	2.8301E+00	1.1508E+00	3.6214E-01	7.2217E+00	1.2933E+00
9.800	9.7779E+00	2.9173E+00	1.1654E+00	3.6968E-01	7.4157E+00	1.3332E+00
10.100	1.0088E+01	3.0024E+00	1.1800E+00	3.7702E-01	7.6007E+00	1.3705E+00
10.400	1.0398E+01	3.0855E+00	1.1946E+00	3.8418E-01	7.7774E+00	1.4054E+00
16.000	1.6067E+01	4.3491E+00	1.4617E+00	4.9174E-01	1.0283E+01	1.8625E+00
24.000	2.3681E+01	5.5346E+00	1.8203E+00	5.8953E-01	1.3053E+01	2.2212E+00
96.000	4.9806E+01	8.0971E+00	2.4825E+00	6.7743E-01	1.7166E+01	2.5225E+00
720.000	1.1497E+02	1.2994E+01	2.9611E+00	7.2382E-01	2.2025E+01	2.7991E+00

##
Worst Two-Hour Doses
##

EAB

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
4.4	6.5964E-01	1.9260E+00	7.2634E-01

Attachment 13.5 - RADTRAD Partial Output File "NMP2MS01.o0"

```
##########################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  5/29/2019  at  3:10:51
 ##########################################################################

 ##########################################################################
                      File information
 ##########################################################################

 Plant file           = NMP2MS01.psf
 Inventory file       = D:\User\Gardner\h21c-106r3\nmp2.nif
 Release file         = D:\User\Gardner\h21c-106r3\bwr_dba.rft
 Dose Conversion file = D:\User\Gardner\h21c-106r3\nmp2.inp




     #####    ####   #####    #  #     #  #####   #     #  #####
     #    #  #       #        #  ##    #  #    #  #     #     #
     #    #  #       #        #  # #   #  #    #  #     #     #
     #####    ####   ####     #  #  #  #  #####   #     #     #
     #            #  #        #  #   # #  #       #     #     #
     #            #  #        #  #    ##  #       #     #     #
     #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - MSIV Bypass Leakage Pathways 7 & 8 Withount Delay Times - Total MSIV Leakage
= 400 scfh and 200 scfh Per Line, MSIV Leak Rate Reduction After 24 hrs, 20-group
Total Effective Aerosol Removal Efficiency, and CAVEX Core Inventory
 Nuclide Inventory File:
 D:\User\Gardner\h21c-106r3\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   9
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
```

```
Compartment 3:
Dummy
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 5:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Compartment 6:
MSIV Failed Inboard Volume 1
  3
 3.9068E+02
  0
  0
  0
  0
  0
Compartment 7:
MSIV Failed Outboard Volume 2
  3
 4.2841E+02
  0
  0
  0
  0
  0
Compartment 8:
Intact Inboard Volume 3
  3
 3.3181E+02
  0
  0
  0
  0
  0
Compartment 9:
Intact Outboard Volume 4
  3
```

```
 4.8703E+02
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW Leakage to RB (Released to Dummy)
  1
  3
  2
Pathway 4:
WW Leakage to RB (Released to Dummy)
  2
  3
  2
Pathway 5:
DW Bypass Pathway 5 to Environment (Released to Dummy)
  1
  3
  2
Pathway 6:
WW Bypass Pathway 6 to Environment (Released to Dummy)
  2
  3
  2
Pathway 7:
DW to MSIV Failed Inboard Volume 1
  1
  6
  2
Pathway 8:
MSIV Failed Inboard Volume 1 to MSIV Failed outboard Volume 2
  6
  7
  2
Pathway 9:
MSIV Failed Outboard Volume 2 to Environment (Pathway 7)
  7
  4
  2
Pathway 10:
DW to Intact Inboard Volume 3
  1
  8
```

```
  2
Pathway 11:
Intact Inboard Volume 3 to Intact Outboard Volume 4
  8
  9
  2
Pathway 12:
CR Filtered Intake (Pathway 9)
  4
  5
  2
Pathway 13:
CR Unfiltered Inleakage (Pathway 10)
  4
  5
  2
Pathway 14:
CR Exhaust to Environment (Pathway 11)
  5
  4
  2
Pathway 15:
Intact Outboard Volume 4 to  Environment  (Pathway 8)
  9
  4
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\User\Gardner\h21c-106r3\nmp2.inp
D:\User\Gardner\h21c-106r3\bwr_dba.rft
  0.0000E+00
  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  9
Compartment 1:
  0
  1
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
```

```
  2.4000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+00
  2.4000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  1
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
```

```
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 7:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 8:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 9:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
```

```
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   2.4930E-01   7.3050E+01   3.6000E+00   0.0000E+00
  8.0000E+00   2.4930E-01   7.3050E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.2470E-01   7.3050E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.2470E-01   7.3050E+01   4.8890E+01   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 6:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.1200E-02   8.5610E+01   3.6000E+00   0.0000E+00
  8.0000E+00   1.1200E-02   8.5610E+01   4.8200E+00   0.0000E+00
  2.4000E+01   5.6000E-03   8.5610E+01   8.4600E+00   0.0000E+00
  9.6000E+01   5.6000E-03   8.5610E+01   4.8890E+01   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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 8:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   0.0000E+00   3.8200E+00   0.0000E+00
  8.0000E+00   1.3520E+00   0.0000E+00   5.1200E+00   0.0000E+00
  2.4000E+01   6.7600E-01   0.0000E+00   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   0.0000E+00   5.1030E+01   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 9:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8910E+01   3.5600E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8910E+01   4.7800E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8910E+01   8.3900E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8910E+01   4.8590E+01   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 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 11:
```

```
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   0.0000E+00   3.8300E+00   0.0000E+00
  8.0000E+00   1.3520E+00   0.0000E+00   5.1300E+00   0.0000E+00
  2.4000E+01   6.7600E-01   0.0000E+00   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   0.0000E+00   5.1040E+01   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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 13:
  0
  0
  0
  0
  0
  1
  7
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   2.5000E+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 14:
```

```
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 15:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8720E+01   3.6000E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8720E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8720E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8720E+01   4.8890E+01   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  4
  1
  2
  0.0000E+00   1.1900E-04
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ
  4
  1
  5
  0.0000E+00   1.6200E-05
  8.0000E+00   1.0900E-05
  2.4000E+01   4.5900E-06
```

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```
  9.6000E+01   1.3300E-06
  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 3:
CR
  5
  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
  6
  0.0000E+00   1.4700E-03
  2.0000E+00   9.7400E-04
  8.0000E+00   3.6300E-04
  2.4000E+01   2.4500E-04
  9.6000E+01   1.9000E-04
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
C:\Radtrad 3.o199
  1
  1
  1
  0
  0
End of Scenario File
```

CALCULATION NO. H21C-106	REV. No. 3	PAGE NO. 377

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.4816E+00	5.8111E+01	4.3125E+00
Accumulated dose (rem)	7.8528E+00	1.0036E+02	1.1014E+01

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.7736E-02	4.2679E-01	4.1183E-02
Accumulated dose (rem)	4.9831E-01	2.3423E+00	5.7312E-01

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0435E-01	4.3332E+00	2.4086E-01
Accumulated dose (rem)	1.1242E+00	1.6687E+01	2.0853E+00

CR Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	1.2662E-01	3.2305E-07	2.2887E+18	1.5890E+16
Rb-86	2.9000E-09	3.5640E-17	2.4957E+08	1.7244E+09
Sr-89	3.2175E-07	1.1075E-14	7.4937E+10	8.0164E+10
Sr-90	5.1854E-08	3.8015E-13	2.5437E+12	9.6003E+09
Y-90	5.2127E-08	9.5811E-17	6.4110E+08	5.4254E+09
Y-91	5.3138E-09	2.1668E-16	1.4339E+09	1.2087E+09
Zr-95	5.1922E-09	2.4169E-16	1.5321E+09	1.2132E+09
Nb-95	6.5930E-09	1.6861E-16	1.0688E+09	1.2918E+09
Mo-99	4.7173E-11	9.8357E-20	5.9830E+05	7.3031E+09
Tc-99m	4.8364E-11	9.1978E-21	5.5950E+04	6.8145E+09
Ru-103	4.6254E-08	1.4332E-15	8.3793E+09	1.2585E+10
Ru-106	3.0856E-08	9.2230E-15	5.2398E+10	5.9373E+09
Sb-127	4.0764E-10	1.5265E-18	7.2382E+06	8.0367E+09
Te-127	1.3772E-08	5.2183E-18	2.4745E+07	9.6598E+09
Te-127m	1.3118E-08	1.3907E-15	6.5947E+09	2.7268E+09
Te-129	2.3494E-08	1.1219E-18	5.2372E+06	1.0712E+10
Te-129m	2.7170E-08	9.0191E-16	4.2104E+09	7.9054E+09
Te-132	2.3051E-09	7.5926E-18	3.4639E+07	1.1528E+11
I-131	3.0221E-05	2.4377E-13	1.1206E+12	2.4418E+13
I-132	5.6736E-08	5.4965E-18	2.5076E+07	2.3940E+12
Xe-133	3.0414E-01	1.6248E-09	7.3571E+15	6.4679E+17
Xe-133m	4.3228E-05	9.8188E-14	4.4459E+11	1.0797E+16
Cs-134	8.5975E-07	6.6450E-13	2.9863E+12	2.1071E+11
Cs-136	5.5137E-08	7.5230E-16	3.3312E+09	4.9382E+10
Cs-137	6.8486E-07	7.8736E-12	3.4610E+13	1.6455E+11
Ba-140	1.3966E-07	1.9077E-15	8.2061E+09	9.1492E+10
La-140	1.6223E-07	2.9187E-16	1.2555E+09	4.7212E+10
Ce-141	8.9234E-09	3.1317E-16	1.3376E+09	2.6394E+09
Ce-144	1.2565E-08	3.9395E-15	1.6475E+10	2.4466E+09
Pr-143	1.7816E-09	2.6458E-17	1.1142E+08	9.5379E+08
Nd-147	3.9520E-10	4.8851E-18	2.0013E+07	3.2265E+08
Np-239	2.8141E-11	1.2130E-19	3.0565E+05	1.4807E+10
Pu-238	4.2133E-11	2.4611E-15	6.2273E+09	7.7730E+06
Pu-239	4.2871E-12	6.8972E-14	1.7379E+11	7.8863E+05
Pu-240	7.4836E-12	3.2857E-15	8.2446E+09	1.3835E+06
Pu-241	1.6562E-09	1.6747E-14	4.1848E+10	3.0702E+08

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Am-241               1.1580E-12  3.3801E-16  8.4463E+08  1.8569E+05
Cm-242               2.2742E-10  6.8703E-17  1.7097E+08  4.6038E+07
Cm-244               1.7029E-11  2.0805E-16  5.1348E+08  3.1555E+06

CR Transport Group Inventory:
Time (h) = 720.0000    Atmosphere     Sump
Noble gases (atoms)    2.2961E+18  0.0000E+00
Elemental I (atoms)    1.1537E+10  0.0000E+00
Organic I (atoms)      1.0963E+12  0.0000E+00
Aerosols (kg)          9.0451E-12  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)         2.8012E-15
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   2.8014E-15
Total I (Ci)                                   3.0278E-05

                       Deposition Recirculating
Time (h) = 720.0000     Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  8.1703E+13
Organic I (atoms)      0.0000E+00  6.6245E+14
Aerosols (kg)          0.0000E+00  1.7571E-09

CR Filtered Intake (Pathway 9) Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  4.8705E+20
Elemental I (atoms)    1.4482E+15  1.4628E+13
Organic I (atoms)      1.1588E+16  1.1705E+14
Aerosols (kg)          2.9638E-08  2.9937E-10

CR Unfiltered Inleakage (Pathway 10) Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  9.0194E+19
Elemental I (atoms)    0.0000E+00  2.7089E+14
Organic I (atoms)      0.0000E+00  2.1676E+15
Aerosols (kg)          0.0000E+00  5.5440E-09

CR Exhaust to Environment (Pathway 11) Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    5.7423E+20  0.0000E+00
Elemental I (atoms)    1.9562E+14  0.0000E+00
Organic I (atoms)      1.5861E+15  0.0000E+00
Aerosols (kg)          4.2069E-09  0.0000E+00

    931

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

                    DW                      WW                   Dummy
Time (hr)    I-131 (Curies)         I-131 (Curies)       I-131 (Curies)
   0.000       6.1456E+03             0.0000E+00           3.4413E-02
```

0.017	1.8470E+05	0.0000E+00	3.1091E+01
0.083	9.2043E+05	0.0000E+00	7.7302E+02
0.333	3.6815E+06	0.0000E+00	1.0908E+03
0.500	6.8011E+05	0.0000E+00	1.2262E+03
0.750	9.4091E+05	0.0000E+00	1.3481E+03
1.000	9.4887E+05	0.0000E+00	1.4778E+03
1.400	9.5868E+05	0.0000E+00	1.6872E+03
1.700	9.6601E+05	0.0000E+00	1.8455E+03
2.000	9.7331E+05	0.0000E+00	2.0050E+03
2.250	5.9152E+04	4.0977E+04	2.0467E+03
2.400	6.1392E+04	3.8263E+04	2.0535E+03
2.700	6.1321E+04	3.8202E+04	2.0671E+03
3.000	6.1240E+04	3.8152E+04	2.0807E+03
3.300	6.1159E+04	3.8101E+04	2.0942E+03
3.600	6.1078E+04	3.8051E+04	2.1077E+03
3.900	6.0997E+04	3.8001E+04	2.1211E+03
4.000	6.0971E+04	3.7984E+04	2.1256E+03
4.300	6.0890E+04	3.7934E+04	2.1390E+03
4.600	6.0810E+04	3.7884E+04	2.1524E+03
4.900	6.0729E+04	3.7834E+04	2.1657E+03
5.200	6.0649E+04	3.7784E+04	2.1790E+03
5.500	6.0569E+04	3.7734E+04	2.1923E+03
5.800	6.0489E+04	3.7684E+04	2.2055E+03
6.100	6.0409E+04	3.7634E+04	2.2187E+03
6.400	6.0329E+04	3.7584E+04	2.2319E+03
6.700	6.0249E+04	3.7535E+04	2.2450E+03
7.000	6.0170E+04	3.7485E+04	2.2581E+03
7.300	6.0090E+04	3.7436E+04	2.2712E+03
7.600	6.0011E+04	3.7386E+04	2.2842E+03
7.900	5.9931E+04	3.7337E+04	2.2972E+03
8.000	5.9905E+04	3.7320E+04	2.3015E+03
8.300	5.9826E+04	3.7271E+04	2.3144E+03
8.600	5.9747E+04	3.7222E+04	2.3273E+03
8.900	5.9668E+04	3.7172E+04	2.3402E+03
9.200	5.9589E+04	3.7123E+04	2.3530E+03
9.500	5.9510E+04	3.7074E+04	2.3658E+03
9.800	5.9431E+04	3.7025E+04	2.3786E+03
10.100	5.9353E+04	3.6976E+04	2.3914E+03
10.400	5.9274E+04	3.6927E+04	2.4041E+03
16.000	5.7827E+04	3.6026E+04	2.6350E+03
24.000	5.5818E+04	3.4774E+04	2.9453E+03
96.000	4.1829E+04	2.6059E+04	3.5915E+03
720.000	3.3936E+03	2.1142E+03	1.4266E+03

Time (hr)	Environment I-131 (Curies)	CR I-131 (Curies)	MSIV Failed Inboard V I-131 (Curies)
0.000	1.3253E-13	9.1943E-17	4.5224E-04
0.017	1.0797E-07	7.4863E-11	4.0812E-01
0.083	6.6216E-05	1.2086E-08	1.0101E+01
0.333	1.6407E-02	2.9281E-06	1.5884E+02
0.500	7.6918E-02	1.3545E-05	2.1697E+02
0.750	2.8702E-01	4.9305E-05	2.6317E+02
1.000	6.6151E-01	1.1075E-04	3.1063E+02
1.400	1.6665E+00	2.6807E-04	3.8240E+02
1.700	2.8028E+00	4.3805E-04	4.3304E+02
2.000	4.3162E+00	6.5598E-04	4.8114E+02
2.250	5.8896E+00	7.8191E-04	4.6964E+02

2.400	6.9642E+00	8.6749E-04	4.5740E+02
2.700	9.3786E+00	1.0561E-03	4.3404E+02
3.000	1.2110E+01	1.2616E-03	4.1212E+02
3.300	1.5118E+01	1.4779E-03	3.9154E+02
3.600	1.8369E+01	1.6998E-03	3.7221E+02
3.900	2.1831E+01	1.9232E-03	3.5406E+02
4.000	2.3028E+01	1.9974E-03	3.4826E+02
4.300	2.6732E+01	2.2180E-03	3.3158E+02
4.600	3.0591E+01	2.4337E-03	3.1591E+02
4.900	3.4585E+01	2.6427E-03	3.0120E+02
5.200	3.8696E+01	2.8438E-03	2.8738E+02
5.500	4.2910E+01	3.0361E-03	2.7441E+02
5.800	4.7214E+01	3.2188E-03	2.6222E+02
6.100	5.1595E+01	3.3918E-03	2.5078E+02
6.400	5.6044E+01	3.5547E-03	2.4004E+02
6.700	6.0551E+01	3.7076E-03	2.2995E+02
7.000	6.5109E+01	3.8507E-03	2.2047E+02
7.300	6.9711E+01	3.9841E-03	2.1156E+02
7.600	7.4351E+01	4.1081E-03	2.0320E+02
7.900	7.9023E+01	4.2232E-03	1.9535E+02
8.000	8.0586E+01	4.2596E-03	1.9283E+02
8.300	8.5278E+01	4.0234E-03	1.8561E+02
8.600	8.9992E+01	3.8124E-03	1.7882E+02
8.900	9.4724E+01	3.6238E-03	1.7244E+02
9.200	9.9472E+01	3.4552E-03	1.6645E+02
9.500	1.0423E+02	3.3045E-03	1.6081E+02
9.800	1.0901E+02	3.1697E-03	1.5552E+02
10.100	1.1379E+02	3.0492E-03	1.5055E+02
10.400	1.1857E+02	2.9413E-03	1.4587E+02
16.000	2.0800E+02	2.1229E-03	9.5523E+01
24.000	3.3303E+02	1.9555E-03	7.5473E+01
96.000	8.1287E+02	4.9179E-04	5.3596E+01
720.000	2.0951E+03	3.0221E-05	4.3481E+00

Time (hr)	MSIV Failed Outboard I-131 (Curies)	Intact Inboard Volume I-131 (Curies)	Intact Outboard Volum I-131 (Curies)
0.000	1.7356E-08	4.5224E-04	2.0436E-08
0.017	4.7009E-04	4.0804E-01	5.5353E-04
0.083	5.7657E-02	1.0090E+01	6.7913E-02
0.333	3.5389E+00	1.5820E+02	4.1732E+00
0.500	9.8463E+00	2.1517E+02	1.1622E+01
0.750	2.0469E+01	2.5934E+02	2.4202E+01
1.000	3.2254E+01	3.0446E+02	3.8193E+01
1.400	5.3025E+01	3.7193E+02	6.2910E+01
1.700	6.9738E+01	4.1898E+02	8.2834E+01
2.000	8.7111E+01	4.6321E+02	1.0357E+02
2.250	1.0081E+02	4.4852E+02	1.1995E+02
2.400	1.0785E+02	4.3454E+02	1.2839E+02
2.700	1.1949E+02	4.0808E+02	1.4236E+02
3.000	1.2828E+02	3.8352E+02	1.5295E+02
3.300	1.3468E+02	3.6070E+02	1.6068E+02
3.600	1.3908E+02	3.3952E+02	1.6598E+02
3.900	1.4182E+02	3.1985E+02	1.6927E+02
4.000	1.4242E+02	3.1361E+02	1.6997E+02
4.300	1.4337E+02	2.9580E+02	1.7107E+02
4.600	1.4327E+02	2.7925E+02	1.7086E+02
4.900	1.4229E+02	2.6388E+02	1.6958E+02

5.200	1.4062E+02	2.4961E+02	1.6743E+02
5.500	1.3840E+02	2.3635E+02	1.6458E+02
5.800	1.3573E+02	2.2404E+02	1.6119E+02
6.100	1.3274E+02	2.1261E+02	1.5738E+02
6.400	1.2949E+02	2.0199E+02	1.5325E+02
6.700	1.2607E+02	1.9212E+02	1.4891E+02
7.000	1.2254E+02	1.8296E+02	1.4441E+02
7.300	1.1893E+02	1.7444E+02	1.3984E+02
7.600	1.1530E+02	1.6654E+02	1.3523E+02
7.900	1.1168E+02	1.5919E+02	1.3064E+02
8.000	1.1048E+02	1.5686E+02	1.2912E+02
8.300	1.0690E+02	1.5019E+02	1.2459E+02
8.600	1.0339E+02	1.4400E+02	1.2015E+02
8.900	9.9965E+01	1.3825E+02	1.1582E+02
9.200	9.6628E+01	1.3291E+02	1.1162E+02
9.500	9.3395E+01	1.2794E+02	1.0755E+02
9.800	9.0271E+01	1.2332E+02	1.0363E+02
10.100	8.7260E+01	1.1902E+02	9.9857E+01
10.400	8.4367E+01	1.1503E+02	9.6243E+01
16.000	4.9727E+01	7.5497E+01	5.4377E+01
24.000	3.4990E+01	6.2435E+01	3.8666E+01
96.000	2.3834E+01	4.5490E+01	2.7083E+01
720.000	1.9167E+00	3.6906E+00	2.1781E+00

##
Cumulative Dose Summary
##

	EAB		LPZ		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
0.017	6.8777E-09	4.7366E-10	9.3629E-10	6.4481E-11	5.8215E-11	2.1044E-12
0.083	4.2150E-06	2.8122E-07	5.7381E-07	3.8284E-08	3.7336E-08	1.6893E-09
0.333	1.0415E-03	6.3301E-05	1.4179E-04	8.6175E-06	3.5193E-05	1.5378E-06
0.500	4.8744E-03	2.8879E-04	6.6357E-04	3.9315E-05	2.5416E-04	1.0967E-05
0.750	1.8148E-02	1.1529E-03	2.4705E-03	1.5695E-04	1.5552E-03	6.8712E-05
1.000	4.1747E-02	3.1654E-03	5.6832E-03	4.3092E-04	4.9901E-03	2.3812E-04
1.400	1.0494E-01	1.1316E-02	1.4285E-02	1.5405E-03	1.7919E-02	1.0549E-03
1.700	1.7615E-01	2.3949E-02	2.3980E-02	3.2603E-03	3.6339E-02	2.5774E-03
2.000	2.7069E-01	4.4631E-02	3.6851E-02	6.0758E-03	6.4891E-02	5.5016E-03
2.250	3.6871E-01	6.9316E-02	5.0194E-02	9.4363E-03	9.6225E-02	9.2865E-03
2.400	4.3550E-01	8.7405E-02	5.9286E-02	1.1899E-02	1.1779E-01	1.2139E-02
2.700	5.8522E-01	1.3064E-01	7.9668E-02	1.7785E-02	1.6793E-01	1.9376E-02
3.000	7.5401E-01	1.8248E-01	1.0265E-01	2.4841E-02	2.2823E-01	2.9040E-02
3.300	9.3930E-01	2.4198E-01	1.2787E-01	3.2942E-02	2.9933E-01	4.1433E-02
3.600	1.1389E+00	3.0818E-01	1.5504E-01	4.1955E-02	3.8159E-01	5.6769E-02
3.900	1.3507E+00	3.8012E-01	1.8388E-01	5.1748E-02	4.7512E-01	7.5169E-02
4.000	1.4238E+00	4.0522E-01	1.9383E-01	5.5164E-02	5.0879E-01	8.1992E-02
4.300	1.6495E+00	4.8338E-01	2.2455E-01	6.5805E-02	6.1721E-01	1.0452E-01
4.600	1.8838E+00	5.6522E-01	2.5645E-01	7.6945E-02	7.3651E-01	1.3009E-01
4.900	2.1256E+00	6.4995E-01	2.8937E-01	8.8481E-02	8.6633E-01	1.5857E-01
5.200	2.3737E+00	7.3689E-01	3.2315E-01	1.0032E-01	1.0062E+00	1.8980E-01
5.500	2.6273E+00	8.2541E-01	3.5767E-01	1.1237E-01	1.1557E+00	2.2359E-01
5.800	2.8855E+00	9.1496E-01	3.9281E-01	1.2456E-01	1.3143E+00	2.5972E-01
6.100	3.1475E+00	1.0051E+00	4.2848E-01	1.3682E-01	1.4814E+00	2.9794E-01
6.400	3.4128E+00	1.0953E+00	4.6460E-01	1.4910E-01	1.6565E+00	3.3803E-01

6.700	3.6808E+00	1.1853E+00	5.0109E-01	1.6136E-01	1.8390E+00	3.7972E-01
7.000	3.9511E+00	1.2747E+00	5.3788E-01	1.7353E-01	2.0284E+00	4.2279E-01
7.300	4.2232E+00	1.3634E+00	5.7493E-01	1.8560E-01	2.2242E+00	4.6699E-01
7.600	4.4968E+00	1.4510E+00	6.1217E-01	1.9754E-01	2.4259E+00	5.1212E-01
7.900	4.7716E+00	1.5375E+00	6.4958E-01	2.0931E-01	2.6329E+00	5.5796E-01
8.000	4.8634E+00	1.5661E+00	6.6207E-01	2.1319E-01	2.7030E+00	5.7336E-01
8.300	5.1383E+00	1.6507E+00	6.7503E-01	2.2055E-01	2.9080E+00	6.1850E-01
8.600	5.4138E+00	1.7339E+00	6.8800E-01	2.2777E-01	3.1014E+00	6.6099E-01
8.900	5.6897E+00	1.8156E+00	7.0100E-01	2.3485E-01	3.2845E+00	7.0074E-01
9.200	5.9658E+00	1.8956E+00	7.1401E-01	2.4179E-01	3.4584E+00	7.3788E-01
9.500	6.2420E+00	1.9740E+00	7.2701E-01	2.4857E-01	3.6240E+00	7.7260E-01
9.800	6.5181E+00	2.0508E+00	7.4002E-01	2.5521E-01	3.7821E+00	8.0514E-01
10.100	6.7940E+00	2.1259E+00	7.5302E-01	2.6169E-01	3.9337E+00	8.3570E-01
10.400	7.0698E+00	2.1993E+00	7.6601E-01	2.6802E-01	4.0793E+00	8.6448E-01
16.000	1.2126E+01	3.3276E+00	1.0042E+00	3.6422E-01	6.2233E+00	1.2551E+00
24.000	1.8923E+01	4.3954E+00	1.3244E+00	4.5256E-01	8.6833E+00	1.5747E+00
96.000	4.2245E+01	6.7010E+00	1.9155E+00	5.3193E-01	1.2354E+01	1.8444E+00
720.000	1.0036E+02	1.1014E+01	2.3423E+00	5.7312E-01	1.6687E+01	2.0853E+00

##
Worst Two-Hour Doses
##

EAB

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
5.3	5.3866E-01	1.7650E+00	5.9699E-01

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Attachment 13.6 - RADTRAD Partial Output File "NMP2MS02.o0"

```
##########################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:15:00
 ##########################################################################

 ##########################################################################
                      File information
 ##########################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NMP2MS02.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




     #####    ####   #####    #  #     #  #####   #    #  #####
     #    #  #       #        #  ##    #  #    #  #    #    #
     #    #  #       #        #  # #   #  #    #  #    #    #
     #####    ####   ####     #  #  #  #  #####   #    #    #
     #            #  #        #  #   # #  #       #    #    #
     #            #  #        #  #    ##  #       #    #    #
     #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Drywell System Bypass Pathway 5 Only Without Delay Times, CAVEX Core
Inventory, and Modified Offisite X/Q Values
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   9
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
```

```
Dummy
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 5:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Compartment 6:
MSIV Failed Inboard Volume 1
  3
 3.9068E+02
  0
  0
  0
  0
  0
Compartment 7:
MSIV Failed Outboard Volume 2
  3
 4.2841E+02
  0
  0
  0
  0
  0
Compartment 8:
Intact Inboard Volume 3
  3
 3.3181E+02
  0
  0
  0
  0
  0
Compartment 9:
Intact Outboard Volume 4
  3
 4.8703E+02
```

```
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW Leakage to RB (Released to Dummy)
  1
  3
  2
Pathway 4:
WW Leakage to RB (Released to Dummy)
  2
  3
  2
Pathway 5:
DW Bypass Pathway 5 to Environment
  1
  4
  2
Pathway 6:
WW Bypass Pathway 6 to Environment (Released to Dummy)
  2
  3
  2
Pathway 7:
DW to MSIV Failed Inboard Volume 1
  1
  6
  2
Pathway 8:
MSIV Failed Inboard Volume 1 to MSIV Failed outboard Volume 2
  6
  7
  2
Pathway 9:
MSIV Failed Outboard Volume 2 to Environment (Released to Dummy)
  7
  3
  2
Pathway 10:
DW to Intact Inboard Volume 3
  1
  8
  2
```

```
Pathway 11:
Intact Inboard Volume 3 to Intact Interstitial Volume 4
  8
  9
  2
Pathway 12:
CR Filtered Intake (Pathway 9)
  4
  5
  2
Pathway 13:
CR Unfiltered Inleakage (Pathway 10)
  4
  5
  2
Pathway 14:
CR Exhaust to Environment (Pathway 11)
  5
  4
  2
Pathway 15:
Intact Outboard Volume 4 to  Environment ( Released to Dummy)
  9
  3
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
  0.0000E+00
  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  9
Compartment 1:
  0
  1
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
  2.4000E+00   0.0000E+00
```

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```
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+00
  2.4000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  1
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
```

```
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 7:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 8:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 9:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
```

```
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   2.4930E-01   7.3050E+01   3.6000E+00   0.0000E+00
  8.0000E+00   2.4930E-01   7.3050E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.2470E-01   7.3050E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.2470E-01   7.3050E+01   4.8890E+01   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 6:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.1200E-02   8.5610E+01   3.6000E+00   0.0000E+00
  8.0000E+00   1.1200E-02   8.5610E+01   4.8200E+00   0.0000E+00
  2.4000E+01   5.6000E-03   8.5610E+01   8.4600E+00   0.0000E+00
  9.6000E+01   5.6000E-03   8.5610E+01   4.8890E+01   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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 8:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   9.8910E+01   3.8200E+00   0.0000E+00
  8.0000E+00   1.3520E+00   9.8910E+01   5.1200E+00   0.0000E+00
  2.4000E+01   6.7600E-01   9.8910E+01   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   9.8910E+01   5.1030E+01   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 9:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8910E+01   3.5600E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8910E+01   4.7800E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8910E+01   8.3900E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8910E+01   4.8590E+01   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 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 11:
  0
```

```
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   9.8720E+01   3.8300E+00   0.0000E+00
  8.0000E+00   1.3520E+00   9.8720E+01   5.1300E+00   0.0000E+00
  2.4000E+01   6.7600E-01   9.8720E+01   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   9.8720E+01   5.1040E+01   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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 13:
  0
  0
  0
  0
  0
  1
  7
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   2.5000E+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 14:
  0
```

```
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 15:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8720E+01   3.6000E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8720E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8720E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8720E+01   4.8890E+01   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  4
  1
  2
  0.0000E+00   1.4600E-04
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ
  4
  1
  5
  0.0000E+00   1.9800E-05
  8.0000E+00   1.3300E-05
  2.4000E+01   5.6100E-06
  9.6000E+01   1.6300E-06
```

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```
  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 3:
CR
  5
  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
  6
  0.0000E+00   1.4700E-03
  2.0000E+00   9.7400E-04
  8.0000E+00   3.6300E-04
  2.4000E+01   2.4500E-04
  9.6000E+01   1.9000E-04
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NMP2MS02.o0
  1
  1
  1
  0
  0
End of Scenario File
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:15:00
##########################################################################

     ####   #    #  #####  #####   #    #  #####
    #    #  #    #    #    #    #  #    #    #
    #    #  #    #    #    #    #  #    #    #
    #    #  #    #    #    #####   #    #    #
    #    #  #    #    #    #       #    #    #
    #    #  #    #    #    #       #    #    #
     ####    ####     #    #        ####     #


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

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.8128E-01	8.3187E+00	6.9049E-01
Accumulated dose (rem)	1.5749E+00	1.7344E+01	2.3488E+00

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.1403E-03	6.1031E-02	6.1425E-03
Accumulated dose (rem)	1.4655E-01	7.4180E-01	1.7870E-01

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.5773E-03	5.0554E-01	3.4424E-02
Accumulated dose (rem)	3.0923E-01	5.2536E+00	6.9669E-01

CR Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	1.1611E-02	2.9622E-08	2.0987E+17	1.5939E+15
Rb-86	6.0476E-09	7.4325E-17	5.2046E+08	5.7191E+09
Sr-89	6.7098E-07	2.3096E-14	1.5628E+11	2.3893E+11
Sr-90	1.0814E-07	7.9276E-13	5.3046E+12	2.7699E+10
Y-90	1.0871E-07	1.9981E-16	1.3370E+09	1.1332E+10
Y-91	1.1081E-08	4.5186E-16	2.9903E+09	3.4181E+09
Zr-95	1.0828E-08	5.0403E-16	3.1951E+09	3.5919E+09
Nb-95	1.3749E-08	3.5161E-16	2.2289E+09	3.7412E+09
Mo-99	9.8376E-11	2.0512E-19	1.2477E+06	2.8557E+10
Tc-99m	1.0086E-10	1.9181E-20	1.1668E+05	2.6105E+10
Ru-103	9.6458E-08	2.9887E-15	1.7474E+10	3.7848E+10
Ru-106	6.4348E-08	1.9234E-14	1.0927E+11	1.7207E+10
Sb-127	8.5010E-10	3.1833E-18	1.5095E+07	3.0062E+10
Te-127	2.8720E-08	1.0882E-17	5.1603E+07	3.3383E+10
Te-127m	2.7357E-08	2.9003E-15	1.3753E+10	7.9451E+09
Te-129	4.8996E-08	2.3396E-18	1.0922E+07	5.7332E+10
Te-129m	5.6662E-08	1.8809E-15	8.7805E+09	2.3901E+10
Te-132	4.8070E-09	1.5834E-17	7.2237E+07	4.4079E+11
I-131	3.4879E-06	2.8134E-14	1.2933E+11	5.2848E+12

I-132	9.3880E-09	9.0950E-19	4.1494E+06	2.3941E+12
Xe-133	2.7888E-02	1.4899E-10	6.7461E+14	7.5433E+16
Xe-133m	3.9638E-06	9.0033E-15	4.0766E+10	1.4594E+15
Cs-134	1.7929E-06	1.3858E-12	6.2278E+12	6.5143E+11
Cs-136	1.1498E-07	1.5689E-15	6.9469E+09	1.6779E+11
Cs-137	1.4282E-06	1.6420E-11	7.2176E+13	5.0775E+11
Ba-140	2.9125E-07	3.9784E-15	1.7113E+10	2.9627E+11
La-140	3.3832E-07	6.0868E-16	2.6183E+09	9.8417E+10
Ce-141	1.8609E-08	6.5310E-16	2.7894E+09	7.9994E+09
Ce-144	2.6203E-08	8.2155E-15	3.4357E+10	7.0998E+09
Pr-143	3.7154E-09	5.5175E-17	2.3236E+08	2.9393E+09
Nd-147	8.2415E-10	1.0187E-17	4.1735E+07	1.0605E+09
Np-239	5.8687E-11	2.5297E-19	6.3741E+05	5.9102E+10
Pu-238	8.7865E-11	5.1324E-15	1.2987E+10	2.2417E+07
Pu-239	8.9403E-12	1.4384E-13	3.6243E+11	2.2706E+06
Pu-240	1.5606E-11	6.8521E-15	1.7193E+10	3.9910E+06
Pu-241	3.4538E-09	3.4925E-14	8.7270E+10	8.8593E+08
Am-241	2.4149E-12	7.0490E-16	1.7614E+09	5.2617E+05
Cm-242	4.7427E-10	1.4327E-16	3.5654E+08	1.3419E+08
Cm-244	3.5513E-11	4.3387E-16	1.0708E+09	9.1050E+06

CR Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump		
Noble gases (atoms)	2.1054E+17	0.0000E+00		
Elemental I (atoms)	2.1542E+09	0.0000E+00		
Organic I (atoms)	1.0053E+11	0.0000E+00		
Aerosols (kg)	1.8863E-11	0.0000E+00		
Dose Effective (Ci/cc)	I-131 (Thyroid)		3.2329E-16	
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		3.2332E-16	
Total I (Ci)			3.4973E-06	

Time (h) = 720.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.5169E+13
Organic I (atoms)	0.0000E+00	7.6086E+13
Aerosols (kg)	0.0000E+00	5.3018E-09

CR Filtered Intake (Pathway 9) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.9343E+19
Elemental I (atoms)	2.7078E+14	2.8248E+12
Organic I (atoms)	1.3356E+15	1.3494E+13
Aerosols (kg)	9.0987E-08	9.4276E-10

CR Unfiltered Inleakage (Pathway 10) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.1376E+18
Elemental I (atoms)	0.0000E+00	5.0682E+13
Organic I (atoms)	0.0000E+00	2.4984E+14
Aerosols (kg)	0.0000E+00	1.7028E-08

CR Exhaust to Environment (Pathway 11) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	5.8181E+19	0.0000E+00
Elemental I (atoms)	3.6319E+13	0.0000E+00
Organic I (atoms)	1.8217E+14	0.0000E+00
Aerosols (kg)	1.2694E-08	0.0000E+00

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##
I-131 Summary
##

Time (hr)	DW I-131 (Curies)	WW I-131 (Curies)	Dummy I-131 (Curies)
0.000	6.1456E+03	0.0000E+00	3.4388E-02
0.017	1.8470E+05	0.0000E+00	3.1068E+01
0.083	9.2043E+05	0.0000E+00	7.7245E+02
0.333	3.6815E+06	0.0000E+00	1.0817E+03
0.500	6.8011E+05	0.0000E+00	1.2134E+03
0.750	9.4091E+05	0.0000E+00	1.3321E+03
1.000	9.4887E+05	0.0000E+00	1.4585E+03
1.400	9.5868E+05	0.0000E+00	1.6627E+03
1.700	9.6601E+05	0.0000E+00	1.8174E+03
2.000	9.7331E+05	0.0000E+00	1.9734E+03
2.250	5.9152E+04	4.0977E+04	2.0154E+03
2.400	6.1392E+04	3.8263E+04	2.0229E+03
2.700	6.1321E+04	3.8202E+04	2.0380E+03
3.000	6.1240E+04	3.8152E+04	2.0533E+03
3.300	6.1159E+04	3.8101E+04	2.0689E+03
3.600	6.1078E+04	3.8051E+04	2.0847E+03
3.900	6.0997E+04	3.8001E+04	2.1006E+03
4.000	6.0971E+04	3.7984E+04	2.1059E+03
4.300	6.0890E+04	3.7934E+04	2.1220E+03
4.600	6.0810E+04	3.7884E+04	2.1383E+03
4.900	6.0729E+04	3.7834E+04	2.1546E+03
5.200	6.0649E+04	3.7784E+04	2.1710E+03
5.500	6.0569E+04	3.7734E+04	2.1875E+03
5.800	6.0489E+04	3.7684E+04	2.2041E+03
6.100	6.0409E+04	3.7634E+04	2.2207E+03
6.400	6.0329E+04	3.7584E+04	2.2373E+03
6.700	6.0249E+04	3.7535E+04	2.2540E+03
7.000	6.0170E+04	3.7485E+04	2.2707E+03
7.300	6.0090E+04	3.7436E+04	2.2874E+03
7.600	6.0011E+04	3.7386E+04	2.3041E+03
7.900	5.9931E+04	3.7337E+04	2.3209E+03
8.000	5.9905E+04	3.7320E+04	2.3265E+03
8.300	5.9826E+04	3.7271E+04	2.3432E+03
8.600	5.9747E+04	3.7222E+04	2.3599E+03
8.900	5.9668E+04	3.7172E+04	2.3766E+03
9.200	5.9589E+04	3.7123E+04	2.3933E+03
9.500	5.9510E+04	3.7074E+04	2.4100E+03
9.800	5.9431E+04	3.7025E+04	2.4267E+03
10.100	5.9353E+04	3.6976E+04	2.4434E+03
10.400	5.9274E+04	3.6927E+04	2.4600E+03
16.000	5.7827E+04	3.6026E+04	2.7654E+03

24.000	5.5818E+04	3.4774E+04	3.1794E+03
96.000	4.1829E+04	2.6059E+04	4.1402E+03
720.000	3.3936E+03	2.1142E+03	1.7705E+03

Time (hr)	Environment I-131 (Curies)	CR I-131 (Curies)	MSIV Failed Inboard V I-131 (Curies)
0.000	2.5375E-05	1.7604E-08	4.5224E-04
0.017	2.2925E-02	1.5891E-05	4.0812E-01
0.083	5.7004E-01	1.1460E-04	1.0101E+01
0.333	9.1221E+00	1.6132E-03	1.5884E+02
0.500	1.2801E+01	2.1660E-03	2.1697E+02
0.750	1.6190E+01	2.5727E-03	2.6317E+02
1.000	1.9849E+01	2.9906E-03	3.1063E+02
1.400	2.5874E+01	3.6149E-03	3.8240E+02
1.700	3.0528E+01	4.0508E-03	4.3304E+02
2.000	3.5298E+01	4.4621E-03	4.8114E+02
2.250	3.6331E+01	4.1953E-03	4.6964E+02
2.400	3.6621E+01	4.0086E-03	4.5740E+02
2.700	3.7201E+01	3.6640E-03	4.3404E+02
3.000	3.7779E+01	3.3546E-03	4.1212E+02
3.300	3.8357E+01	3.0769E-03	3.9154E+02
3.600	3.8934E+01	2.8275E-03	3.7221E+02
3.900	3.9511E+01	2.6037E-03	3.5406E+02
4.000	3.9703E+01	2.5343E-03	3.4826E+02
4.300	4.0278E+01	2.3404E-03	3.3158E+02
4.600	4.0853E+01	2.1663E-03	3.1591E+02
4.900	4.1426E+01	2.0100E-03	3.0120E+02
5.200	4.2000E+01	1.8696E-03	2.8738E+02
5.500	4.2572E+01	1.7436E-03	2.7441E+02
5.800	4.3144E+01	1.6304E-03	2.6222E+02
6.100	4.3714E+01	1.5287E-03	2.5078E+02
6.400	4.4284E+01	1.4373E-03	2.4004E+02
6.700	4.4854E+01	1.3553E-03	2.2995E+02
7.000	4.5422E+01	1.2815E-03	2.2047E+02
7.300	4.5990E+01	1.2153E-03	2.1156E+02
7.600	4.6557E+01	1.1557E-03	2.0320E+02
7.900	4.7124E+01	1.1022E-03	1.9535E+02
8.000	4.7312E+01	1.0856E-03	1.9283E+02
8.300	4.7877E+01	9.9840E-04	1.8561E+02
8.600	4.8442E+01	9.2014E-04	1.7882E+02
8.900	4.9005E+01	8.4987E-04	1.7244E+02
9.200	4.9568E+01	7.8678E-04	1.6645E+02
9.500	5.0130E+01	7.3013E-04	1.6081E+02
9.800	5.0692E+01	6.7926E-04	1.5552E+02
10.100	5.1252E+01	6.3357E-04	1.5055E+02
10.400	5.1812E+01	5.9254E-04	1.4587E+02
16.000	6.2119E+01	2.7777E-04	9.5523E+01
24.000	7.6398E+01	2.2515E-04	7.5473E+01
96.000	1.3120E+02	5.6165E-05	5.3596E+01
720.000	2.7915E+02	3.4879E-06	4.3481E+00

Time (hr)	MSIV Failed Outboard I-131 (Curies)	Intact Inboard Volume I-131 (Curies)	Intact Outboard Volum I-131 (Curies)
0.000	1.0173E-09	4.5224E-04	1.2346E-09
0.017	2.7552E-05	4.0804E-01	3.3442E-05
0.083	3.3793E-03	1.0090E+01	4.1029E-03
0.333	2.0742E-01	1.5820E+02	2.5212E-01

0.500	5.7961E-01	2.1517E+02	7.0511E-01
0.750	1.2254E+00	2.5934E+02	1.4924E+00
1.000	1.9768E+00	3.0446E+02	2.4093E+00
1.400	3.4038E+00	3.7193E+02	4.1501E+00
1.700	4.6545E+00	4.1898E+02	5.6746E+00
2.000	6.0574E+00	4.6321E+02	7.3829E+00
2.250	7.2464E+00	4.4852E+02	8.8303E+00
2.400	7.9018E+00	4.3454E+02	9.6284E+00
2.700	9.0867E+00	4.0808E+02	1.1071E+01
3.000	1.0122E+01	3.8352E+02	1.2330E+01
3.300	1.1026E+01	3.6070E+02	1.3427E+01
3.600	1.1816E+01	3.3952E+02	1.4382E+01
3.900	1.2507E+01	3.1985E+02	1.5212E+01
4.000	1.2717E+01	3.1361E+02	1.5464E+01
4.300	1.3294E+01	2.9580E+02	1.6152E+01
4.600	1.3798E+01	2.7925E+02	1.6747E+01
4.900	1.4239E+01	2.6388E+02	1.7262E+01
5.200	1.4625E+01	2.4961E+02	1.7707E+01
5.500	1.4962E+01	2.3635E+02	1.8090E+01
5.800	1.5256E+01	2.2404E+02	1.8418E+01
6.100	1.5513E+01	2.1261E+02	1.8699E+01
6.400	1.5738E+01	2.0199E+02	1.8939E+01
6.700	1.5934E+01	1.9212E+02	1.9143E+01
7.000	1.6105E+01	1.8296E+02	1.9315E+01
7.300	1.6253E+01	1.7444E+02	1.9459E+01
7.600	1.6383E+01	1.6654E+02	1.9579E+01
7.900	1.6495E+01	1.5919E+02	1.9679E+01
8.000	1.6530E+01	1.5686E+02	1.9708E+01
8.300	1.6617E+01	1.5019E+02	1.9778E+01
8.600	1.6693E+01	1.4400E+02	1.9834E+01
8.900	1.6758E+01	1.3825E+02	1.9878E+01
9.200	1.6815E+01	1.3291E+02	1.9911E+01
9.500	1.6863E+01	1.2794E+02	1.9935E+01
9.800	1.6904E+01	1.2332E+02	1.9951E+01
10.100	1.6939E+01	1.1902E+02	1.9959E+01
10.400	1.6968E+01	1.1503E+02	1.9962E+01
16.000	1.6982E+01	7.5497E+01	1.9563E+01
24.000	1.6502E+01	6.2435E+01	1.8828E+01
96.000	1.2362E+01	4.5490E+01	1.4073E+01
720.000	9.8613E-01	3.6906E+00	1.1227E+00

##
Cumulative Dose Summary
##

	EAB		LPZ		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
0.017	1.8039E-03	9.3882E-05	2.4464E-04	1.2732E-05	1.7625E-05	7.3721E-07
0.083	4.4828E-02	2.3148E-03	6.0794E-03	3.1393E-04	6.7080E-04	2.8885E-05
0.333	7.1577E-01	3.6100E-02	9.7071E-02	4.8958E-03	3.2895E-02	1.4242E-03
0.500	1.0038E+00	5.2525E-02	1.3613E-01	7.1232E-03	9.2166E-02	4.0094E-03
0.750	1.2768E+00	7.9470E-02	1.7316E-01	1.0777E-02	1.9779E-01	8.9520E-03
1.000	1.5722E+00	1.2025E-01	2.1322E-01	1.6308E-02	3.2288E-01	1.5784E-02
1.400	2.0566E+00	2.0753E-01	2.7890E-01	2.8145E-02	5.6143E-01	3.2069E-02
1.700	2.4288E+00	2.8720E-01	3.2938E-01	3.8949E-02	7.6901E-01	4.9730E-02

2.000	2.8086E+00	3.7711E-01	3.8090E-01	5.1142E-02	9.9935E-01	7.2636E-02
2.250	2.8898E+00	4.1934E-01	3.9190E-01	5.6869E-02	1.1947E+00	9.4481E-02
2.400	2.9121E+00	4.4178E-01	3.9493E-01	5.9912E-02	1.3052E+00	1.0772E-01
2.700	2.9565E+00	4.8530E-01	4.0096E-01	6.5814E-02	1.5112E+00	1.3401E-01
3.000	3.0008E+00	5.2662E-01	4.0696E-01	7.1418E-02	1.6990E+00	1.5988E-01
3.300	3.0448E+00	5.6559E-01	4.1293E-01	7.6704E-02	1.8705E+00	1.8506E-01
3.600	3.0887E+00	6.0226E-01	4.1887E-01	8.1677E-02	2.0274E+00	2.0940E-01
3.900	3.1323E+00	6.3673E-01	4.2479E-01	8.6351E-02	2.1712E+00	2.3282E-01
4.000	3.1468E+00	6.4775E-01	4.2676E-01	8.7846E-02	2.2165E+00	2.4042E-01
4.300	3.1901E+00	6.7949E-01	4.3264E-01	9.2151E-02	2.3450E+00	2.6258E-01
4.600	3.2333E+00	7.0936E-01	4.3849E-01	9.6200E-02	2.4634E+00	2.8378E-01
4.900	3.2763E+00	7.3748E-01	4.4432E-01	1.0001E-01	2.5728E+00	3.0402E-01
5.200	3.3191E+00	7.6399E-01	4.5012E-01	1.0361E-01	2.6741E+00	3.2332E-01
5.500	3.3617E+00	7.8901E-01	4.5590E-01	1.0700E-01	2.7681E+00	3.4172E-01
5.800	3.4041E+00	8.1264E-01	4.6166E-01	1.1021E-01	2.8555E+00	3.5922E-01
6.100	3.4464E+00	8.3500E-01	4.6739E-01	1.1324E-01	2.9371E+00	3.7587E-01
6.400	3.4885E+00	8.5617E-01	4.7310E-01	1.1611E-01	3.0135E+00	3.9170E-01
6.700	3.5304E+00	8.7623E-01	4.7878E-01	1.1883E-01	3.0852E+00	4.0675E-01
7.000	3.5721E+00	8.9528E-01	4.8444E-01	1.2141E-01	3.1527E+00	4.2104E-01
7.300	3.6137E+00	9.1337E-01	4.9008E-01	1.2387E-01	3.2163E+00	4.3462E-01
7.600	3.6551E+00	9.3057E-01	4.9569E-01	1.2620E-01	3.2766E+00	4.4752E-01
7.900	3.6964E+00	9.4696E-01	5.0129E-01	1.2842E-01	3.3338E+00	4.5978E-01
8.000	3.7101E+00	9.5224E-01	5.0315E-01	1.2914E-01	3.3522E+00	4.6372E-01
8.300	3.7511E+00	9.6761E-01	5.0507E-01	1.3047E-01	3.4048E+00	4.7498E-01
8.600	3.7919E+00	9.8228E-01	5.0698E-01	1.3173E-01	3.4530E+00	4.8527E-01
8.900	3.8326E+00	9.9630E-01	5.0889E-01	1.3294E-01	3.4974E+00	4.9464E-01
9.200	3.8732E+00	1.0097E+00	5.1079E-01	1.3409E-01	3.5383E+00	5.0317E-01
9.500	3.9136E+00	1.0225E+00	5.1268E-01	1.3519E-01	3.5762E+00	5.1094E-01
9.800	3.9538E+00	1.0348E+00	5.1457E-01	1.3624E-01	3.6112E+00	5.1803E-01
10.100	3.9939E+00	1.0467E+00	5.1645E-01	1.3725E-01	3.6438E+00	5.2451E-01
10.400	4.0339E+00	1.0580E+00	5.1832E-01	1.3821E-01	3.6741E+00	5.3045E-01
16.000	4.7567E+00	1.2172E+00	5.5218E-01	1.5150E-01	4.0245E+00	5.9439E-01
24.000	5.7201E+00	1.3558E+00	5.9731E-01	1.6255E-01	4.3235E+00	6.3194E-01
96.000	9.0253E+00	1.6583E+00	6.8077E-01	1.7255E-01	4.7481E+00	6.6227E-01
720.000	1.7344E+01	2.3488E+00	7.4180E-01	1.7870E-01	5.2536E+00	6.9669E-01

##
Worst Two-Hour Doses
##

EAB

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
0.8	3.3513E-01	1.6354E+00	4.1144E-01

Attachment 13.7 - RADTRAD Partial Output File "NMP2MS03.o0"

```
##############################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:16:02
 ##############################################################################

 ##############################################################################
                      File information
 ##############################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NMP2MS03.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




      #####    ####   #####    #  #     #  #####   #    #  #####
      #    #  #       #        #  ##    #  #    #  #    #    #
      #    #  #       #        #  # #   #  #    #  #    #    #
      #####    ####   ####     #  #  #  #  #####   #    #    #
      #            #  #        #  #   # #  #       #    #    #
      #            #  #        #  #    ##  #       #    #    #
      #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Wetwell System Bypass Pathway 6 Only  Without Delay Times,  Wetwell Bypass
Leakage Reduction after 24 hrs, CAVEX Core Inventory, and Modified Offisite X/Q
Values
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   9
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
```

```
Dummy
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 5:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Compartment 6:
MSIV Failed Inboard Volume 1
  3
 3.9068E+02
  0
  0
  0
  0
  0
Compartment 7:
MSIV Failed Outboard Volume 2
  3
 4.2841E+02
  0
  0
  0
  0
  0
Compartment 8:
Intact Inboard Volume 3
  3
 3.3181E+02
  0
  0
  0
  0
  0
Compartment 9:
Intact Outboard Volume 4
  3
 4.8703E+02
```

```
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW Leakage to RB (Released to Dummy)
  1
  3
  2
Pathway 4:
WW Leakage to RB (Released to Dummy)
  2
  3
  2
Pathway 5:
DW Bypass Pathway 5 to Environment (Released to Dummy)
  1
  3
  2
Pathway 6:
WW Bypass Pathway 6 to Environment
  2
  4
  2
Pathway 7:
DW to MSIV Failed Inboard Volume 1
  1
  6
  2
Pathway 8:
MSIV Failed Inboard Volume 1 to MSIV Failed outboard Volume 2
  6
  7
  2
Pathway 9:
MSIV Failed Outboard Volume 2 to Environment (Released to Dummy)
  7
  3
  2
Pathway 10:
DW to Intact Inboard Volume 3
  1
  8
  2
```

```
Pathway 11:
Intact Inboard Volume 3 to Intact Outboard Volume 4
  8
  9
  2
Pathway 12:
CR Filtered Intake (Pathway 9)
  4
  5
  2
Pathway 13:
CR Unfiltered Inleakage (Pathway 10)
  4
  5
  2
Pathway 14:
CR Exhaust to Environment (Pathway 11)
  5
  4
  2
Pathway 15:
Intact Outboard Volume 4 to Environment (Released to Dummy)
  9
  3
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
  0.0000E+00
  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  9
Compartment 1:
  0
  1
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
  2.4000E+00   0.0000E+00
```

```
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+00
  2.4000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  1
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
```

```
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 7:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 8:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 9:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
```

```
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   2.4930E-01   7.3050E+01   3.6000E+00   0.0000E+00
  8.0000E+00   2.4930E-01   7.3050E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.2470E-01   7.3050E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.2470E-01   7.3050E+01   4.8890E+01   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 6:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.1200E-02   8.5610E+01   3.6000E+00   0.0000E+00
  8.0000E+00   1.1200E-02   8.5610E+01   4.8200E+00   0.0000E+00
  2.4000E+01   5.6000E-03   8.5610E+01   8.4600E+00   0.0000E+00
  9.6000E+01   5.6000E-03   8.5610E+01   4.8890E+01   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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 8:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   9.8910E+01   3.8200E+00   0.0000E+00
  8.0000E+00   1.3520E+00   9.8910E+01   5.1200E+00   0.0000E+00
  2.4000E+01   6.7600E-01   9.8910E+01   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   9.8910E+01   5.1030E+01   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 9:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8910E+01   3.5600E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8910E+01   4.7800E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8910E+01   8.3900E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8910E+01   4.8590E+01   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 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 11:
  0
```

```
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   9.8720E+01   3.8300E+00   0.0000E+00
  8.0000E+00   1.3520E+00   9.8720E+01   5.1300E+00   0.0000E+00
  2.4000E+01   6.7600E-01   9.8720E+01   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   9.8720E+01   5.1040E+01   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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 13:
  0
  0
  0
  0
  0
  1
  7
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   2.5000E+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 14:
  0
```

```
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 15:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8720E+01   3.6000E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8720E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8720E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8720E+01   4.8890E+01   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  4
  1
  2
  0.0000E+00   3.1300E-04
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ
  4
  1
  5
  0.0000E+00   4.2600E-05
  8.0000E+00   2.8700E-05
  2.4000E+01   1.2100E-05
  9.6000E+01   3.5000E-06
```

```
  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 3:
CR
  5
  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
  6
  0.0000E+00   1.4700E-03
  2.0000E+00   9.7400E-04
  8.0000E+00   3.6300E-04
  2.4000E+01   2.4500E-04
  9.6000E+01   1.9000E-04
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NMP2MS03.o0
  1
  1
  1
  0
  0
End of Scenario File
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:16:02
##########################################################################

     ####   #    #  #####  #####   #    #  #####
    #    #  #    #    #    #    #  #    #    #
    #    #  #    #    #    #    #  #    #    #
    #    #  #    #    #    #####   #    #    #
    #    #  #    #    #    #       #    #    #
    #    #  #    #    #    #       #    #    #
     ####    ####     #    #        ####     #


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

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.6977E-02	7.2035E-01	5.6927E-02
Accumulated dose (rem)	1.2501E-01	1.2580E+00	1.7395E-01

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.0166E-04	5.2933E-03	5.2174E-04
Accumulated dose (rem)	1.0595E-02	3.1240E-02	1.1762E-02

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.2982E-04	2.0420E-02	1.2783E-03
Accumulated dose (rem)	9.5072E-03	8.3824E-02	1.7087E-02

CR Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	5.2130E-04	1.3300E-09	9.4226E+15	6.9635E+13
Rb-86	1.4498E-10	1.7818E-18	1.2477E+07	4.0701E+07
Sr-89	1.6086E-08	5.5368E-16	3.7465E+09	2.8164E+09
Sr-90	2.5924E-09	1.9005E-14	1.2717E+11	3.5184E+08
Y-90	2.6061E-09	4.7900E-18	3.2051E+07	2.5947E+08
Y-91	2.6566E-10	1.0833E-17	7.1688E+07	4.3870E+07
Zr-95	2.5958E-10	1.2083E-17	7.6597E+07	4.3007E+07
Nb-95	3.2961E-10	8.4293E-18	5.3434E+07	4.7105E+07
Mo-99	2.3584E-12	4.9173E-21	2.9912E+04	1.6179E+08
Ru-103	2.3124E-09	7.1650E-17	4.1892E+08	4.3684E+08
Ru-106	1.5426E-09	4.6110E-16	2.6196E+09	2.1638E+08
Sb-127	2.0380E-11	7.6314E-20	3.6187E+05	1.9371E+08
Te-127	6.8851E-10	2.6089E-19	1.2371E+06	2.6813E+08
Te-127m	6.5584E-10	6.9530E-17	3.2970E+08	9.8634E+07
Te-129	1.1746E-09	5.6087E-20	2.6183E+05	2.5531E+08
Te-129m	1.3584E-09	4.5091E-17	2.1050E+08	2.7202E+08
Te-132	1.1524E-10	3.7959E-19	1.7318E+06	2.6642E+09
I-131	1.4156E-07	1.1418E-15	5.2491E+09	1.1824E+11

I-132	3.3040E-10	3.2009E-20	1.4603E+05	1.5264E+10
Xe-133	1.2521E-03	6.6893E-12	3.0289E+13	3.1565E+15
Xe-133m	1.7797E-07	4.0423E-16	1.8303E+09	5.8689E+13
Cs-134	4.2983E-08	3.3221E-14	1.4930E+11	5.9244E+09
Cs-136	2.7565E-09	3.7611E-17	1.6654E+08	1.0879E+09
Cs-137	3.4239E-08	3.9364E-13	1.7303E+12	4.6467E+09
Ba-140	6.9823E-09	9.5375E-17	4.1026E+08	2.8487E+09
La-140	8.1107E-09	1.4592E-17	6.2768E+07	2.1249E+09
Ce-141	4.4612E-10	1.5657E-17	6.6872E+07	9.0605E+07
Ce-144	6.2818E-10	1.9695E-16	8.2367E+08	8.9009E+07
Pr-143	8.9071E-11	1.3227E-18	5.5704E+06	3.1477E+07
Nd-147	1.9758E-11	2.4423E-19	1.0005E+06	9.8093E+06
Np-239	1.4069E-12	6.0646E-21	1.5281E+04	3.1583E+08
Pu-238	2.1064E-12	1.2304E-16	3.1133E+08	2.8502E+05
Pu-239	2.1433E-13	3.4482E-15	8.6886E+09	2.8969E+04
Pu-240	3.7414E-13	1.6427E-16	4.1219E+08	5.0714E+04
Pu-241	8.2799E-11	8.3726E-16	2.0922E+09	1.1250E+07
Am-241	5.7893E-14	1.6899E-17	4.2227E+07	6.9581E+03
Cm-242	1.1370E-11	3.4348E-18	8.5474E+06	1.6656E+06
Cm-244	8.5136E-13	1.0401E-17	2.5671E+07	1.1563E+05

CR Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump		
Noble gases (atoms)	9.4529E+15	0.0000E+00		
Elemental I (atoms)	9.6719E+07	0.0000E+00		
Organic I (atoms)	4.5135E+09	0.0000E+00		
Aerosols (kg)	4.5221E-13	0.0000E+00		
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.3121E-17	
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.3122E-17	
Total I (Ci)			1.4189E-07	

Time (h) = 720.0000	Deposition Surfaces	Recirculating Filter
Noble gases (atoms)	0.0000E+00	0.0000E+00
Elemental I (atoms)	0.0000E+00	1.0751E+11
Organic I (atoms)	0.0000E+00	3.1670E+12
Aerosols (kg)	0.0000E+00	4.9211E-11

CR Filtered Intake (Pathway 9) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.1497E+18
Elemental I (atoms)	1.8907E+12	1.9098E+10
Organic I (atoms)	5.5520E+13	5.6081E+11
Aerosols (kg)	8.4286E-10	8.5138E-12

CR Unfiltered Inleakage (Pathway 10) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.9810E+17
Elemental I (atoms)	0.0000E+00	3.5366E+11
Organic I (atoms)	0.0000E+00	1.0385E+13
Aerosols (kg)	0.0000E+00	1.5766E-10

CR Exhaust to Environment (Pathway 11) Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	2.5347E+18	0.0000E+00
Elemental I (atoms)	2.5740E+11	0.0000E+00
Organic I (atoms)	7.5827E+12	0.0000E+00
Aerosols (kg)	1.1783E-10	0.0000E+00

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##
I-131 Summary
##

Time (hr)	DW I-131 (Curies)	WW I-131 (Curies)	Dummy I-131 (Curies)
0.000	6.1456E+03	0.0000E+00	3.4413E-02
0.017	1.8470E+05	0.0000E+00	3.1091E+01
0.083	9.2043E+05	0.0000E+00	7.7302E+02
0.333	3.6815E+06	0.0000E+00	1.0908E+03
0.500	6.8011E+05	0.0000E+00	1.2262E+03
0.750	9.4091E+05	0.0000E+00	1.3483E+03
1.000	9.4887E+05	0.0000E+00	1.4784E+03
1.400	9.5868E+05	0.0000E+00	1.6885E+03
1.700	9.6601E+05	0.0000E+00	1.8478E+03
2.000	9.7331E+05	0.0000E+00	2.0085E+03
2.250	5.9152E+04	4.0977E+04	2.0516E+03
2.400	6.1392E+04	3.8263E+04	2.0593E+03
2.700	6.1321E+04	3.8202E+04	2.0749E+03
3.000	6.1240E+04	3.8152E+04	2.0908E+03
3.300	6.1159E+04	3.8101E+04	2.1068E+03
3.600	6.1078E+04	3.8051E+04	2.1231E+03
3.900	6.0997E+04	3.8001E+04	2.1396E+03
4.000	6.0971E+04	3.7984E+04	2.1451E+03
4.300	6.0890E+04	3.7934E+04	2.1617E+03
4.600	6.0810E+04	3.7884E+04	2.1784E+03
4.900	6.0729E+04	3.7834E+04	2.1953E+03
5.200	6.0649E+04	3.7784E+04	2.2122E+03
5.500	6.0569E+04	3.7734E+04	2.2292E+03
5.800	6.0489E+04	3.7684E+04	2.2462E+03
6.100	6.0409E+04	3.7634E+04	2.2633E+03
6.400	6.0329E+04	3.7584E+04	2.2805E+03
6.700	6.0249E+04	3.7535E+04	2.2977E+03
7.000	6.0170E+04	3.7485E+04	2.3149E+03
7.300	6.0090E+04	3.7436E+04	2.3321E+03
7.600	6.0011E+04	3.7386E+04	2.3493E+03
7.900	5.9931E+04	3.7337E+04	2.3665E+03
8.000	5.9905E+04	3.7320E+04	2.3723E+03
8.300	5.9826E+04	3.7271E+04	2.3895E+03
8.600	5.9747E+04	3.7222E+04	2.4067E+03
8.900	5.9668E+04	3.7172E+04	2.4239E+03
9.200	5.9589E+04	3.7123E+04	2.4411E+03
9.500	5.9510E+04	3.7074E+04	2.4583E+03
9.800	5.9431E+04	3.7025E+04	2.4755E+03
10.100	5.9353E+04	3.6976E+04	2.4926E+03
10.400	5.9274E+04	3.6927E+04	2.5098E+03
16.000	5.7827E+04	3.6026E+04	2.8240E+03

24.000	5.5818E+04	3.4774E+04	3.2498E+03
96.000	4.1829E+04	2.6059E+04	4.2408E+03
720.000	3.3936E+03	2.1142E+03	1.8174E+03

Time (hr)	Environment I-131 (Curies)	CR I-131 (Curies)	MSIV Failed Inboard V I-131 (Curies)
0.000	0.0000E+00	0.0000E+00	4.5224E-04
0.017	0.0000E+00	0.0000E+00	4.0812E-01
0.083	0.0000E+00	0.0000E+00	1.0101E+01
0.333	0.0000E+00	0.0000E+00	1.5884E+02
0.500	0.0000E+00	0.0000E+00	2.1697E+02
0.750	0.0000E+00	0.0000E+00	2.6317E+02
1.000	0.0000E+00	0.0000E+00	3.1063E+02
1.400	0.0000E+00	0.0000E+00	3.8240E+02
1.700	0.0000E+00	0.0000E+00	4.3304E+02
2.000	0.0000E+00	0.0000E+00	4.8114E+02
2.250	3.3489E-02	3.8506E-06	4.6964E+02
2.400	4.5343E-02	5.0456E-06	4.5740E+02
2.700	6.8907E-02	7.2336E-06	4.3404E+02
3.000	9.2439E-02	9.1935E-06	4.1212E+02
3.300	1.1594E-01	1.0949E-05	3.9154E+02
3.600	1.3941E-01	1.2520E-05	3.7221E+02
3.900	1.6285E-01	1.3927E-05	3.5406E+02
4.000	1.7066E-01	1.4363E-05	3.4826E+02
4.300	1.9405E-01	1.5576E-05	3.3158E+02
4.600	2.1742E-01	1.6661E-05	3.1591E+02
4.900	2.4076E-01	1.7631E-05	3.0120E+02
5.200	2.6406E-01	1.8498E-05	2.8738E+02
5.500	2.8734E-01	1.9273E-05	2.7441E+02
5.800	3.1058E-01	1.9965E-05	2.6222E+02
6.100	3.3379E-01	2.0582E-05	2.5078E+02
6.400	3.5697E-01	2.1132E-05	2.4004E+02
6.700	3.8013E-01	2.1623E-05	2.2995E+02
7.000	4.0325E-01	2.2059E-05	2.2047E+02
7.300	4.2634E-01	2.2448E-05	2.1156E+02
7.600	4.4940E-01	2.2793E-05	2.0320E+02
7.900	4.7243E-01	2.3099E-05	1.9535E+02
8.000	4.8010E-01	2.3193E-05	1.9283E+02
8.300	5.0307E-01	2.1797E-05	1.8561E+02
8.600	5.2602E-01	2.0543E-05	1.7882E+02
8.900	5.4894E-01	1.9416E-05	1.7244E+02
9.200	5.7183E-01	1.8404E-05	1.6645E+02
9.500	5.9469E-01	1.7494E-05	1.6081E+02
9.800	6.1751E-01	1.6676E-05	1.5552E+02
10.100	6.4031E-01	1.5941E-05	1.5055E+02
10.400	6.6308E-01	1.5280E-05	1.4587E+02
16.000	1.0822E+00	1.0126E-05	9.5523E+01
24.000	1.6628E+00	9.0901E-06	7.5473E+01
96.000	3.8901E+00	2.2827E-06	5.3596E+01
720.000	9.8949E+00	1.4156E-07	4.3481E+00

Time (hr)	MSIV Failed Outboard I-131 (Curies)	Intact Inboard Volume I-131 (Curies)	Intact Outboard Volum I-131 (Curies)
0.000	1.0173E-09	4.5224E-04	1.2346E-09
0.017	2.7552E-05	4.0804E-01	3.3442E-05
0.083	3.3793E-03	1.0090E+01	4.1029E-03
0.333	2.0742E-01	1.5820E+02	2.5212E-01

0.500	5.7961E-01	2.1517E+02	7.0511E-01
0.750	1.2254E+00	2.5934E+02	1.4924E+00
1.000	1.9768E+00	3.0446E+02	2.4093E+00
1.400	3.4038E+00	3.7193E+02	4.1501E+00
1.700	4.6545E+00	4.1898E+02	5.6746E+00
2.000	6.0574E+00	4.6321E+02	7.3829E+00
2.250	7.2464E+00	4.4852E+02	8.8303E+00
2.400	7.9018E+00	4.3454E+02	9.6284E+00
2.700	9.0867E+00	4.0808E+02	1.1071E+01
3.000	1.0122E+01	3.8352E+02	1.2330E+01
3.300	1.1026E+01	3.6070E+02	1.3427E+01
3.600	1.1816E+01	3.3952E+02	1.4382E+01
3.900	1.2507E+01	3.1985E+02	1.5212E+01
4.000	1.2717E+01	3.1361E+02	1.5464E+01
4.300	1.3294E+01	2.9580E+02	1.6152E+01
4.600	1.3798E+01	2.7925E+02	1.6747E+01
4.900	1.4239E+01	2.6388E+02	1.7262E+01
5.200	1.4625E+01	2.4961E+02	1.7707E+01
5.500	1.4962E+01	2.3635E+02	1.8090E+01
5.800	1.5256E+01	2.2404E+02	1.8418E+01
6.100	1.5513E+01	2.1261E+02	1.8699E+01
6.400	1.5738E+01	2.0199E+02	1.8939E+01
6.700	1.5934E+01	1.9212E+02	1.9143E+01
7.000	1.6105E+01	1.8296E+02	1.9315E+01
7.300	1.6253E+01	1.7444E+02	1.9459E+01
7.600	1.6383E+01	1.6654E+02	1.9579E+01
7.900	1.6495E+01	1.5919E+02	1.9679E+01
8.000	1.6530E+01	1.5686E+02	1.9708E+01
8.300	1.6617E+01	1.5019E+02	1.9778E+01
8.600	1.6693E+01	1.4400E+02	1.9834E+01
8.900	1.6758E+01	1.3825E+02	1.9878E+01
9.200	1.6815E+01	1.3291E+02	1.9911E+01
9.500	1.6863E+01	1.2794E+02	1.9935E+01
9.800	1.6904E+01	1.2332E+02	1.9951E+01
10.100	1.6939E+01	1.1902E+02	1.9959E+01
10.400	1.6968E+01	1.1503E+02	1.9962E+01
16.000	1.6982E+01	7.5497E+01	1.9563E+01
24.000	1.6502E+01	6.2435E+01	1.8828E+01
96.000	1.2362E+01	4.5490E+01	1.4073E+01
720.000	9.8613E-01	3.6906E+00	1.1227E+00

##
Cumulative Dose Summary
##

	EAB		LPZ		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
0.017	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.083	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.333	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.500	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.750	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.400	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.700	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

2.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.250	5.5928E-03	3.6858E-03	7.6119E-04	5.0164E-04	1.0087E-04	2.8728E-05
2.400	7.5370E-03	5.8116E-03	1.0258E-03	7.9097E-04	2.1964E-04	7.5673E-05
2.700	1.1392E-02	9.8896E-03	1.5505E-03	1.3460E-03	5.4680E-04	2.3626E-04
3.000	1.5229E-02	1.3727E-02	2.0727E-03	1.8683E-03	9.8253E-04	4.8177E-04
3.300	1.9048E-02	1.7331E-02	2.5925E-03	2.3588E-03	1.5147E-03	7.9898E-04
3.600	2.2850E-02	2.0714E-02	3.1099E-03	2.8192E-03	2.1325E-03	1.1738E-03
3.900	2.6634E-02	2.3889E-02	3.6249E-03	3.2513E-03	2.8260E-03	1.5931E-03
4.000	2.7891E-02	2.4903E-02	3.7960E-03	3.3894E-03	3.0724E-03	1.7407E-03
4.300	3.1652E-02	2.7825E-02	4.3080E-03	3.7870E-03	3.8535E-03	2.2020E-03
4.600	3.5397E-02	3.0573E-02	4.8176E-03	4.1610E-03	4.6913E-03	2.6840E-03
4.900	3.9125E-02	3.3160E-02	5.3250E-03	4.5132E-03	5.5791E-03	3.1790E-03
5.200	4.2837E-02	3.5599E-02	5.8302E-03	4.8452E-03	6.5111E-03	3.6810E-03
5.500	4.6533E-02	3.7901E-02	6.3332E-03	5.1585E-03	7.4820E-03	4.1849E-03
5.800	5.0213E-02	4.0076E-02	6.8341E-03	5.4545E-03	8.4869E-03	4.6866E-03
6.100	5.3878E-02	4.2134E-02	7.3329E-03	5.7345E-03	9.5217E-03	5.1830E-03
6.400	5.7528E-02	4.4082E-02	7.8297E-03	5.9996E-03	1.0583E-02	5.6715E-03
6.700	6.1163E-02	4.5929E-02	8.3244E-03	6.2510E-03	1.1667E-02	6.1500E-03
7.000	6.4783E-02	4.7682E-02	8.8171E-03	6.4896E-03	1.2770E-02	6.6172E-03
7.300	6.8389E-02	4.9348E-02	9.3079E-03	6.7163E-03	1.3891E-02	7.0720E-03
7.600	7.1981E-02	5.0932E-02	9.7967E-03	6.9319E-03	1.5027E-02	7.5135E-03
7.900	7.5558E-02	5.2441E-02	1.0284E-02	7.1373E-03	1.6175E-02	7.9412E-03
8.000	7.6747E-02	5.2928E-02	1.0445E-02	7.2036E-03	1.6561E-02	8.0807E-03
8.300	8.0305E-02	5.4343E-02	1.0613E-02	7.3276E-03	1.7682E-02	8.4815E-03
8.600	8.3848E-02	5.5695E-02	1.0780E-02	7.4458E-03	1.8734E-02	8.8506E-03
8.900	8.7379E-02	5.6986E-02	1.0947E-02	7.5585E-03	1.9724E-02	9.1887E-03
9.200	9.0896E-02	5.8222E-02	1.1113E-02	7.6662E-03	2.0659E-02	9.4982E-03
9.500	9.4400E-02	5.9405E-02	1.1278E-02	7.7691E-03	2.1544E-02	9.7817E-03
9.800	9.7890E-02	6.0539E-02	1.1443E-02	7.8675E-03	2.2384E-02	1.0042E-02
10.100	1.0137E-01	6.1627E-02	1.1607E-02	7.9618E-03	2.3184E-02	1.0281E-02
10.400	1.0483E-01	6.2673E-02	1.1770E-02	8.0522E-03	2.3947E-02	1.0501E-02
16.000	1.6752E-01	7.7273E-02	1.4726E-02	9.2930E-03	3.4643E-02	1.2995E-02
24.000	2.5108E-01	8.9903E-02	1.8666E-02	1.0323E-02	4.6250E-02	1.4564E-02
96.000	5.3765E-01	1.1702E-01	2.5946E-02	1.1240E-02	6.3404E-02	1.5808E-02
720.000	1.2580E+00	1.7395E-01	3.1240E-02	1.1762E-02	8.3824E-02	1.7087E-02

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

EAB

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
2.0	2.3780E-02	2.7891E-02	2.4903E-02

Attachment 13.8 – RADTRAD Partial Output File "NP2CL11.o0"

```
##############################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:18:44
 ##############################################################################

 ##############################################################################
                      File information
 ##############################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2CL11.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




     #####    ####   #####    #  #     #  #####   #    #  #####
     #    #  #       #        #  ##    #  #    #  #    #    #
     #    #  #       #        #  # #   #  #    #  #    #    #
     #####    ####   ####     #  #  #  #  #####   #    #    #
     #            #  #        #  #   # #  #       #    #    #
     #            #  #        #  #    ##  #       #    #    #
     #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Drywell Spray Cuttoff Time - Containment Leakage from Drywell & Wetwell
(DW+WW)
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   6
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
 Dummy
```

```
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
RB
  3
 1.9400E+06
  0
  0
  0
  0
  0
Compartment 5:
Env
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 6:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Pathways:
 13
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW to RB
  1
  4
  2
Pathway 4:
WW to RB
  2
  4
  2
Pathway 5:
```

```
CR Filtered Intake
  5
  6
  2
Pathway 6:
CR Unfiltered Inleakage
  5
  6
  2
Pathway 7:
CR Exhaust to Environment
  6
  5
  2
Pathway 8:
Drawdown Release from RB to Env
  4
  5
  2
Pathway 9:
RB Exhaust to Environment
  4
  5
  2
Pathway 10:
DW to Dummy (Equivalent Bypass Leakages)
  1
  3
  2
Pathway 11:
WW to Dummy (Equivalent Bypass Leakage)
  2
  3
  2
Pathway 12:
DW to  Dummy (MSIV Failed Pathway 7)
  1
  3
  2
Pathway 13:
DW to  Dummy (Intact MSIV Pathway  8)
  1
  3
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
  0.0000E+00
  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
```

```
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  6
Compartment 1:
  1
  1
  1
  0.0000E+00
 10
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2000E+00   1.9800E+01
  2.2500E+00   1.9800E+01
  2.3000E+00   1.9800E+01
  2.3500E+00   1.9800E+01
  2.4000E+00   1.9800E+01
  2.4500E+00   1.9800E+01
  2.5000E+00   1.9800E+01
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
 10
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2000E+00   1.9800E+01
  2.2500E+00   1.9800E+01
  2.3000E+00   1.9800E+01
  2.3500E+00   1.9800E+01
  2.4000E+00   1.9800E+01
  2.4500E+00   1.9800E+01
  2.5000E+00   1.9800E+01
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
Compartment 5:
  0
  1
  0
  0
  0
  0
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Pathways:
 13
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
```

```
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   2.5000E+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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 8:
  0
  0
  0
  0
  0
```

```
  1
  2
  0.0000E+00   2.6700E+03   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 9:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   4.4000E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   2.4930E-01   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.2470E-01   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 11:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.1200E-02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   5.6000E-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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 13:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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
Dose Locations:
  3
Location 1:
EAB
  5
  1
  3
  0.0000E+00   1.1900E-04
  1.0000E+00   2.9600E-05
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  0
Location 2:
LPZ
  5
  1
```

```
  6
  0.0000E+00   1.6200E-05
  1.0000E+00   1.4200E-05
  8.0000E+00   5.4100E-07
  2.4000E+01   2.3100E-07
  9.6000E+01   7.6500E-08
  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   2.3000E-04
  0
Location 3:
CR
  6
  0
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  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
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
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End of Scenario File
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```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:18:44
##########################################################################


     ####   #     #  #####  #####   #     #  #####
    #    #  #     #    #    #    #  #     #    #
    #    #  #     #    #    #    #  #     #    #
    #    #  #     #    #    #####   #     #    #
    #    #  #     #    #    #       #     #    #
    #    #  #     #    #    #       #     #    #
     ####    ####     #    #        ####     #


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

DW Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
Kr-83m	7.8100E+06	3.8474E-04	2.7915E+21	1.0733E+21
Kr-85m	2.7195E+07	3.3046E-03	2.3412E+22	3.2905E+21
Kr-85	1.8733E+06	4.7791E+00	3.3859E+25	2.0802E+20
Kr-87	2.5134E+07	8.8732E-04	6.1420E+21	3.8419E+21
Kr-88	6.2349E+07	4.9723E-03	3.4027E+22	7.9409E+21
Rb-86	1.7090E+03	2.1004E-05	1.4708E+20	6.0536E+17
Rb-88	1.6971E+07	1.4059E-04	9.6208E+20	4.9793E+20
Sr-89	9.4099E+04	3.2390E-03	2.1916E+22	1.8236E+19
Sr-90	1.0078E+04	7.3881E-02	4.9436E+23	1.9523E+18
Sr-91	1.0035E+05	2.7683E-05	1.8320E+20	2.0510E+19
Sr-92	7.2082E+04	5.7347E-06	3.7538E+19	1.6919E+19
Y-90	1.1680E+02	2.1468E-07	1.4365E+18	2.0674E+16
Y-91	1.1820E+03	4.8198E-05	3.1896E+20	2.2866E+17
Y-92	2.7669E+03	2.8755E-07	1.8823E+18	3.0412E+17
Y-93	1.1483E+03	3.4418E-07	2.2287E+18	2.3394E+17
Zr-95	1.3927E+03	6.4827E-05	4.1094E+20	2.6987E+17
Zr-97	1.2387E+03	6.4799E-07	4.0230E+18	2.4728E+17
Nb-95	1.3748E+03	3.5157E-05	2.2287E+20	2.6631E+17
Mo-99	1.7230E+04	3.5924E-05	2.1852E+20	3.3633E+18
Tc-99m	1.5478E+04	2.9436E-06	1.7906E+19	2.9889E+18
Ru-103	1.5211E+04	4.7131E-04	2.7556E+21	2.9482E+18
Ru-105	7.9413E+03	1.1814E-06	6.7757E+18	1.7273E+18
Ru-106	6.3319E+03	1.8926E-03	1.0753E+22	1.2267E+18
Rh-105	1.0068E+04	1.1929E-05	6.8415E+19	1.9534E+18
Sb-127	1.7266E+04	6.4653E-05	3.0658E+20	3.3630E+18
Sb-129	3.9289E+04	6.9868E-06	3.2616E+19	8.5737E+18
Te-127	1.7305E+04	6.5572E-06	3.1093E+19	3.3449E+18
Te-127m	2.9646E+03	3.1429E-04	1.4903E+21	5.7428E+17
Te-129	4.4427E+04	2.1214E-06	9.9034E+18	8.9551E+18
Te-129m	9.7227E+03	3.2274E-04	1.5067E+21	1.8834E+18
Te-131m	3.5170E+04	4.4106E-05	2.0276E+20	6.9290E+18
Te-132	2.5963E+05	8.5519E-04	3.9015E+21	5.0620E+19
I-131	9.7331E+05	7.8509E-03	3.6091E+22	3.0442E+20
I-132	1.3689E+06	1.3261E-04	6.0501E+20	4.3109E+20
I-133	1.8997E+06	1.6770E-03	7.5933E+21	6.1465E+20

I-134	4.7918E+05	1.7962E-05	8.0726E+19	3.9909E+20
I-135	1.5560E+06	4.4306E-04	1.9764E+21	5.4611E+20
Xe-133	2.2815E+08	1.2189E+00	5.5189E+24	2.5377E+22
Xe-133m	6.9481E+06	1.5782E-02	7.1460E+22	7.7478E+20
Xe-135	1.0026E+08	3.9259E-02	1.7513E+23	1.1186E+22
Xe-135m	6.6917E+06	7.3509E-05	3.2791E+20	1.3680E+21
Xe-138	5.8765E+05	6.1244E-06	2.6726E+19	7.0527E+20
Cs-134	1.7142E+05	1.3249E-01	5.9543E+23	6.0611E+19
Cs-136	5.2076E+04	7.1054E-04	3.1463E+21	1.8460E+19
Cs-137	1.3309E+05	1.5301E+00	6.7260E+24	4.7057E+19
Ba-139	5.2086E+04	3.1844E-06	1.3796E+19	1.4880E+19
Ba-140	1.3794E+05	1.8843E-03	8.1052E+21	2.6766E+19
La-140	1.6715E+03	3.0073E-06	1.2936E+19	2.8128E+17
La-141	9.1416E+02	1.6164E-07	6.9039E+17	2.0191E+17
La-142	5.1926E+02	3.6274E-08	1.5383E+17	1.4206E+17
Ce-141	3.2715E+03	1.1482E-04	4.9038E+20	6.3385E+17
Ce-143	3.0592E+03	4.6066E-06	1.9400E+19	6.0177E+17
Ce-144	2.6216E+03	8.2196E-04	3.4375E+21	5.0790E+17
Pr-143	1.2492E+03	1.8552E-05	7.8126E+19	2.4192E+17
Nd-147	5.0670E+02	6.2634E-06	2.5659E+19	9.8345E+16
Np-239	3.6409E+04	1.5694E-04	3.9545E+20	7.1164E+18
Pu-238	8.1474E+00	4.7591E-04	1.2042E+21	1.5783E+15
Pu-239	8.2181E-01	1.3222E-02	3.3315E+22	1.5918E+14
Pu-240	1.4514E+00	6.3726E-04	1.5990E+21	2.8117E+14
Pu-241	3.2246E+02	3.2607E-03	8.1480E+21	6.2467E+16
Am-241	1.8244E-01	5.3254E-05	1.3307E+20	3.5338E+13
Cm-242	5.0098E+01	1.5134E-05	3.7662E+19	9.7061E+15
Cm-244	3.3136E+00	4.0483E-05	9.9917E+19	6.4191E+14

DW Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	3.9692E+25	0.0000E+00	
Elemental I (atoms)	2.1372E+21	7.5050E+22	
Organic I (atoms)	2.3466E+21	0.0000E+00	
Aerosols (kg)	1.7747E+00	6.3337E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.5492E-04
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.9238E-04
Total I (Ci)			6.2770E+06

DW to WW Transport Group Inventory:
Time (h) = 2.0000 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

WW to DW Transport Group Inventory:
Time (h) = 2.0000 Leakage Transport

Noble gases (atoms)	0.0000E+00
Elemental I (atoms)	0.0000E+00
Organic I (atoms)	0.0000E+00
Aerosols (kg)	0.0000E+00

DW to RB Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7396E+22
Elemental I (atoms)	0.0000E+00	4.6054E+18
Organic I (atoms)	0.0000E+00	1.2273E+18
Aerosols (kg)	0.0000E+00	4.1530E-03

DW to Dummy (Equivalent Bypass Leakages) Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5525E+21
Elemental I (atoms)	0.0000E+00	2.5599E+17
Organic I (atoms)	0.0000E+00	1.0627E+17
Aerosols (kg)	0.0000E+00	2.2356E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.4193E+21
Elemental I (atoms)	0.0000E+00	1.3883E+18
Organic I (atoms)	0.0000E+00	5.7631E+17
Aerosols (kg)	0.0000E+00	1.2124E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.4193E+21
Elemental I (atoms)	0.0000E+00	1.3883E+18
Organic I (atoms)	0.0000E+00	5.7631E+17
Aerosols (kg)	0.0000E+00	1.2124E-03

EAB Doses:

Time (h) = 2.2000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2344E-02	7.2367E-03	1.2679E-02
Accumulated dose (rem)	8.2305E-02	5.6743E+00	3.2487E-01

LPZ Doses:

Time (h) = 2.2000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.9215E-03	3.4717E-03	6.0823E-03
Accumulated dose (rem)	2.6896E-02	7.8628E-01	6.0543E-02

CR Doses:

Time (h) = 2.2000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.0528E-04	3.2904E-01	1.5002E-02
Accumulated dose (rem)	4.1918E-03	3.5120E+00	1.5561E-01

DW Compartment Nuclide Inventory:

Time (h) = 2.2000	Ci	kg	Atoms	Decay
Kr-83m	4.4657E+06	2.1999E-04	1.5962E+21	1.1968E+21
Kr-85m	1.6243E+07	1.9737E-03	1.3983E+22	3.7300E+21

Kr-85	1.1540E+06	2.9441E+00	2.0859E+25	2.3877E+20
Kr-87	1.3884E+07	4.9017E-04	3.3929E+21	4.2327E+21
Kr-88	3.6580E+07	2.9172E-03	1.9963E+22	8.9396E+21
Rb-86	9.3431E+01	1.1483E-06	8.0406E+18	6.1043E+17
Rb-88	1.1370E+07	9.4186E-05	6.4455E+20	5.7182E+20
Sr-89	5.1452E+03	1.7710E-04	1.1984E+21	1.8515E+19
Sr-90	5.5111E+02	4.0402E-03	2.7034E+22	1.9821E+18
Sr-91	5.4081E+03	1.4919E-06	9.8730E+18	2.0805E+19
Sr-92	3.7452E+03	2.9796E-07	1.9504E+18	1.7129E+19
Y-90	7.5664E+00	1.3907E-08	9.3057E+16	2.1028E+16
Y-91	6.4858E+01	2.6447E-06	1.7502E+19	2.3216E+17
Y-92	2.9451E+02	3.0606E-08	2.0034E+17	3.1321E+17
Y-93	6.1940E+01	1.8565E-08	1.2022E+17	2.3733E+17
Zr-95	7.6152E+01	3.5448E-06	2.2471E+19	2.7400E+17
Zr-97	6.7187E+01	3.5146E-08	2.1820E+17	2.5094E+17
Nb-95	7.5180E+01	1.9226E-06	1.2188E+19	2.7038E+17
Mo-99	9.4023E+02	1.9604E-06	1.1925E+19	3.4143E+18
Tc-99m	8.4613E+02	1.6091E-07	9.7884E+17	3.0345E+18
Ru-103	8.3169E+02	2.5770E-05	1.5067E+20	2.9933E+18
Ru-105	4.2092E+02	6.2619E-08	3.5914E+17	1.7505E+18
Ru-106	3.4626E+02	1.0350E-04	5.8800E+20	1.2454E+18
Rh-105	5.5011E+02	6.5175E-07	3.7380E+18	1.9832E+18
Sb-127	9.4277E+02	3.5303E-06	1.6740E+19	3.4142E+18
Sb-129	2.0807E+03	3.7001E-07	1.7273E+18	8.6887E+18
Te-127	9.4618E+02	3.5853E-07	1.7001E+18	3.3960E+18
Te-127m	1.6212E+02	1.7187E-05	8.1499E+19	5.8307E+17
Te-129	2.3848E+03	1.1388E-07	5.3161E+17	9.0826E+18
Te-129m	5.3168E+02	1.7649E-05	8.2391E+19	1.9123E+18
Te-131m	1.9144E+03	2.4008E-06	1.1037E+19	7.0331E+18
Te-132	1.4173E+04	4.6683E-05	2.1298E+20	5.1389E+19
I-131	8.0833E+04	6.5201E-04	2.9973E+21	3.0796E+20
I-132	1.0810E+05	1.0473E-05	4.7778E+19	4.3597E+20
I-133	1.5683E+05	1.3844E-04	6.2687E+20	6.2155E+20
I-134	3.3999E+04	1.2745E-06	5.7276E+18	4.0073E+20
I-135	1.2663E+05	3.6057E-05	1.6085E+20	5.5173E+20
Xe-133	1.4040E+08	7.5007E-01	3.3963E+24	2.9120E+22
Xe-133m	4.2692E+06	9.6972E-03	4.3908E+22	8.8866E+20
Xe-135	6.0877E+07	2.3839E-02	1.0634E+23	1.2820E+22
Xe-135m	2.4086E+06	2.6458E-05	1.1803E+20	1.4529E+21
Xe-138	2.0153E+05	2.1003E-06	9.1654E+18	7.1257E+20
Cs-134	9.3741E+03	7.2453E-03	3.2561E+22	6.1119E+19
Cs-136	2.8466E+03	3.8839E-05	1.7198E+20	1.8615E+19
Cs-137	7.2783E+03	8.3676E-02	3.6781E+23	4.7452E+19
Ba-139	2.5758E+03	1.5747E-07	6.8226E+17	1.5029E+19
Ba-140	7.5401E+03	1.0299E-04	4.4303E+20	2.7175E+19
La-140	1.1703E+02	2.1056E-07	9.0571E+17	2.8640E+17
La-141	4.8258E+01	8.5332E-09	3.6445E+16	2.0458E+17
La-142	2.5954E+01	1.8130E-09	7.6890E+15	1.4355E+17
Ce-141	1.7888E+02	6.2779E-06	2.6813E+19	6.4354E+17
Ce-143	1.6659E+02	2.5086E-07	1.0564E+18	6.1082E+17
Ce-144	1.4336E+02	4.4948E-05	1.8798E+20	5.1567E+17
Pr-143	6.8357E+01	1.0151E-06	4.2750E+18	2.4562E+17
Nd-147	2.7695E+01	3.4234E-07	1.4024E+18	9.9846E+16
Np-239	1.9862E+03	8.5613E-06	2.1572E+19	7.2242E+18
Pu-238	4.4555E-01	2.6025E-05	6.5852E+19	1.6024E+15
Pu-239	4.4942E-02	7.2305E-04	1.8219E+21	1.6162E+14
Pu-240	7.9373E-02	3.4849E-05	8.7444E+19	2.8547E+14

Pu-241	1.7634E+01	1.7831E-04	4.4558E+20	6.3423E+16
Am-241	9.9774E-03	2.9124E-06	7.2776E+18	3.5878E+13
Cm-242	2.7395E+00	8.2760E-07	2.0595E+18	9.8546E+15
Cm-244	1.8121E-01	2.2138E-06	5.4640E+18	6.5173E+14

DW Transport Group Inventory:

Time (h) = 2.2000	Atmosphere	Sump	
Noble gases (atoms)	2.4444E+25	0.0000E+00	
Elemental I (atoms)	1.1647E+20	7.7938E+22	
Organic I (atoms)	1.4406E+21	0.0000E+00	
Aerosols (kg)	9.7134E-02	6.5736E+01	
Dose Effective (Ci/cc) I-131 (Thyroid)			1.2834E-05
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			1.5889E-05
Total I (Ci)			5.0639E+05

DW to WW Transport Group Inventory:
Time (h) = 2.2000 Leakage Transport

Noble gases (atoms)	1.2833E+26
Elemental I (atoms)	5.4520E+21
Organic I (atoms)	7.5786E+21
Aerosols (kg)	4.5284E+00

WW to DW Transport Group Inventory:
Time (h) = 2.2000 Leakage Transport

Noble gases (atoms)	2.7023E+26
Elemental I (atoms)	9.5067E+21
Organic I (atoms)	1.5967E+22
Aerosols (kg)	7.8957E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.2000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9246E+22
Elemental I (atoms)	0.0000E+00	4.6840E+18
Organic I (atoms)	0.0000E+00	1.3366E+18
Aerosols (kg)	0.0000E+00	4.2183E-03

DW to Dummy (Equivalent Bypass Leakages) Transport Group Inventory:

	Pathway	
Time (h) = 2.2000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7202E+21
Elemental I (atoms)	0.0000E+00	2.6312E+17
Organic I (atoms)	0.0000E+00	1.1617E+17
Aerosols (kg)	0.0000E+00	2.2948E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 2.2000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.3289E+21
Elemental I (atoms)	0.0000E+00	1.4269E+18
Organic I (atoms)	0.0000E+00	6.3002E+17
Aerosols (kg)	0.0000E+00	1.2445E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 2.2000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.3289E+21
Elemental I (atoms)	0.0000E+00	1.4269E+18
Organic I (atoms)	0.0000E+00	6.3002E+17
Aerosols (kg)	0.0000E+00	1.2445E-03

EAB Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.3343E-03	1.7911E-03	3.4175E-03
Accumulated dose (rem)	8.5639E-02	5.6761E+00	3.2829E-01

LPZ Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5995E-03	8.5922E-04	1.6395E-03
Accumulated dose (rem)	2.8496E-02	7.8714E-01	6.2183E-02

CR Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5350E-04	7.8481E-02	3.5973E-03
Accumulated dose (rem)	4.3453E-03	3.5905E+00	1.5921E-01

DW Compartment Nuclide Inventory:

Time (h) = 2.2500	Ci	kg	Atoms	Decay
Kr-83m	4.3831E+06	2.1592E-04	1.5666E+21	1.2263E+21
Kr-85m	1.6117E+07	1.9584E-03	1.3875E+22	3.8378E+21
Kr-85	1.1540E+06	2.9440E+00	2.0858E+25	2.4645E+20
Kr-87	1.3510E+07	4.7697E-04	3.3016E+21	4.3239E+21
Kr-88	3.6134E+07	2.8817E-03	1.9720E+22	9.1818E+21
Rb-86	5.3333E+01	6.5546E-07	4.5898E+18	6.1078E+17
Rb-88	9.6456E+06	7.9903E-05	5.4680E+20	6.0980E+20
Sr-89	2.9372E+03	1.0110E-04	6.8409E+20	1.8535E+19
Sr-90	3.1462E+02	2.3064E-03	1.5433E+22	1.9842E+18
Sr-91	3.0761E+03	8.4859E-07	5.6157E+18	2.0826E+19
Sr-92	2.1109E+03	1.6794E-07	1.0993E+18	1.7143E+19
Y-90	4.4875E+00	8.2481E-09	5.5190E+16	2.1056E+16
Y-91	3.7057E+01	1.5110E-06	9.9997E+18	2.3241E+17
Y-92	1.8729E+02	1.9464E-08	1.2741E+17	3.1432E+17
Y-93	3.5239E+01	1.0562E-08	6.8394E+16	2.3756E+17
Zr-95	4.3472E+01	2.0236E-06	1.2828E+19	2.7429E+17
Zr-97	3.8277E+01	2.0023E-08	1.2431E+17	2.5119E+17
Nb-95	4.2918E+01	1.0976E-06	6.9576E+18	2.7067E+17
Mo-99	5.3647E+02	1.1185E-06	6.8041E+18	3.4179E+18
Tc-99m	4.8298E+02	9.1852E-08	5.5873E+17	3.0377E+18
Ru-103	4.7477E+02	1.4711E-05	8.6010E+19	2.9964E+18
Ru-105	2.3843E+02	3.5470E-08	2.0343E+17	1.7521E+18
Ru-106	1.9767E+02	5.9084E-05	3.3567E+20	1.2468E+18
Rh-105	3.1397E+02	3.7198E-07	2.1335E+18	1.9853E+18
Sb-127	5.3800E+02	2.0146E-06	9.5529E+18	3.4177E+18
Sb-129	1.1783E+03	2.0954E-07	9.7820E+17	8.6966E+18

Te-127	5.4013E+02	2.0466E-07	9.7048E+17	3.3996E+18
Te-127m	9.2550E+01	9.8118E-06	4.6526E+19	5.8368E+17
Te-129	1.3545E+03	6.4677E-08	3.0193E+17	9.0915E+18
Te-129m	3.0352E+02	1.0075E-05	4.7034E+19	1.9143E+18
Te-131m	1.0916E+03	1.3690E-06	6.2933E+18	7.0403E+18
Te-132	8.0872E+03	2.6638E-05	1.2153E+20	5.1443E+19
I-131	5.9152E+04	4.7713E-04	2.1934E+21	3.0836E+20
I-132	7.8067E+04	7.5631E-06	3.4505E+19	4.3649E+20
I-133	1.1460E+05	1.0116E-04	4.5805E+20	6.2232E+20
I-134	2.3920E+04	8.9664E-07	4.0296E+18	4.0089E+20
I-135	9.2196E+04	2.6253E-05	1.1711E+20	5.5235E+20
Xe-133	1.4036E+08	7.4984E-01	3.3952E+24	3.0055E+22
Xe-133m	4.2663E+06	9.6905E-03	4.3878E+22	9.1709E+20
Xe-135	6.0652E+07	2.3750E-02	1.0595E+23	1.3224E+22
Xe-135m	2.1045E+06	2.3118E-05	1.0313E+20	1.4679E+21
Xe-138	1.7407E+05	1.8141E-06	7.9165E+18	7.1381E+20
Cs-134	5.3515E+03	4.1361E-03	1.8588E+22	6.1155E+19
Cs-136	1.6249E+03	2.2170E-05	9.8169E+19	1.8625E+19
Cs-137	4.1550E+03	4.7768E-02	2.0998E+23	4.7479E+19
Ba-139	1.4340E+03	8.7666E-08	3.7981E+17	1.5039E+19
Ba-140	4.3040E+03	5.8790E-05	2.5289E+20	2.7204E+19
La-140	7.0458E+01	1.2676E-07	5.4527E+17	2.8685E+17
La-141	2.7308E+01	4.8286E-09	2.0623E+16	2.0476E+17
La-142	1.4487E+01	1.0120E-09	4.2919E+15	1.4365E+17
Ce-141	1.0211E+02	3.5838E-06	1.5306E+19	6.4422E+17
Ce-143	9.5003E+01	1.4306E-07	6.0246E+17	6.1146E+17
Ce-144	8.1842E+01	2.5660E-05	1.0731E+20	5.1621E+17
Pr-143	3.9029E+01	5.7960E-07	2.4409E+18	2.4588E+17
Nd-147	1.5808E+01	1.9541E-07	8.0052E+17	9.9952E+16
Np-239	1.1332E+03	4.8845E-06	1.2307E+19	7.2317E+18
Pu-238	2.5435E-01	1.4857E-05	3.7593E+19	1.6041E+15
Pu-239	2.5657E-02	4.1277E-04	1.0401E+21	1.6179E+14
Pu-240	4.5312E-02	1.9894E-05	4.9919E+19	2.8577E+14
Pu-241	1.0067E+01	1.0180E-04	2.5437E+20	6.3490E+16
Am-241	5.6959E-03	1.6626E-06	4.1546E+18	3.5916E+13
Cm-242	1.5639E+00	4.7245E-07	1.1757E+18	9.8650E+15
Cm-244	1.0345E-01	1.2638E-06	3.1192E+18	6.5242E+14

DW Transport Group Inventory:

Time (h) = 2.2500	Atmosphere	Sump	
Noble gases (atoms)	2.4442E+25	0.0000E+00	
Elemental I (atoms)	6.6435E+19	7.8026E+22	
Organic I (atoms)	1.4393E+21	0.0000E+00	
Aerosols (kg)	5.5477E-02	6.5809E+01	
Dose Effective (Ci/cc) I-131 (Thyroid)			9.3863E-06
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)			1.1611E-05
Total I (Ci)			3.6793E+05

DW to WW Transport Group Inventory:

Time (h) = 2.2500 Leakage Transport	
Noble gases (atoms)	1.7402E+26
Elemental I (atoms)	5.6182E+21
Organic I (atoms)	1.0271E+22
Aerosols (kg)	4.6670E+00

WW to DW Transport Group Inventory:

Time (h) = 2.2500 Leakage Transport

Noble gases (atoms)	3.1591E+26
Elemental I (atoms)	9.7111E+21
Organic I (atoms)	1.8660E+22
Aerosols (kg)	8.0662E+00

DW to RB Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9904E+22
Elemental I (atoms)	0.0000E+00	4.6863E+18
Organic I (atoms)	0.0000E+00	1.3754E+18
Aerosols (kg)	0.0000E+00	4.2203E-03

DW to Dummy (Equivalent Bypass Leakages) Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7799E+21
Elemental I (atoms)	0.0000E+00	2.6333E+17
Organic I (atoms)	0.0000E+00	1.1969E+17
Aerosols (kg)	0.0000E+00	2.2966E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.6527E+21
Elemental I (atoms)	0.0000E+00	1.4281E+18
Organic I (atoms)	0.0000E+00	6.4910E+17
Aerosols (kg)	0.0000E+00	1.2455E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 2.2500	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.6527E+21
Elemental I (atoms)	0.0000E+00	1.4281E+18
Organic I (atoms)	0.0000E+00	6.4910E+17
Aerosols (kg)	0.0000E+00	1.2455E-03

EAB Doses:

Time (h) = 2.3000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.4338E-03	1.7803E-03	3.5166E-03
Accumulated dose (rem)	8.9073E-02	5.6779E+00	3.3181E-01

LPZ Doses:

Time (h) = 2.3000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.6473E-03	8.5408E-04	1.6870E-03
Accumulated dose (rem)	3.0143E-02	7.8799E-01	6.3870E-02

CR Doses:

Time (h) = 2.3000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5452E-04	7.7040E-02	3.5375E-03
Accumulated dose (rem)	4.4998E-03	3.6675E+00	1.6275E-01

DW Compartment Nuclide Inventory:

Time (h) = 2.3000	Ci	kg	Atoms	Decay
Kr-83m	4.3020E+06	2.1193E-04	1.5377E+21	1.2552E+21
Kr-85m	1.5992E+07	1.9432E-03	1.3768E+22	3.9447E+21
Kr-85	1.1539E+06	2.9439E+00	2.0857E+25	2.5414E+20
Kr-87	1.3147E+07	4.6412E-04	3.2127E+21	4.4127E+21
Kr-88	3.5694E+07	2.8466E-03	1.9480E+22	9.4210E+21
Rb-86	3.0444E+01	3.7416E-07	2.6200E+18	6.1098E+17
Rb-88	8.9187E+06	7.3881E-05	5.0560E+20	6.4301E+20
Sr-89	1.6767E+03	5.7714E-05	3.9052E+20	1.8546E+19
Sr-90	1.7961E+02	1.3167E-03	8.8103E+21	1.9854E+18
Sr-91	1.7497E+03	4.8267E-07	3.1942E+18	2.0838E+19
Sr-92	1.1897E+03	9.4654E-08	6.1959E+17	1.7151E+19
Y-90	2.6577E+00	4.8849E-09	3.2686E+16	2.1073E+16
Y-91	2.1172E+01	8.6334E-07	5.7133E+18	2.3255E+17
Y-92	1.1760E+02	1.2221E-08	7.9999E+16	3.1503E+17
Y-93	2.0048E+01	6.0090E-09	3.8911E+16	2.3770E+17
Zr-95	2.4817E+01	1.1552E-06	7.3228E+18	2.7446E+17
Zr-97	2.1807E+01	1.1407E-08	7.0820E+16	2.5134E+17
Nb-95	2.4501E+01	6.2657E-07	3.9719E+18	2.7083E+17
Mo-99	3.0610E+02	6.3821E-07	3.8822E+18	3.4200E+18
Tc-99m	2.7569E+02	5.2430E-08	3.1893E+17	3.0395E+18
Ru-103	2.7103E+02	8.3977E-06	4.9099E+19	2.9982E+18
Ru-105	1.3505E+02	2.0091E-08	1.1523E+17	1.7530E+18
Ru-106	1.1284E+02	3.3729E-05	1.9163E+20	1.2475E+18
Rh-105	1.7920E+02	2.1230E-07	1.2176E+18	1.9865E+18
Sb-127	3.0702E+02	1.1497E-06	5.4515E+18	3.4198E+18
Sb-129	6.6730E+02	1.1867E-07	5.5397E+17	8.7011E+18
Te-127	3.0833E+02	1.1683E-07	5.5399E+17	3.4016E+18
Te-127m	5.2835E+01	5.6013E-06	2.6560E+19	5.8403E+17
Te-129	7.6925E+02	3.6732E-08	1.7148E+17	9.0966E+18
Te-129m	1.7327E+02	5.7517E-06	2.6851E+19	1.9154E+18
Te-131m	6.2247E+02	7.8062E-07	3.5885E+18	7.0445E+18
Te-132	4.6148E+03	1.5201E-05	6.9348E+19	5.1474E+19
I-131	4.6774E+04	3.7729E-04	1.7344E+21	3.0867E+20
I-132	6.0893E+04	5.8993E-06	2.6914E+19	4.3690E+20
I-133	9.0482E+04	7.9874E-05	3.6166E+20	6.2292E+20
I-134	1.8184E+04	6.8166E-07	3.0635E+18	4.0102E+20
I-135	7.2536E+04	2.0654E-05	9.2136E+19	5.5283E+20
Xe-133	1.4031E+08	7.4961E-01	3.3942E+24	3.0989E+22
Xe-133m	4.2633E+06	9.6838E-03	4.3848E+22	9.4549E+20
Xe-135	6.0426E+07	2.3662E-02	1.0555E+23	1.3627E+22
Xe-135m	1.8386E+06	2.0197E-05	9.0094E+19	1.4810E+21
Xe-138	1.5035E+05	1.5669E-06	6.8378E+18	7.1489E+20
Cs-134	3.0550E+03	2.3612E-03	1.0612E+22	6.1175E+19
Cs-136	9.2748E+02	1.2655E-05	5.6036E+19	1.8632E+19
Cs-137	2.3720E+03	2.7270E-02	1.1987E+23	4.7495E+19
Ba-139	7.9828E+02	4.8804E-08	2.1144E+17	1.5044E+19
Ba-140	2.4568E+03	3.3558E-05	1.4435E+20	2.7220E+19
La-140	4.2302E+01	7.6107E-08	3.2737E+17	2.8712E+17
La-141	1.5452E+01	2.7323E-09	1.1670E+16	2.0487E+17
La-142	8.0864E+00	5.6489E-10	2.3957E+15	1.4370E+17

Ce-141	5.8293E+01	2.0458E-06	8.7378E+18	6.4461E+17
Ce-143	5.4178E+01	8.1583E-08	3.4357E+17	6.1182E+17
Ce-144	4.6721E+01	1.4648E-05	6.1260E+19	5.1652E+17
Pr-143	2.2284E+01	3.3093E-07	1.3936E+18	2.4603E+17
Nd-147	9.0232E+00	1.1154E-07	4.5693E+17	1.0001E+17
Np-239	6.4649E+02	2.7867E-06	7.0217E+18	7.2360E+18
Pu-238	1.4520E-01	8.4816E-06	2.1461E+19	1.6051E+15
Pu-239	1.4647E-02	2.3564E-04	5.9376E+20	1.6189E+14
Pu-240	2.5867E-02	1.1357E-05	2.8498E+19	2.8594E+14
Pu-241	5.7469E+00	5.8112E-05	1.4521E+20	6.3528E+16
Am-241	3.2517E-03	9.4918E-07	2.3718E+18	3.5938E+13
Cm-242	8.9279E-01	2.6971E-07	6.7116E+17	9.8709E+15
Cm-244	5.9055E-02	7.2149E-07	1.7807E+18	6.5281E+14

DW Transport Group Inventory:

Time (h) = 2.3000	Atmosphere	Sump	
Noble gases (atoms)	2.4439E+25	0.0000E+00	
Elemental I (atoms)	3.7894E+19	7.8076E+22	
Organic I (atoms)	1.4381E+21	0.0000E+00	
Aerosols (kg)	3.1699E-02	6.5851E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		7.4177E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		9.1688E-06
Total I (Ci)			2.8887E+05

DW to WW Transport Group Inventory:
Time (h) = 2.3000 Leakage Transport

Noble gases (atoms)	2.1970E+26
Elemental I (atoms)	5.7130E+21
Organic I (atoms)	1.2961E+22
Aerosols (kg)	4.7462E+00

WW to DW Transport Group Inventory:
Time (h) = 2.3000 Leakage Transport

Noble gases (atoms)	3.6159E+26
Elemental I (atoms)	9.8277E+21
Organic I (atoms)	2.1350E+22
Aerosols (kg)	8.1635E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.3000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0563E+22
Elemental I (atoms)	0.0000E+00	4.6877E+18
Organic I (atoms)	0.0000E+00	1.4142E+18
Aerosols (kg)	0.0000E+00	4.2214E-03

DW to Dummy (Equivalent Bypass Leakages) Transport Group Inventory:

	Pathway	
Time (h) = 2.3000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8396E+21
Elemental I (atoms)	0.0000E+00	2.6346E+17
Organic I (atoms)	0.0000E+00	1.2321E+17
Aerosols (kg)	0.0000E+00	2.2977E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

Time (h) = 2.3000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.9764E+21
Elemental I (atoms)	0.0000E+00	1.4288E+18
Organic I (atoms)	0.0000E+00	6.6817E+17
Aerosols (kg)	0.0000E+00	1.2461E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

Time (h) = 2.3000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.9764E+21
Elemental I (atoms)	0.0000E+00	1.4288E+18
Organic I (atoms)	0.0000E+00	6.6817E+17
Aerosols (kg)	0.0000E+00	1.2461E-03

EAB Doses:

Time (h) = 2.3500	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.5297E-03	1.7691E-03	3.6121E-03
Accumulated dose (rem)	9.2603E-02	5.6797E+00	3.3542E-01

LPZ Doses:

Time (h) = 2.3500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.6933E-03	8.4869E-04	1.7328E-03
Accumulated dose (rem)	3.1836E-02	7.8884E-01	6.5603E-02

CR Doses:

Time (h) = 2.3500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5567E-04	7.5625E-02	3.4791E-03
Accumulated dose (rem)	4.6554E-03	3.7431E+00	1.6622E-01

DW Compartment Nuclide Inventory:

Time (h) = 2.3500	Ci	kg	Atoms	Decay
Kr-83m	4.2224E+06	2.0801E-04	1.5092E+21	1.2836E+21
Kr-85m	1.5868E+07	1.9282E-03	1.3661E+22	4.0508E+21
Kr-85	1.1539E+06	2.9438E+00	2.0856E+25	2.6182E+20
Kr-87	1.2793E+07	4.5163E-04	3.1262E+21	4.4991E+21
Kr-88	3.5260E+07	2.8120E-03	1.9243E+22	9.6572E+21
Rb-86	1.7378E+01	2.1358E-07	1.4956E+18	6.1110E+17
Rb-88	8.5016E+06	7.0426E-05	4.8195E+20	6.7364E+20
Sr-89	9.5718E+02	3.2947E-05	2.2293E+20	1.8552E+19
Sr-90	1.0253E+02	7.5167E-04	5.0296E+21	1.9861E+18
Sr-91	9.9522E+02	2.7454E-07	1.8169E+18	2.0844E+19
Sr-92	6.7056E+02	5.3349E-08	3.4921E+17	1.7156E+19
Y-90	1.5719E+00	2.8892E-09	1.9332E+16	2.1083E+16
Y-91	1.2097E+01	4.9327E-07	3.2643E+18	2.3263E+17
Y-92	7.3087E+01	7.5956E-09	4.9719E+16	3.1547E+17
Y-93	1.1406E+01	3.4186E-09	2.2137E+16	2.3777E+17
Zr-95	1.4167E+01	6.5945E-07	4.1803E+18	2.7455E+17
Zr-97	1.2423E+01	6.4987E-09	4.0346E+16	2.5142E+17

Nb-95	1.3987E+01	3.5769E-07	2.2675E+18	2.7092E+17
Mo-99	1.7465E+02	3.6415E-07	2.2151E+18	3.4211E+18
Tc-99m	1.5737E+02	2.9927E-08	1.8205E+17	3.0406E+18
Ru-103	1.5472E+02	4.7938E-06	2.8028E+19	2.9993E+18
Ru-105	7.6499E+01	1.1380E-08	6.5271E+16	1.7535E+18
Ru-106	6.4420E+01	1.9255E-05	1.0939E+20	1.2479E+18
Rh-105	1.0227E+02	1.2117E-07	6.9495E+17	1.9871E+18
Sb-127	1.7520E+02	6.5606E-07	3.1109E+18	3.4210E+18
Sb-129	3.7790E+02	6.7202E-08	3.1372E+17	8.7036E+18
Te-127	1.7601E+02	6.6692E-08	3.1624E+17	3.4028E+18
Te-127m	3.0162E+01	3.1976E-06	1.5163E+19	5.8424E+17
Te-129	4.3687E+02	2.0861E-08	9.7385E+16	9.0995E+18
Te-129m	9.8915E+01	3.2835E-06	1.5328E+19	1.9161E+18
Te-131m	3.5494E+02	4.4512E-07	2.0462E+18	7.0469E+18
Te-132	2.6333E+03	8.6737E-06	3.9572E+19	5.1491E+19
I-131	3.9707E+04	3.2028E-04	1.4723E+21	3.0893E+20
I-132	5.0971E+04	4.9380E-06	2.2528E+19	4.3724E+20
I-133	7.6696E+04	6.7704E-05	3.0656E+20	6.2343E+20
I-134	1.4841E+04	5.5633E-07	2.5002E+18	4.0112E+20
I-135	6.1264E+04	1.7445E-05	7.7819E+19	5.5324E+20
Xe-133	1.4027E+08	7.4937E-01	3.3931E+24	3.1924E+22
Xe-133m	4.2604E+06	9.6771E-03	4.3817E+22	9.7387E+20
Xe-135	6.0201E+07	2.3574E-02	1.0516E+23	1.4029E+22
Xe-135m	1.6061E+06	1.7644E-05	7.8705E+19	1.4924E+21
Xe-138	1.2986E+05	1.3534E-06	5.9061E+18	7.1582E+20
Cs-134	1.7440E+03	1.3480E-03	6.0579E+21	6.1187E+19
Cs-136	5.2942E+02	7.2235E-06	3.1986E+19	1.8635E+19
Cs-137	1.3541E+03	1.5568E-02	6.8431E+22	4.7504E+19
Ba-139	4.4440E+02	2.7169E-08	1.1771E+17	1.5047E+19
Ba-140	1.4023E+03	1.9155E-05	8.2397E+19	2.7230E+19
La-140	2.5335E+01	4.5581E-08	1.9607E+17	2.8728E+17
La-141	8.7439E+00	1.5461E-09	6.6035E+15	2.0493E+17
La-142	4.5137E+00	3.1531E-10	1.3372E+15	1.4373E+17
Ce-141	3.3277E+01	1.1679E-06	4.9880E+18	6.4483E+17
Ce-143	3.0896E+01	4.6525E-08	1.9593E+17	6.1202E+17
Ce-144	2.6672E+01	8.3624E-06	3.4972E+19	5.1670E+17
Pr-143	1.2724E+01	1.8895E-07	7.9571E+17	2.4611E+17
Nd-147	5.1504E+00	6.3665E-08	2.6082E+17	1.0005E+17
Np-239	3.6884E+02	1.5899E-06	4.0061E+18	7.2385E+18
Pu-238	8.2892E-02	4.8419E-06	1.2252E+19	1.6056E+15
Pu-239	8.3616E-03	1.3452E-04	3.3896E+20	1.6194E+14
Pu-240	1.4767E-02	6.4835E-06	1.6269E+19	2.8604E+14
Pu-241	3.2807E+00	3.3175E-05	8.2898E+19	6.3550E+16
Am-241	1.8564E-03	5.4187E-07	1.3540E+18	3.5950E+13
Cm-242	5.0967E-01	1.5397E-07	3.8315E+17	9.8743E+15
Cm-244	3.3713E-02	4.1188E-07	1.0166E+18	6.5304E+14

DW Transport Group Inventory:

Time (h) = 2.3500	Atmosphere	Sump	
Noble gases (atoms)	2.4436E+25	0.0000E+00	
Elemental I (atoms)	2.1614E+19	7.8105E+22	
Organic I (atoms)	1.4368E+21	0.0000E+00	
Aerosols (kg)	1.8124E-02	6.5875E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		6.2931E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		7.7727E-06
Total I (Ci)			2.4348E+05

DW to WW Transport Group Inventory:
Time (h) = 2.3500 Leakage Transport

Noble gases (atoms)	2.6537E+26
Elemental I (atoms)	5.7671E+21
Organic I (atoms)	1.5649E+22
Aerosols (kg)	4.7914E+00

WW to DW Transport Group Inventory:
Time (h) = 2.3500 Leakage Transport

Noble gases (atoms)	4.0726E+26
Elemental I (atoms)	9.8942E+21
Organic I (atoms)	2.4037E+22
Aerosols (kg)	8.2192E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.3500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.1221E+22
Elemental I (atoms)	0.0000E+00	4.6885E+18
Organic I (atoms)	0.0000E+00	1.4529E+18
Aerosols (kg)	0.0000E+00	4.2221E-03

DW to Dummy (Equivalent Bypass Leakages) Transport Group Inventory:

	Pathway	
Time (h) = 2.3500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8993E+21
Elemental I (atoms)	0.0000E+00	2.6353E+17
Organic I (atoms)	0.0000E+00	1.2672E+17
Aerosols (kg)	0.0000E+00	2.2983E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 2.3500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0300E+22
Elemental I (atoms)	0.0000E+00	1.4292E+18
Organic I (atoms)	0.0000E+00	6.8722E+17
Aerosols (kg)	0.0000E+00	1.2464E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

	Pathway	
Time (h) = 2.3500	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0300E+22
Elemental I (atoms)	0.0000E+00	1.4292E+18
Organic I (atoms)	0.0000E+00	6.8722E+17
Aerosols (kg)	0.0000E+00	1.2464E-03

EAB Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.6221E-03	1.7576E-03	3.7039E-03
Accumulated dose (rem)	9.6225E-02	5.6814E+00	3.3912E-01

LPZ Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.7376E-03	8.4316E-04	1.7769E-03
Accumulated dose (rem)	3.3574E-02	7.8969E-01	6.7380E-02

CR Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5694E-04	7.4237E-02	3.4219E-03
Accumulated dose (rem)	4.8124E-03	3.8174E+00	1.6965E-01

DW Compartment Nuclide Inventory:

Time (h) = 2.4000	Ci	kg	Atoms	Decay
Kr-83m	4.1442E+06	2.0416E-04	1.4813E+21	1.3115E+21
Kr-85m	1.5745E+07	1.9132E-03	1.3555E+22	4.1561E+21
Kr-85	1.1538E+06	2.9436E+00	2.0855E+25	2.6951E+20
Kr-87	1.2448E+07	4.3946E-04	3.0420E+21	4.5831E+21
Kr-88	3.4831E+07	2.7777E-03	1.9009E+22	9.8906E+21
Rb-86	9.9202E+00	1.2192E-07	8.5373E+17	6.1117E+17
Rb-88	8.2415E+06	6.8272E-05	4.6721E+20	7.0278E+20
Sr-89	5.4641E+02	1.8808E-05	1.2726E+20	1.8556E+19
Sr-90	5.8533E+01	4.2911E-04	2.8713E+21	1.9865E+18
Sr-91	5.6607E+02	1.5616E-07	1.0334E+18	2.0848E+19
Sr-92	3.7794E+02	3.0069E-08	1.9682E+17	1.7158E+19
Y-90	9.2857E-01	1.7067E-09	1.1420E+16	2.1089E+16
Y-91	6.9115E+00	2.8183E-07	1.8651E+18	2.3268E+17
Y-92	4.5041E+01	4.6809E-09	3.0640E+16	3.1575E+17
Y-93	6.4889E+00	1.9449E-09	1.2594E+16	2.3782E+17
Zr-95	8.0873E+00	3.7645E-07	2.3864E+18	2.7460E+17
Zr-97	7.0777E+00	3.7023E-09	2.2986E+16	2.5147E+17
Nb-95	7.9848E+00	2.0420E-07	1.2944E+18	2.7098E+17
Mo-99	9.9652E+01	2.0777E-07	1.2639E+18	3.4218E+18
Tc-99m	8.9825E+01	1.7083E-08	1.0391E+17	3.0412E+18
Ru-103	8.8320E+01	2.7366E-06	1.6000E+19	2.9999E+18
Ru-105	4.3332E+01	6.4463E-09	3.6972E+16	1.7538E+18
Ru-106	3.6775E+01	1.0992E-05	6.2450E+19	1.2482E+18
Rh-105	5.8371E+01	6.9155E-08	3.9663E+17	1.9875E+18
Sb-127	9.9981E+01	3.7439E-07	1.7753E+18	3.4216E+18
Sb-129	2.1401E+02	3.8057E-08	1.7766E+17	8.7050E+18
Te-127	1.0047E+02	3.8071E-08	1.8053E+17	3.4035E+18
Te-127m	1.7219E+01	1.8255E-06	8.6560E+18	5.8435E+17
Te-129	2.4810E+02	1.1847E-08	5.5304E+16	9.1011E+18
Te-129m	5.6468E+01	1.8744E-06	8.7505E+18	1.9165E+18
Te-131m	2.0239E+02	2.5382E-07	1.1668E+18	7.0482E+18
Te-132	1.5026E+03	4.9494E-06	2.2580E+19	5.1502E+19
I-131	3.5670E+04	2.8772E-04	1.3226E+21	3.0917E+20
I-132	4.5137E+04	4.3728E-06	1.9950E+19	4.3755E+20
I-133	6.8796E+04	6.0730E-05	2.7498E+20	6.2389E+20
I-134	1.2818E+04	4.8048E-07	2.1593E+18	4.0121E+20
I-135	5.4757E+04	1.5592E-05	6.9554E+19	5.5361E+20
Xe-133	1.4023E+08	7.4914E-01	3.3921E+24	3.2858E+22
Xe-133m	4.2575E+06	9.6704E-03	4.3787E+22	1.0022E+21
Xe-135	5.9975E+07	2.3485E-02	1.0476E+23	1.4429E+22
Xe-135m	1.4031E+06	1.5413E-05	6.8756E+19	1.5024E+21

Xe-138	1.1217E+05	1.1690E-06	5.1013E+18	7.1663E+20
Cs-134	9.9562E+02	7.6951E-04	3.4583E+21	6.1193E+19
Cs-136	3.0220E+02	4.1233E-06	1.8258E+19	1.8637E+19
Cs-137	7.7302E+02	8.8871E-03	3.9065E+22	4.7509E+19
Ba-139	2.4740E+02	1.5125E-08	6.5529E+16	1.5049E+19
Ba-140	8.0047E+02	1.0934E-05	4.7033E+19	2.7235E+19
La-140	1.5140E+01	2.7238E-08	1.1717E+17	2.8737E+17
La-141	4.9478E+00	8.7489E-10	3.7367E+15	2.0496E+17
La-142	2.5195E+00	1.7600E-10	7.4642E+14	1.4375E+17
Ce-141	1.8996E+01	6.6669E-07	2.8474E+18	6.4496E+17
Ce-143	1.7619E+01	2.6532E-08	1.1173E+17	6.1214E+17
Ce-144	1.5226E+01	4.7739E-06	1.9964E+19	5.1680E+17
Pr-143	7.2646E+00	1.0788E-07	4.5432E+17	2.4616E+17
Nd-147	2.9399E+00	3.6340E-08	1.4887E+17	1.0007E+17
Np-239	2.1043E+02	9.0707E-07	2.2856E+18	7.2399E+18
Pu-238	4.7321E-02	2.7641E-06	6.9941E+18	1.6060E+15
Pu-239	4.7734E-03	7.6797E-05	1.9351E+20	1.6197E+14
Pu-240	8.4301E-03	3.7013E-06	9.2874E+18	2.8610E+14
Pu-241	1.8729E+00	1.8939E-05	4.7324E+19	6.3562E+16
Am-241	1.0598E-03	3.0935E-07	7.7300E+17	3.5957E+13
Cm-242	2.9095E-01	8.7895E-08	2.1873E+17	9.8763E+15
Cm-244	1.9246E-02	2.3513E-07	5.8033E+17	6.5317E+14

DW Transport Group Inventory:

Time (h) = 2.4000	Atmosphere	Sump	
Noble gases (atoms)	2.4433E+25	0.0000E+00	
Elemental I (atoms)	1.2328E+19	7.8121E+22	
Organic I (atoms)	1.4355E+21	0.0000E+00	
Aerosols (kg)	1.0375E-02	6.5889E+01	
Dose Effective (Ci/cc)	I-131 (Thyroid)		5.6499E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		6.9729E-06
Total I (Ci)			2.1718E+05

DW to WW Transport Group Inventory:

Time (h) = 2.4000 Leakage Transport

Noble gases (atoms)	3.1104E+26
Elemental I (atoms)	5.7979E+21
Organic I (atoms)	1.8334E+22
Aerosols (kg)	4.8173E+00

WW to DW Transport Group Inventory:

Time (h) = 2.4000 Leakage Transport

Noble gases (atoms)	4.5293E+26
Elemental I (atoms)	9.9321E+21
Organic I (atoms)	2.6723E+22
Aerosols (kg)	8.2510E+00

DW to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.4000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.1880E+22
Elemental I (atoms)	0.0000E+00	4.6889E+18
Organic I (atoms)	0.0000E+00	1.4916E+18
Aerosols (kg)	0.0000E+00	4.2224E-03

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DW to Dummy (Equivalent Bypass Leakages) Transport Group Inventory:

	Pathway	
Time (h) = 2.4000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9590E+21
Elemental I (atoms)	0.0000E+00	2.6357E+17
Organic I (atoms)	0.0000E+00	1.3023E+17
Aerosols (kg)	0.0000E+00	2.2986E-04

DW to Dummy (MSIV Failed Pathway 7) Transport Group Inventory:

	Pathway	
Time (h) = 2.4000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0624E+22
Elemental I (atoms)	0.0000E+00	1.4294E+18
Organic I (atoms)	0.0000E+00	7.0625E+17
Aerosols (kg)	0.0000E+00	1.2466E-03

DW to Dummy (Intact MSIV Pathway 8) Transport Group Inventory:

	Pathway	
Time (h) = 2.4000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0624E+22
Elemental I (atoms)	0.0000E+00	1.4294E+18
Organic I (atoms)	0.0000E+00	7.0625E+17
Aerosols (kg)	0.0000E+00	1.2466E-03

EAB Doses:

Time (h) = 2.4500	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.7110E-03	1.7459E-03	3.7923E-03
Accumulated dose (rem)	9.9936E-02	5.6832E+00	3.4292E-01

LPZ Doses:

Time (h) = 2.4500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.7803E-03	8.3758E-04	1.8193E-03
Accumulated dose (rem)	3.5354E-02	7.9052E-01	6.9199E-02

CR Doses:

Time (h) = 2.4500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5833E-04	7.2874E-02	3.3660E-03
Accumulated dose (rem)	4.9707E-03	3.8903E+00	1.7301E-01

Attachment 13.9 – RADTRAD Partial Output File "NP2CL22.o0"

```
##########################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:19:41
 ##########################################################################

 ##########################################################################
                      File information
 ##########################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2CL22.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




      #####    ####   #####    #  #     #  #####   #    #  #####
      #    #  #       #        #  ##    #  #    #  #    #    #
      #    #  #       #        #  # #   #  #    #  #    #    #
      #####    ####   ####     #  #  #  #  #####   #    #    #
      #            #  #        #  #   # #  #       #    #    #
      #            #  #        #  #    ##  #       #    #    #
      #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Containment Leakage from Drywell & Wetwell (DW+WW) Using CAVEX Core Inventory
- External Cloud Dose
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   6
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
```

```
Dummy
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
RB
  3
 1.9400E+06
  0
  0
  0
  0
  0
Compartment 5:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 6:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Pathways:
 13
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW to RB
  1
  4
  2
Pathway 4:
WW to RB
  2
  4
  2
```

```
Pathway 5:
CR Filtered Intake
  5
  6
  2
Pathway 6:
CR Unfiltered Inleakage
  5
  6
  2
Pathway 7:
CR Exhaust to Environment
  6
  5
  2
Pathway 8:
Drawdown Release from RB to Environment
  4
  5
  2
Pathway 9:
RB Exhaust to Environment
  4
  5
  2
Pathway 10:
DW to Dummy (Bypass Pathway 5)
  1
  3
  2
Pathway 11:
WW to  Dummy (Bypass Pathway 6)
  2
  3
  2
Pathway 12:
DW to  Dummy (MSIV Failed Pathway 7)
  1
  3
  2
Pathway 13:
DW to  Dummy (Intact MSIV Pathway  8)
  1
  3
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
  0.0000E+00
  1
```

```
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  6
Compartment 1:
  0
  1
  1
  0.0000E+00
  6
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
  2.4000E+00   0.0000E+00
  6.0000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  6
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+01
  2.4000E+00   0.0000E+00
  6.0000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Pathways:
 13
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
```

```
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
```

```
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   2.5000E+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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 8:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   2.6700E+03   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
```

```
  0
  0
  0
Pathway 9:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   4.4000E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   2.4930E-01   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.2470E-01   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 11:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.1200E-02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   5.6000E-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 12:
  0
  0
```

```
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 13:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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
Dose Locations:
  3
Location 1:
EAB
  5
  1
  3
  0.0000E+00   1.1900E-04
  1.0000E+00   2.9600E-05
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
CR Intake
  5
  1
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
```

```
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 3:
CR
  6
  0
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  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
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2CL22.o0
  1
  1
  1
  0
  0
End of Scenario File
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:19:41
##########################################################################


      ####   #     #  #####  #####   #     #  #####
     #    #  #     #    #    #    #  #     #    #
     #    #  #     #    #    #    #  #     #    #
     #    #  #     #    #    #####   #     #    #
     #    #  #     #    #    #       #     #    #
     #    #  #     #    #    #       #     #    #
      ####    ####      #    #        ####     #


##########################################################################
                                 Dose Output
##########################################################################

EAB Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.4339E-06  9.1664E-04  4.5228E-05
Accumulated dose (rem)  6.4339E-06  9.1664E-04  4.5228E-05

CR Intake Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.9478E-05  1.1323E-02  5.5869E-04
Accumulated dose (rem)  7.9478E-05  1.1323E-02  5.5869E-04

CR Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.1243E-09  8.9558E-06  3.8315E-07
Accumulated dose (rem)  4.1243E-09  8.9558E-06  3.8315E-07

EAB Doses:

Time (h) =   0.0833    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.6681E-04  1.1255E-01  5.5301E-03
Accumulated dose (rem)  7.7325E-04  1.1347E-01  5.5753E-03

CR Intake Doses:

Time (h) =   0.0833    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.4724E-03  1.3903E+00  6.8313E-02
Accumulated dose (rem)  9.5519E-03  1.4016E+00  6.8872E-02

CR Doses:

Time (h) =   0.0833    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.2185E-06  1.3040E-03  5.6416E-05
Accumulated dose (rem)  1.2226E-06  1.3129E-03  5.6799E-05
```

EAB Doses:

Time (h) = 0.3333	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.3502E-03	1.1707E+00	5.6893E-02
Accumulated dose (rem)	8.1235E-03	1.2841E+00	6.2469E-02

CR Intake Doses:

Time (h) = 0.3333	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.0797E-02	1.4461E+01	7.0280E-01
Accumulated dose (rem)	1.0035E-01	1.5863E+01	7.7167E-01

CR Doses:

Time (h) = 0.3333	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.0934E-05	8.2916E-02	3.5837E-03
Accumulated dose (rem)	7.2156E-05	8.4229E-02	3.6405E-03

EAB Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.8172E-03	1.0011E+00	4.8185E-02
Accumulated dose (rem)	1.3941E-02	2.2852E+00	1.1065E-01

CR Intake Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.1860E-02	1.2366E+01	5.9522E-01
Accumulated dose (rem)	1.7221E-01	2.8229E+01	1.3669E+00

CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1051E-04	1.4277E-01	6.1632E-03
Accumulated dose (rem)	1.8267E-04	2.2700E-01	9.8037E-03

EAB Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.2695E-02	3.3489E+00	1.6673E-01
Accumulated dose (rem)	3.6636E-02	5.6341E+00	2.7738E-01

CR Intake Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.8035E-01	4.1369E+01	2.0596E+00
Accumulated dose (rem)	4.5256E-01	6.9598E+01	3.4265E+00

CR Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.6578E-04	8.8954E-01	3.8713E-02
Accumulated dose (rem)	9.4844E-04	1.1165E+00	4.8517E-02

EAB Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE

Delta dose (rem)	3.3325E-02	3.2956E-02	3.4810E-02
Accumulated dose (rem)	6.9961E-02	5.6671E+00	3.1219E-01

CR Intake Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.0407E-02	8.9405E-02	9.4435E-02
Accumulated dose (rem)	5.4297E-01	6.9688E+01	3.5209E+00

CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.6380E-03	2.0664E+00	9.2092E-02
Accumulated dose (rem)	3.5865E-03	3.1830E+00	1.4061E-01

EAB Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5678E-02	9.0278E-03	1.6096E-02
Accumulated dose (rem)	8.5639E-02	5.6761E+00	3.2829E-01

CR Intake Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.3729E-02	1.3664E-02	2.4362E-02
Accumulated dose (rem)	5.6670E-01	6.9701E+01	3.5453E+00

CR Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.5878E-04	4.0752E-01	1.8599E-02
Accumulated dose (rem)	4.3453E-03	3.5905E+00	1.5921E-01

EAB Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0631E-02	5.3107E-03	1.0878E-02
Accumulated dose (rem)	9.6270E-02	5.6814E+00	3.3917E-01

CR Intake Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.6090E-02	8.0378E-03	1.6465E-02
Accumulated dose (rem)	5.8279E-01	6.9709E+01	3.5618E+00

CR Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.6875E-04	2.2697E-01	1.0442E-02
Accumulated dose (rem)	4.8140E-03	3.8175E+00	1.6965E-01

EAB Doses:

Time (h) = 6.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.6297E-01	1.0335E-01	3.6791E-01
Accumulated dose (rem)	4.5924E-01	5.7848E+00	7.0708E-01

CR Intake Doses:

Time (h) = 6.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.4936E-01	1.5642E-01	5.5684E-01
Accumulated dose (rem)	1.1321E+00	6.9866E+01	4.1186E+00

CR Doses:

Time (h) = 6.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.7080E-02	2.9309E+00	1.5296E-01
Accumulated dose (rem)	2.1894E-02	6.7483E+00	3.2261E-01

EAB Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.9777E-01	4.2279E-02	1.9981E-01
Accumulated dose (rem)	6.5701E-01	5.8271E+00	9.0688E-01

CR Intake Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.9932E-01	6.3990E-02	3.0241E-01
Accumulated dose (rem)	1.4315E+00	6.9930E+01	4.4210E+00

CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2614E-02	5.5484E-01	4.3791E-02
Accumulated dose (rem)	3.4508E-02	7.3032E+00	3.6640E-01

EAB Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	8.5208E-01	1.8039E-01	8.6057E-01
Accumulated dose (rem)	1.5091E+00	6.0074E+00	1.7675E+00

CR Intake Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.8362E-01	1.0238E-01	4.8843E-01
Accumulated dose (rem)	1.9151E+00	7.0032E+01	4.9094E+00

CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.8852E-02	5.2271E-01	7.9534E-02
Accumulated dose (rem)	7.3360E-02	7.8259E+00	4.4594E-01

EAB Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.9775E-01	2.0650E-01	7.0734E-01
Accumulated dose (rem)	2.2068E+00	6.2139E+00	2.4748E+00

CR Intake Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE

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Delta dose (rem)	2.8287E-01	8.3717E-02	2.8676E-01
Accumulated dose (rem)	2.1980E+00	7.0116E+01	5.1962E+00

CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2532E-02	7.3618E-03	1.3246E-02
Accumulated dose (rem)	8.5891E-02	7.8332E+00	4.5918E-01

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.5549E-01	4.5074E-01	9.8911E-01
Accumulated dose (rem)	3.1623E+00	6.6647E+00	3.4639E+00

CR Intake Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.8503E-01	1.3446E-01	2.9506E-01
Accumulated dose (rem)	2.4830E+00	7.0250E+01	5.4913E+00

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.5562E-03	6.2836E-03	8.0243E-03
Accumulated dose (rem)	9.3448E-02	7.8395E+00	4.6721E-01

Attachment 13.10 – RADTRAD Partial Output File "NP2ES22.o0"

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:21:56
 ##########################################################################

 ##########################################################################
                     File information
 ##########################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2ES22.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_I.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




     #####    ####   #####    #  #     #  #####   #    #  #####
     #    #  #       #        #  ##    #  #    #  #    #    #
     #    #  #       #        #  # #   #  #    #  #    #    #
     #####    ####   ####     #  #  #  #  #####   #    #    #
     #            #  #        #  #   # #  #       #    #    #
     #            #  #        #  #    ##  #       #    #    #
     #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Post-LOCA ESF Leakage - CAVEX Core Inventory - External Cloud WB Dose
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   4
 Compartment 1:
 Pool
   3
  1.4500E+05
   0
   0
   0
   0
   0
 Compartment 2:
 RB
   3
  1.9400E+06
   0
   0
   0
   0
   0
 Compartment 3:
 Environment
```

CALCULATION NO. H21C-106	REV. No. 3	PAGE NO. 461

```
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 4:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Pathways:
  6
Pathway 1:
CR Filtered Intake
  3
  4
  2
Pathway 2:
CR Unfiltered Inleakage
  3
  4
  2
Pathway 3:
CR Exhaust to Environment
  4
  3
  2
Pathway 4:
RB Drawdown Release to Environment
  2
  3
  2
Pathway 5:
RB Exhaust to Environment
  2
  3
  2
Pathway 6:
ESF leakage to RB
  1
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
```

CALCULATION NO. H21C-106	REV. No. 3	PAGE NO. 462

```
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_I.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:
  4
Compartment 1:
  0
  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
Compartment 4:
  0
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
```

```
  0
Pathways:
  6
Pathway 1:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   2.5000E+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 3:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  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   2.6700E+03   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   4.4000E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   8.2900E+00   0.0000E+00   9.0000E+01   9.0000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  3
  1
  3
  0.0000E+00   1.1900E-04
  1.0000E+00   2.9600E-05
  7.2000E+02   0.0000E+00
  1
  2
```

```
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
CR Intake
  3
  1
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 3:
CR
  4
  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
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2ES22.o0
  1
  1
```

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```
  1
  0
  0
End of Scenario File
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:21:56
##########################################################################


     ####   #     #  #####  #####   #     #  #####
    #    #  #     #    #    #    #  #     #    #
    #    #  #     #    #    #    #  #     #    #
    #    #  #     #    #    #####   #     #    #
    #    #  #     #    #    #       #     #    #
    #    #  #     #    #    #       #     #    #
     ####    ####     #    #        ####     #


##########################################################################
                                 Dose Output
##########################################################################

EAB Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.6236E-08  1.5457E-05  5.6519E-07
Accumulated dose (rem)  7.6236E-08  1.5457E-05  5.6519E-07

CR Intake Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.4174E-07  1.9094E-04  6.9817E-06
Accumulated dose (rem)  9.4174E-07  1.9094E-04  6.9817E-06

CR Doses:

Time (h) =   0.0167    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.8862E-11  1.5102E-07  4.8260E-09
Accumulated dose (rem)  4.8862E-11  1.5102E-07  4.8260E-09

EAB Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.8012E-03  4.0805E-01  1.4683E-02
Accumulated dose (rem)  1.8012E-03  4.0806E-01  1.4684E-02

CR Intake Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2250E-02  5.0406E+00  1.8138E-01
Accumulated dose (rem)  2.2251E-02  5.0408E+00  1.8139E-01

CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.8865E-06  2.5300E-02  8.0646E-04
Accumulated dose (rem)  7.8866E-06  2.5300E-02  8.0647E-04

EAB Doses:

Time (h) =   1.0000    Whole Body   Thyroid       TEDE
```

Delta dose (rem)	1.1939E-02	3.0721E+00	1.0874E-01
Accumulated dose (rem)	1.3741E-02	3.4801E+00	1.2342E-01

CR Intake Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.4749E-01	3.7949E+01	1.3432E+00
Accumulated dose (rem)	1.6974E-01	4.2990E+01	1.5246E+00

CR Doses:

Time (h) = 1.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0696E-04	3.7635E-01	1.1963E-02
Accumulated dose (rem)	1.1485E-04	4.0165E-01	1.2770E-02

EAB Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.5541E-03	1.1430E-01	6.1462E-03
Accumulated dose (rem)	1.6295E-02	3.5944E+00	1.2957E-01

CR Intake Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.9289E-03	3.1007E-01	1.6674E-02
Accumulated dose (rem)	1.7666E-01	4.3300E+01	1.5413E+00

CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.3972E-04	1.3690E+00	4.3369E-02
Accumulated dose (rem)	4.5457E-04	1.7707E+00	5.6138E-02

EAB Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1612E-01	3.9022E+00	2.3778E-01
Accumulated dose (rem)	1.3242E-01	7.4966E+00	3.6734E-01

CR Intake Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.7575E-01	5.9060E+00	3.5988E-01
Accumulated dose (rem)	3.5242E-01	4.9206E+01	1.9012E+00

CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.4699E-03	3.0765E+00	9.9570E-02
Accumulated dose (rem)	3.9244E-03	4.8472E+00	1.5571E-01

EAB Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	8.1056E-01	1.9200E+01	1.4039E+00
Accumulated dose (rem)	9.4298E-01	2.6697E+01	1.7712E+00

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CR Intake Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.6005E-01	1.0897E+01	7.9680E-01
Accumulated dose (rem)	8.1247E-01	6.0103E+01	2.6980E+00

CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.0956E-02	1.6660E+00	7.2486E-02
Accumulated dose (rem)	2.4880E-02	6.5131E+00	2.2819E-01

EAB Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0856E+00	6.7231E+01	3.1428E+00
Accumulated dose (rem)	2.0286E+00	9.3928E+01	4.9140E+00

CR Intake Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.4013E-01	2.7256E+01	1.2741E+00
Accumulated dose (rem)	1.2526E+00	8.7359E+01	3.9721E+00

CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5953E-02	1.9498E+00	7.5617E-02
Accumulated dose (rem)	4.0833E-02	8.4629E+00	3.0381E-01

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.0186E-01	9.4608E+01	3.2830E+00
Accumulated dose (rem)	2.4305E+00	1.8854E+02	8.1970E+00

CR Intake Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1988E-01	2.8223E+01	9.7935E-01
Accumulated dose (rem)	1.3725E+00	1.1558E+02	4.9514E+00

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.0970E-03	1.3338E+00	4.3715E-02
Accumulated dose (rem)	4.3930E-02	9.7967E+00	3.4753E-01

Attachment 13.11 – RADTRAD Partial Output File "NP2MS22.o0"

```
##############################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  5/29/2019  at  3:11:07
 ##############################################################################

 ##############################################################################
                      File information
 ##############################################################################

 Plant file           = NP2MS22.psf
 Inventory file       = D:\User\Gardner\h21c-106r3\nmp2.nif
 Release file         = D:\User\Gardner\h21c-106r3\bwr_dba.rft
 Dose Conversion file = D:\User\Gardner\h21c-106r3\nmp2.inp




     #####    ####   #####    #  #     #  #####   #     #  #####
     #    #  #       #        #  ##    #  #    #  #     #     #
     #    #  #       #        #  # #   #  #    #  #     #     #
     #####    ####   ####     #  #  #  #  #####   #     #     #
     #            #  #        #  #   # #  #       #     #     #
     #            #  #        #  #    ##  #       #     #     #
     #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 Combined Bypass Leakage Releases Without Delay Times, CAVEX Core Inventory  -
External Cloud WB Dose
 Nuclide Inventory File:
 D:\User\Gardner\h21c-106r3\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   9
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
```

```
Dummy
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 5:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Compartment 6:
MSIV Failed Inboard Volume 1
  3
 3.9068E+02
  0
  0
  0
  0
  0
Compartment 7:
MSIV Failed Outboard Volume 2
  3
 4.2841E+02
  0
  0
  0
  0
  0
Compartment 8:
Intact Inboard Volume 3
  3
 3.3181E+02
  0
  0
  0
  0
  0
Compartment 9:
Intact Interstitial Volume 4
  3
 4.8703E+02
```

```
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW Leakage to RB (Released to Dummy)
  1
  3
  2
Pathway 4:
WW Leakage to RB (Released to Dummy)
  2
  3
  2
Pathway 5:
DW Bypass Pathway 5 to Environment
  1
  4
  2
Pathway 6:
WW Bypass Pathway 6 to Environment
  2
  4
  2
Pathway 7:
DW to MSIV Failed Inboard Volume 1
  1
  6
  2
Pathway 8:
MSIV Failed Inboard Volume 1 to MSIV Failed outboard Volume 2
  6
  7
  2
Pathway 9:
MSIV Failed Outboard Volume 2 to Environment ( Pathway  7)
  7
  4
  2
Pathway 10:
DW to Intact Inboard Volume 3
  1
  8
  2
```

```
Pathway 11:
Intact Inboard Volume 3 to Intact Outboard Volume 4
  8
  9
  2
Pathway 12:
CR Filtered Intake (Pathway 9)
  4
  5
  2
Pathway 13:
CR Unfiltered Inleakage (Pathway 10)
  4
  5
  2
Pathway 14:
CR Exhaust to Environment (Pathway 11)
  5
  4
  2
Pathway 15:
Intact Outboard Volume 4 to  Environment ( Pathway  8)
  9
  4
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\User\Gardner\h21c-106r3\nmp2.inp
D:\User\Gardner\h21c-106r3\bwr_dba.rft
  0.0000E+00
  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  9
Compartment 1:
  0
  1
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
  2.4000E+00   0.0000E+00
```

```
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+00
  2.4000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  0
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
```

```
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 7:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 8:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 9:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
```

```
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   2.4930E-01   7.3050E+01   3.6000E+00   0.0000E+00
  8.0000E+00   2.4930E-01   7.3050E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.2470E-01   7.3050E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.2470E-01   7.3050E+01   4.8890E+01   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 6:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.1200E-02   8.5610E+01   3.6000E+00   0.0000E+00
  8.0000E+00   1.1200E-02   8.5610E+01   4.8200E+00   0.0000E+00
  2.4000E+01   5.6000E-03   8.5610E+01   8.4600E+00   0.0000E+00
  9.6000E+01   5.6000E-03   8.5610E+01   4.8890E+01   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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 8:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   0.0000E+00   3.8200E+00   0.0000E+00
  8.0000E+00   1.3520E+00   0.0000E+00   5.1200E+00   0.0000E+00
  2.4000E+01   6.7600E-01   0.0000E+00   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   0.0000E+00   5.1030E+01   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 9:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8910E+01   3.5600E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8910E+01   4.7800E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8910E+01   8.3900E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8910E+01   4.8590E+01   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 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 11:
  0
```

```
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.3520E+00   0.0000E+00   3.8300E+00   0.0000E+00
  8.0000E+00   1.3520E+00   0.0000E+00   5.1300E+00   0.0000E+00
  2.4000E+01   6.7600E-01   0.0000E+00   8.9800E+00   0.0000E+00
  9.6000E+01   6.7600E-01   0.0000E+00   5.1040E+01   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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 13:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   2.5000E+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 14:
  0
  0
  0
  0
  0
  1
```

```
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 15:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   3.3330E+00   9.8720E+01   3.6000E+00   0.0000E+00
  8.0000E+00   3.3330E+00   9.8720E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.6670E+00   9.8720E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.6670E+00   9.8720E+01   4.8890E+01   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  4
  1
  2
  0.0000E+00   1.1900E-04
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
CR Air Intake
  4
  1
  6
  0.0000E+00   1.4700E-03
  2.0000E+00   9.7400E-04
  8.0000E+00   3.6300E-04
  2.4000E+01   2.4500E-04
  9.6000E+01   1.9000E-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 3:
CR
  5
  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
  6
  0.0000E+00   1.4700E-03
  2.0000E+00   9.7400E-04
  8.0000E+00   3.6300E-04
  2.4000E+01   2.4500E-04
  9.6000E+01   1.9000E-04
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
C:\Radtrad 3.o185
  1
  1
  1
  0
  0
End of Scenario File
```

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EAB Doses:

Time (h) = 0.0167	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.6076E-05	1.4703E-03	7.6520E-05
Accumulated dose (rem)	1.6076E-05	1.4703E-03	7.6520E-05

CR Air Intake Doses:

Time (h) = 0.0167	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.9858E-04	1.8162E-02	9.4525E-04
Accumulated dose (rem)	1.9858E-04	1.8162E-02	9.4525E-04

CR Doses:

Time (h) = 0.0167	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2639E-08	1.7625E-05	7.3721E-07
Accumulated dose (rem)	1.2639E-08	1.7625E-05	7.3721E-07

EAB Doses:

Time (h) = 0.0833	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.6878E-04	3.5072E-02	1.8105E-03
Accumulated dose (rem)	3.8485E-04	3.6542E-02	1.8870E-03

CR Air Intake Doses:

Time (h) = 0.0833	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.5555E-03	4.3324E-01	2.2365E-02
Accumulated dose (rem)	4.7541E-03	4.5140E-01	2.3311E-02

CR Doses:

Time (h) = 0.0833	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2758E-06	6.5321E-04	2.8149E-05
Accumulated dose (rem)	1.2885E-06	6.7084E-04	2.8887E-05

EAB Doses:

Time (h) = 0.3333	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.0853E-03	5.4790E-01	2.7601E-02
Accumulated dose (rem)	5.4702E-03	5.8445E-01	2.9488E-02

CR Air Intake Doses:

Time (h) = 0.3333	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.2819E-02	6.7682E+00	3.4095E-01
Accumulated dose (rem)	6.7573E-02	7.2196E+00	3.6426E-01

CR Doses:

Time (h) = 0.3333	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.6127E-05	3.2259E-02	1.3968E-03
Accumulated dose (rem)	6.7416E-05	3.2930E-02	1.4257E-03

EAB Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE

Delta dose (rem)	3.8553E-03	2.3857E-01	1.3612E-02
Accumulated dose (rem)	9.3255E-03	8.2301E-01	4.3100E-02

CR Air Intake Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.7624E-02	2.9470E+00	1.6815E-01
Accumulated dose (rem)	1.1520E-01	1.0167E+01	5.3241E-01

CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.3403E-04	5.9490E-02	2.5947E-03
Accumulated dose (rem)	2.0144E-04	9.2420E-02	4.0204E-03

EAB Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.3074E-01	1.7369E+00	3.0890E-01
Accumulated dose (rem)	2.4007E-01	2.5599E+00	3.5200E-01

CR Air Intake Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.8504E+00	2.1456E+01	3.8158E+00
Accumulated dose (rem)	2.9656E+00	3.1623E+01	4.3482E+00

CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.3119E-02	9.7182E-01	7.4118E-02
Accumulated dose (rem)	2.3320E-02	1.0642E+00	7.8138E-02

EAB Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.4195E-02	1.6627E-01	6.0506E-02
Accumulated dose (rem)	2.9426E-01	2.7262E+00	4.1250E-01

CR Air Intake Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.4358E-01	1.3609E+00	4.9523E-01
Accumulated dose (rem)	3.4091E+00	3.2984E+01	4.8435E+00

CR Doses:

Time (h) = 2.2500	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0477E-02	2.2678E-01	2.5659E-02
Accumulated dose (rem)	3.3797E-02	1.2910E+00	1.0380E-01

EAB Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.4153E-02	8.5729E-02	3.7189E-02
Accumulated dose (rem)	3.2842E-01	2.8119E+00	4.4969E-01

CR Air Intake Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.7954E-01	7.0168E-01	3.0439E-01
Accumulated dose (rem)	3.6887E+00	3.3685E+01	5.1478E+00

CR Doses:

Time (h) = 2.4000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.7363E-03	1.3215E-01	1.6133E-02
Accumulated dose (rem)	4.0533E-02	1.4232E+00	1.1993E-01

EAB Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.7354E+00	5.1046E+00	1.9126E+00
Accumulated dose (rem)	2.0638E+00	7.9165E+00	2.3623E+00

CR Air Intake Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.4204E+01	4.1780E+01	1.5655E+01
Accumulated dose (rem)	1.7892E+01	7.5466E+01	2.0803E+01

CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.7376E-01	4.6486E+00	9.2523E-01
Accumulated dose (rem)	5.1429E-01	6.0718E+00	1.0452E+00

EAB Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.6635E+00	1.5764E+01	3.1723E+00
Accumulated dose (rem)	4.7273E+00	2.3681E+01	5.5346E+00

CR Air Intake Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	8.1248E+00	2.4731E+01	8.9230E+00
Accumulated dose (rem)	2.6017E+01	1.0020E+02	2.9726E+01

CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.4833E-01	6.9812E+00	1.1761E+00
Accumulated dose (rem)	1.1626E+00	1.3053E+01	2.2212E+00

EAB Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.7355E+00	2.6125E+01	2.5624E+00
Accumulated dose (rem)	6.4628E+00	4.9806E+01	8.0971E+00

CR Air Intake Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE

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Delta dose (rem)	3.5732E+00	3.5345E+01	4.6919E+00
Accumulated dose (rem)	2.9590E+01	1.3554E+02	3.4417E+01

CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.6592E-01	4.1128E+00	3.0127E-01
Accumulated dose (rem)	1.3285E+00	1.7166E+01	2.5225E+00

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.7212E+00	6.5165E+01	4.8970E+00
Accumulated dose (rem)	9.1840E+00	1.1497E+02	1.2994E+01

CR Air Intake Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.3447E+00	6.8372E+01	6.6276E+00
Accumulated dose (rem)	3.3935E+01	2.0391E+02	4.1045E+01

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.1436E-01	4.8592E+00	2.7656E-01
Accumulated dose (rem)	1.4429E+00	2.2025E+01	2.7991E+00

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Attachment 13.12 – RADTRAD Partial Output File "NP2CL00.o0"

```
##########################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:18:01
 ##########################################################################

 ##########################################################################
                      File information
 ##########################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2CL00.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




     #####    ####   #####    #  #     #  #####   #    #  #####
     #    #  #       #        #  ##    #  #    #  #    #    #
     #    #  #       #        #  # #   #  #    #  #    #    #
     #####    ####   ####     #  #  #  #  #####   #    #    #
     #            #  #        #  #   # #  #       #    #    #
     #            #  #        #  #    ##  #       #    #    #
     #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Containment Leakage from Drywell & Wetwell (DW+WW) Using CAVEX Core Inventory
-  Containment Shine Dose
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   6
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
 Dummy
```

```
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
RB
  3
 1.9400E+06
  0
  0
  0
  0
  0
Compartment 5:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 6:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Pathways:
 13
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW to RB
  1
  4
  2
Pathway 4:
WW to RB
  2
  4
  2
Pathway 5:
```

```
CR Filtered Intake
  5
  6
  2
Pathway 6:
CR Unfiltered Inleakage
  5
  6
  2
Pathway 7:
CR Exhaust to Environment
  6
  5
  2
Pathway 8:
Drawdown Release from RB to Environment
  4
  5
  2
Pathway 9:
RB Exhaust to Environment
  4
  5
  2
Pathway 10:
DW to Dummy (Bypass Pathway 5)
  1
  3
  2
Pathway 11:
WW to  Dummy (Bypass Pathway 6)
  2
  3
  2
Pathway 12:
DW to  Dummy (MSIV Failed Pathway 7)
  1
  3
  2
Pathway 13:
DW to  Dummy (Intact MSIV Pathway  8)
  1
  3
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_DBA.RFT
  0.0000E+00
  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
```

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```
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  6
Compartment 1:
  0
  1
  1
  0.0000E+00
  6
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
  2.4000E+00   0.0000E+00
  6.0000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  6
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+01
  2.4000E+00   0.0000E+00
  6.0000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
```

```
Compartment 4:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Pathways:
 13
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
```

```
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
```

```
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  6
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  9.6000E+01   2.5000E+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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 8:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   2.6700E+03   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
```

```
  0
  0
  0
  0
  0
  0
Pathway 9:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   3.6000E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   2.4930E-01   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.2470E-01   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 11:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.1200E-02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   5.6000E-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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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 13:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.3520E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   6.7600E-01   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
Dose Locations:
  3
Location 1:
EAB
  5
  1
  3
  0.0000E+00   1.1900E-04
  1.0000E+00   2.9600E-05
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  0
Location 2:
LPZ
  5
  1
  6
  0.0000E+00   1.6200E-05
  1.0000E+00   1.4200E-05
  8.0000E+00   5.4100E-07
```

```
  2.4000E+01   2.3100E-07
  9.6000E+01   7.6500E-08
  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   2.3000E-04
  0
Location 3:
CR
  6
  0
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  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
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2CL00.o0
  1
  1
  1
  0
  0
End of Scenario File
```

```
##############################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:18:01
##############################################################################


     ####   #     #  #####  #####   #     #  #####
    #    #  #     #    #    #    #  #     #    #
    #    #  #     #    #    #    #  #     #    #
    #    #  #     #    #    #####   #     #    #
    #    #  #     #    #    #       #     #    #
    #    #  #     #    #    #       #     #    #
     ####    ####     #    #        ####     #


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

RB Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
Kr-83m	3.2205E+03	1.5865E-07	1.1511E+18	3.1495E+17
Kr-85m	1.1214E+04	1.3627E-06	9.6543E+18	9.8650E+17
Kr-85	7.7246E+02	1.9707E-03	1.3962E+22	6.3294E+16
Kr-87	1.0364E+04	3.6589E-07	2.5327E+18	1.1079E+18
Kr-88	2.5710E+04	2.0504E-06	1.4031E+19	2.3600E+18
Rb-86	3.5940E+00	4.4171E-08	3.0930E+17	7.7318E+14
Rb-88	2.1006E+04	1.7401E-07	1.1908E+18	1.3677E+18
Sr-89	6.7998E+01	2.3405E-06	1.5837E+19	7.0774E+15
Sr-90	7.2825E+00	5.3388E-05	3.5723E+20	7.5777E+14
Sr-91	7.2515E+01	2.0004E-08	1.3238E+17	7.8249E+15
Sr-92	5.2088E+01	4.1440E-09	2.7126E+16	6.1743E+15
Y-90	1.3678E-01	2.5141E-10	1.6823E+15	1.1671E+13
Y-91	8.6461E-01	3.5256E-08	2.3332E+17	8.9486E+13
Y-92	9.1128E+00	9.4705E-10	6.1992E+15	6.5326E+14
Y-93	8.2979E-01	2.4872E-10	1.6105E+15	8.9346E+13
Zr-95	1.0064E+00	4.6845E-08	2.9696E+17	1.0474E+14
Zr-97	8.9514E-01	4.6825E-10	2.9071E+15	9.5059E+13
Nb-95	9.9344E-01	2.5406E-08	1.6105E+17	1.0337E+14
Mo-99	1.2450E+01	2.5959E-08	1.5791E+17	1.3023E+15
Tc-99m	1.1185E+01	2.1271E-09	1.2939E+16	1.1586E+15
Ru-103	1.0992E+01	3.4058E-07	1.9913E+18	1.1441E+15
Ru-105	5.7386E+00	8.5370E-10	4.8963E+15	6.4594E+14
Ru-106	4.5756E+00	1.3677E-06	7.7700E+18	4.7612E+14
Rh-105	7.2756E+00	8.6199E-09	4.9438E+16	7.5769E+14
Sb-127	1.2477E+01	4.6720E-08	2.2154E+17	1.3031E+15
Sb-129	2.8391E+01	5.0488E-09	2.3569E+16	3.2029E+15
Te-127	1.2505E+01	4.7384E-09	2.2469E+16	1.2972E+15
Te-127m	2.1423E+00	2.2711E-07	1.0769E+18	2.2291E+14
Te-129	3.2104E+01	1.5330E-09	7.1564E+15	3.3991E+15
Te-129m	7.0259E+00	2.3322E-07	1.0888E+18	7.3105E+14
Te-131m	2.5415E+01	3.1872E-08	1.4652E+17	2.6750E+15
Te-132	1.8761E+02	6.1798E-07	2.8193E+18	1.9608E+16
I-131	1.7106E+03	1.3798E-05	6.3430E+19	3.5096E+17
I-132	1.6731E+03	1.6209E-07	7.3948E+17	4.0078E+17
I-133	3.3411E+03	2.9494E-06	1.3355E+19	7.0366E+17

I-134	8.4276E+02	3.1592E-08	1.4198E+17	3.7618E+17
I-135	2.7366E+03	7.7923E-07	3.4760E+18	6.1418E+17
Xe-133	9.3975E+04	5.0205E-04	2.2733E+21	7.7133E+18
Xe-133m	2.8578E+03	6.4913E-06	2.9392E+19	2.3516E+17
Xe-135	4.0145E+04	1.5720E-05	7.0125E+19	3.3341E+18
Xe-135m	1.6783E+03	1.8436E-08	8.2240E+16	2.8601E+17
Xe-138	2.4232E+02	2.5254E-09	1.1021E+16	1.7207E+17
Cs-134	3.6049E+02	2.7862E-04	1.2522E+21	7.7448E+16
Cs-136	1.0951E+02	1.4942E-06	6.6166E+18	2.3573E+16
Cs-137	2.7989E+02	3.2178E-03	1.4145E+22	6.0129E+16
Ba-139	3.7639E+01	2.3011E-09	9.9694E+15	5.0991E+15
Ba-140	9.9682E+01	1.3616E-06	5.8570E+18	1.0384E+16
La-140	2.3450E+00	4.2189E-09	1.8148E+16	1.8845E+14
La-141	6.6059E-01	1.1681E-10	4.9889E+14	7.5135E+13
La-142	3.7523E-01	2.6212E-11	1.1116E+14	4.9359E+13
Ce-141	2.3634E+00	8.2945E-08	3.5426E+17	2.4597E+14
Ce-143	2.2106E+00	3.3289E-09	1.4019E+16	2.3243E+14
Ce-144	1.8945E+00	5.9397E-07	2.4840E+18	1.9713E+14
Pr-143	9.0466E-01	1.3434E-08	5.6576E+16	9.4032E+13
Nd-147	3.6615E-01	4.5261E-09	1.8542E+16	3.8149E+13
Np-239	2.6310E+01	1.1341E-07	2.8576E+17	2.7543E+15
Pu-238	5.8875E-03	3.4390E-07	8.7018E+17	6.1261E+11
Pu-239	5.9386E-04	9.5543E-06	2.4074E+19	6.1788E+10
Pu-240	1.0488E-03	4.6050E-07	1.1555E+18	1.0914E+11
Pu-241	2.3302E-01	2.3563E-06	5.8879E+18	2.4246E+13
Am-241	1.3185E-04	3.8488E-08	9.6174E+16	1.3718E+10
Cm-242	3.6202E-02	1.0936E-08	2.7215E+16	3.7673E+12
Cm-244	2.3945E-03	2.9254E-08	7.2202E+16	2.4916E+11

RB Compartment Nuclide Inventory:

Time (h) = 8.0000	Ci	kg	Atoms	Decay
Kr-83m	2.0282E+03	9.9916E-08	7.2495E+17	3.3034E+18
Kr-85m	2.6113E+04	3.1731E-06	2.2481E+19	2.0768E+19
Kr-85	4.5514E+03	1.1612E-02	8.2268E+22	2.3846E+18
Kr-87	2.3199E+03	8.1900E-08	5.6691E+17	7.4236E+18
Kr-88	3.5025E+04	2.7933E-06	1.9115E+19	3.6679E+19
Rb-86	2.0609E+00	2.5328E-08	1.7736E+17	2.9737E+15
Rb-88	4.3877E+04	3.6347E-07	2.4874E+18	3.8348E+19
Sr-89	4.7772E+01	1.6443E-06	1.1126E+19	5.3372E+16
Sr-90	5.1338E+00	3.7636E-05	2.5183E+20	5.7238E+15
Sr-91	3.2996E+01	9.1025E-09	6.0238E+16	4.8444E+16
Sr-92	7.9143E+00	6.2965E-10	4.1216E+15	2.5222E+16
Y-90	4.0410E-01	7.4274E-10	4.9699E+15	2.4214E+14
Y-91	6.5713E-01	2.6795E-08	1.7732E+17	7.0184E+14
Y-92	1.2862E+01	1.3367E-09	8.7496E+15	1.2593E+16
Y-93	3.8753E-01	1.1616E-10	7.5215E+14	5.5942E+14
Zr-95	7.0754E-01	3.2935E-08	2.0878E+17	7.9014E+14
Zr-97	4.9338E-01	2.5809E-10	1.6023E+15	6.4052E+14
Nb-95	7.0034E-01	1.7910E-08	1.1353E+17	7.8078E+14
Mo-99	8.2411E+00	1.7183E-08	1.0452E+17	9.5474E+15
Tc-99m	7.6936E+00	1.4632E-09	8.9003E+15	8.6734E+15
Ru-103	7.7146E+00	2.3904E-07	1.3976E+18	8.6242E+15
Ru-105	1.5855E+00	2.3587E-10	1.3528E+15	3.2637E+15
Ru-106	3.2241E+00	9.6369E-07	5.4750E+18	3.5956E+15
Rh-105	4.8490E+00	5.7449E-09	3.2949E+16	5.6103E+15
Sb-127	8.4085E+00	3.1486E-08	1.4930E+17	9.6347E+15

Sb-129	7.6428E+00	1.3591E-09	6.3448E+15	1.6023E+16
Te-127	8.7210E+00	3.3045E-09	1.5670E+16	9.7595E+15
Te-127m	1.5103E+00	1.6011E-07	7.5923E+17	1.6838E+15
Te-129	1.1534E+01	5.5073E-10	2.5710E+15	1.9427E+16
Te-129m	4.9420E+00	1.6405E-07	7.6583E+17	5.5181E+15
Te-131m	1.5597E+01	1.9560E-08	8.9918E+16	1.8932E+16
Te-132	1.2541E+02	4.1309E-07	1.8846E+18	1.4442E+17
I-131	1.0870E+03	8.7681E-06	4.0308E+19	1.4475E+18
I-132	3.0307E+02	2.9361E-08	1.3395E+17	1.0160E+18
I-133	1.7755E+03	1.5674E-06	7.0970E+18	2.6786E+18
I-134	4.7610E+00	1.7847E-10	8.0207E+14	5.0612E+17
I-135	9.4674E+02	2.6958E-07	1.2026E+18	1.9599E+18
Xe-133	5.3683E+05	2.8680E-03	1.2986E+22	2.8495E+20
Xe-133m	1.5620E+04	3.5479E-05	1.6064E+20	8.4478E+18
Xe-135	1.5452E+05	6.0509E-05	2.6992E+20	9.7989E+19
Xe-135m	1.6873E+02	1.8535E-09	8.2684E+15	6.1916E+17
Xe-138	3.3335E-05	3.4741E-16	1.5161E+09	1.8774E+17
Cs-134	2.0859E+02	1.6122E-04	7.2456E+20	2.9908E+17
Cs-136	6.2551E+01	8.5346E-07	3.7792E+18	9.0507E+16
Cs-137	1.6199E+02	1.8623E-03	8.1864E+21	2.3222E+17
Ba-139	1.2983E+00	7.9376E-11	3.4389E+14	1.3908E+16
Ba-140	6.9323E+01	9.4692E-07	4.0732E+18	7.7928E+16
La-140	8.1470E+00	1.4657E-08	6.3049E+16	4.7087E+15
La-141	1.6163E-01	2.8579E-11	1.2206E+14	3.6262E+14
La-142	1.7819E-02	1.2448E-12	5.2790E+12	1.4500E+14
Ce-141	1.6589E+00	5.8220E-08	2.4866E+17	1.8545E+15
Ce-143	1.3739E+00	2.0688E-09	8.7125E+15	1.6546E+15
Ce-144	1.3347E+00	4.1847E-07	1.7501E+18	1.4886E+15
Pr-143	6.4788E-01	9.6212E-09	4.0518E+16	7.1553E+14
Nd-147	2.5408E-01	3.1407E-09	1.2867E+16	2.8600E+14
Np-239	1.7232E+01	7.4277E-08	1.8716E+17	2.0093E+16
Pu-238	4.1506E-03	2.4244E-07	6.1346E+17	4.6274E+12
Pu-239	4.1900E-04	6.7411E-06	1.6986E+19	4.6691E+11
Pu-240	7.3940E-04	3.2463E-07	8.1458E+17	8.2436E+11
Pu-241	1.6426E-01	1.6610E-06	4.1506E+18	1.8314E+14
Am-241	9.3127E-05	2.7184E-08	6.7927E+16	1.0371E+11
Cm-242	2.5494E-02	7.7015E-09	1.9165E+16	2.8442E+13
Cm-244	1.6880E-03	2.0623E-08	5.0898E+16	1.8820E+12

RB Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
Kr-83m	8.9199E+00	4.3942E-10	3.1883E+15	4.1744E+18
Kr-85m	3.7540E+03	4.5617E-07	3.2319E+18	4.8204E+19
Kr-85	7.7781E+03	1.9844E-02	1.4059E+23	1.6643E+19
Kr-87	6.4667E-01	2.2830E-11	1.5803E+14	8.0768E+18
Kr-88	1.2056E+03	9.6143E-08	6.5794E+17	6.0448E+19
Rb-86	6.7954E-01	8.3515E-09	5.8481E+16	5.4297E+15
Rb-88	3.6531E+03	3.0262E-08	2.0709E+17	6.5214E+19
Sr-89	2.7153E+01	9.3462E-07	6.3241E+18	1.2641E+17
Sr-90	2.9447E+00	2.1587E-05	1.4445E+20	1.3605E+16
Sr-91	5.8896E+00	1.6247E-09	1.0752E+16	8.0008E+16
Sr-92	7.5811E-02	6.0314E-12	3.9480E+13	2.8648E+16
Y-90	6.5675E-01	1.2071E-09	8.0771E+15	1.3623E+15
Y-91	4.0869E-01	1.6665E-08	1.1029E+17	1.7564E+15
Y-92	7.2679E-01	7.5532E-11	4.9441E+14	2.1945E+16
Y-93	7.4139E-02	2.2222E-11	1.4389E+14	9.3955E+14

Zr-95	4.0293E-01	1.8756E-08	1.1890E+17	1.8728E+15
Zr-97	1.4683E-01	7.6805E-11	4.7683E+14	1.2134E+15
Nb-95	4.0171E-01	1.0273E-08	6.5122E+16	1.8557E+15
Mo-99	3.9960E+00	8.3317E-09	5.0681E+16	2.1287E+16
Tc-99m	4.0026E+00	7.6121E-10	4.6304E+15	1.9601E+16
Ru-103	4.3735E+00	1.3551E-07	7.9229E+17	2.0405E+16
Ru-105	7.4817E-02	1.1130E-11	6.3835E+13	4.2616E+15
Ru-106	1.8471E+00	5.5209E-07	3.1366E+18	8.5426E+15
Rh-105	2.1177E+00	2.5090E-09	1.4390E+16	1.2253E+16
Sb-127	4.2777E+00	1.6018E-08	7.5955E+16	2.1868E+16
Sb-129	3.3647E-01	5.9834E-11	2.7932E+14	2.0743E+16
Te-127	4.7731E+00	1.8086E-09	8.5762E+15	2.2578E+16
Te-127m	8.6611E-01	9.1821E-08	4.3540E+17	4.0021E+15
Te-129	2.8944E+00	1.3821E-10	6.4520E+14	2.9141E+16
Te-129m	2.8008E+00	9.2972E-08	4.3402E+17	1.3066E+16
Te-131m	6.1818E+00	7.7524E-09	3.5638E+16	3.9303E+16
Te-132	6.2425E+01	2.0562E-07	9.3809E+17	3.2513E+17
I-131	5.1299E+02	4.1378E-06	1.9022E+19	2.9648E+18
I-132	7.4998E+01	7.2657E-09	3.3148E+16	1.2632E+18
I-133	5.2017E+02	4.5918E-07	2.0791E+18	4.7108E+18
I-134	7.6205E-06	2.8566E-16	1.2838E+09	5.0686E+17
I-135	8.8295E+01	2.5142E-08	1.1215E+17	2.6824E+18
Xe-133	8.4219E+05	4.4993E-03	2.0372E+22	1.8915E+21
Xe-133m	2.1702E+04	4.9295E-05	2.2320E+20	5.2297E+19
Xe-135	7.8115E+04	3.0589E-05	1.3645E+20	3.6468E+20
Xe-135m	4.0958E+01	4.4992E-10	2.0070E+15	7.3018E+17
Cs-134	7.0461E+01	5.4459E-05	2.4475E+20	5.5010E+17
Cs-136	2.0409E+01	2.7847E-07	1.2331E+18	1.6473E+17
Cs-137	5.4750E+01	6.2944E-04	2.7668E+21	4.2721E+17
Ba-139	2.3855E-04	1.4584E-14	6.3186E+10	1.4219E+16
Ba-140	3.8348E+01	5.2381E-07	2.2532E+18	1.8263E+17
La-140	1.2840E+01	2.3101E-08	9.9368E+16	2.7022E+16
La-141	5.5152E-03	9.7521E-13	4.1652E+12	4.5597E+14
La-142	7.6789E-06	5.3642E-16	2.2749E+09	1.4973E+14
Ce-141	9.3870E-01	3.2944E-08	1.4071E+17	4.3859E+15
Ce-143	5.6314E-01	8.4799E-10	3.5711E+15	3.4747E+15
Ce-144	7.6436E-01	2.3965E-07	1.0022E+18	3.5362E+15
Pr-143	3.8122E-01	5.6612E-09	2.3841E+16	1.7222E+15
Nd-147	1.3974E-01	1.7273E-09	7.0763E+15	6.6875E+14
Np-239	8.1232E+00	3.5015E-08	8.8229E+16	4.4338E+16
Pu-238	2.3810E-03	1.3908E-07	3.5191E+17	1.1000E+13
Pu-239	2.4082E-04	3.8743E-06	9.7623E+18	1.1107E+12
Pu-240	4.2413E-04	1.8621E-07	4.6725E+17	1.9595E+12
Pu-241	9.4216E-02	9.5271E-07	2.3806E+18	4.3532E+14
Am-241	5.3690E-05	1.5672E-08	3.9162E+16	2.4699E+11
Cm-242	1.4582E-02	4.4052E-09	1.0962E+16	6.7531E+13
Cm-244	9.6818E-04	1.1829E-08	2.9194E+16	4.4734E+12

RB Compartment Nuclide Inventory:

Time (h) = 96.0000	Ci	kg	Atoms	Decay
Kr-85m	2.8684E-02	3.4855E-12	2.4695E+13	5.0764E+19
Kr-85	4.0905E+03	1.0436E-02	7.3935E+22	6.0503E+19
Kr-88	1.4811E-05	1.1811E-15	8.0829E+09	6.1000E+19
Rb-86	1.7813E-01	2.1892E-09	1.5330E+16	7.7929E+15
Rb-88	4.4879E-05	3.7177E-16	2.5442E+09	6.5939E+19
Sr-89	1.0746E+01	3.6989E-07	2.5029E+18	2.5077E+17

Sr-90	1.2142E+00	8.9010E-06	5.9559E+19	2.7340E+16
Sr-91	1.2703E-02	3.5044E-12	2.3191E+13	8.6841E+16
Sr-92	3.1420E-10	2.4998E-20	1.6363E+05	2.8679E+16
Y-90	7.8460E-01	1.4421E-09	9.6495E+15	7.2888E+15
Y-91	1.6898E-01	6.8904E-09	4.5599E+16	3.6869E+15
Y-92	3.0739E-07	3.1945E-17	2.0911E+08	2.2350E+16
Y-93	2.1848E-04	6.5485E-14	4.2404E+11	1.0297E+15
Zr-95	1.6086E-01	7.4877E-09	4.7465E+16	3.7254E+15
Zr-97	3.1596E-03	1.6528E-12	1.0261E+13	1.4736E+15
Nb-95	1.6545E-01	4.2311E-09	2.6821E+16	3.7279E+15
Mo-99	7.7366E-01	1.6131E-09	9.8124E+15	3.4937E+16
Tc-99m	7.9318E-01	1.5085E-10	9.1759E+14	3.2814E+16
Ru-103	1.7106E+00	5.3004E-08	3.0990E+17	4.0332E+16
Ru-105	4.0528E-07	6.0291E-17	3.4579E+08	4.3089E+15
Ru-106	7.5745E-01	2.2640E-07	1.2863E+18	1.7137E+16
Rh-105	2.1402E-01	2.5356E-10	1.4543E+15	1.8017E+16
Sb-127	1.0279E+00	3.8492E-09	1.8252E+16	3.7761E+16
Sb-129	1.3338E-06	2.3719E-16	1.1073E+09	2.0951E+16
Te-127	1.3343E+00	5.0558E-10	2.3974E+15	4.0906E+16
Te-127m	3.5507E-01	3.7643E-08	1.7850E+17	8.0333E+15
Te-129	9.3899E-01	4.4837E-11	2.0931E+14	3.7658E+16
Te-129m	1.0859E+00	3.6046E-08	1.6827E+17	2.5779E+16
Te-131m	4.8302E-01	6.0574E-10	2.7846E+15	5.4772E+16
Te-132	1.3599E+01	4.4795E-08	2.0436E+17	5.4827E+17
I-131	1.5350E+02	1.2382E-06	5.6920E+18	5.0080E+18
I-132	1.6232E+01	1.5726E-09	7.1744E+15	1.4943E+18
I-133	1.8270E+01	1.6128E-08	7.3027E+16	5.7296E+18
I-135	1.7971E-02	5.1171E-12	2.2827E+13	2.7578E+18
Xe-133	3.0048E+05	1.6053E-03	7.2686E+21	5.8869E+21
Xe-133m	4.4952E+03	1.0211E-05	4.6232E+19	1.3484E+20
Xe-135	1.6988E+02	6.6524E-08	2.9675E+17	4.6200E+20
Xe-135m	8.3361E-03	9.1573E-14	4.0849E+11	7.4284E+17
Cs-134	2.0590E+01	1.5914E-05	7.1520E+19	8.0634E+17
Cs-136	5.1027E+00	6.9622E-08	3.0829E+17	2.3436E+17
Cs-137	1.6040E+01	1.8441E-04	8.1061E+20	6.2652E+17
Ba-140	1.3433E+01	1.8349E-07	7.8929E+17	3.4916E+17
La-140	1.1810E+01	2.1247E-08	9.1393E+16	1.2786E+17
La-141	6.9475E-09	1.2285E-18	5.2469E+06	4.5912E+14
Ce-141	3.6316E-01	1.2746E-08	5.4436E+16	8.6426E+15
Ce-143	5.1185E-02	7.7076E-11	3.2459E+14	4.9525E+15
Ce-144	3.1293E-01	9.8112E-08	4.1031E+17	7.0900E+15
Pr-143	1.5153E-01	2.2503E-09	9.4766E+15	3.4932E+15
Nd-147	4.7686E-02	5.8945E-10	2.4148E+15	1.2688E+15
Np-239	1.3854E+00	5.9718E-09	1.5047E+16	7.0803E+16
Pu-238	9.8226E-04	5.7376E-08	1.4518E+17	2.2108E+13
Pu-239	9.9840E-05	1.6063E-06	4.0473E+18	2.2371E+12
Pu-240	1.7491E-04	7.6797E-08	1.9270E+17	3.9379E+12
Pu-241	3.8840E-02	3.9275E-07	9.8142E+17	8.7472E+14
Am-241	2.2652E-05	6.6121E-09	1.6522E+16	4.9996E+11
Cm-242	5.9375E-03	1.7937E-09	4.4636E+15	1.3517E+14
Cm-244	3.9916E-04	4.8766E-09	1.2036E+16	8.9889E+12

RB Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	3.1054E+03	7.9226E-03	5.6131E+22	3.5757E+20

Rb-86	5.1691E-02	6.3528E-10	4.4485E+15	1.6281E+16
Sr-89	5.7351E+00	1.9741E-07	1.3357E+18	9.1375E+17
Sr-90	9.2429E-01	6.7760E-06	4.5340E+19	1.1562E+17
Y-90	9.2915E-01	1.7078E-09	1.1427E+16	9.0442E+16
Y-91	9.4716E-02	3.8622E-09	2.5559E+16	1.4346E+16
Zr-95	9.2550E-02	4.3081E-09	2.7309E+16	1.3992E+16
Nb-95	1.1752E-01	3.0053E-09	1.9051E+16	1.5455E+16
Mo-99	8.4085E-04	1.7532E-12	1.0665E+13	4.4345E+16
Tc-99m	8.6208E-04	1.6395E-13	9.9729E+11	4.1972E+16
Ru-103	8.2446E-01	2.5546E-08	1.4936E+17	1.4120E+17
Ru-106	5.5000E-01	1.6440E-07	9.3398E+17	7.0989E+16
Rh-105	7.9512E-07	9.4203E-16	5.4029E+09	1.9439E+16
Sb-127	7.2661E-03	2.7209E-11	1.2902E+14	5.4882E+16
Te-127	2.4548E-01	9.3016E-11	4.4107E+14	8.0423E+16
Te-127m	2.3383E-01	2.4790E-08	1.1755E+17	3.2281E+16
Te-129	4.1878E-01	1.9997E-11	9.3352E+13	7.7969E+16
Te-129m	4.8431E-01	1.6076E-08	7.5050E+16	8.7677E+16
Te-131m	2.0175E-07	2.5301E-16	1.1631E+09	5.7504E+16
Te-132	4.1087E-02	1.3534E-10	6.1744E+14	7.4239E+17
I-131	1.2447E+01	1.0040E-07	4.6156E+17	9.6733E+18
I-132	4.9042E-02	4.7511E-12	2.1676E+13	1.6953E+18
I-133	1.2974E-08	1.1453E-17	5.1860E+07	5.8016E+18
Xe-133	7.4589E+03	3.9848E-05	1.8043E+20	1.2496E+22
Xe-133m	1.0601E+00	2.4080E-09	1.0903E+16	1.7954E+20
Cs-134	1.5325E+01	1.1845E-05	5.3231E+19	2.2872E+18
Cs-136	9.8279E-01	1.3409E-08	5.9378E+16	4.4212E+17
Cs-137	1.2207E+01	1.4034E-04	6.1691E+20	1.7925E+18
Ba-140	2.4894E+00	3.4004E-08	1.4627E+17	8.8850E+17
La-140	2.8917E+00	5.2026E-09	2.2379E+16	7.2109E+17
Ce-141	1.5906E-01	5.5823E-09	2.3842E+16	2.9182E+16
Ce-143	7.9288E-08	1.1940E-16	5.0281E+08	5.2703E+15
Ce-144	2.2397E-01	7.0220E-08	2.9366E+17	2.9187E+16
Pr-143	3.1757E-02	4.7160E-10	1.9860E+15	9.9756E+15
Nd-147	7.0443E-03	8.7076E-11	3.5672E+14	3.0343E+15
Np-239	5.0161E-04	2.1622E-12	5.4482E+12	8.5321E+16
Pu-238	7.5101E-04	4.3868E-08	1.1100E+17	9.3680E+13
Pu-239	7.6416E-05	1.2294E-06	3.0978E+18	9.5256E+12
Pu-240	1.3339E-04	5.8567E-08	1.4696E+17	1.6667E+13
Pu-241	2.9520E-02	2.9851E-07	7.4592E+17	3.6967E+15
Am-241	2.0641E-05	6.0250E-09	1.5055E+16	2.3016E+12
Cm-242	4.0538E-03	1.2246E-09	3.0474E+15	5.4523E+14
Cm-244	3.0354E-04	3.7084E-09	9.1527E+15	3.7998E+13

Attachment 13.13 – RADTRAD Partial Output File "NP2ES00.o0"

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:21:12
 ##########################################################################

 ##########################################################################
                     File information
 ##########################################################################

 Plant file           = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2ES00.psf
 Inventory file       = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Release file         = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_I.RFT
 Dose Conversion file = D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp




     #####    ####   #####    #  #     #  #####   #    #  #####
     #    #  #       #        #  ##    #  #    #  #    #    #
     #    #  #       #        #  # #   #  #    #  #    #    #
     #####    ####   ####     #  #  #  #  #####   #    #    #
     #            #  #        #  #   # #  #       #    #    #
     #            #  #        #  #    ##  #       #    #    #
     #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - Post-LOCA ESF Leakage - CAVEX Core Inventory
 Nuclide Inventory File:
 D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   4
 Compartment 1:
 Pool
   3
  1.4500E+05
   0
   0
   0
   0
   0
 Compartment 2:
 RB
   3
  1.9400E+06
   0
   0
   0
   0
   0
 Compartment 3:
 Environment
   2
```

```
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 4:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Pathways:
  6
Pathway 1:
CR Filtered Intake
  3
  4
  2
Pathway 2:
CR Unfiltered Inleakage
  3
  4
  2
Pathway 3:
CR Exhaust to Environment
  4
  3
  2
Pathway 4:
RB Drawdown Release to Environment
  2
  3
  2
Pathway 5:
RB Exhaust to Environment
  2
  3
  2
Pathway 6:
ESF leakage to RB
  1
  2
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\nmp2.inp
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\BWR_I.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:
  4
Compartment 1:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 2:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 4:
  0
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
```

```
Pathways:
  6
Pathway 1:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  6
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  9.6000E+01   2.5000E+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 3:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  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   2.6700E+03   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  1.0000E+00   3.6000E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  2
  0.0000E+00   8.2900E+00   0.0000E+00   9.0000E+01   9.0000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  3
  1
  3
  0.0000E+00   1.1900E-04
  1.0000E+00   2.9600E-05
```

```
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ
  3
  1
  6
  0.0000E+00   1.6200E-05
  1.0000E+00   1.4200E-05
  8.0000E+00   5.4100E-07
  2.4000E+01   2.3100E-07
  9.6000E+01   7.6500E-08
  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 3:
CR
  4
  0
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   3.5000E-04
  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
  7
  0.0000E+00   1.4700E-03
  1.0000E+00   8.0300E-05
  2.0000E+00   4.4800E-05
  8.0000E+00   1.6800E-05
  2.4000E+01   1.2000E-05
  9.6000E+01   8.8300E-06
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
```

CALCULATION NO. H21C-106	REV. No. 3	PAGE NO. 508

```
Output Filename:
D:\Heasley\2019 NMP2 LOCA\RADTRAD_GMH 3-27-19\NP2ES00.o0
  1
  1
  1
  0
  0
End of Scenario File
```

```
##########################################################################
   RADTRAD Version 3.03 (Spring 2001) run on  3/27/2019  at 16:21:12
##########################################################################


      ####   #     #  #####  #####   #     #  #####
     #    #  #     #    #    #    #  #     #    #
     #    #  #     #    #    #    #  #     #    #
     #    #  #     #    #    #####   #     #    #
     #    #  #     #    #    #       #     #    #
     #    #  #     #    #    #       #     #    #
      ####    ####     #    #        ####     #


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

RB Compartment Nuclide Inventory:

Time (h) = 2.0000	Ci	kg	Atoms	Decay
I-131	9.6801E+03	7.8081E-05	3.5894E+20	8.6968E+17
I-132	9.7737E+03	9.4687E-07	4.3198E+18	9.6557E+17
I-133	1.8905E+04	1.6689E-05	7.5566E+19	1.7231E+18
I-134	4.7687E+03	1.7876E-07	8.0336E+17	6.5418E+17
I-135	1.5484E+04	4.4092E-06	1.9669E+19	1.4614E+18
Xe-133	6.9554E+02	3.7158E-06	1.6825E+19	4.8005E+16
Xe-133m	4.8569E+01	1.1032E-07	4.9952E+17	3.3570E+15
Xe-135	7.9564E+03	3.1156E-06	1.3898E+19	5.5565E+17
Xe-135m	7.9576E+03	8.7415E-08	3.8994E+17	7.7370E+17

RB Transport Group Inventory:

Time (h) = 2.0000	Atmosphere	Sump	
Noble gases (atoms)	3.1613E+19	0.0000E+00	
Elemental I (atoms)	4.4552E+20	0.0000E+00	
Organic I (atoms)	1.3779E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		2.4280E-07
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		2.9954E-07
Total I (Ci)			5.8612E+04

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6039E+18
Elemental I (atoms)	2.7898E+19	2.8180E+17
Organic I (atoms)	8.6282E+17	8.7154E+15

Aerosols (kg) 0.0000E+00 0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 2.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0718E+19
Elemental I (atoms)	4.3362E+21	4.8179E+20
Organic I (atoms)	1.3411E+20	1.4901E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	9.8699E-02	3.3580E+00	2.0338E-01
Accumulated dose (rem)	1.1454E-01	6.9324E+00	3.3188E-01

LPZ Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.7349E-02	1.6109E+00	9.7569E-02
Accumulated dose (rem)	5.0229E-02	2.1300E+00	1.1680E-01

CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.9977E-03	3.0215E+00	9.7382E-02
Accumulated dose (rem)	3.4480E-03	4.7913E+00	1.5349E-01

RB Compartment Nuclide Inventory:

Time (h) = 8.0000	Ci	kg	Atoms	Decay
I-131	5.2598E+04	4.2426E-04	1.9503E+21	2.8186E+19
I-132	9.6805E+03	9.3784E-07	4.2786E+18	1.2263E+19
I-133	8.5927E+04	7.5853E-05	3.4346E+20	4.9678E+19
I-134	2.3041E+02	8.6370E-09	3.8816E+16	2.3853E+18
I-135	4.5817E+04	1.3046E-05	5.8198E+19	3.2149E+19
Xe-133	2.1807E+04	1.1650E-04	5.2751E+20	7.5790E+18
Xe-133m	1.4814E+03	3.3648E-06	1.5236E+19	5.1958E+17
Xe-135	1.6717E+05	6.5460E-05	2.9201E+20	6.6519E+19
Xe-135m	1.3021E+04	1.4303E-07	6.3805E+17	1.1522E+19

RB Transport Group Inventory:

Time (h) = 8.0000	Atmosphere	Sump	
Noble gases (atoms)	8.3540E+20	0.0000E+00	
Elemental I (atoms)	2.2856E+21	0.0000E+00	
Organic I (atoms)	7.0690E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.2430E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.4514E-06
Total I (Ci)			1.9425E+05

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 8.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16

Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.5111E+20
Elemental I (atoms)	1.0202E+21	1.0305E+19
Organic I (atoms)	3.1554E+19	3.1872E+17
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0790E+21
Elemental I (atoms)	3.0957E+22	3.4397E+21
Organic I (atoms)	9.5744E+20	1.0638E+20
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.3200E-01	1.7894E+01	1.2849E+00
Accumulated dose (rem)	8.4655E-01	2.4826E+01	1.6168E+00

LPZ Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.3379E-02	1.6820E-01	1.8576E-02
Accumulated dose (rem)	6.3608E-02	2.2981E+00	1.3538E-01

CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.8684E-02	1.5488E+00	6.6589E-02
Accumulated dose (rem)	2.2132E-02	6.3402E+00	2.2008E-01

RB Compartment Nuclide Inventory:

Time (h) = 24.0000	Ci	kg	Atoms	Decay
I-131	8.1956E+04	6.6107E-04	3.0390E+21	1.8486E+20
I-132	1.2958E+02	1.2554E-08	5.7274E+16	1.7485E+19
I-133	8.3203E+04	7.3448E-05	3.3257E+20	2.5031E+20
I-134	1.2189E-03	4.5693E-14	2.0535E+11	2.4283E+18
I-135	1.4123E+04	4.0215E-06	1.7939E+19	9.6226E+19
Xe-133	1.0756E+05	5.7461E-04	2.6018E+21	1.5144E+20
Xe-133m	6.7547E+03	1.5343E-05	6.9470E+19	9.8438E+18
Xe-135	2.6702E+05	1.0456E-04	4.6643E+20	6.4552E+20
Xe-135m	7.0682E+03	7.7644E-08	3.4636E+17	3.0958E+19

RB Transport Group Inventory:

Time (h) = 24.0000	Atmosphere	Sump
Noble gases (atoms)	3.1380E+21	0.0000E+00
Elemental I (atoms)	3.2878E+21	0.0000E+00

```
Organic I (atoms)      1.0169E+20  0.0000E+00
Aerosols (kg)          0.0000E+00  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)         1.7514E-06
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   1.9182E-06
Total I (Ci)                                   1.7941E+05

RB Drawdown Release to Environment Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  7.5537E+16
Elemental I (atoms)    0.0000E+00  2.5888E+18
Organic I (atoms)      0.0000E+00  8.0065E+16
Aerosols (kg)          0.0000E+00  0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  4.0149E+21
Elemental I (atoms)    6.3723E+21  6.4367E+19
Organic I (atoms)      1.9708E+20  1.9907E+18
Aerosols (kg)          0.0000E+00  0.0000E+00

ESF leakage to RB Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered   Transported
Noble gases (atoms)    0.0000E+00  7.6038E+21
Elemental I (atoms)    9.2357E+22  1.0262E+22
Organic I (atoms)      2.8564E+21  3.1738E+20
Aerosols (kg)          0.0000E+00  0.0000E+00

EAB Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0477E+00  6.7123E+01  3.1015E+00
Accumulated dose (rem)  1.8942E+00  9.1950E+01  4.7183E+00

LPZ Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.1760E-03  3.4423E-01  1.8709E-02
Accumulated dose (rem)  7.1784E-02  2.6424E+00  1.5409E-01

CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.5297E-02  1.9407E+00  7.4683E-02
Accumulated dose (rem)  3.7429E-02  8.2809E+00  2.9476E-01

RB Compartment Nuclide Inventory:

Time (h) =  96.0000       Ci           kg         Atoms      Decay
I-131                  5.3989E+04  4.3548E-04  2.0019E+21  8.4928E+20
I-132                  4.1727E-08  4.0425E-18  1.8443E+07  1.7543E+19
I-133                  6.4441E+03  5.6886E-06  2.5758E+19  5.4910E+20
```

I-135	6.3385E+00	1.8049E-09	8.0513E+15	1.1440E+20
Xe-133	1.6065E+05	8.5823E-04	3.8860E+21	1.7454E+21
Xe-133m	6.8043E+03	1.5455E-05	6.9981E+19	9.2789E+19
Xe-135	2.4170E+03	9.4645E-07	4.2220E+18	1.3273E+21
Xe-135m	3.1526E+00	3.4632E-11	1.5449E+14	3.7142E+19

RB Transport Group Inventory:

Time (h) = 96.0000	Atmosphere	Sump	
Noble gases (atoms)	3.9602E+21	0.0000E+00	
Elemental I (atoms)	1.9669E+21	0.0000E+00	
Organic I (atoms)	6.0831E+19	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.0023E-06
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.0142E-06
Total I (Ci)			6.0439E+04

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.7936E+22
Elemental I (atoms)	2.7199E+22	2.7474E+20
Organic I (atoms)	8.4120E+20	8.4970E+18
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 96.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.4306E+22
Elemental I (atoms)	2.7837E+23	3.0930E+22
Organic I (atoms)	8.6094E+21	9.5659E+20
Aerosols (kg)	0.0000E+00	0.0000E+00

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.0365E-01	9.5155E+01	3.3014E+00
Accumulated dose (rem)	2.2979E+00	1.8710E+02	8.0197E+00

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0432E-03	1.6161E-01	5.9647E-03
Accumulated dose (rem)	7.2827E-02	2.8040E+00	1.6005E-01

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.1099E-03	1.3415E+00	4.3962E-02
Accumulated dose (rem)	4.0539E-02	9.6224E+00	3.3873E-01

RB Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
I-131	6.7487E+02	5.4436E-06	2.5024E+19	1.8588E+21
I-133	7.0576E-07	6.2301E-16	2.8210E+09	5.7241E+20
Xe-133	6.9275E+02	3.7009E-06	1.6758E+19	4.3507E+21
Xe-133m	3.0048E-01	6.8252E-10	3.0904E+15	1.5463E+20

RB Transport Group Inventory:

Time (h) = 720.0000	Atmosphere	Sump	
Noble gases (atoms)	1.6761E+19	0.0000E+00	
Elemental I (atoms)	2.4274E+19	0.0000E+00	
Organic I (atoms)	7.5073E+17	0.0000E+00	
Aerosols (kg)	0.0000E+00	0.0000E+00	
Dose Effective (Ci/cc)	I-131 (Thyroid)		1.2285E-08
Dose Effective (Ci/cc)	I-131 (ICRP2 Thyroid)		1.2285E-08
Total I (Ci)			6.7487E+02

RB Drawdown Release to Environment Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.5537E+16
Elemental I (atoms)	0.0000E+00	2.5888E+18
Organic I (atoms)	0.0000E+00	8.0065E+16
Aerosols (kg)	0.0000E+00	0.0000E+00

RB Exhaust to Environment Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.1376E+22
Elemental I (atoms)	5.7429E+22	5.8009E+20
Organic I (atoms)	1.7762E+21	1.7941E+19
Aerosols (kg)	0.0000E+00	0.0000E+00

ESF leakage to RB Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.6389E+22
Elemental I (atoms)	5.4472E+23	6.0525E+22
Organic I (atoms)	1.6847E+22	1.8719E+21
Aerosols (kg)	0.0000E+00	0.0000E+00

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Attachment 13.14 - RADTRAD Nuclide Inventory File "nmp2.nif"

```
Nuclide Inventory Name:
 NMP2 149 MTU Core CAVEX Window NF184178 (41 GWD/MTU Max)
 Power Level:
  1.0000E+00
 Nuclides:
  63
 Nuclide 001:
 Kr-83m
    1
  6.6960000000E+03
  8.3000E+01
  4.0500E+03
 none     0.0000E+00
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 002:
 Kr-85m
    1
  1.6128000000E+04
  8.5000E+01
  9.1200E+03
 Kr-85    2.1000E-01
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 003:
 Kr-85
    1
  3.3861304800E+08
  8.5000E+01
  4.6100E+02
 none     0.0000E+00
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 004:
 Kr-87
    1
  4.5780000000E+03
  8.7000E+01
  1.8400E+04
 Rb-87    1.0000E+00
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 005:
 Kr-88
    1
  1.0224000000E+04
  8.8000E+01
  2.5000E+04
 Rb-88    1.0000E+00
 none     0.0000E+00
 none     0.0000E+00
 Nuclide 006:
 Rb-86
    3
  1.6122240000E+06
```

```
 8.6000E+01
 6.2600E+01
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 007:
Rb-88
  3
 1.0620000000E+03
 8.8000E+01
 2.5200E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 008:
Sr-89
  5
 4.3632000000E+06
 8.9000E+01
 3.4400E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 009:
Sr-90
  5
 9.1895731200E+08
 9.0000E+01
 3.6800E+03
Y-90     1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 010:
Sr-91
  5
 3.4200000000E+04
 9.1000E+01
 4.2400E+04
Y-91m    5.8000E-01
Y-91     4.2000E-01
none     0.0000E+00
Nuclide 011:
Sr-92
  5
 9.7560000000E+03
 9.2000E+01
 4.3900E+04
Y-92     1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 012:
Y-90
  9
 2.3040000000E+05
 9.0000E+01
 3.8100E+03
none     0.0000E+00
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none     0.0000E+00
none     0.0000E+00
Nuclide 013:
Y-91
  9
 5.0552640000E+06
 9.1000E+01
 4.3100E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 014:
Y-92
  9
 1.2744000000E+04
 9.2000E+01
 4.4400E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 015:
Y-93
  9
 3.6360000000E+04
 9.3000E+01
 4.8100E+04
Zr-93    1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 016:
Zr-95
  9
 5.5278720000E+06
 9.5000E+01
 5.0900E+04
Nb-95m   7.0000E-03
Nb-95    9.9000E-01
none     0.0000E+00
Nuclide 017:
Zr-97
  9
 6.0840000000E+04
 9.7000E+01
 4.9100E+04
Nb-97m   9.5000E-01
Nb-97    5.3000E-02
none     0.0000E+00
Nuclide 018:
Nb-95
  9
 3.0369600000E+06
 9.5000E+01
 5.0200E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 019:
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```
Mo-99
  7
 2.3760000000E+05
 9.9000E+01
 5.1400E+04
Tc-99m   8.8000E-01
Tc-99    1.2000E-01
none     0.0000E+00
Nuclide 020:
Tc-99m
  7
 2.1672000000E+04
 9.9000E+01
 4.5300E+04
Tc-99    1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 021:
Ru-103
  7
 3.3937920000E+06
 1.0300E+02
 4.4500E+04
Rh-103m  1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 022:
Ru-105
  7
 1.5984000000E+04
 1.0500E+02
 3.1700E+04
Rh-105   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 023:
Ru-106
  7
 3.1812480000E+07
 1.0600E+02
 1.8500E+04
Rh-106   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 024:
Rh-105
  7
 1.2729600000E+05
 1.0500E+02
 2.9500E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 025:
Sb-127
  4
 3.3264000000E+05
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```
 1.2700E+02
 2.5600E+03
Te-127m  1.8000E-01
Te-127   8.2000E-01
none     0.0000E+00
Nuclide 026:
Sb-129
  4
 1.5552000000E+04
 1.2900E+02
 7.9100E+03
Te-129m  2.2000E-01
Te-129   7.7000E-01
none     0.0000E+00
Nuclide 027:
Te-127
  4
 3.3660000000E+04
 1.2700E+02
 2.5300E+03
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 028:
Te-127m
  4
 9.4176000000E+06
 1.2700E+02
 4.3300E+02
Te-127   9.8000E-01
none     0.0000E+00
none     0.0000E+00
Nuclide 029:
Te-129
  4
 4.1760000000E+03
 1.2900E+02
 7.4100E+03
I-129    1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 030:
Te-129m
  4
 2.9030400000E+06
 1.2900E+02
 1.4200E+03
Te-129   6.5000E-01
I-129    3.5000E-01
none     0.0000E+00
Nuclide 031:
Te-131m
  4
 1.0800000000E+05
 1.3100E+02
 5.3800E+03
Te-131   2.2000E-01
```

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I-131    7.8000E-01
none     0.0000E+00
Nuclide 032:
Te-132
  4
 2.8152000000E+05
 1.3200E+02
 3.8600E+04
I-132    1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 033:
I-131
  2
 6.9465600000E+05
 1.3100E+02
 2.7200E+04
Xe-131m  1.1000E-02
none     0.0000E+00
none     0.0000E+00
Nuclide 034:
I-132
  2
 8.2800000000E+03
 1.3200E+02
 3.9600E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 035:
I-133
  2
 7.4880000000E+04
 1.3300E+02
 5.6400E+04
Xe-133m  2.9000E-02
Xe-133   9.7000E-01
none     0.0000E+00
Nuclide 036:
I-134
  2
 3.1560000000E+03
 1.3400E+02
 6.4700E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 037:
I-135
  2
 2.3796000000E+04
 1.3500E+02
 5.3300E+04
Xe-135m  1.5000E-01
Xe-135   8.5000E-01
none     0.0000E+00
Nuclide 038:
```

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```
Xe-133
  1
 4.5316800000E+05
 1.3300E+02
 5.6400E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 039:
Xe-133m
  1
 1.9267200000E+05
 1.3300E+02
 1.7300E+03
Xe-133   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 040:
Xe-135
  1
 3.2724000000E+04
 1.3500E+02
 2.3700E+04
Cs-135   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 041:
Xe-135m
  1
 9.1800000000E+02
 1.3500E+02
 1.1700E+04
Xe-135   9.9400E-01
Cs-135   6.0000E-04
none     0.0000E+00
Nuclide 042:
Xe-138
  1
 8.5200000000E+02
 1.3800E+02
 5.0600E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 043:
Cs-134
  3
 6.5071771200E+07
 1.3400E+02
 6.2600E+03
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 044:
Cs-136
  3
 1.1318400000E+06
```

```
 1.3600E+02
 1.9100E+03
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 045:
Cs-137
  3
 9.4672800000E+08
 1.3700E+02
 4.8600E+03
Ba-137m  9.5000E-01
none     0.0000E+00
none     0.0000E+00
Nuclide 046:
Ba-139
  6
 4.9620000000E+03
 1.3900E+02
 5.2000E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 047:
Ba-140
  6
 1.1007360000E+06
 1.4000E+02
 5.0600E+04
La-140   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 048:
La-140
  9
 1.4497920000E+05
 1.4000E+02
 5.1100E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 049:
La-141
  9
 1.4148000000E+04
 1.4100E+02
 4.7500E+04
Ce-141   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 050:
La-142
  9
 5.5500000000E+03
 1.4200E+02
 4.6600E+04
none     0.0000E+00
```

```
none     0.0000E+00
none     0.0000E+00
Nuclide 051:
Ce-141
  8
 2.8080864000E+06
 1.4100E+02
 4.7800E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 052:
Ce-143
  8
 1.1880000000E+05
 1.4300E+02
 4.6600E+04
Pr-143   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 053:
Ce-144
  8
 2.4563520000E+07
 1.4400E+02
 3.8300E+04
Pr-144m  1.8000E-02
Pr-144   9.8000E-01
none     0.0000E+00
Nuclide 054:
Pr-143
  9
 1.1715840000E+06
 1.4300E+02
 4.5600E+04
none     0.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 055:
Nd-147
  9
 9.4867200000E+05
 1.4700E+02
 1.8600E+04
Pm-147   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 056:
Np-239
  8
 2.0347200000E+05
 2.3900E+02
 5.4500E+05
Pu-239   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 057:
```

```
Pu-238
  8
 2.7688638240E+09
 2.3800E+02
 1.1900E+02
U-234    1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 058:
Pu-239
  8
 7.5943364400E+11
 2.3900E+02
 1.2000E+01
U-235    1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 059:
Pu-240
  8
 2.0638670000E+10
 2.4000E+02
 2.1200E+01
U-236    1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 060:
Pu-241
  8
 4.7336400000E+08
 2.4100E+02
 4.7100E+03
Am-241   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 061:
Am-241
  9
 1.3664441000E+10
 2.4100E+02
 6.6600E+00
Np-237   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 062:
Cm-242
  9
 1.4083200000E+07
 2.4200E+02
 1.8300E+03
Pu-238   1.0000E+00
none     0.0000E+00
none     0.0000E+00
Nuclide 063:
Cm-244
  9
 5.6488104000E+08
```

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```
 2.4400E+02
 1.2100E+02
Pu-240   1.0000E+00
none     0.0000E+00
none     0.0000E+00
End of Nuclear Inventory File
```

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Attachment 13.15 - RADTRAD Release Fraction and Timing File "bwr_dba.rft"

```
Release Fraction and Timing Name:
BWR, RG 1.183, Table 1 Section 3.2
Duration (h):   Design Basis Accident
 0.5000E+00  0.1500E+01  0.0000E+00  0.0000E+00
Noble Gases:
 0.5000E-01  0.9500E+00  0.0000E+00  0.0000E+00
Iodine:
 0.5000E-01  0.2500E+00  0.0000E+00  0.0000E+00
Cesium:
 0.5000E-01  0.2000E+00  0.0000E+00  0.0000E+00
Tellurium:
 0.0000E+00  0.0500E+00  0.0000E+00  0.0000E+00
Strontium:
 0.0000E+00  0.2000E-01  0.0000E+00  0.0000E+00
Barium:
 0.0000E+00  0.2000E-01  0.0000E+00  0.0000E+00
Ruthenium:
 0.0000E+00  0.2500E-02  0.0000E+00  0.0000E+00
Cerium:
 0.0000E+00  0.5000E-03  0.0000E+00  0.0000E+00
Lanthanum:
 0.0000E+00  0.2000E-03  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 13.16 - RADTRAD Dose Conversion Factor File "nmp2.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:
Kr-83m
Kr-85m
Kr-85
Kr-87
Kr-88
Rb-86     D
Rb-88     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-133m
Xe-135
Xe-135m
```

Xe-138		
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		
Pu-241		
Am-241		
Cm-242		
Cm-244		

	CLOUDSHINE SHINE 8HR	GROUND SHINE 7DAY	GROUND SHINE RATE	GROUND ACUTE	INHALED CHRONIC	INHALED	INGESTION
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
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-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-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
Rb-88						
GONADS	3.260E-14	2.788E-12	5.187E-11	9.740E-17-1.000E+00	1.310E-12	2.150E-09
BREAST	3.670E-14	2.662E-12	4.953E-11	9.300E-17-1.000E+00	1.430E-12	2.140E-09
LUNGS	3.310E-14	2.553E-12	4.750E-11	8.920E-17-1.000E+00	1.470E-10	2.140E-09
RED MARR	3.300E-14	2.619E-12	4.873E-11	9.150E-17-1.000E+00	1.450E-12	3.720E-09
BONE SUR	4.620E-14	3.635E-12	6.764E-11	1.270E-16-1.000E+00	1.470E-12	6.860E-09
THYROID	3.370E-14	2.599E-12	4.836E-11	9.080E-17-1.000E+00	1.370E-12	2.140E-09
REMAINDER	3.210E-14	2.542E-12	4.729E-11	8.880E-17-1.000E+00	1.380E-11	2.330E-09
EFFECTIVE	3.360E-14	2.665E-12	4.958E-11	9.310E-17-1.000E+00	2.260E-11	2.530E-09
SKIN(FGR)	1.830E-13	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
EFFECTIVE	7.730E-17	6.523E-14	1.309E-12	2.270E-18-1.000E+00	1.760E-09	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	6.470E-08	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	3.380E-14	2.155E-11	5.062E-11	1.026E-15-1.000E+00	5.650E-11	2.520E-10
BREAST	3.830E-14	2.059E-11	4.838E-11	9.806E-16-1.000E+00	1.740E-11	3.676E-11
LUNGS	3.370E-14	1.970E-11	4.626E-11	9.376E-16-1.000E+00	2.130E-09	1.055E-11
RED MARR	3.310E-14	2.011E-11	4.722E-11	9.570E-16-1.000E+00	2.230E-11	5.659E-11
BONE SUR	5.200E-14	2.852E-11	6.709E-11	1.360E-15-1.000E+00	1.270E-11	2.070E-11
THYROID	3.470E-14	2.035E-11	4.782E-11	9.693E-16-1.000E+00	9.640E-12	1.968E-12
REMAINDER	3.240E-14	1.948E-11	4.573E-11	9.268E-16-1.000E+00	5.780E-10	2.557E-09
EFFECTIVE	4.929E-14	2.057E-11	4.832E-11	9.793E-16-1.000E+00	2.577E-10	8.455E-10
SKIN(FGR)	8.140E-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	1.700E-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	1.870E-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	
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	8.800E-15	2.179E-11	7.799E-11	9.253E-16-1.000E+00	1.840E-10	6.228E-10	
BREAST	9.990E-15	2.083E-11	7.455E-11	8.846E-16-1.000E+00	4.700E-11	8.137E-11	
LUNGS	8.810E-15	1.992E-11	7.127E-11	8.456E-16-1.000E+00	4.110E-09	1.770E-11	
RED MARR	8.640E-15	2.034E-11	7.279E-11	8.634E-16-1.000E+00	6.370E-11	1.302E-10	
BONE SUR	1.380E-14	2.881E-11	1.031E-10	1.224E-15-1.000E+00	3.500E-11	4.558E-11	
THYROID	9.030E-15	2.061E-11	7.377E-11	8.755E-16-1.000E+00	2.310E-11	2.671E-12	
REMAINDER	8.480E-15	1.966E-11	7.035E-11	8.345E-16-1.000E+00	2.040E-09	6.990E-09	
EFFECTIVE	4.432E-14	2.078E-11	7.438E-11	8.824E-16-1.000E+00	1.171E-09	2.283E-09	
SKIN(FGR)	5.550E-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	3.570E-15	1.935E-12	1.284E-11	7.260E-17	-1.000E+00	9.580E-10	3.860E-12
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	1.560E-15	2.206E-12	4.799E-11	8.561E-17	-1.000E+00	1.780E-10	2.420E-10
BREAST	1.810E-15	2.181E-12	4.739E-11	8.454E-17	-1.000E+00	1.690E-10	1.664E-10
LUNGS	1.460E-15	1.741E-12	3.815E-11	6.808E-17	-1.000E+00	4.030E-08	1.593E-10
RED MARR	1.420E-15	1.729E-12	3.793E-11	6.768E-17	-1.000E+00	3.100E-09	3.500E-09
BONE SUR	2.600E-15	3.287E-12	7.147E-11	1.275E-16	-1.000E+00	7.050E-09	7.990E-09
THYROID	1.560E-15	1.923E-12	4.201E-11	7.495E-17	-1.000E+00	1.560E-10	1.572E-10
REMAINDER	1.410E-15	1.746E-12	3.822E-11	6.819E-17	-1.000E+00	3.270E-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)	1.490E-14	1.501E-10	3.360E-09	6.001E-15	-1.000E+00	0.000E+00	0.000E+00
Te-131m							
GONADS	6.850E-14	4.020E-11	2.343E-10	1.535E-15	-1.000E+00	2.340E-10	7.415E-10
BREAST	7.780E-14	3.853E-11	2.246E-10	1.472E-15	-1.000E+00	9.250E-11	1.361E-10
LUNGS	6.830E-14	3.657E-11	2.131E-10	1.397E-15	-1.000E+00	2.230E-09	6.335E-11
RED MARR	6.680E-14	3.736E-11	2.178E-10	1.427E-15	-1.000E+00	1.410E-10	2.435E-10
BONE SUR	1.090E-13	5.467E-11	3.189E-10	2.090E-15	-1.000E+00	2.270E-10	3.248E-10
THYROID	7.020E-14	3.741E-11	2.181E-10	1.429E-15	-1.000E+00	3.610E-08	4.383E-08
REMAINDER	6.550E-14	3.626E-11	2.113E-10	1.385E-15	-1.000E+00	9.460E-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)	8.850E-14	1.033E-10	6.188E-10	4.056E-15	-1.000E+00	0.000E+00	0.000E+00
Te-132							
GONADS	1.020E-14	6.812E-12	7.706E-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-133m						
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	1.370E-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)	3.120E-14	4.506E-11	9.867E-11	2.090E-15-1.000E+00	0.000E+00	0.000E+00
Xe-135m						
GONADS	2.000E-14	5.933E-13	5.933E-13	4.480E-16-1.000E+00	0.000E+00	0.000E+00
BREAST	2.290E-14	5.695E-13	5.695E-13	4.300E-16-1.000E+00	0.000E+00	0.000E+00
LUNGS	1.980E-14	5.351E-13	5.351E-13	4.040E-16-1.000E+00	0.000E+00	0.000E+00
RED MARR	1.910E-14	5.404E-13	5.404E-13	4.080E-16-1.000E+00	0.000E+00	0.000E+00
BONE SUR	3.500E-14	8.251E-13	8.251E-13	6.230E-16-1.000E+00	0.000E+00	0.000E+00
THYROID	2.040E-14	5.615E-13	5.615E-13	4.240E-16-1.000E+00	0.000E+00	0.000E+00
REMAINDER	1.890E-14	5.245E-13	5.245E-13	3.960E-16-1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	2.040E-14	5.615E-13	5.615E-13	4.240E-16-1.000E+00	0.000E+00	0.000E+00
SKIN(FGR)	2.970E-14	1.867E-12	1.867E-12	1.410E-15-1.000E+00	0.000E+00	0.000E+00
Xe-138						
GONADS	5.590E-14	1.315E-12	1.315E-12	1.070E-15-1.000E+00	0.000E+00	0.000E+00
BREAST	6.320E-14	1.254E-12	1.254E-12	1.020E-15-1.000E+00	0.000E+00	0.000E+00
LUNGS	5.660E-14	1.225E-12	1.225E-12	9.970E-16-1.000E+00	0.000E+00	0.000E+00
RED MARR	5.600E-14	1.254E-12	1.254E-12	1.020E-15-1.000E+00	0.000E+00	0.000E+00
BONE SUR	8.460E-14	1.733E-12	1.733E-12	1.410E-15-1.000E+00	0.000E+00	0.000E+00
THYROID	5.770E-14	1.174E-12	1.174E-12	9.550E-16-1.000E+00	0.000E+00	0.000E+00
REMAINDER	5.490E-14	1.222E-12	1.222E-12	9.940E-16-1.000E+00	0.000E+00	0.000E+00
EFFECTIVE	5.770E-14	1.266E-12	1.266E-12	1.030E-15-1.000E+00	0.000E+00	0.000E+00
SKIN(FGR)	1.070E-13	9.403E-12	9.403E-12	7.650E-15-1.000E+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	1.978E-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	8.070E-11	5.200E-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
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

CALCULATION NO. H21C-106	REV. No. 3	PAGE NO. 540

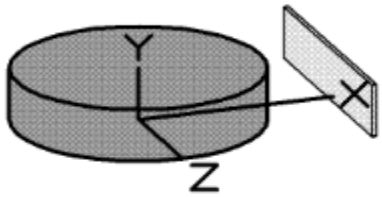
Attachment 13.17 – MicroShield Output Files "NMP2CS[02, 08, 24, 96, &720].MS5

MicroShield v5.05 (5.05-00513)
Calvert Cliffs Nuclear Power Plant

Page : 1
DOS File : NMP2CS02.MS5
Run Date : March 28, 2019
Run Time : 5:24:32 PM
Duration : 00:00:37

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: Case 1
Description: Containment Shine Dose to CR at 2 hrs
Geometry: 7 - Cylinder Volume - Side Shields



Source Dimensions

Height	1.2e+3 cm	39 ft 5.0 in
Radius	2.7e+3 cm	88 ft

Dose Points

	X	Y	Z
# 1	4297.68 cm	600.7608 cm	0 cm
	141 ft 0.0 in	19 ft 8.5 in	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	2.72e+10 cm³	Air	0.00122
Transition	1495.044 cm	Air	0.00122
Shield 2	89.916 cm	Concrete	2.16
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Am-241	1.3185e-004	4.8785e+006	4.8552e-009	1.7964e-004
Ba-137m	2.6478e+002	9.7967e+012	9.7499e-003	3.6075e+002
Ba-139	3.7639e+001	1.3926e+012	1.3860e-003	5.1282e+001
Ba-140	9.9682e+001	3.6882e+012	3.6706e-003	1.3581e+002
Ce-141	2.3634e+000	8.7446e+010	8.7028e-005	3.2200e+000
Ce-143	2.2106e+000	8.1792e+010	8.1402e-005	3.0119e+000
Ce-144	1.8945e+000	7.0097e+010	6.9762e-005	2.5812e+000
Cm-242	3.6202e-002	1.3395e+009	1.3331e-006	4.9324e-002
Cm-244	2.3945e-003	8.8597e+007	8.8174e-008	3.2624e-003
Cs-134	3.6049e+002	1.3338e+013	1.3274e-002	4.9115e+002
Cs-136	1.0951e+002	4.0519e+012	4.0325e-003	1.4920e+002
Cs-137	2.7989e+002	1.0356e+013	1.0306e-002	3.8134e+002
I-131	1.1391e+004	4.2146e+014	4.1944e-001	1.5519e+004
I-132	1.1447e+004	4.2353e+014	4.2151e-001	1.5596e+004
I-133	2.2246e+004	8.2311e+014	8.1918e-001	3.0310e+004
I-134	5.6115e+003	2.0762e+014	2.0663e-001	7.6454e+003

Page : 2
DOS File : NMP2CS02.MS5
Run Date : March 28, 2019
Run Time: 5:24:32 PM
Duration : 00:00:37

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
I-135	1.8221e+004	6.7416e+014	6.7094e-001	2.4825e+004
Kr-83m	3.2205e+003	1.1916e+014	1.1859e-001	4.3878e+003
Kr-85	7.7246e+002	2.8581e+013	2.8445e-002	1.0524e+003
Kr-85m	1.1214e+004	4.1492e+014	4.1294e-001	1.5279e+004
Kr-87	1.0364e+004	3.8347e+014	3.8164e-001	1.4121e+004
Kr-88	2.5710e+004	9.5127e+014	9.4673e-001	3.5029e+004
La-140	2.3450e+000	8.6765e+010	8.6351e-005	3.1950e+000
La-141	6.6059e-001	2.4442e+010	2.4325e-005	9.0003e-001
La-142	3.7523e-001	1.3884e+010	1.3817e-005	5.1124e-001
Mo-99	1.2450e+001	4.6065e+011	4.5845e-004	1.6963e+001
Nb-95	9.9344e-001	3.6757e+010	3.6582e-005	1.3535e+000
Nd-147	3.6615e-001	1.3548e+010	1.3483e-005	4.9887e-001
Np-239	2.6310e+001	9.7347e+011	9.6882e-004	3.5846e+001
Pr-143	9.0466e-001	3.3472e+010	3.3313e-005	1.2326e+000
Pr-144	1.8674e+000	6.9094e+010	6.8764e-005	2.5443e+000
Pu-238	5.8875e-003	2.1784e+008	2.1680e-007	8.0215e-003
Pu-239	5.9386e-004	2.1973e+007	2.1868e-008	8.0911e-004
Pu-240	1.0488e-003	3.8806e+007	3.8620e-008	1.4290e-003
Pu-241	2.3302e-001	8.6217e+009	8.5806e-006	3.1748e-001
Rb-86	3.5940e+000	1.3298e+011	1.3234e-004	4.8967e+000
Rb-88	2.1006e+004	7.7722e+014	7.7351e-001	2.8620e+004
Rh-103m	1.0963e+001	4.0563e+011	4.0370e-004	1.4937e+001
Rh-105	7.2756e+000	2.6920e+011	2.6791e-004	9.9127e+000
Rh-106	4.5756e+000	1.6930e+011	1.6849e-004	6.2341e+000
Ru-103	1.0992e+001	4.0670e+011	4.0476e-004	1.4976e+001
Ru-105	5.7386e+000	2.1233e+011	2.1131e-004	7.8186e+000
Ru-106	4.5756e+000	1.6930e+011	1.6849e-004	6.2341e+000
Sb-127	1.2477e+001	4.6165e+011	4.5944e-004	1.6999e+001
Sb-129	2.8391e+001	1.0505e+012	1.0455e-003	3.8682e+001
Sr-89	6.7998e+001	2.5159e+012	2.5039e-003	9.2645e+001
Sr-90	7.2825e+000	2.6945e+011	2.6817e-004	9.9221e+000
Sr-91	7.2515e+001	2.6831e+012	2.6702e-003	9.8799e+001
Sr-92	5.2088e+001	1.9273e+012	1.9181e-003	7.0968e+001
Tc-99m	1.1185e+001	4.1385e+011	4.1187e-004	1.5239e+001
Te-127	1.2505e+001	4.6269e+011	4.6048e-004	1.7038e+001
Te-127m	2.1423e+000	7.9265e+010	7.8887e-005	2.9188e+000
Te-129	3.2104e+001	1.1878e+012	1.1822e-003	4.3741e+001
Te-129m	7.0259e+000	2.5996e+011	2.5872e-004	9.5725e+000
Te-131m	2.5415e+001	9.4036e+011	9.3587e-004	3.4627e+001
Te-132	1.8761e+002	6.9416e+012	6.9084e-003	2.5561e+002
Xe-133	9.4671e+004	3.5028e+015	3.4861e+000	1.2899e+005
Xe-133m	2.9064e+003	1.0754e+014	1.0702e-001	3.9598e+003
Xe-135	4.8101e+004	1.7798e+015	1.7713e+000	6.5536e+004
Xe-135m	9.6359e+003	3.5653e+014	3.5483e-001	1.3129e+004
Xe-138	2.4232e+002	8.9658e+012	8.9230e-003	3.3015e+002

Page : 3
DOS File : NMP2CS02.MS5
Run Date : March 28, 2019
Run Time: 5:24:32 PM
Duration : 00:00:37

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Y-90	1.3678e-001	5.0609e+009	5.0367e-006	1.8636e-001
Y-91	8.6461e-001	3.1991e+010	3.1838e-005	1.1780e+000
Y-92	9.1128e+000	3.3717e+011	3.3556e-004	1.2416e+001
Y-93	8.2979e-001	3.0702e+010	3.0556e-005	1.1306e+000
Zr-95	1.0064e+000	3.7237e+010	3.7059e-005	1.3712e+000
Zr-97	8.9514e-001	3.3120e+010	3.2962e-005	1.2196e+000

Buildup
The material reference is : Shield 2

Integration Parameters

Radial	30
Circumferential	30
Y Direction (axial)	30

Results

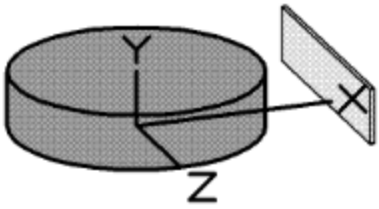
Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	5.858e+07	0.000e+00	4.600e-29	0.000e+00	3.945e-30
0.02	8.175e+10	1.113e-298	1.010e-25	3.855e-300	3.499e-27
0.03	1.938e+15	2.654e-93	5.295e-21	2.630e-95	5.248e-23
0.04	3.950e+11	4.824e-48	2.862e-24	2.134e-50	1.266e-26
0.05	9.127e+11	3.297e-30	2.162e-23	8.782e-33	5.759e-26
0.06	5.324e+11	1.268e-22	6.126e-21	2.519e-25	1.217e-23
0.08	1.297e+15	1.062e-12	8.336e-11	1.680e-15	1.319e-13
0.1	2.945e+12	1.164e-12	1.914e-10	1.781e-15	2.928e-13
0.15	3.613e+14	9.699e-08	3.020e-05	1.597e-10	4.974e-08
0.2	1.892e+15	1.345e-05	4.600e-03	2.374e-08	8.119e-06
0.3	1.349e+14	5.220e-05	1.254e-02	9.903e-08	2.379e-05
0.4	6.492e+14	3.468e-03	5.350e-01	6.758e-06	1.042e-03
0.5	1.208e+15	4.515e-02	4.741e+00	8.863e-05	9.305e-03
0.6	7.484e+14	1.288e-01	9.732e+00	2.514e-04	1.900e-02
0.8	1.188e+15	2.049e+00	9.228e+01	3.897e-03	1.755e-01
1.0	5.899e+14	5.540e+00	1.688e+02	1.021e-02	3.112e-01
1.5	6.731e+14	1.078e+02	1.709e+03	1.814e-01	2.876e+00
2.0	8.715e+14	8.154e+02	8.755e+03	1.261e+00	1.354e+01
3.0	8.301e+13	6.458e+02	4.304e+03	8.762e-01	5.840e+00
4.0	3.644e+08	9.928e-03	4.949e-02	1.228e-05	6.123e-05
5.0	1.114e+12	7.007e+01	2.841e+02	8.032e-02	3.257e-01
TOTALS:	1.164e+16	1.647e+03	1.533e+04	2.413e+00	2.310e+01

MicroShield v5.05 (5.05-00513)
Calvert Cliffs Nuclear Power Plant

Page : 1
DOS File : NMP2CS08.MS5
Run Date : March 28, 2019
Run Time: 5:27:22 PM
Duration : 00:00:37

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: Case 2
Description: Containment Shine Dose to CR at 8 hrs
Geometry: 7 - Cylinder Volume - Side Shields



Source Dimensions

Height	1.2e+3 cm	39 ft 5.0 in
Radius	2.7e+3 cm	88 ft

Dose Points

	X	Y	Z
# 1	4297.68 cm	600.7608 cm	0 cm
	141 ft 0.0 in	19 ft 8.5 in	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	2.72e+10 cm³	Air	0.00122
Transition	1495.044 cm	Air	0.00122
Shield 2	89.916 cm	Concrete	2.16
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Am-241	9.3130e-005	3.4458e+006	3.4294e-009	1.2689e-004
Ba-137m	1.5324e+002	5.6700e+012	5.6429e-003	2.0879e+002
Ba-139	1.2983e+000	4.8037e+010	4.7808e-005	1.7689e+000
Ba-140	6.9323e+001	2.5650e+012	2.5527e-003	9.4450e+001
Ce-141	1.6589e+000	6.1379e+010	6.1086e-005	2.2602e+000
Ce-143	1.3739e+000	5.0834e+010	5.0592e-005	1.8719e+000
Ce-144	1.3347e+000	4.9384e+010	4.9148e-005	1.8185e+000
Cm-242	2.5494e-002	9.4328e+008	9.3877e-007	3.4735e-002
Cm-244	1.6880e-003	6.2456e+007	6.2158e-008	2.2998e-003
Cs-134	2.0859e+002	7.7178e+012	7.6810e-003	2.8420e+002
Cs-136	6.2551e+001	2.3144e+012	2.3033e-003	8.5223e+001
Cs-137	1.6199e+002	5.9936e+012	5.9650e-003	2.2071e+002
I-131	5.3685e+004	1.9863e+015	1.9769e+000	7.3144e+004
I-132	9.9836e+003	3.6939e+014	3.6763e-001	1.3602e+004
I-133	8.7703e+004	3.2450e+015	3.2295e+000	1.1949e+005
I-134	2.3517e+002	8.7013e+012	8.6597e-003	3.2041e+002

Page : 2
DOS File : NMP2CS08.MS5
Run Date : March 28, 2019
Run Time: 5:27:22 PM
Duration : 00:00:37

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
I-135	4.6764e+004	1.7303e+015	1.7220e+000	6.3714e+004
Kr-83m	2.0282e+003	7.5043e+013	7.4685e-002	2.7633e+003
Kr-85	4.5514e+003	1.6840e+014	1.6760e-001	6.2011e+003
Kr-85m	2.6113e+004	9.6618e+014	9.6157e-001	3.5578e+004
Kr-87	2.3199e+003	8.5836e+013	8.5426e-002	3.1608e+003
Kr-88	3.5025e+004	1.2959e+015	1.2897e+000	4.7720e+004
La-140	8.1470e+000	3.0144e+011	3.0000e-004	1.1100e+001
La-141	1.6163e-001	5.9803e+009	5.9518e-006	2.2022e-001
La-142	1.7819e-002	6.5930e+008	6.5616e-007	2.4278e-002
Mo-99	8.2411e+000	3.0492e+011	3.0346e-004	1.1228e+001
Nb-95	7.0034e-001	2.5913e+010	2.5789e-005	9.5419e-001
Nd-147	2.5408e-001	9.4010e+009	9.3561e-006	3.4617e-001
Np-239	1.7232e+001	6.3758e+011	6.3454e-004	2.3478e+001
Pr-143	6.4788e-001	2.3972e+010	2.3857e-005	8.8271e-001
Pr-144	1.3156e+000	4.8678e+010	4.8445e-005	1.7925e+000
Pu-238	4.1506e-003	1.5357e+008	1.5284e-007	5.6550e-003
Pu-239	4.1900e-004	1.5503e+007	1.5429e-008	5.7087e-004
Pu-240	7.3940e-004	2.7358e+007	2.7227e-008	1.0074e-003
Pu-241	1.6426e-001	6.0776e+009	6.0486e-006	2.2380e-001
Rb-86	2.0609e+000	7.6253e+010	7.5889e-005	2.8079e+000
Rb-88	4.3877e+004	1.6234e+015	1.6157e+000	5.9781e+004
Rh-103m	7.6943e+000	2.8469e+011	2.8333e-004	1.0483e+001
Rh-105	4.8490e+000	1.7941e+011	1.7856e-004	6.6066e+000
Rh-106	3.2241e+000	1.1929e+011	1.1872e-004	4.3927e+000
Ru-103	7.7146e+000	2.8544e+011	2.8408e-004	1.0511e+001
Ru-105	1.5855e+000	5.8664e+010	5.8383e-005	2.1602e+000
Ru-106	3.2241e+000	1.1929e+011	1.1872e-004	4.3927e+000
Sb-127	8.4085e+000	3.1111e+011	3.0963e-004	1.1456e+001
Sb-129	7.6428e+000	2.8278e+011	2.8143e-004	1.0413e+001
Sr-89	4.7772e+001	1.7676e+012	1.7591e-003	6.5088e+001
Sr-90	5.1338e+000	1.8995e+011	1.8904e-004	6.9946e+000
Sr-91	3.2996e+001	1.2209e+012	1.2150e-003	4.4956e+001
Sr-92	7.9143e+000	2.9283e+011	2.9143e-004	1.0783e+001
Tc-99m	7.6936e+000	2.8466e+011	2.8330e-004	1.0482e+001
Te-127	8.7210e+000	3.2268e+011	3.2114e-004	1.1882e+001
Te-127m	1.5103e+000	5.5881e+010	5.5614e-005	2.0577e+000
Te-129	1.1534e+001	4.2676e+011	4.2472e-004	1.5715e+001
Te-129m	4.9420e+000	1.8285e+011	1.8198e-004	6.7333e+000
Te-131m	1.5597e+001	5.7709e+011	5.7433e-004	2.1250e+001
Te-132	1.2541e+002	4.6402e+012	4.6180e-003	1.7087e+002
Xe-133	5.5864e+005	2.0670e+016	2.0571e+001	7.6112e+005
Xe-133m	1.7101e+004	6.3275e+014	6.2973e-001	2.3300e+004
Xe-135	3.2169e+005	1.1903e+016	1.1846e+001	4.3829e+005
Xe-135m	1.3190e+004	4.8802e+014	4.8569e-001	1.7971e+004
Xe-138	3.3335e-005	1.2334e+006	1.2275e-009	4.5418e-005

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DOS File : NMP2CS08.MS5
Run Date : March 28, 2019
Run Time: 5:27:22 PM
Duration : 00:00:37

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Y-90	4.0410e-001	1.4952e+010	1.4880e-005	5.5057e-001
Y-91	6.5713e-001	2.4314e+010	2.4198e-005	8.9532e-001
Y-92	1.2862e+001	4.7589e+011	4.7362e-004	1.7524e+001
Y-93	3.8753e-001	1.4339e+010	1.4270e-005	5.2800e-001
Zr-95	7.0754e-001	2.6179e+010	2.6054e-005	9.6400e-001
Zr-97	4.9338e-001	1.8255e+010	1.8168e-005	6.7221e-001

Buildup
The material reference is : Shield 2

Integration Parameters

Radial	30
Circumferential	30
Y Direction (axial)	30

Results

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	3.451e+07	0.000e+00	2.710e-29	0.000e+00	2.325e-30
0.02	5.582e+10	7.599e-299	6.897e-26	2.632e-300	2.389e-27
0.03	1.109e+16	1.519e-92	3.030e-20	1.505e-94	3.003e-22
0.04	2.311e+11	2.822e-48	1.674e-24	1.248e-50	7.404e-27
0.05	6.101e+11	2.204e-30	1.445e-23	5.871e-33	3.850e-26
0.06	3.062e+11	7.294e-23	3.523e-21	1.449e-25	6.998e-24
0.08	7.638e+15	6.253e-12	4.909e-10	9.896e-15	7.769e-13
0.1	3.254e+12	1.286e-12	2.114e-10	1.967e-15	3.235e-13
0.15	8.069e+14	2.166e-07	6.746e-05	3.567e-10	1.111e-07
0.2	1.117e+16	7.937e-05	2.715e-02	1.401e-07	4.792e-05
0.3	3.600e+14	1.393e-04	3.348e-02	2.643e-07	6.351e-05
0.4	1.879e+15	1.004e-02	1.549e+00	1.956e-05	3.018e-03
0.5	3.511e+15	1.312e-01	1.378e+01	2.576e-04	2.704e-02
0.6	1.064e+15	1.830e-01	1.383e+01	3.573e-04	2.699e-02
0.8	1.220e+15	2.105e+00	9.482e+01	4.004e-03	1.804e-01
1.0	1.012e+15	9.508e+00	2.897e+02	1.753e-02	5.341e-01
1.5	1.326e+15	2.123e+02	3.366e+03	3.572e-01	5.663e+00
2.0	1.354e+15	1.266e+03	1.360e+04	1.958e+00	2.103e+01
3.0	6.805e+13	5.294e+02	3.529e+03	7.183e-01	4.787e+00
4.0	1.731e+07	4.715e-04	2.350e-03	5.833e-07	2.908e-06
5.0	2.328e+12	1.464e+02	5.934e+02	1.678e-01	6.803e-01
TOTALS:	4.250e+16	2.166e+03	2.150e+04	3.224e+00	3.293e+01

MicroShield v5.05 (5.05-00513)
Calvert Cliffs Nuclear Power Plant

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Run Date : March 29, 2019
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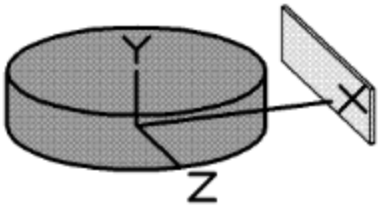
Duration : 00:00:37

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: Case 3
Description: Containment Shine Dose to CR at 24 hrs
Geometry: 7 - Cylinder Volume - Side Shields



Source Dimensions

Height	1.2e+3 cm	39 ft 5.0 in
Radius	2.7e+3 cm	88 ft

Dose Points

	X	Y	Z
# 1	4297.68 cm	600.7608 cm	0 cm
	141 ft 0.0 in	19 ft 8.5 in	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	2.72e+10 cm³	Air	0.00122
Transition	1495.044 cm	Air	0.00122
Shield 2	89.916 cm	Concrete	2.16
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Am-241	5.3690e-005	1.9865e+006	1.9770e-009	7.3151e-005
Ba-137m	5.1794e+001	1.9164e+012	1.9072e-003	7.0567e+001
Ba-139	2.3855e-004	8.8264e+006	8.7842e-009	3.2502e-004
Ba-140	3.8348e+001	1.4189e+012	1.4121e-003	5.2248e+001
Ce-141	9.3870e-001	3.4732e+010	3.4566e-005	1.2789e+000
Ce-143	5.6310e-001	2.0835e+010	2.0735e-005	7.6720e-001
Ce-144	7.6436e-001	2.8281e+010	2.8146e-005	1.0414e+000
Cm-242	1.4582e-002	5.3953e+008	5.3696e-007	1.9867e-002
Cm-244	9.6818e-004	3.5823e+007	3.5652e-008	1.3191e-003
Cs-134	7.0461e+001	2.6071e+012	2.5946e-003	9.6001e+001
Cs-136	2.0409e+001	7.5513e+011	7.5153e-004	2.7807e+001
Cs-137	5.4750e+001	2.0258e+012	2.0161e-003	7.4595e+001
I-131	8.2469e+004	3.0514e+015	3.0368e+000	1.1236e+005
I-132	2.0458e+002	7.5694e+012	7.5332e-003	2.7873e+002
I-133	8.3723e+004	3.0978e+015	3.0830e+000	1.1407e+005
I-134	1.2270e-003	4.5399e+007	4.5182e-008	1.6717e-003

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Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
I-135	1.4211e+004	5.2582e+014	5.2331e-001	1.9362e+004
Kr-83m	8.9200e+000	3.3004e+011	3.2846e-004	1.2153e+001
Kr-85	7.7781e+003	2.8779e+014	2.8642e-001	1.0597e+004
Kr-85m	3.7540e+003	1.3890e+014	1.3823e-001	5.1147e+003
Kr-87	6.5000e-001	2.4050e+010	2.3935e-005	8.8560e-001
Kr-88	1.2056e+003	4.4607e+013	4.4394e-002	1.6426e+003
La-140	1.2840e+001	4.7508e+011	4.7281e-004	1.7494e+001
La-141	5.5152e-003	2.0406e+008	2.0309e-007	7.5143e-003
La-142	7.6789e-006	2.8412e+005	2.8276e-010	1.0462e-005
Mo-99	3.9960e+000	1.4785e+011	1.4715e-004	5.4444e+000
Nb-95	4.0171e-001	1.4863e+010	1.4792e-005	5.4732e-001
Nd-147	1.3974e-001	5.1704e+009	5.1457e-006	1.9039e-001
Np-239	8.1232e+000	3.0056e+011	2.9912e-004	1.1068e+001
Pr-143	3.8122e-001	1.4105e+010	1.4038e-005	5.1940e-001
Pr-144	7.5343e-001	2.7877e+010	2.7744e-005	1.0265e+000
Pu-238	2.3810e-003	8.8097e+007	8.7676e-008	3.2440e-003
Pu-239	2.4082e-004	8.9103e+006	8.8678e-009	3.2811e-004
Pu-240	4.2413e-004	1.5693e+007	1.5618e-008	5.7786e-004
Pu-241	9.4216e-002	3.4860e+009	3.4693e-006	1.2837e-001
Rb-86	6.7954e-001	2.5143e+010	2.5023e-005	9.2585e-001
Rb-88	3.6531e+003	1.3516e+014	1.3452e-001	4.9772e+003
Rh-103m	4.3620e+000	1.6139e+011	1.6062e-004	5.9431e+000
Rh-105	2.1177e+000	7.8355e+010	7.7981e-005	2.8853e+000
Rh-106	1.8471e+000	6.8343e+010	6.8016e-005	2.5166e+000
Ru-103	4.3735e+000	1.6182e+011	1.6105e-004	5.9587e+000
Ru-105	7.4817e-002	2.7682e+009	2.7550e-006	1.0194e-001
Ru-106	1.8471e+000	6.8343e+010	6.8016e-005	2.5166e+000
Sb-127	4.2777e+000	1.5827e+011	1.5752e-004	5.8282e+000
Sb-129	3.3647e-001	1.2449e+010	1.2390e-005	4.5843e-001
Sr-89	2.7153e+001	1.0047e+012	9.9986e-004	3.6995e+001
Sr-90	2.9447e+000	1.0895e+011	1.0843e-004	4.0120e+000
Sr-91	5.8896e+000	2.1792e+011	2.1687e-004	8.0244e+000
Sr-92	7.5811e-002	2.8050e+009	2.7916e-006	1.0329e-001
Tc-99m	4.0026e+000	1.4810e+011	1.4739e-004	5.4534e+000
Te-127	4.7731e+000	1.7660e+011	1.7576e-004	6.5032e+000
Te-127m	8.6611e-001	3.2046e+010	3.1893e-005	1.1800e+000
Te-129	2.8944e+000	1.0709e+011	1.0658e-004	3.9435e+000
Te-129m	2.8008e+000	1.0363e+011	1.0313e-004	3.8160e+000
Te-131m	6.1818e+000	2.2873e+011	2.2763e-004	8.4225e+000
Te-132	6.2425e+001	2.3097e+012	2.2987e-003	8.5052e+001
Xe-133	9.4975e+005	3.5141e+016	3.4973e+001	1.2940e+006
Xe-133m	2.8457e+004	1.0529e+015	1.0479e+000	3.8771e+004
Xe-135	3.4514e+005	1.2770e+016	1.2709e+001	4.7023e+005
Xe-135m	7.1092e+003	2.6304e+014	2.6178e-001	9.6860e+003
Xe-138				

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DOS File : NMP2CS24.MS5
Run Date : March 29, 2019
Run Time: 2:37:29 PM
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Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Y-90	6.5675e-001	2.4300e+010	2.4184e-005	8.9480e-001
Y-91	4.0869e-001	1.5122e+010	1.5049e-005	5.5683e-001
Y-92	7.2679e-001	2.6891e+010	2.6763e-005	9.9023e-001
Y-93	7.4139e-002	2.7431e+009	2.7300e-006	1.0101e-001
Zr-95	4.0293e-001	1.4908e+010	1.4837e-005	5.4898e-001
Zr-97	1.4683e-001	5.4327e+009	5.4068e-006	2.0005e-001

Buildup
The material reference is : Shield 2

Integration Parameters

Radial	30
Circumferential	30
Y Direction (axial)	30

Results

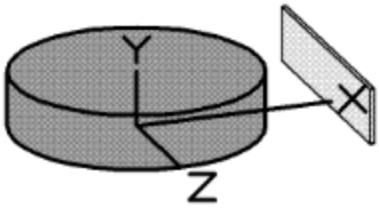
Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	1.471e+07	0.000e+00	1.155e-29	0.000e+00	9.906e-31
0.02	2.962e+10	4.033e-299	3.660e-26	1.397e-300	1.268e-27
0.03	1.830e+16	2.506e-92	5.000e-20	2.483e-94	4.955e-22
0.04	8.734e+10	1.067e-48	6.329e-25	4.718e-51	2.799e-27
0.05	3.038e+11	1.097e-30	7.195e-24	2.923e-33	1.917e-26
0.06	1.023e+11	2.437e-23	1.177e-21	4.840e-26	2.338e-24
0.08	1.298e+16	1.062e-11	8.341e-10	1.681e-14	1.320e-12
0.1	4.176e+11	1.650e-13	2.713e-11	2.525e-16	4.151e-14
0.15	1.436e+14	3.855e-08	1.201e-05	6.348e-11	1.977e-08
0.2	1.165e+16	8.279e-05	2.832e-02	1.461e-07	4.998e-05
0.3	2.565e+14	9.929e-05	2.386e-02	1.883e-07	4.525e-05
0.4	2.597e+15	1.387e-02	2.140e+00	2.703e-05	4.169e-03
0.5	3.016e+15	1.127e-01	1.184e+01	2.213e-04	2.323e-02
0.6	6.799e+14	1.170e-01	8.841e+00	2.284e-04	1.726e-02
0.8	3.735e+14	6.441e-01	2.902e+01	1.225e-03	5.519e-02
1.0	2.987e+14	2.805e+00	8.548e+01	5.171e-03	1.576e-01
1.5	3.726e+14	5.969e+01	9.462e+02	1.004e-01	1.592e+00
2.0	1.152e+14	1.078e+02	1.157e+03	1.667e-01	1.789e+00
3.0	4.197e+12	3.265e+01	2.176e+02	4.430e-02	2.953e-01
4.0	7.458e+03	2.032e-07	1.013e-06	2.513e-10	1.253e-09
5.0	1.938e+11	1.218e+01	4.941e+01	1.397e-02	5.664e-02
TOTALS:	5.078e+16	2.160e+02	2.508e+03	3.322e-01	3.991e+00

MicroShield v5.05 (5.05-00513)
Calvert Cliffs Nuclear Power Plant

Page : 1
DOS File : NMP2CS96.MS5
Run Date : March 29, 2019
Run Time: 2:41:32 PM
Duration : 00:00:35

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: Case 4
Description: Containment Shine Dose to CR at 96 hrs
Geometry: 7 - Cylinder Volume - Side Shields



Source Dimensions

Height	1.2e+3 cm	39 ft 5.0 in
Radius	2.7e+3 cm	88 ft

Dose Points

	X	Y	Z
# 1	4297.68 cm	600.7608 cm	0 cm
	141 ft 0.0 in	19 ft 8.5 in	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	2.72e+10 cm³	Air	0.00122
Transition	1495.044 cm	Air	0.00122
Shield 2	89.916 cm	Concrete	2.16
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Am-241	2.2650e-005	8.3805e+005	8.3405e-010	3.0860e-005
Ba-137m	1.5174e+001	5.6143e+011	5.5875e-004	2.0674e+001
Ba-139				
Ba-140	1.3433e+001	4.9702e+011	4.9465e-004	1.8302e+001
Ce-141	3.6316e-001	1.3437e+010	1.3373e-005	4.9479e-001
Ce-143	5.1200e-002	1.8944e+009	1.8854e-006	6.9758e-002
Ce-144	3.1293e-001	1.1578e+010	1.1523e-005	4.2636e-001
Cm-242	5.9375e-003	2.1969e+008	2.1864e-007	8.0896e-003
Cm-244	3.9916e-004	1.4769e+007	1.4698e-008	5.4384e-004
Cs-134	2.0590e+001	7.6183e+011	7.5819e-004	2.8053e+001
Cs-136	5.1030e+000	1.8881e+011	1.8791e-004	6.9527e+000
Cs-137	1.6040e+001	5.9348e+011	5.9065e-004	2.1854e+001
I-131	5.4143e+004	2.0033e+015	1.9937e+000	7.3767e+004
I-132	1.6232e+001	6.0058e+011	5.9772e-004	2.2116e+001
I-133	6.4624e+003	2.3911e+014	2.3797e-001	8.8047e+003
I-134				

Page : 2
DOS File : NMP2CS96.MS5
Run Date : March 29, 2019
Run Time: 2:41:32 PM
Duration : 00:00:35

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
I-135	6.3600e+000	2.3532e+011	2.3420e-004	8.6653e+000
Kr-83m				
Kr-85	4.0905e+003	1.5135e+014	1.5063e-001	5.5732e+003
Kr-85m	3.0000e-002	1.1100e+009	1.1047e-006	4.0874e-002
Kr-87				
Kr-88	1.4810e-005	5.4797e+005	5.4535e-010	2.0178e-005
La-140	1.1810e+001	4.3697e+011	4.3488e-004	1.6091e+001
La-141	6.9480e-009	2.5708e+002	2.5585e-013	9.4664e-009
La-142				
Mo-99	7.7370e-001	2.8627e+010	2.8490e-005	1.0541e+000
Nb-95	1.6545e-001	6.1217e+009	6.0924e-006	2.2542e-001
Nd-147	4.7686e-002	1.7644e+009	1.7560e-006	6.4970e-002
Np-239	1.3854e+000	5.1260e+010	5.1015e-005	1.8876e+000
Pr-143	1.5153e-001	5.6066e+009	5.5798e-006	2.0645e-001
Pr-144	3.0846e-001	1.1413e+010	1.1358e-005	4.2026e-001
Pu-238	9.8226e-004	3.6344e+007	3.6170e-008	1.3383e-003
Pu-239	9.9840e-005	3.6941e+006	3.6764e-009	1.3603e-004
Pu-240	1.7491e-004	6.4717e+006	6.4408e-009	2.3831e-004
Pu-241	3.8840e-002	1.4371e+009	1.4302e-006	5.2918e-002
Rb-86	1.7813e-001	6.5908e+009	6.5593e-006	2.4270e-001
Rb-88	4.4879e-005	1.6605e+006	1.6526e-009	6.1146e-005
Rh-103m	1.7061e+000	6.3126e+010	6.2824e-005	2.3245e+000
Rh-105	2.1402e-001	7.9187e+009	7.8809e-006	2.9159e-001
Rh-106	7.5745e-001	2.8026e+010	2.7892e-005	1.0320e+000
Ru-103	1.7106e+000	6.3292e+010	6.2990e-005	2.3306e+000
Ru-105	4.0528e-007	1.4995e+004	1.4924e-011	5.5218e-007
Ru-106	7.5745e-001	2.8026e+010	2.7892e-005	1.0320e+000
Sb-127	1.0279e+000	3.8032e+010	3.7851e-005	1.4005e+000
Sb-129	1.3338e-006	4.9351e+004	4.9115e-011	1.8173e-006
Sr-89	1.0746e+001	3.9760e+011	3.9570e-004	1.4641e+001
Sr-90	1.2142e+000	4.4925e+010	4.4711e-005	1.6543e+000
Sr-91	1.2703e-002	4.7001e+008	4.6777e-007	1.7307e-002
Sr-92	3.1420e-010	1.1625e+001	1.1570e-014	4.2809e-010
Tc-99m	7.9318e-001	2.9348e+010	2.9208e-005	1.0807e+000
Te-127	1.3343e+000	4.9369e+010	4.9133e-005	1.8179e+000
Te-127m	3.5507e-001	1.3138e+010	1.3075e-005	4.8377e-001
Te-129	9.3899e-001	3.4743e+010	3.4577e-005	1.2793e+000
Te-129m	1.0859e+000	4.0178e+010	3.9986e-005	1.4795e+000
Te-131m	4.8302e-001	1.7872e+010	1.7786e-005	6.5810e-001
Te-132	1.3599e+001	5.0316e+011	5.0076e-004	1.8528e+001
Xe-133	4.6113e+005	1.7062e+016	1.6980e+001	6.2827e+005
Xe-133m	1.1300e+004	4.1808e+014	4.1609e-001	1.5395e+004
Xe-135	2.5869e+003	9.5715e+013	9.5258e-002	3.5245e+003
Xe-135m	3.1609e+000	1.1695e+011	1.1640e-004	4.3067e+000
Xe-138				

Page : 3
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Duration : 00:00:35

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Y-90	7.8460e-001	2.9030e+010	2.8892e-005	1.0690e+000
Y-91	1.6898e-001	6.2523e+009	6.2224e-006	2.3023e-001
Y-92	3.0739e-007	1.1373e+004	1.1319e-011	4.1881e-007
Y-93	2.1848e-004	8.0838e+006	8.0452e-009	2.9767e-004
Zr-95	1.6086e-001	5.9518e+009	5.9234e-006	2.1917e-001
Zr-97	3.1596e-003	1.1691e+008	1.1635e-007	4.3048e-003

Buildup
The material reference is : Shield 2

Integration Parameters

Radial	30
Circumferential	30
Y Direction (axial)	30

Results

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	5.016e+06	0.000e+00	3.939e-30	0.000e+00	3.378e-31
0.02	8.486e+09	1.155e-299	1.049e-26	4.002e-301	3.632e-28
0.03	8.521e+15	1.167e-92	2.328e-20	1.156e-94	2.307e-22
0.04	2.399e+10	2.930e-49	1.738e-25	1.296e-51	7.688e-28
0.05	6.626e+10	2.394e-31	1.570e-24	6.376e-34	4.181e-27
0.06	2.493e+10	5.938e-24	2.869e-22	1.179e-26	5.698e-25
0.08	6.314e+15	5.170e-12	4.058e-10	8.181e-15	6.422e-13
0.1	6.002e+10	2.372e-14	3.900e-12	3.629e-17	5.966e-15
0.15	3.763e+11	1.010e-10	3.146e-08	1.663e-13	5.180e-11
0.2	1.470e+14	1.045e-06	3.576e-04	1.845e-09	6.311e-07
0.3	1.325e+14	5.130e-05	1.233e-02	9.731e-08	2.338e-05
0.4	1.628e+15	8.697e-03	1.342e+00	1.694e-05	2.614e-03
0.5	2.207e+14	8.249e-03	8.661e-01	1.619e-05	1.700e-03
0.6	1.579e+14	2.717e-02	2.053e+00	5.304e-05	4.007e-03
0.8	5.646e+13	9.738e-02	4.387e+00	1.852e-04	8.344e-03
1.0	6.263e+12	5.883e-02	1.792e+00	1.084e-04	3.304e-03
1.5	6.589e+12	1.055e+00	1.673e+01	1.776e-03	2.815e-02
2.0	5.017e+10	4.694e-02	5.040e-01	7.259e-05	7.794e-04
3.0	1.556e+10	1.211e-01	8.069e-01	1.642e-04	1.095e-03
5.0	2.381e+03	1.497e-07	6.070e-07	1.716e-10	6.959e-10
TOTALS:	1.719e+16	1.424e+00	2.849e+01	2.393e-03	5.002e-02

MicroShield v5.05 (5.05-00513)
Calvert Cliffs Nuclear Power Plant

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Run Date : March 29, 2019
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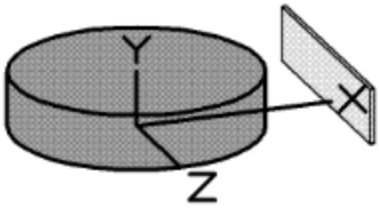
Duration : 00:00:34

File Ref: _____
Date: _____
By: _____
Checked: _____

Case Title: Case 5
Description: Containment Shine Dose to CR at 720 hrs
Geometry: 7 - Cylinder Volume - Side Shields



Source Dimensions

Height	1.2e+3 cm	39 ft 5.0 in
Radius	2.7e+3 cm	88 ft

Dose Points

	X	Y	Z
# 1	4297.68 cm	600.7608 cm	0 cm
	141 ft 0.0 in	19 ft 8.5 in	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	2.72e+10 cm³	Air	0.00122
Transition	1495.044 cm	Air	0.00122
Shield 2	89.916 cm	Concrete	2.16
Air Gap		Air	0.00122

Source Input
Grouping Method : Standard Indices
Number of Groups : 25
Lower Energy Cutoff : 0.015
Photons < 0.015 : Excluded
Library : Grove

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Am-241	2.0640e-005	7.6368e+005	7.6003e-010	2.8121e-005
Ba-137m	1.1548e+001	4.2727e+011	4.2523e-004	1.5733e+001
Ba-139				
Ba-140	2.4890e+000	9.2093e+010	9.1653e-005	3.3912e+000
Ce-141	1.5906e-001	5.8852e+009	5.8571e-006	2.1671e-001
Ce-143	7.9290e-008	2.9337e+003	2.9197e-012	1.0803e-007
Ce-144	2.2397e-001	8.2869e+009	8.2473e-006	3.0515e-001
Cm-242	4.0538e-003	1.4999e+008	1.4927e-007	5.5232e-003
Cm-244	3.0354e-004	1.1231e+007	1.1177e-008	4.1356e-004
Cs-134	1.5325e+001	5.6703e+011	5.6432e-004	2.0880e+001
Cs-136	9.8300e-001	3.6371e+010	3.6197e-005	1.3393e+000
Cs-137	1.2207e+001	4.5166e+011	4.4950e-004	1.6632e+001
I-131	6.8732e+002	2.5431e+013	2.5309e-002	9.3644e+002
I-132	4.9042e-002	1.8146e+009	1.8059e-006	6.6818e-002
I-133	7.1873e-007	2.6593e+004	2.6466e-011	9.7925e-007
I-134				

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DOS File : NMP2C720.MS5
Run Date : March 29, 2019
Run Time: 2:43:44 PM
Duration : 00:00:34

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
I-135				
Kr-83m				
Kr-85	3.1054e+003	1.1490e+014	1.1435e-001	4.2310e+003
Kr-85m				
Kr-87				
Kr-88				
La-140	2.8917e+000	1.0699e+011	1.0648e-004	3.9398e+000
La-141				
La-142				
Mo-99	8.4085e-004	3.1111e+007	3.0963e-008	1.1456e-003
Nb-95	1.1752e-001	4.3482e+009	4.3275e-006	1.6012e-001
Nd-147	7.0443e-003	2.6064e+008	2.5939e-007	9.5976e-003
Np-239	5.0161e-004	1.8560e+007	1.8471e-008	6.8343e-004
Pr-143	3.1757e-002	1.1750e+009	1.1694e-006	4.3268e-002
Pr-144	2.2077e-001	8.1684e+009	8.1294e-006	3.0079e-001
Pu-238	7.5101e-004	2.7787e+007	2.7655e-008	1.0232e-003
Pu-239	7.6416e-005	2.8274e+006	2.8139e-009	1.0411e-004
Pu-240	1.3339e-004	4.9354e+006	4.9119e-009	1.8174e-004
Pu-241	2.9520e-002	1.0922e+009	1.0870e-006	4.0220e-002
Rb-86	5.1691e-002	1.9126e+009	1.9034e-006	7.0427e-002
Rb-88				
Rh-103m	8.2229e-001	3.0425e+010	3.0280e-005	1.1203e+000
Rh-105	7.9512e-007	2.9419e+004	2.9279e-011	1.0833e-006
Rh-106	5.5000e-001	2.0350e+010	2.0253e-005	7.4936e-001
Ru-103	8.2446e-001	3.0505e+010	3.0359e-005	1.1233e+000
Ru-105				
Ru-106	5.5000e-001	2.0350e+010	2.0253e-005	7.4936e-001
Sb-127	7.2661e-003	2.6885e+008	2.6756e-007	9.8998e-003
Sb-129				
Sr-89	5.7351e+000	2.1220e+011	2.1119e-004	7.8139e+000
Sr-90	9.2429e-001	3.4199e+010	3.4035e-005	1.2593e+000
Sr-91				
Sr-92				
Tc-99m	8.6208e-004	3.1897e+007	3.1745e-008	1.1746e-003
Te-127	2.4548e-001	9.0828e+009	9.0394e-006	3.3446e-001
Te-127m	2.3383e-001	8.6517e+009	8.6104e-006	3.1858e-001
Te-129	4.1878e-001	1.5495e+010	1.5421e-005	5.7057e-001
Te-129m	4.8431e-001	1.7919e+010	1.7834e-005	6.5985e-001
Te-131m	2.0175e-007	7.4648e+003	7.4291e-012	2.7488e-007
Te-132	4.1087e-002	1.5202e+009	1.5130e-006	5.5980e-002
Xe-133	8.1517e+003	3.0161e+014	3.0017e-001	1.1106e+004
Xe-133m	1.3606e+000	5.0341e+010	5.0101e-005	1.8537e+000
Xe-135				
Xe-135m				
Xe-138				

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Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Y-90	9.2915e-001	3.4379e+010	3.4214e-005	1.2659e+000
Y-91	9.4716e-002	3.5045e+009	3.4878e-006	1.2905e-001
Y-92				
Y-93				
Zr-95	9.2550e-002	3.4244e+009	3.4080e-006	1.2610e-001
Zr-97				

Buildup
The material reference is : Shield 2

Integration Parameters

Radial	30
Circumferential	30
Y Direction (axial)	30

Results

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.015	3.557e+06	0.000e+00	2.794e-30	0.000e+00	2.396e-31
0.02	2.609e+09	3.552e-300	3.224e-27	1.230e-301	1.117e-28
0.03	1.460e+14	1.999e-94	3.988e-22	1.981e-96	3.953e-24
0.04	1.053e+10	1.286e-49	7.631e-26	5.689e-52	3.375e-28
0.05	3.133e+08	1.132e-33	7.420e-27	3.014e-36	1.977e-29
0.06	4.581e+09	1.091e-24	5.271e-23	2.167e-27	1.047e-25
0.08	1.114e+14	9.117e-14	7.158e-12	1.443e-16	1.133e-14
0.1	5.901e+08	2.332e-16	3.834e-14	3.567e-19	5.866e-17
0.15	1.553e+10	4.168e-12	1.298e-09	6.864e-15	2.138e-12
0.2	2.942e+11	2.092e-09	7.154e-07	3.691e-12	1.263e-09
0.3	1.711e+12	6.623e-07	1.591e-04	1.256e-09	3.018e-07
0.4	2.065e+13	1.103e-04	1.702e-02	2.149e-07	3.316e-05
0.5	7.045e+11	2.633e-05	2.764e-03	5.168e-08	5.426e-06
0.6	2.982e+12	5.133e-04	3.878e-02	1.002e-06	7.569e-05
0.8	1.074e+12	1.853e-03	8.346e-02	3.524e-06	1.587e-04
1.0	6.495e+10	6.101e-04	1.859e-02	1.125e-06	3.427e-05
1.5	1.199e+11	1.920e-02	3.044e-01	3.230e-05	5.121e-04
2.0	1.033e+09	9.666e-04	1.038e-02	1.495e-06	1.605e-05
3.0	3.810e+09	2.964e-02	1.976e-01	4.022e-05	2.680e-04
TOTALS:	2.850e+14	5.292e-02	6.731e-01	7.993e-05	1.104e-03

Attachment 13.18 - RADTRAD Partial Output File "NMP2MS201.o0"

```
##############################################################################
    RADTRAD Version 3.03 (Spring 2001) run on  5/29/2019  at  3:10:57
 ##############################################################################

 ##############################################################################
                      File information
 ##############################################################################

 Plant file           = NMP2MS201.psf
 Inventory file       = D:\User\Gardner\h21c-106r3\nmp2.nif
 Release file         = D:\User\Gardner\h21c-106r3\bwr_dba.rft
 Dose Conversion file = D:\User\Gardner\h21c-106r3\nmp2.inp




     #####    ####   #####    #  #     #  #####   #    #  #####
     #    #  #       #        #  ##    #  #    #  #    #    #
     #    #  #       #        #  # #   #  #    #  #    #    #
     #####    ####   ####     #  #  #  #  #####   #    #    #
     #            #  #        #  #   # #  #       #    #    #
     #            #  #        #  #    ##  #       #    #    #
     #        ####   #        #  #     #  #        ####     #


 Radtrad 3.03 4/15/2001
 NMP2 - MSIV Bypass Leakage Pathways 7 & 8 Without Delay Times - Total MSIV Leakage
= 200 scfh and 100 scfh Per Line, MSIV Leak Rate Reduction After 24 hrs, 20-group
Total Effective Aerosol Removal Efficiency, and CAVEX Core Inventory
 Nuclide Inventory File:
 D:\User\Gardner\h21c-106r3\nmp2.nif
 Plant Power Level:
  4.0670E+03
 Compartments:
   9
 Compartment 1:
 DW
   3
  3.0620E+05
   1
   0
   0
   0
   0
 Compartment 2:
 WW
   3
  1.9080E+05
   0
   0
   0
   0
   0
 Compartment 3:
```

```
Dummy
  3
 1.0000E+02
  0
  0
  0
  0
  0
Compartment 4:
Environment
  2
 0.0000E+00
  0
  0
  0
  0
  0
Compartment 5:
CR
  1
 3.8100E+05
  0
  0
  1
  0
  0
Compartment 6:
MSIV Failed Inboard Volume 1
  3
 3.9068E+02
  0
  0
  0
  0
  0
Compartment 7:
MSIV Failed Outboard Volume 2
  3
 4.2841E+02
  0
  0
  0
  0
  0
Compartment 8:
Intact Inboard Volume 3
  3
 3.3181E+02
  0
  0
  0
  0
  0
Compartment 9:
Intact Outboard Volume 4
  3
 4.8703E+02
```

```
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
DW to WW
  1
  2
  4
Pathway 2:
WW to DW
  2
  1
  4
Pathway 3:
DW Leakage to RB (Released to Dummy)
  1
  3
  2
Pathway 4:
WW Leakage to RB (Released to Dummy)
  2
  3
  2
Pathway 5:
DW Bypass Pathway 5 to Environment (Released to Dummy)
  1
  3
  2
Pathway 6:
WW Bypass Pathway 6 to Environment (Released to Dummy)
  2
  3
  2
Pathway 7:
DW to MSIV Failed Inboard Volume 1
  1
  6
  2
Pathway 8:
MSIV Failed Inboard Volume 1 to MSIV Failed outboard Volume 2
  6
  7
  2
Pathway 9:
MSIV Failed Outboard Volume 2 to Environment (Pathway 7)
  7
  4
  2
Pathway 10:
DW to Intact Inboard Volume 3
  1
  8
  2
```

```
Pathway 11:
Intact Inboard Volume 3 to Intact Outboard Volume 4
  8
  9
  2
Pathway 12:
CR Filtered Intake (Pathway 9)
  4
  5
  2
Pathway 13:
CR Unfiltered Inleakage (Pathway 10)
  4
  5
  2
Pathway 14:
CR Exhaust to Environment (Pathway 11)
  5
  4
  2
Pathway 15:
Intact Outboard Volume 4 to  Environment  (Pathway 8)
  9
  4
  2
End of Plant Model File
Scenario Description Name:

Plant Model Filename:

Source Term:
  1
  1   1.0000E+00
D:\User\Gardner\h21c-106r3\nmp2.inp
D:\User\Gardner\h21c-106r3\bwr_dba.rft
  0.0000E+00
  1
  9.5000E-01   4.8500E-02   1.5000E-03   1.0000E+00
Overlying Pool:
  0
  0.0000E+00
  0
  0
  0
  0
Compartments:
  9
Compartment 1:
  0
  1
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   0.0000E+00
  2.4000E+00   0.0000E+00
```

```
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  5
  0.0000E+00   0.0000E+00
  3.3330E-01   1.9800E+01
  2.2500E+00   1.9800E+00
  2.4000E+00   0.0000E+00
  7.2000E+02   0.0000E+00
  1
  0.0000E+00
  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
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 5:
  1
  1
  0
  0
  0
  0
  1
  6.7500E+02
  3
  0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
```

```
  1.6700E-02   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
Compartment 6:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 7:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 8:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 9:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
 15
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
```

```
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   8.9710E+04
  7.2000E+02   0.0000E+00
  0
Pathway 2:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   0.0000E+00
  2.0000E+00   1.4400E+05
  7.2000E+02   0.0000E+00
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  4
  0.0000E+00   1.0280E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   2.7500E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   1.3800E+00   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
  4
  0.0000E+00   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  8.3300E-02   1.4600E+00   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   7.3000E-01   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 5:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   2.4930E-01   7.3050E+01   3.6000E+00   0.0000E+00
  8.0000E+00   2.4930E-01   7.3050E+01   4.8200E+00   0.0000E+00
  2.4000E+01   1.2470E-01   7.3050E+01   8.4600E+00   0.0000E+00
  9.6000E+01   1.2470E-01   7.3050E+01   4.8890E+01   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 6:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.1200E-02   8.5610E+01   3.6000E+00   0.0000E+00
  8.0000E+00   1.1200E-02   8.5610E+01   4.8200E+00   0.0000E+00
  2.4000E+01   5.6000E-03   8.5610E+01   8.4600E+00   0.0000E+00
  9.6000E+01   5.6000E-03   8.5610E+01   4.8890E+01   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 7:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   6.7600E-01   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   3.3800E-01   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 8:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   6.7600E-01   0.0000E+00   3.8200E+00   0.0000E+00
  8.0000E+00   6.7600E-01   0.0000E+00   5.1200E+00   0.0000E+00
  2.4000E+01   3.3800E-01   0.0000E+00   8.9800E+00   0.0000E+00
  9.6000E+01   3.3800E-01   0.0000E+00   5.1030E+01   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 9:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.6670E+00   9.9670E+01   3.5600E+00   0.0000E+00
  8.0000E+00   1.6670E+00   9.9670E+01   4.7800E+00   0.0000E+00
  2.4000E+01   8.3330E-01   9.9670E+01   8.3900E+00   0.0000E+00
  9.6000E+01   8.3330E-01   9.9670E+01   4.8590E+01   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 10:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   6.7600E-01   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   3.3800E-01   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 11:
  0
```

```
  0
  0
  0
  0
  1
  5
  0.0000E+00   6.7600E-01   0.0000E+00   3.8300E+00   0.0000E+00
  8.0000E+00   6.7600E-01   0.0000E+00   5.1300E+00   0.0000E+00
  2.4000E+01   3.3800E-01   0.0000E+00   8.9800E+00   0.0000E+00
  9.6000E+01   3.3800E-01   0.0000E+00   5.1040E+01   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 12:
  0
  0
  0
  0
  0
  1
  3
  0.0000E+00   7.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6700E-02   1.3500E+03   9.9000E+01   9.9000E+01   9.9000E+01
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 13:
  0
  0
  0
  0
  0
  1
  7
  0.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  4.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  8.0000E+00   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  1.6000E+01   2.5000E+02   0.0000E+00   0.0000E+00   0.0000E+00
  2.4000E+01   2.5000E+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 14:
  0
```

```
  0
  0
  0
  0
  1
  3
  0.0000E+00   1.0000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  1.6700E-02   1.6000E+03   1.0000E+02   1.0000E+02   1.0000E+02
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Pathway 15:
  0
  0
  0
  0
  0
  1
  5
  0.0000E+00   1.6670E+00   9.9600E+01   3.6000E+00   0.0000E+00
  8.0000E+00   1.6670E+00   9.9600E+01   4.8200E+00   0.0000E+00
  2.4000E+01   8.3330E-01   9.9600E+01   8.4600E+00   0.0000E+00
  9.6000E+01   8.3330E-01   9.9600E+01   4.8890E+01   0.0000E+00
  7.2000E+02   0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  3
Location 1:
EAB
  4
  1
  2
  0.0000E+00   1.1900E-04
  7.2000E+02   0.0000E+00
  1
  2
  0.0000E+00   3.5000E-04
  7.2000E+02   0.0000E+00
  0
Location 2:
LPZ
  4
  1
  5
  0.0000E+00   1.6200E-05
  8.0000E+00   1.0900E-05
  2.4000E+01   4.5900E-06
  9.6000E+01   1.3300E-06
```

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```
  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 3:
CR
  5
  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
  6
  0.0000E+00   1.4700E-03
  2.0000E+00   9.7400E-04
  8.0000E+00   3.6300E-04
  2.4000E+01   2.4500E-04
  9.6000E+01   1.9000E-04
  7.2000E+02   0.0000E+00
Simulation Parameters:
  7
  0.0000E+00   1.0000E-02
  1.0000E+00   1.0000E-01
  2.0000E+00   5.0000E-01
  8.0000E+00   1.0000E+00
  2.4000E+01   2.0000E+00
  9.6000E+01   5.0000E+00
  7.2000E+02   0.0000E+00
Output Filename:
C:\Radtrad 3.o203
  1
  1
  1
  0
  0
End of Scenario File
```

EAB Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2727E+00	2.9666E+01	2.1861E+00
Accumulated dose (rem)	3.0995E+00	4.7389E+01	4.5617E+00

LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.4224E-02	2.1789E-01	2.0933E-02
Accumulated dose (rem)	1.5319E-01	8.9244E-01	1.8093E-01

CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.3502E-02	2.2114E+00	1.2158E-01
Accumulated dose (rem)	3.3587E-01	6.4051E+00	6.3411E-01

CR Compartment Nuclide Inventory:

Time (h) = 720.0000	Ci	kg	Atoms	Decay
Kr-85	6.7493E-02	1.7219E-07	1.2199E+18	7.8166E+15
Rb-86	4.7605E-10	5.8506E-18	4.0969E+07	2.1201E+08
Sr-89	5.2818E-08	1.8180E-15	1.2302E+10	1.0780E+10
Sr-90	8.5124E-09	6.2404E-14	4.1756E+11	1.3176E+09
Y-90	8.5571E-09	1.5728E-17	1.0524E+08	8.5969E+08
Y-91	8.7230E-10	3.5569E-17	2.3539E+08	1.6609E+08
Zr-95	8.5235E-10	3.9676E-17	2.5151E+08	1.6385E+08
Nb-95	1.0823E-09	2.7678E-17	1.7545E+08	1.7685E+08
Mo-99	7.7439E-12	1.6146E-20	9.8216E+04	8.0252E+08
Ru-103	7.5929E-09	2.3527E-16	1.3755E+09	1.6828E+09
Ru-106	5.0653E-09	1.5140E-15	8.6016E+09	8.1263E+08
Sb-127	6.6918E-11	2.5058E-19	1.1882E+06	9.1568E+08
Te-127	2.2608E-09	8.5664E-19	4.0620E+06	1.1684E+09
Te-127m	2.1535E-09	2.2830E-16	1.0826E+09	3.7188E+08
Te-129	3.8568E-09	1.8416E-19	8.5974E+05	1.0937E+09
Te-129m	4.4603E-09	1.4806E-16	6.9118E+08	1.0528E+09
Te-132	3.7840E-10	1.2464E-18	5.6863E+06	1.2902E+10
I-131	1.5983E-05	1.2892E-13	5.9266E+11	1.0697E+13
I-132	2.9522E-08	2.8601E-18	1.3048E+07	7.3996E+11
Xe-133	1.6211E-01	8.6606E-10	3.9215E+15	2.8621E+17
Xe-133m	2.3041E-05	5.2336E-14	2.3697E+11	4.2962E+15
Cs-134	1.4113E-07	1.0908E-13	4.9023E+11	2.7332E+10
Cs-136	9.0511E-09	1.2350E-16	5.4684E+08	5.9529E+09
Cs-137	1.1242E-07	1.2925E-12	5.6815E+12	2.1375E+10
Ba-140	2.2927E-08	3.1317E-16	1.3471E+09	1.1637E+10
La-140	2.6632E-08	4.7914E-17	2.0610E+08	7.3407E+09
Ce-141	1.4649E-09	5.1410E-17	2.1957E+08	3.5108E+08
Ce-144	2.0626E-09	6.4670E-16	2.7045E+09	3.3458E+08
Pr-143	2.9247E-10	4.3432E-18	1.8291E+07	1.2496E+08
Nd-147	6.4875E-11	8.0193E-19	3.2853E+06	4.0604E+07
Np-239	4.6197E-12	1.9913E-20	5.0175E+04	1.5999E+09
Pu-238	6.9165E-12	4.0401E-16	1.0223E+09	1.0670E+06
Pu-239	7.0376E-13	1.1322E-14	2.8529E+10	1.0836E+05
Pu-240	1.2285E-12	5.3938E-16	1.3534E+09	1.8989E+05
Pu-241	2.7187E-10	2.7492E-15	6.8697E+09	4.2131E+07
Am-241	1.9009E-13	5.5488E-17	1.3865E+08	2.5763E+04

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Cm-242                3.7333E-11  1.1278E-17  2.8066E+07  6.2788E+06
Cm-244                2.7955E-12  3.4153E-17  8.4292E+07  4.3303E+05

CR Transport Group Inventory:
Time (h) = 720.0000    Atmosphere     Sump
Noble gases (atoms)    1.2239E+18  0.0000E+00
Elemental I (atoms)    6.1487E+09  0.0000E+00
Organic I (atoms)      5.8443E+11  0.0000E+00
Aerosols (kg)          1.4848E-12  0.0000E+00
Dose Effective (Ci/cc) I-131 (Thyroid)         1.4815E-15
Dose Effective (Ci/cc) I-131 (ICRP2 Thyroid)   1.4816E-15
Total I (Ci)                                   1.6013E-05

                       Deposition Recirculating
Time (h) = 720.0000     Surfaces     Filter
Noble gases (atoms)    0.0000E+00  0.0000E+00
Elemental I (atoms)    0.0000E+00  2.8322E+13
Organic I (atoms)      0.0000E+00  2.9852E+14
Aerosols (kg)          0.0000E+00  2.3248E-10

CR Filtered Intake (Pathway 9) Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  2.3810E+20
Elemental I (atoms)    5.0020E+14  5.0526E+12
Organic I (atoms)      5.2147E+15  5.2674E+13
Aerosols (kg)          3.8561E-09  3.8950E-11

CR Unfiltered Inleakage (Pathway 10) Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    0.0000E+00  4.4092E+19
Elemental I (atoms)    0.0000E+00  9.3566E+13
Organic I (atoms)      0.0000E+00  9.7544E+14
Aerosols (kg)          0.0000E+00  7.2130E-10

CR Exhaust to Environment (Pathway 11) Transport Group Inventory:

                         Pathway
Time (h) = 720.0000     Filtered   Transported
Noble gases (atoms)    2.8066E+20  0.0000E+00
Elemental I (atoms)    6.7811E+13  0.0000E+00
Organic I (atoms)      7.1476E+14  0.0000E+00
Aerosols (kg)          5.5663E-10  0.0000E+00

    931

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

                   DW                      WW                    Dummy
Time (hr)    I-131 (Curies)          I-131 (Curies)         I-131 (Curies)
   0.000       6.1456E+03              0.0000E+00             3.4413E-02
   0.017       1.8470E+05              0.0000E+00             3.1091E+01
```

0.083	9.2044E+05	0.0000E+00	7.7302E+02
0.333	3.6817E+06	0.0000E+00	1.0908E+03
0.500	6.8012E+05	0.0000E+00	1.2262E+03
0.750	9.4093E+05	0.0000E+00	1.3481E+03
1.000	9.4889E+05	0.0000E+00	1.4778E+03
1.400	9.5870E+05	0.0000E+00	1.6872E+03
1.700	9.6603E+05	0.0000E+00	1.8455E+03
2.000	9.7334E+05	0.0000E+00	2.0050E+03
2.250	5.9162E+04	4.0983E+04	2.0468E+03
2.400	6.1404E+04	3.8270E+04	2.0536E+03
2.700	6.1335E+04	3.8211E+04	2.0672E+03
3.000	6.1257E+04	3.8163E+04	2.0807E+03
3.300	6.1180E+04	3.8114E+04	2.0943E+03
3.600	6.1102E+04	3.8066E+04	2.1078E+03
3.900	6.1024E+04	3.8017E+04	2.1212E+03
4.000	6.0998E+04	3.8001E+04	2.1257E+03
4.300	6.0921E+04	3.7953E+04	2.1391E+03
4.600	6.0843E+04	3.7905E+04	2.1525E+03
4.900	6.0766E+04	3.7856E+04	2.1658E+03
5.200	6.0688E+04	3.7808E+04	2.1791E+03
5.500	6.0611E+04	3.7760E+04	2.1924E+03
5.800	6.0534E+04	3.7712E+04	2.2056E+03
6.100	6.0457E+04	3.7664E+04	2.2189E+03
6.400	6.0380E+04	3.7616E+04	2.2320E+03
6.700	6.0303E+04	3.7568E+04	2.2452E+03
7.000	6.0226E+04	3.7520E+04	2.2583E+03
7.300	6.0150E+04	3.7473E+04	2.2713E+03
7.600	6.0073E+04	3.7425E+04	2.2844E+03
7.900	5.9997E+04	3.7377E+04	2.2974E+03
8.000	5.9971E+04	3.7361E+04	2.3017E+03
8.300	5.9895E+04	3.7314E+04	2.3147E+03
8.600	5.9819E+04	3.7266E+04	2.3276E+03
8.900	5.9742E+04	3.7219E+04	2.3405E+03
9.200	5.9666E+04	3.7171E+04	2.3533E+03
9.500	5.9590E+04	3.7124E+04	2.3662E+03
9.800	5.9514E+04	3.7077E+04	2.3790E+03
10.100	5.9439E+04	3.7030E+04	2.3917E+03
10.400	5.9363E+04	3.6982E+04	2.4044E+03
16.000	5.7966E+04	3.6112E+04	2.6360E+03
24.000	5.6026E+04	3.4903E+04	2.9474E+03
96.000	4.2233E+04	2.6310E+04	3.6018E+03
720.000	3.6054E+03	2.2461E+03	1.4638E+03

Time (hr)	Environment I-131 (Curies)	CR I-131 (Curies)	MSIV Failed Inboard V I-131 (Curies)
0.000	1.4334E-14	9.9439E-18	2.2613E-04
0.017	1.1689E-08	8.1054E-12	2.0418E-01
0.083	7.2009E-06	1.3143E-09	5.0649E+00
0.333	1.8137E-03	3.2373E-07	8.0334E+01
0.500	8.6076E-03	1.5162E-06	1.1108E+02
0.750	3.2878E-02	5.6522E-06	1.3718E+02
1.000	7.7640E-02	1.3019E-05	1.6444E+02
1.400	2.0316E-01	3.2791E-05	2.0699E+02
1.700	3.5115E-01	5.5153E-05	2.3807E+02
2.000	5.5513E-01	8.4937E-05	2.6844E+02
2.250	7.7375E-01	1.0298E-04	2.6808E+02
2.400	9.2663E-01	1.1559E-04	2.6501E+02

2.700	1.2803E+00	1.4440E-04	2.5901E+02
3.000	1.6964E+00	1.7744E-04	2.5320E+02
3.300	2.1734E+00	2.1406E-04	2.4757E+02
3.600	2.7095E+00	2.5372E-04	2.4211E+02
3.900	3.3032E+00	2.9591E-04	2.3683E+02
4.000	3.5136E+00	3.1046E-04	2.3510E+02
4.300	4.1815E+00	3.5536E-04	2.3003E+02
4.600	4.9032E+00	4.0182E-04	2.2513E+02
4.900	5.6771E+00	4.4952E-04	2.2037E+02
5.200	6.5019E+00	4.9816E-04	2.1576E+02
5.500	7.3759E+00	5.4746E-04	2.1129E+02
5.800	8.2977E+00	5.9719E-04	2.0697E+02
6.100	9.2659E+00	6.4714E-04	2.0277E+02
6.400	1.0279E+01	6.9712E-04	1.9871E+02
6.700	1.1336E+01	7.4698E-04	1.9477E+02
7.000	1.2435E+01	7.9658E-04	1.9095E+02
7.300	1.3574E+01	8.4578E-04	1.8726E+02
7.600	1.4754E+01	8.9448E-04	1.8367E+02
7.900	1.5972E+01	9.4259E-04	1.8020E+02
8.000	1.6386E+01	9.5849E-04	1.7907E+02
8.300	1.7647E+01	9.1414E-04	1.7573E+02
8.600	1.8944E+01	8.7585E-04	1.7250E+02
8.900	2.0274E+01	8.4294E-04	1.6938E+02
9.200	2.1638E+01	8.1483E-04	1.6634E+02
9.500	2.3033E+01	7.9096E-04	1.6340E+02
9.800	2.4459E+01	7.7087E-04	1.6055E+02
10.100	2.5916E+01	7.5412E-04	1.5779E+02
10.400	2.7401E+01	7.4032E-04	1.5511E+02
16.000	5.9312E+01	7.3845E-04	1.1769E+02
24.000	1.1293E+02	8.5186E-04	9.0282E+01
96.000	3.4756E+02	2.4669E-04	5.4590E+01
720.000	1.0025E+03	1.5983E-05	4.6315E+00

Time (hr)	MSIV Failed Outboard I-131 (Curies)	Intact Inboard Volume I-131 (Curies)	Intact Outboard Volum I-131 (Curies)
0.000	4.3393E-09	2.2612E-04	5.1091E-09
0.017	1.1769E-04	2.0416E-01	1.3857E-04
0.083	1.4516E-02	5.0623E+00	1.7094E-02
0.333	9.0967E-01	8.0171E+01	1.0719E+00
0.500	2.5778E+00	1.1062E+02	3.0390E+00
0.750	5.5431E+00	1.3616E+02	6.5409E+00
1.000	9.0219E+00	1.6277E+02	1.0655E+01
1.400	1.5568E+01	2.0407E+02	1.8408E+01
1.700	2.1184E+01	2.3405E+02	2.5071E+01
2.000	2.7338E+01	2.6320E+02	3.2377E+01
2.250	3.2547E+01	2.6177E+02	3.8571E+01
2.400	3.5481E+01	2.5809E+02	4.2064E+01
2.700	4.0907E+01	2.5093E+02	4.8537E+01
3.000	4.5783E+01	2.4403E+02	5.4368E+01
3.300	5.0154E+01	2.3738E+02	5.9604E+01
3.600	5.4058E+01	2.3097E+02	6.4290E+01
3.900	5.7533E+01	2.2480E+02	6.8469E+01
4.000	5.8603E+01	2.2280E+02	6.9756E+01
4.300	6.1559E+01	2.1692E+02	7.3318E+01
4.600	6.4163E+01	2.1127E+02	7.6460E+01
4.900	6.6443E+01	2.0581E+02	7.9214E+01
5.200	6.8427E+01	2.0056E+02	8.1610E+01

5.500	7.0138E+01	1.9550E+02	8.3678E+01
5.800	7.1600E+01	1.9062E+02	8.5445E+01
6.100	7.2833E+01	1.8592E+02	8.6934E+01
6.400	7.3859E+01	1.8140E+02	8.8169E+01
6.700	7.4693E+01	1.7703E+02	8.9171E+01
7.000	7.5355E+01	1.7283E+02	8.9961E+01
7.300	7.5858E+01	1.6878E+02	9.0556E+01
7.600	7.6218E+01	1.6487E+02	9.0974E+01
7.900	7.6447E+01	1.6111E+02	9.1231E+01
8.000	7.6496E+01	1.5988E+02	9.1283E+01
8.300	7.6567E+01	1.5630E+02	9.1345E+01
8.600	7.6535E+01	1.5285E+02	9.1277E+01
8.900	7.6409E+01	1.4952E+02	9.1094E+01
9.200	7.6200E+01	1.4631E+02	9.0806E+01
9.500	7.5916E+01	1.4322E+02	9.0424E+01
9.800	7.5565E+01	1.4024E+02	8.9957E+01
10.100	7.5153E+01	1.3736E+02	8.9416E+01
10.400	7.4688E+01	1.3459E+02	8.8807E+01
16.000	6.1787E+01	9.7735E+01	7.2136E+01
24.000	4.5800E+01	7.3696E+01	5.1905E+01
96.000	2.4428E+01	4.6150E+01	2.7622E+01
720.000	2.0444E+00	3.9295E+00	2.3228E+00

##
Cumulative Dose Summary
##

	EAB		LPZ		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
0.017	7.4367E-10	5.3639E-11	1.0124E-10	7.3021E-12	6.2940E-12	2.2049E-13
0.083	4.5777E-07	3.1886E-08	6.2319E-08	4.3408E-09	4.0510E-09	1.8459E-10
0.333	1.1499E-04	7.2241E-06	1.5654E-05	9.8345E-07	3.8715E-06	1.6947E-07
0.500	5.4475E-04	3.3257E-05	7.4159E-05	4.5274E-06	2.8227E-05	1.2175E-06
0.750	2.0758E-03	1.3647E-04	2.8259E-04	1.8579E-05	1.7573E-04	7.7804E-06
1.000	4.8913E-03	3.8721E-04	6.6587E-04	5.2713E-05	5.7453E-04	2.7682E-05
1.400	1.2763E-02	1.4503E-03	1.7375E-03	1.9743E-04	2.1270E-03	1.2846E-04
1.700	2.2009E-02	3.1554E-03	2.9962E-03	4.2955E-04	4.4110E-03	3.2398E-04
2.000	3.4709E-02	6.0221E-03	4.7251E-03	8.1982E-04	8.0512E-03	7.1077E-04
2.250	4.8278E-02	9.5248E-03	6.5723E-03	1.2967E-03	1.2131E-02	1.2221E-03
2.400	5.7746E-02	1.2141E-02	7.8612E-03	1.6528E-03	1.4980E-02	1.6126E-03
2.700	7.9596E-02	1.8544E-02	1.0836E-02	2.5244E-03	2.1729E-02	2.6201E-03
3.000	1.0522E-01	2.6466E-02	1.4324E-02	3.6029E-03	3.0067E-02	3.9978E-03
3.300	1.3449E-01	3.5849E-02	1.8309E-02	4.8803E-03	4.0185E-02	5.8081E-03
3.600	1.6729E-01	4.6617E-02	2.2774E-02	6.3462E-03	5.2245E-02	8.1039E-03
3.900	2.0349E-01	5.8678E-02	2.7702E-02	7.9881E-03	6.6377E-02	1.0927E-02
4.000	2.1629E-01	6.2969E-02	2.9445E-02	8.5723E-03	7.1568E-02	1.1990E-02
4.300	2.5685E-01	7.6600E-02	3.4966E-02	1.0428E-02	8.8625E-02	1.5560E-02
4.600	3.0054E-01	9.1289E-02	4.0913E-02	1.2428E-02	1.0797E-01	1.9709E-02
4.900	3.4725E-01	1.0693E-01	4.7273E-02	1.4557E-02	1.2966E-01	2.4441E-02
5.200	3.9688E-01	1.2343E-01	5.4029E-02	1.6803E-02	1.5373E-01	2.9752E-02
5.500	4.4932E-01	1.4068E-01	6.1168E-02	1.9152E-02	1.8022E-01	3.5631E-02
5.800	5.0446E-01	1.5860E-01	6.8675E-02	2.1591E-02	2.0913E-01	4.2059E-02
6.100	5.6222E-01	1.7710E-01	7.6538E-02	2.4109E-02	2.4048E-01	4.9014E-02
6.400	6.2249E-01	1.9609E-01	8.4742E-02	2.6695E-02	2.7424E-01	5.6469E-02
6.700	6.8518E-01	2.1551E-01	9.3276E-02	2.9338E-02	3.1041E-01	6.4392E-02

7.000	7.5019E-01	2.3527E-01	1.0213E-01	3.2028E-02	3.4897E-01	7.2753E-02
7.300	8.1745E-01	2.5532E-01	1.1128E-01	3.4758E-02	3.8988E-01	8.1518E-02
7.600	8.8686E-01	2.7561E-01	1.2073E-01	3.7520E-02	4.3311E-01	9.0652E-02
7.900	9.5834E-01	2.9607E-01	1.3046E-01	4.0305E-02	4.7863E-01	1.0012E-01
8.000	9.8262E-01	3.0292E-01	1.3377E-01	4.1238E-02	4.9430E-01	1.0335E-01
8.300	1.0564E+00	3.2353E-01	1.3724E-01	4.3022E-02	5.4051E-01	1.1288E-01
8.600	1.1320E+00	3.4422E-01	1.4081E-01	4.4810E-02	5.8457E-01	1.2195E-01
8.900	1.2095E+00	3.6495E-01	1.4445E-01	4.6600E-02	6.2678E-01	1.3052E-01
9.200	1.2886E+00	3.8568E-01	1.4818E-01	4.8387E-02	6.6738E-01	1.3861E-01
9.500	1.3694E+00	4.0639E-01	1.5199E-01	5.0171E-02	7.0661E-01	1.4627E-01
9.800	1.4519E+00	4.2705E-01	1.5587E-01	5.1947E-02	7.4467E-01	1.5354E-01
10.100	1.5358E+00	4.4764E-01	1.5983E-01	5.3716E-02	7.8174E-01	1.6047E-01
10.400	1.6212E+00	4.6814E-01	1.6385E-01	5.5474E-02	8.1798E-01	1.6708E-01
16.000	3.4232E+00	8.3182E-01	2.4873E-01	8.6272E-02	1.4531E+00	2.7168E-01
24.000	6.3354E+00	1.2625E+00	3.8592E-01	1.2169E-01	2.4279E+00	3.8630E-01
96.000	1.7723E+01	2.3757E+00	6.7456E-01	1.5999E-01	4.1936E+00	5.1253E-01
720.000	4.7389E+01	4.5617E+00	8.9244E-01	1.8093E-01	6.4051E+00	6.3411E-01

##
Worst Two-Hour Doses
##

EAB

Time (hr)	Whole Body (rem)	Thyroid (rem)	TEDE (rem)
8.0	1.2125E-01	5.2520E-01	1.3785E-01

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1st Pass Attributes – General Overview

Yes	No	Attribute
☒	☐	The purpose/scope is clear and well defined. You should be able to understand the purpose without resorting to consultation with the preparer. (4.3.2)
☒	☐	The reason or need for the product is clearly discussed. (4.3.2)
☒	☐	You possess the proper knowledge and skill sets needed for the review. **If** additional expertise is needed, **then** those reviews have been scheduled to ensure that appropriate knowledgeable "experts" are utilized for reviews.
☒	☐	The Methodology is appropriate for the purpose and scope of the document, and is clearly documented.

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2nd Pass Attributes – Technical Review

Yes	No	Attribute
☒	☐	Input Parameters are clearly listed, defined with source documentation.
☒	☐	The Inputs are valid and are referenced to a quality documented reference.
☒	☐	Assumptions are reasonable and well documented.
☒	☐	The Methodology is appropriate and Equations Used have been verified- Ensure proper methodology & units
☒	☐	**If** an Alternate Calculation Tools or Methods was used as the review method, **then** that analysis has been attached to the final document
☒	☐	The Numerical calculations and computations have been verified correct- validate the numbers
☒	☐	The acceptance criteria is consistent with the Design Basis, Design Standards and applicable codes.
☒	☐	Does the analysis consider new potential failure modes and disposition them as appropriate? If none are indicated, is this appropriate?
☒	☐	Does the product consider the most limiting or bounding design basis conditions?
☒	☐	Are the results consistent with actual plant response and do they appear reasonable?
☒	☐	Does the conclusion clearly support the purpose as described?

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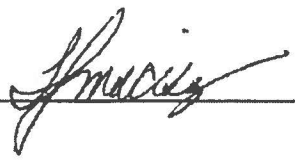
3rd Pass Attributes – Administrative

Yes	No	Attribute
☒	☐	Check references- are they the correct rev
☒	☐	Check procedures used- are they the correct rev
☒	☐	Check for Spelling Errors, Punctuation and Grammar
☒	☐	Check for simplicity and readability
☒	☐	Are the proper forms included in the document and filled out correctly
☒	☐	Check Page and Attachment Numbering
☒	☐	Right Boxes Checked on Forms
☒	☐	Proper process has been used, Major Rev, Minor Rev, EC/ECR etc.
☒	☐	Appropriate boxes are signed off or marked N/A
☒	☐	Appropriate definition and use of abbreviations and acronyms

Reviewer: Thomas J. Mscisz  05/29/2019
Print / Signature Date