ENCLOSURE 7 CONTAINS SECURITY-RELATED INFORMATION WITHHOLD UNDER 10 CFR 2.390

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10 CFR 50.90

SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENT TO LICENSES NPF-14 AND NPF-22: REVISION TO THE DOSE CONSEQUENCE ANALYSIS FOR A LOSS OF COOLANT ACCIDENT
PLA-7823

Docket No. 50-387 and 50-388

Pursuant to 10 CFR 50.90, Susquehanna Nuclear, LLC (Susquehanna), is submitting a request for an amendment to the Updated Final Safety Analysis Report (FSAR) and Technical Specifications (TS) for the Susquehanna Steam Electric Station (SSES), Units 1 and 2, Facility Operating License numbers NPF-14 and NPF-22. The proposed amendment would modify the Current Licensing Basis for the Design Basis Accident (DBA) Loss of Coolant Accident (LOCA) analysis described in the SSES FSAR, as previously reviewed by the NRC. The proposed changes would utilize an updated version of the ORIGEN code, introduce a new source term to account for the introduction of ATRIUM 11 fuel, use new inputs/assumptions that decrease the assumed Emergency Safety Feature leakage into secondary containment, increase the assumed maximum allowable Standby Gas Treatment (SGT) System exhaust flow rate from secondary containment, and increase the allowed control structure unfiltered inleakage that is assumed in the DBA LOCA dose analysis. As a result, the proposed amendment would modify TS 5.5.2, "Primary Coolant Sources Outside Containment," and the TS Bases for TS 3.6.4.1, "Secondary Containment."

Enclosure 1 provides a description and assessment of the proposed changes along with Susquehanna's determination that the proposed changes do not involve a significant hazard consideration. Enclosure 2 provides a summary table of the inputs, assumptions, and references used in the Susquehanna LOCA analysis. Enclosure 3 provides the existing TS pages marked to show the proposed changes. Enclosure 4 provides revised (clean) TS pages. Enclosure 5 provides existing TS Bases pages marked up to show the proposed changes and are provided for information only. Enclosure 6 provides excerpts from Susquehanna calculations

EC-RADN-1125, Revision 7, "CRHE and Off Site Post LOCA Doses," and EC-RADN-1129, Revision 7, "DBA LOCA Total Control Room Dose." The calculation excerpts provide summary dose results as well as RADTRAD output files produced to calculate the resultant dose consequences and are provided for information only. Enclosure 7 provides FSAR figures depicting the control structure layout to aid in the NRC's review of this request. The drawings provided in Enclosure 7 are considered sensitive un-classified non-safeguards information and are requested to be withheld from public disclosure in accordance with 10 CFR 2.390(d)(1).

The proposed amendment is required to support fuel loading during the Unit 2 refueling outage scheduled for Spring 2021. Thus, Susquehanna requests NRC approval of the proposed changes and issuance of the requested license amendment by January 31, 2021. Once approved the amendment shall be implemented within 90 days.

By letter dated July 15, 2019 (ADAMS Accession No. ML19196A270), Susquehanna submitted a request for an amendment to the TS to adopt Advanced Framatome Methodologies. The July 15 submittal was also requested to be approved by January 31, 2021, in order to support fuel loading during the Unit 2 refueling outage scheduled for Spring 2021. While both amendments are required to be approved in order to operate the SSES units with ATRIUM 11 fuel, neither amendment relies upon the other for approval. All information necessary for the NRC to complete its review is present in each application and the NRC could issue the amendments in any order without regards to the results of the other review. Therefore, the two submittals are not "linked" as defined in NRC Office Instruction LIC-109, "Acceptance Review Procedures."

In accordance with 10 CFR 50.91, Susquehanna is providing a copy of this application, with enclosures, to the designated Commonwealth of Pennsylvania state official.

Both the Plant Operations Review Committee and the Nuclear Safety Review Board have reviewed the proposed changes.

Should you have any questions regarding this submittal, please contact Ms. Melisa Krick, Manager – Nuclear Regulatory Affairs, at (570) 542-1818.

This letter contains no new or revised regulatory commitments.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 1/02/2020

Derek Jones for K. Cimorelli

K. Cimorelli

Enclosures:

1. Description and Assessment
2. LOCA Analysis Inputs and Assumptions
3. Marked-Up Technical Specification Pages
4. Revised (Clean) Technical Specification Pages
5. Marked-Up Technical Specification Bases Pages (For Information Only)
6. Calculation Excerpts (For Information Only)
7. Related FSAR Figures

Copy: NRC Region I
Ms. L. H. Micewski, NRC Sr. Resident Inspector
Ms. S. Goetz, NRC Project Manager
Mr. M. Shields, PA DEP/BRP

Enclosure 1 to PLA-7823

Description and Assessment

SUSQUEHANNA ASSESSMENT

1. Summary Description

Pursuant to 10 CFR 50.90, Susquehanna Nuclear, LLC (Susquehanna), is submitting a request for an amendment to the Updated Final Safety Analysis Report (FSAR) and Technical Specifications (TS) for the Susquehanna Steam Electric Station (SSES), Units 1 and 2, Facility Operating License numbers NPF-14 and NPF-22. The proposed amendment would modify the Current Licensing Basis (CLB) for the Design Basis Accident (DBA) Loss of Coolant Accident (LOCA) analysis described in the SSES FSAR, as previously reviewed by the NRC. The proposed changes would utilize an updated version of the ORIGEN code, introduce a new source term to account for the introduction of ATRIUM 11 fuel, use new inputs/assumptions that decrease the assumed Emergency Safety Feature (ESF) leakage into secondary containment, increase the assumed maximum allowable Standby Gas Treatment (SGT) System exhaust flow rate from secondary containment, and increase the allowed control structure unfiltered inleakage that is assumed in the DBA LOCA dose analysis. As a result, the proposed amendment would modify TS 5.5.2, "Primary Coolant Sources Outside Containment," and the TS Bases for TS 3.6.4.1, "Secondary Containment."

2. Detailed Description

NRC review and approval is requested for the following changes associated with accident source term calculation methodology and with the LOCA parameters for postulated accident analysis. Enclosure 2 provides a summary table of the inputs and assumptions used in the Susquehanna LOCA analysis. These changes will support loading ATRIUM 11 fuel and will increase margin for surveillance testing.

2.1 Accident Source Term

The current approved (Reference 1) accident radionuclide activity source term for the SSES core containing ATRIUM 10 fuel was generated using the SAS2H/ORIGEN-S version of the ORIGEN code from SCALE 4.4a. The core radionuclide activity inventory for the new ATRIUM 11 fuel was generated using a revised version of the ORIGEN code, TRITON/ORIGEN-ARP from SCALE 6.2.3 (Reference 2). The proposed change is required to support loading ATRIUM 11 fuel in Spring 2021.

2.2 Emergency Safety Feature System Leakage

The current approved LOCA analysis utilizes a total of 20 gpm of flow through the ESF leakage pathway. This includes 5 gpm to account for ESF leakage and an additional (non-ESF) potential leakage of 15 gpm. The proposed change removes the additional (non-ESF) leakage from the

flowpath so that the LOCA analysis will utilize a total of 5 gpm of flow through the ESF leakage pathway.

The revision to ESF leakage pathways results in changes to FSAR Sections 6.2.4.3.2.3, 15.6.5.5.1.2, and 18.1.69.3 as well as Tables 6.2-22 and 15.6-22. Additionally, the revision to ESF leakage pathways results in eliminating Scram Discharge from the list of systems within the scope of the Primary Coolant Sources Outside Containment Program in TS 5.5.2. Enclosure 3 provides marked-up TS pages for the proposed change; Enclosure 4 provides a clean version of the revised TS pages.

2.3 Secondary Containment Inleakage

The FSAR describes the reactor building as designed to limit the inleakage to 140 percent of the secondary containment free volume per day at a vacuum of 0.25 inches water gauge (in. wg) while operating the SGT System. The proposed change would increase the inleakage limit to 225 percent per day, which requires increased SGT System flow following drawdown. As a result, the acceptance criteria for SGT System flow rate would increase; this change is reflected in the TS Bases for Surveillance Requirement (SR) 3.6.4.1.5. Enclosure 5 provides the marked-up TS Bases pages depicting the increased flow rate.

The increased secondary containment inleakage limit results in changes to FSAR Sections 6.2.3.2.1, 15.6.5.5.1.2, and 18.1.20.3.2.1.10 and Tables 6.2-17, 6.5-7, and 15.6-22.

2.4 Control Room Habitability Envelope Unfiltered Inleakage

Control structure unfiltered inleakage of 500 cubic feet per minute (cfm) is a LOCA parameter for postulated accident analysis which has been used to evaluate control room dose consequence. The proposed change increases that assumed inleakage flow to 600 cfm. The unfiltered control structure inleakage testing acceptance criterion with Control Room Emergency Outside Air Supply (CREOAS) System in operation (emergency mode) will be increased to 600 cfm for this change. The accident dose model descriptions in FSAR Appendix 15B describe the Control Room Habitability Envelope (CRHE) dose model.

The increased CRHE unfiltered inleakage assumption results in changes to FSAR Sections 6.4.2.1 and 15B.2, and Table 15.6-22.

2.5 Control Room Habitability Envelope Continuous Occupancy Locations

The CRHE for SSES Units 1 and 2 is defined in FSAR Figure 6.4-1A and includes the following rooms: Control Room, Technical Support Center (TSC), Backup Operational Support Center (OSC), computer, relay, cable spreading, HVAC and battery rooms for both Units 1

and 2 (refer to Enclosure 7). Of these areas within the CRHE, the following are currently assumed to be continuously occupied following a DBA LOCA:

- Control Structure Elevation 729’-1” (All areas)
- Control Structure Elevation 741'-1" (All areas)
- Computer Room (Room C-202) at Elevation 698'-0"

The proposed change reduces the continuous occupancy assumption to the following rooms following a DBA LOCA:

- Main Control Room (Room C-409), Elevation 729’-1”
- Technical Support Center (Room C-410), Elevation 741’-1”
- Computer Room (Room C-202), Elevation 698’-0”

The proposed change to the continuous occupancy assumption results in changes to FSAR Sections 6.4.2.5 and 15B.2. This change has been determined to require NRC review and approval because the continuous occupancy assumptions were specifically repeated by the NRC in Reference 1.

2.6 Analysis Code (RADTRAD) Version

The current approved dose analysis code per Reference 1 is RADTRAD Version 3.03. The DBA LOCA analysis will be performed with the updated RADTRAD Version 3.10.

2.7 Resultant Dose Consequences

The aggregate dose effects to the analysis of record from the changes that are described above are shown in Table 4. The proposed changes result in dose consequences that remain within the regulatory limits of 10 CFR 50.67.

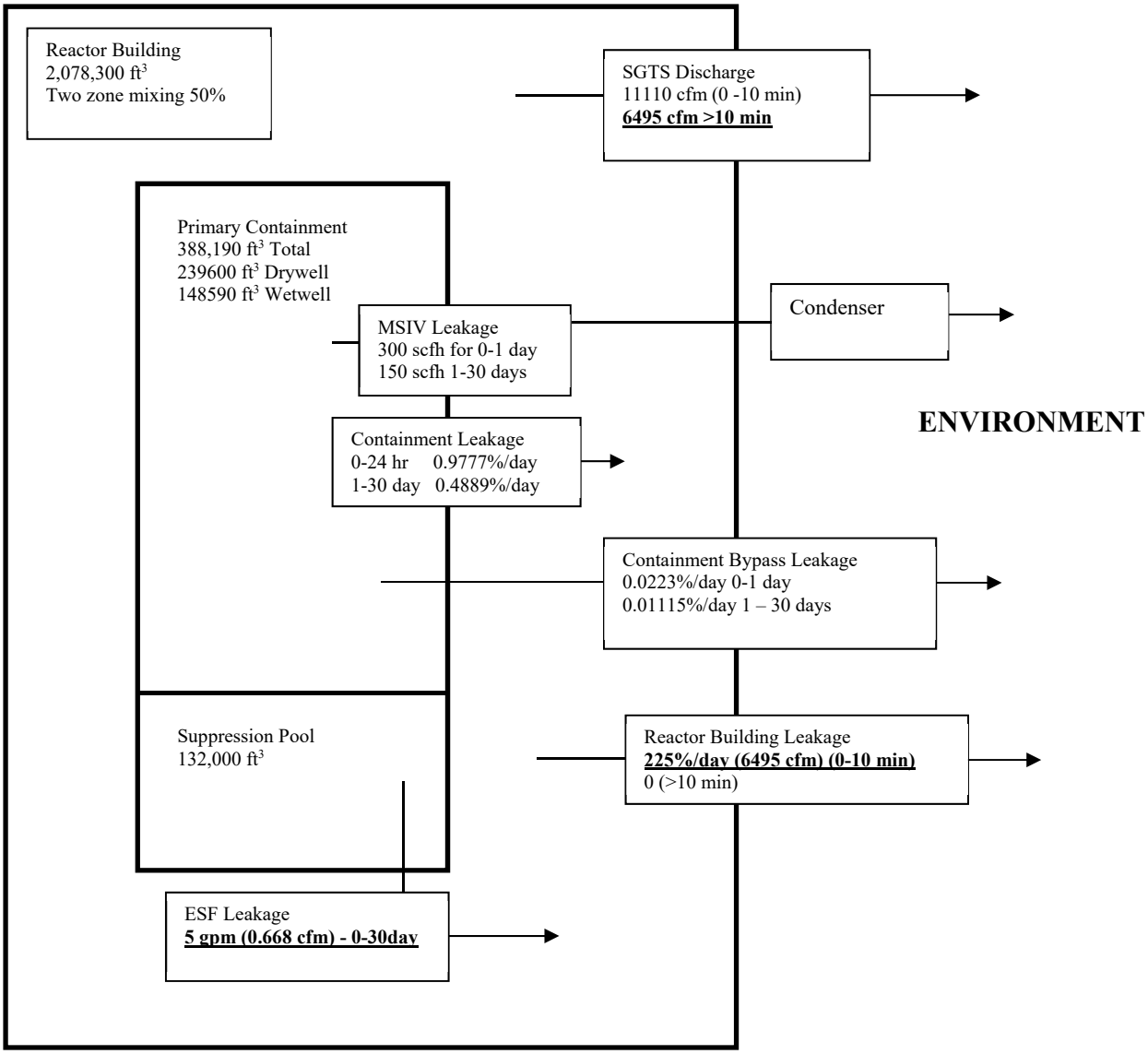
The aggregate impacts of the revised DBA LOCA dose analysis of record results in changes to FSAR Tables 15.6-11, 15.6-13, 15.6-14, 15.6-18, and 15.6-21.

3. Technical Evaluation

The implementation of alternative radiological source term (AST) for SSES Units 1 and 2 was approved by the NRC in Amendment 239/216 (Reference 1). More recent revisions of calculations of the CRHE and offsite post-LOCA doses were approved by the NRC in

Amendment 251/231 (Reference 3). Figure 1 provides a graphical representation of the release paths for the DBA LOCA and shows the relevant proposed changes; the changes are shown in bold and underlined. Enclosure 2 provides a summary table of the inputs and assumptions used in the Susquehanna DBA LOCA analysis.

Figure 1: Release Paths for Susquehanna DBA LOCA



3.1 Accident Source Term

The current source term was developed for cores with ATRIUM 10 fuel using SAS2H/ORIGEN-S from SCALE 4.4.a (Reference 1). The SAS2H/ORIGEN-S code comprises

an advanced version of ORIGEN, and is consistent with the source term code recommendations given by Regulatory Guide (RG) 1.183 (Reference 4), for generation of alternate source terms. Susquehanna plans to load Framatome ATRIUM 11 fuel in spring 2021. The ATRIUM 11 core source term was developed using TRITON/ORIGEN-ARP from SCALE 6.2.3 (Reference 2). The ATRIUM 11 assemblies are modeled in three axial segments based on part length fuel rod length. Each of the three axial segments use a region averaged power and moderator density. Each region also uses a lattice library determined to be representative for the region. The libraries account for fuel lattice geometry at the selected axial elevation.

The current ORIGEN-S based core inventory uses an ATRIUM 10 fuel cycle with core thermal power of 4032 megawatt thermal (MWt) (102 percent of the SSES rated thermal power of 3952 MWt) and core average burnup of 39 gigawatt-days per metric ton of uranium (GWd/MTU). The proposed ORIGEN-ARP based core inventory uses an ATRIUM 11 fuel cycle with core thermal power of 4032 MWt and core average burnup of 41 GWd/MTU. The source term assumes a conservative fuel uranium mass and enrichment sensitivities were performed to bound the range of expected U-235 enrichments in ATRIUM 11 reload fuel. ATRIUM 11 has a higher assembly uranium mass and higher core average burnup than ATRIUM 10, resulting in a conservative core source term for Susquehanna core designs.

The ATRIUM 11 reactor core radionuclide activity inventory will be used to calculate the radiological consequences of all DBAs that assume the release of reactor core activity. For the DBA LOCA, all fuel assemblies in the core are assumed to be affected and the core average inventory was used. The DBA Fuel Handling and Equipment Handling accident, and the DBA Control Rod Drop Accident are also impacted by the source term change; these analyses have been performed and the results will be implemented pursuant to 10 CFR 50.59 following the approval of this submittal.

3.2 Emergency Safety Feature System Leakage

RG 1.183, Appendix A, identifies ESF System Leakage as a source of activity release for evaluating the radiological consequences of a DBA LOCA (compliance with RG 1.183 is discussed in SSES FSAR Section 3.13.1). RG 1.183 defines ESF systems as those systems that recirculate sump water outside of primary containment and these systems are assumed to leak during their intended operation. Two sources of potential suppression pool water leakage directly into secondary containment were conservatively included in the DBA LOCA release model for Susquehanna's RG 1.183 AST submittal (approved in Reference 1). The first was ESF system leakage directly into secondary containment, consistent with RG 1.183, Appendix A. The leakage contribution from this source is 5 gpm. The total leakage from these systems is maintained less than 2.5 gpm in accordance with TS 5.5.2. This leakage was increased for the DBA LOCA dose analysis by a factor of two in accordance with RG 1.183, Appendix A.

In addition to the 5 gpm ESF System leakage, a leakage of 15 gpm was assumed for suppression pool water leakage into secondary containment. This leakage was conservatively assumed to bound any leakage which could occur from other sources inside secondary containment including the Control Rod Drive (CRD) insert/withdrawal lines and the Scram Discharge Volume (SDV). This additional leakage is not ESF System leakage, is not required by RG 1.183, Appendix A, and was strictly included as a conservative assumption. Therefore, a total water leakage of 20 gpm was conservatively assumed for the DBA LOCA dose analysis for the initial AST submittal (refer to Section 3.1.1.3 of Reference 1).

This additional, conservative, non-ESF leakage of 15 gpm is not consistent with current modeling practices employed by the industry and is not consistent with the requirements of RG 1.183, Appendix A, for evaluating the radiological consequences of the DBA LOCA (i.e., it is not recirculated sump leakage). As such, it is being removed as an assumption in the DBA LOCA. Including the SDV in TS 5.5.2 is inconsistent with the standard TS contained in NUREG-1433 (Reference 5). Therefore, it is also being removed from TS 5.5.2 as shown in Enclosure 3.

The Realistic LOCA analysis, which is bounded by the DBA LOCA analysis, also utilizes the current 20 gpm total ESF leakage value. The Realistic LOCA analysis has been re-performed utilizing the 5 gpm total ESF leakage value and the results will be implemented pursuant to 10 CFR 50.59 following the approval of this submittal.

3.3 Secondary Containment Inleakage

The secondary containment structure completely encloses the primary containment structure such that a dual-containment design is utilized to limit the spread of radioactivity to the environment to within limits. The function of the secondary containment is to contain, dilute, and hold up fission products that may leak from primary containment into secondary containment following a DBA. The secondary containment boundary consists of the reactor building structure and associated removable walls and panels, hatches, doors, dampers, sealed penetrations and valves. The secondary containment is divided into Zone I, Zone II and Zone III, each of which must be OPERABLE depending on plant status and the alignment of the secondary containment boundary. Zones I and II are the portions of the reactor building below Elevation 779’-1” surrounding the Unit 1 and Unit 2 primary containments, respectively. Zone III consists of the portion of the reactor buildings above Elevation 779’-1” with the exception of the HVAC equipment rooms which are not part of the secondary containment. The Unit 1 secondary containment boundary can be modified to exclude Zone II. Similarly, the Unit 2 secondary containment boundary can be modified to exclude Zone I.

The SSES TS Bases for SR 3.6.4.1.5 specifies the SGT System exhaust flow rate for various configurations. The proposed change would modify SGT System flow rates specified in Tables 1 and 2.

Table 1: Flow Rates- Railroad Bay Aligned to Secondary Containment

Secondary Containment Configuration	**Existing Flow Rates** (cfm)	**New Flow Rates** (cfm)
Zones I, II and III	5400	6400
Zones I and III	3900	6200
Zones II and III	4000	6300

Table 2: Flow Rates- Railroad Bay Aligned as No Zone

Secondary Containment Configuration	**Existing Flow Rates** (cfm)	**New Flow Rates** (cfm)
Zones I, II and III	5300	6400
Zones I and III	3800	6000
Zones II and III	3900	6100

The proposed change will increase the allowable inleakage from 140 percent per day to 225 percent per day. This change is proposed in order to provide additional margin for secondary containment drawdown testing performed at SSES per SR 3.6.4.1.5. This change is necessary due to the unique nature of the SSES secondary containment configuration. The Unit 1 and 2 secondary containment at Susquehanna spans all eight elevations of the SSES reactor buildings and is divided into three zones with multiple isolation configurations. The secondary containment zones can be interconnected or remain independent based on unit operations. Additionally, the Unit 1 railroad bay can be excluded from secondary containment to support various maintenance activities (e.g., fuel deliveries). As a result of this flexibility, the SSES secondary containment boundary contains more penetrations than other similar sites, resulting in greater inleakage values. Additionally, the assumed SGT System flow rates must be greater to account for this greater inleakage and still be able to draw down the reactor building in the time assumed in the accident analyses. Based on the most recent testing, the inleakage value for the most limiting configuration (Zones II and III with the railroad bay aligned to secondary containment) was 3630 cfm compared to a limit of 4000 cfm. To provide more margin, the limit will be increased from 140 percent per day to 225 percent per day with resultant increases in SGT System exhaust flow rate show in Tables 1 and 2.

Due to the assumed increase in release rate, the dose consequences will increase for the Exclusion Area Boundary (EAB), control room operator, and Low Population Zone (LPZ) but remain below the regulatory limit specified in 10 CFR 50.67; the doses to the control room operator and LPZ will decrease as a result of aggregate impacts (see Section 3.7 of this Enclosure). As stated in the FSAR Section 6.5.1.1.1, the only DBAs that the SGT System is required to mitigate are the DBA LOCA (FSAR Section 15.6.5) and Fuel and Equipment

Handling Accident (FSAR Section 15.7.4). The Main Steam Line Break Outside Containment and the Control Rod Drop Accident do not credit SGT System operation for dose contributions from their respective activity release pathways. The Fuel and Equipment Handling Accident assumes a non-mechanistic activity release over a two hour period. So, even though the SGT System is credited for this accident, the SGT System exhaust flow rate is not representative of the physical system and a specific SGT System exhaust flow rate that correlates to the actual system performance is not assumed in the analysis. Therefore, the only design basis dose analysis that is impacted is the DBA LOCA analysis.

The change is within the capacity of the SGT System so there is no expected impact to SGT System equipment due to the increased flow rate. The other impact of the proposed change is the ability of the SGT System to drawdown the reactor building to a vacuum of 0.25 in. wg post-accident. Per SR 3.6.4.1.4, the secondary containment 0.25 in. wg vacuum must be re-established within five minutes, which bounds the 10 minute drawdown assumed in the dose analysis. The drawdown time will continue to be validated through SR 3.6.4.1.4. The drawdown time is an assumed value in the DBA LOCA dose consequence analysis and is not proposed to be changed in this amendment request.

The Realistic LOCA analysis, which is bounded by the DBA LOCA results, also utilizes the current 140 percent per day inleakage value. The Realistic LOCA analysis has been re-performed using the 225 percent per day inleakage value and the results will be implemented pursuant to 10 CFR 50.59 following the approval of this submittal.

3.4 Control Room Habitability Envelope Unfiltered Inleakage

Under LOCA conditions, habitability for the Control Structure is maintained by the CREOAS System. This system provides habitability zone isolation and a positive pressure for the CRHE. The CRHE is defined for SSES as six separate floors of the control building (refer to Enclosure 7).

Habitability systems are designed to ensure habitability inside the control structure pressurization envelope during all normal and abnormal station operating conditions including the post-LOCA requirements, pursuant to General Design Criteria (GDC) 19 of 10 CFR 50, Appendix A, and 10 CFR 50.67.

The 10 CFR 50.67 dose limit is 5 Rem Total Effective Dose Equivalent (TEDE) to the control room operators. The control structure unfiltered inleakage is leakage into the control structure habitability boundary that bypasses the emergency filtration system (CREOAS). The DBA LOCA analysis assumes a value of control structure unfiltered inleakage that is controlled by the TS 5.5.14 Control Room Envelope Habitability Program and verified by SR 3.7.3.4. This value is controlled by the program, so there are no required TS changes to support the increase in

CRHE unfiltered inleakage. The control structure unfiltered inleakage only impacts the control room operator dose and does not affect the EAB and LPZ doses.

The proposed change will increase the allowable unidentified unfiltered inleakage from 500 cfm to 600 cfm. This change is proposed in order to provide additional margin for the tracer gas inleakage tests performed at SSES per SR 3.7.3.4 as required by TS 5.5.14. This change is necessary due to the unique nature of the SSES CRHE. The envelope at SSES encompasses multiple floor elevations in the control structure. In order to pressurize a boundary of this size, a substantial amount of outside air is required (5810 cfm). Substantial error is introduced into the testing due to measurement of this flow rate and also due to maintaining a uniform concentration in the various rooms on different elevations. In the last tracer gas testing performed in 2017, uncertainty associated with the 'A' train was ±326 cfm. This is a substantial portion of the available limit. To provide more margin, the limit will be increased from 500 cfm to 600 cfm.

The unfiltered control structure inleakage testing acceptance criterion with CREOAS in operation (emergency mode) will be increased to 600 cfm. The DBA LOCA design analysis will be updated to reflect this increase. The only other analysis that relies on CREOAS System actuation is the Equipment and Fuel Handling Accident. This analysis has been re-performed using 600 cfm and the results will be implemented pursuant to 10 CFR 50.59 following the approval of this submittal.

The Realistic LOCA analysis, which is bounded by the DBA LOCA analysis, also utilizes the current 500 cfm CRHE unfiltered inleakage value. The Realistic LOCA analysis has been re-performed utilizing the 600 cfm CRHE unfiltered inleakage value and the results will be implemented pursuant to 10 CFR 50.59 following the approval of this submittal.

3.5 Control Room Habitability Envelope Continuous Occupancy Locations

The CRHE is designed with adequate radiation protection to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of specified values. Although all areas of the control structure envelope are designed for habitability following a DBA LOCA, not all areas inside the envelope require continuous occupancy. The current DBA LOCA analysis assumes continuous occupancy in the following locations (refer to Enclosure 7):

- Control Structure Elevation 729'-1" (All areas)
- Control Structure Elevation 741'-1" (All areas)
- Computer Room (Room C-202) at Elevation 698'-0"

Susquehanna's AST submittal (approved in Reference 1) states that "Elevations 698' (Computer Room), 729'-1" (Control Room), and 741'-1" (TSC) are the only areas of the CRHE that require personnel to meet the occupancy requirements of RG 1.183, Section 4.2.6 during a DBA LOCA. Other areas of the CRHE require significantly less occupancy." The current calculated CRHE dose (TEDE) for areas assumed to be continuously occupied post-accident are displayed in Table 3.

Table 3: Current Dose (including Shine) for Areas Assumed to be Continuously Occupied Post-LOCA

Plant Area	Dose (Rem TEDE)
Control Structure Elevation 729'-1" - All areas except Rooms C-401 & C-402, includes Main Control Room	4.35
Control Structure Elevation 741'-1" - All areas except Rooms C-413 and C-414, includes TSC	4.35
Control Structure Elevations 729'-1" and 741'-1" - All remaining areas (Rooms C-401 (STA Office), C-402 (Backup OSC), C-413 (Electrical Equipment Room) and C-414 (NRC Conference Room))	4.69
Control Structure Elevation 698'-0" - Computer Room (Room C-202)	4.35

The proposed change reduces the continuous occupancy assumption to the following rooms following a DBA LOCA:

- Main Control Room (Room C-409), Elevation 729'-1"
- Technical Support Center (Room C-410), Elevation 741'-1"
- Computer Room (Room C-202), Elevation 698'-0"

Elevation 729'-1" contains the Main Control Room (Room C-409), the Shift Technical Advisor (STA) Office (Room C-401), the Backup OSC (Room C-402), and other ancillary rooms. Elevation 741'-1" contains the TSC (Room C-410), an electrical equipment room (Room C-413) and the NRC conference room (Room C-414). All areas on elevations 729'-1" and 741'-1" are currently assumed to be continuously occupied post-accident. Based on the locations of the piping sources inside the reactor building, the maximum dose rate inside these areas occurs at the closest location to the 14" GBB-101 core spray line. The shine dose rate from this contained

source for corresponding locations in the north and south ends of these areas is the same due to the same source locations in both the Unit 1 and Unit 2 reactor buildings.

On elevation 729'-1", the STA Office (Room C-401) and the Backup OSC (Room C-402) are directly opposite the location of 14" GBB-101. On elevation 741'-1", an electrical equipment room (Room C-413) and the NRC conference room (Room C-414) are also directly opposite the location of 14" GBB-101. As a result of the location of the contained source piping, the Electrical Equipment Room (C-413) has the limiting dose (4.69 Rem TEDE).

It was previously acknowledged that assuming continuous occupancy in the ancillary rooms on Elevations 729'-1" and 741'-1" was a conservative assumption. Continuous occupancy of rooms other than the Control Room, TSC, and Computer Room is not required for safe plant operation or for execution of the Emergency Plan. Therefore, access to the additional rooms on Elevations 729'-1" and 741'-1" can be restricted if needed based on radiation monitoring and the assumption of continuous occupancy will be removed from the DBA LOCA analysis.

3.6 Analysis Code (RADTRAD) Version

As described in Section 1.1 of Reference 6, Alion has revised RADTRAD from Version 3.03 to Version 3.10 (Reference 7) to correct errors and to add enhancements. RADTRAD Version 3.03 was used in Susquehanna's AST amendment and the specific version of the code was specifically referenced in the Safety Evaluation attached to Reference 1.

RADTRAD Version 3.10 is a level 2 software package controlled in accordance with Susquehanna's Software Quality Assurance Program. Verification and validation calculations were performed for Susquehanna and demonstrated RADTRAD Version 3.10 is slightly more conservative than RADTRAD Version 3.03.

3.7 Resultant Dose Consequences

RG 1.183 (Reference 4) provides guidance for implementation of 10 CFR 50.67. This includes assumptions and methods that are acceptable to the NRC for performing design basis radiological analyses using an AST. RG 1.183, Table 6, provides DBA LOCA dose limits at the EAB (worst 2 hour) and LPZ of 25 Rem TEDE. The control room dose limit is 5 Rem TEDE per 10 CFR 50.67.

The proposed changes result in dose consequences that would remain within the regulatory limits. The aggregate of effects from implementing the evaluated changes in Sections 3.1 to 3.6 will decrease the Control Room and LPZ doses and will increase the EAB dose. The increase to the worst case two hour EAB dose is within 10 percent of the available margin to the regulatory limit. Consequently, this proposed change represents only a minimal increase in consequences of the previously evaluated conditions in the FSAR. The LOCA Control Room operator dose is

below the 5 Rem TEDE regulatory limit and the offsite doses are well below the 25 Rem TEDE regulatory limit.

Table 4: DBA LOCA Dose Consequences including Shine

Post-LOCA Dose Type	**Existing DBA LOCA** (Rem TEDE)	**New DBA LOCA** (Rem TEDE)	**Regulatory Limit** (Rem TEDE)
Control Room (30 day)	4.69	4.28	5
EAB (Worst Case 2 hr)	12.0	13.2	25
LPZ (30 day)	4.53	4.19	25

4. Regulatory Evaluation

4.1 Applicable Regulatory Requirements/Criteria

Title 10 Code of Federal Regulations (10 CFR) 50.67

10 CFR 50.67 requires those licensees with an approved alternative source term to ensure, with reasonable assurance that:

(i) An individual located at any point on the boundary of the exclusion area for any two-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 Rem) total effective dose equivalent (TEDE).

(ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 Rem) total effective dose equivalent (TEDE).

(iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 Rem) total effective dose equivalent (TEDE) for the duration of the accident.

Conclusion

10 CFR 50.67 establishes the radiological dose limits for accident conditions.
10 CFR 50.67(b)(2) requires that licensees maintain dose to specific groups of individuals below 5 Rem or 25 Rem, depending on proximity to the accident. As demonstrated in Table 4, each of

the radiological dose limits for a LOCA will continue to be met upon revising the DBA LOCA analysis in the manner described herein. Therefore, 10 CFR 50.67 will continue to be met.

10 CFR 50.36(c)(3)

Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that the facility operation will be within safety limits, and that the limiting conditions for operation will be met.

Conclusion

10 CFR 50.36 sets the regulatory requirements for the content of TS. 10 CFR 50.36(c)(3) requires, in part, that the TS contain SRs, and that the SRs ensure plant safety limits and limiting conditions of operation are met. The proposed change would modify the acceptance criteria for demonstrating an SR has been met which are not specified by the regulation. Therefore, 10 CFR 50.36(c)(3) will continue to be met.

10 CFR 50.36(c)(5)

Administrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.

Conclusions

10 CFR 50.36 sets the regulatory requirements for the content of TS. 10 CFR 50.36(c)(5) requires, in part, that the TS contain administrative controls to ensure that the overall organization and management of a nuclear power plant assures safe operation of the plant. The proposed change would modify the scope of the Primary Coolant Sources Outside Containment program, the content of which is not specified by the regulation. Therefore, 10 CFR 50.36(c)(5) will continue to be met.

10 CFR 50.59(c)(2)

A licensee shall obtain a license amendment pursuant to 10 CFR 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would. . . (viii) Result in a departure from a method of evaluation described in the FSAR (as updated) used in establishing the design bases or in the safety analyses.

Conclusion

Susquehanna has determined that the proposed changes to the LOCA Dose Analysis constitute a departure from a method of evaluation described in the FSAR used in establishing the design bases or in the safety analyses. As such, Susquehanna is requesting a license amendment pursuant to 10 CFR 50.90 prior to implementing the proposed change.

General Design Criteria

During the applicable period of this proposed license amendment, SSES will maintain the ability to meet the applicable GDC as outlined in 10 CFR 50, Appendix A. The applicable GDC are:

> GDC-5, Sharing of Structures, Systems, and Components
>
> Structures, systems, and components important to safety shall not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, an orderly shutdown and cooldown of the remaining units.
>
> GDC-19, Control Room
>
> A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 Rem whole body, or its equivalent to any part of the body, for the duration of the accident. . . holders of operating licenses using an alternative source term under § 50.67, shall meet the requirements of this criterion, except that with regard to control room access and occupancy, adequate radiation protection shall be provided to ensure that radiation exposures shall not exceed 0.05 Sv (5 rem) total effective dose equivalent (TEDE) as defined in § 50.2 for the duration of the accident.

Conclusion

The proposed change to the LOCA dose analysis does not result in any permanent changes to installed structures, systems, or components. Rather, the proposed change modifies the manner by which dose calculations are performed by accounting for new isotopic inventories and adjusting assumptions to more realistically model a LOCA at SSES. As demonstrated in Section 3 of this enclosure, all changes to the LOCA analysis are consistent with the appropriate regulatory guidance and all regulatory limits regarding total dose continue to be met. Therefore,

the criteria above and as listed in 10 CFR 50, Appendix A, and the SSES FSAR continue to be met.

4.2 Precedent

The NRC routinely approves license amendments which make changes to dose consequence analyses of records. Recently, the NRC issued an amendment to Virginia Electric and Power Company for the Surry Power Station which utilized new analysis codes, updated atmospheric dispersion factors, and made other changes (Reference 8). The Surry amendment approved in Reference 8 did not utilize TRITON/ORIGEN-ARP for generation of the source term. However, the NRC has approved a revision to Certificate of Compliance No. 9302 for TN Americas which utilized a source term calculated using TRITON/ORIGEN-ARP in SCALE 6.0 (Reference 9) and has issued an exemption to Entergy which utilized ORIGEN-ARP in an Exemption Request for the Pilgrim Nuclear Power Station to support decommissioning (Reference 10). Additionally, the NRC issued an amendment to Indiana Michigan Power Company for the DC Cook Nuclear Power Plant regarding implementation of AST (Reference 11). In its application for this amendment, Indiana Michigan Power Company stated that they utilized RADTRAD Version 3.10 in its analyses.

While none of these amendments are directly applicable to Susquehanna's request, they do demonstrate the acceptability of updating AST analyses using TRITON/ORIGEN-ARP and RADTRAD Version 3.10.

4.3 No Significant Hazards Consideration Analysis

Pursuant to 10 CFR 50.90, Susquehanna Nuclear, LLC (Susquehanna), is submitting a request for an amendment to the Updated Final Safety Analysis Report (FSAR) and Technical Specifications (TS) for the Susquehanna Steam Electric Station (SSES), Units 1 and 2, Facility Operating License numbers NPF-14 and NPF-22. The proposed amendment would modify the Current Licensing Basis (CLB) for the Design Basis Accident (DBA) Loss of Coolant Accident (LOCA) analysis described in the SSES FSAR, as previously reviewed by the NRC. The proposed changes would utilize an updated version of the ORIGEN code, introduce a new source term to account for the introduction of ATRIUM 11 fuel, use new inputs/assumptions that decrease the assumed Emergency Safety Feature (ESF) leakage into secondary containment, increase the assumed maximum allowable Standby Gas Treatment (SGT) System exhaust flow rate from secondary containment, increase the allowed control structure unfiltered inleakage that is assumed in the DBA LOCA dose analysis. As a result, the proposed amendment would modify TS 5.5.2, "Primary Coolant Sources Outside Containment," and the TS Bases for TS 3.6.4.1, "Secondary Containment."

Susquehanna has evaluated the proposed amendment against the standards in 10 CFR 50.92 and has determined that the operation of SSES in accordance with the proposed amendment presents

no significant hazards. Susquehanna's evaluation against each of the criteria in 10 CFR 50.92 follows.

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

   Response: No

   The proposed change would modify inputs and assumptions to the DBA LOCA analysis to account for a new fuel type while more realistically modeling the impacts of a LOCA at SSES. The proposed change is considered to be a departure from a method of evaluation described in the FSAR, but it does not modify any structures, systems, or components (SSCs) installed at SSES. The proposed change does result in a higher Exclusion Area Boundary (EAB) dose calculated as a result of a postulated LOCA. The increased dose does not affect any initiator or precursor of any accident previously evaluated. Thus, the proposed change does not involve a significant increase in the probability of an accident previously evaluated. Further, the increase in post-LOCA radiological dose remains within the limits of 10 CFR 50.67 and 10 CFR 50, Appendix A, Criterion 19. As such, the proposed change also does not involve a significant increase in the consequences of an accident previously evaluated.

   Therefore, the proposed change does 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 proposed change would modify inputs and assumptions to the DBA LOCA analysis to account for a new fuel type while more realistically modeling the impacts of a LOCA at SSES. The proposed change does not alter the design function or operation of any SSCs installed at SSES. The proposed change is considered a departure from a method of evaluation described in the FSAR and it does result in new or different assumptions into the DBA LOCA analysis, but all assumptions are within the capabilities of installed SSCs or are relaxations to existing assumptions that are assumed while still demonstrating the post-LOCA radiological dose remains within the limits of 10 CFR 50.67 and 10 CFR 50, Appendix A, Criterion 19. The proposed change does not introduce any new modes of plant operation. As such, no new failure modes are introduced.

   Therefore, the proposed change does 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

   The proposed change is considered a departure from a method of evaluation described in the FSAR. But, the calculations continue to be performed in accordance with the requirements of 10 CFR 50.67 and Regulatory Guide 1.183. The margin of safety is considered to be that provided by meeting the applicable regulatory limits. The proposed changes do result in an increase to post-LOCA radiological dose at the EAB. However, the post-LOCA dose remains within the regulatory limits of 10 CFR 50.67 and 10 CFR 50, Appendix A, Criterion 19.

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

Based on the above evaluation, Susquehanna concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusions

In conclusion, 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. Environmental Consideration

Susquehanna has determined that 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. References

1. NRC letter to Susquehanna, "Issuance of Amendment Re: Implementation of Alternative Radiological Source Term (TAC Nos. MC8730 and MC8731)," dated January 31, 2007 (ADAMS Accession No. ML070080301)

2. Oak Ridge National Laboratory Technical Document ORNL/TM-2005/39, "SCALE Code System," Version 6.2.3, dated March 2018

3. NRC letter to Susquehanna, "Issuance of Amendment Re: Technical Specification Change to Technical Specification 3.6.1.3 to Increase the Maximum Allowable Secondary Containment Bypass Leakage Limit (TAC Nos. MD9572 and MD9573)," dated March 18, 2009 (ADAMS Accession No. ML090500233)

4. NRC Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," Revision 0, dated July 2000 (ADAMS Accession No. ML003716792)

5. NRC NUREG-1433, "Standard Technical Specifications – General Electric Plants (BWR/4)," Revision 4, Volumes 1 and 2, dated April 2012 (ADAMS Accession Nos. ML12104A192 and ML12104A193)

6. Alion Science and Technology Document ALION-UGM-RADTRAD-2408-02, "Alion RADTRAD 3.10 User's Manual," Revision 0, dated December 2008

7. Alion Science and Technology Document ALION-REP-RADTRAD-2408-04, "Alion RADTRAD 3.10 Validation and Verification Report," Revision 3, dated February 22, 2018

8. NRC letter to Surry, "Issuance of Amendment Nos. 295 and 295 to Adopt TSTF-490, Revision 0, and Update Alternative Source Term Analyses (EPID L-2018-LLA-0068)," dated June 12, 2019 (ADAMS Accession No. ML19028A384)

9. NRC letter to TN Americas, LLC, "Revision No. 8 of Certificate of Compliance No. 9302 for the Model No. NUHOMS® -MP197 Package," dated May 23, 2017 (ADAMS Package Accession No. ML17143A259)

10. NRC SRM SECY 19-0078, "Request by Entergy Nuclear Operations, Inc. for Exemptions from Certain Emergency Planning Requirements for the Pilgrim Nuclear Power Station," dated November 4, 2019 (ADAMS Accession No. ML19308A034 and Package No. ML18347A717)

11. NRC letter to DC Cook, "Issuance of Amendments Re: Adoption of TSTF-490, Rev. 0, 'Deletion of E-Bar Definition and Revision to Reactor Coolant System Specific Activity

Technical Specification' and Implementation of Full-Scope Alternative Source Term (CAC Nos. MF5184 and MF5185)," dated October 20, 2016 (ADAMS Accession No. ML16242A111)

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LOCA Analysis Inputs and Assumptions

This table contains all the input parameters/assumptions used to generate the Susquehanna DBA LOCA dose consequence analysis. The middle column identifies the values used in the existing analysis; the right-most column identifies the values in the proposed revised analysis. All changes from the existing analysis to the proposed revised analysis are bolded in the right-most column. Changes are limited to parameters 20, 22, 42, 56, and 57.

Parameter		Current Design Basis	Revised Design Basis
1	Core Thermal Power Level	4032 MWt	4032 MWt
2	Activity Inventory in Core Ci/MWt	60 dose significant isotopes used in RADTRAD	60 dose significant isotopes used in RADTRAD
3	Radioisotope Decay Properties	RADTRAD Table 1.4.3.2-3	RADTRAD Table 1.4.3.2-3
4	Activity Release to Containment	Per RG 1.183, Table 1 (Gap & Early In-Vessel Phases Only)	Per RG 1.183, Table 1 (Gap & Early In-Vessel Phases Only)
5	Release Timing	Per RG 1.183, Table 4	Per RG 1.183, Table 4
6	Radioiodine Chemical Species	95% Aerosol (CsI) 4.85% Elemental 0.15% Organic	95% Aerosol (CsI) 4.85% Elemental 0.15% Organic
7	Primary Containment Volume	Drywell free volume = 239600 ft^3 Wetwell free volume = 148590 ft^3 Total free volume = 388190 ft^3	Drywell free volume = 239600 ft^3 Wetwell free volume = 148590 ft^3 Total free volume = 388190 ft^3
8	Primary Containment Cleanup (Natural Deposition)	Aerosol removal via Natural Deposition (10th percentile Powers Model)	Aerosol removal via Natural Deposition (10th percentile Powers Model)
9	Primary Containment Cleanup (Drywell Sprays)	No credit taken	No credit taken
10	Primary Containment Design Leak Rate	1%/day for first 24 hours; and 0.5%/day thereafter.	1%/day for first 24 hours; and 0.5%/day thereafter.
11	Primary Containment Design Leak Rate into Secondary Containment (RB)	0.9777 %/day for first 24 hours; and 0.4889 %/day thereafter.	0.9777 %/day for first 24 hours; and 0.4889 %/day thereafter.

Parameter		Current Design Basis	Revised Design Basis
12	Containment Bypass Leak Rate	0.0223%/day (0.0601 cfm) 0 - 24 hours 0.01115%/day (0.03005 cfm) thereafter	0.0223%/day (0.0601 cfm) 0 - 24 hours 0.01115%/day (0.03005 cfm) thereafter
13	Offsite Breathing Rates(m^3/sec)	3.5E-04, 0-8 hrs 1.8E-04, 8-24 hrs 2.3E-04, 1-30 d	3.5E-04, 0-8 hrs 1.8E-04, 8-24 hrs 2.3E-04, 1-30 d
14	Dose Conversion Factors	RADTRAD Table 1.4.3.3-2	RADTRAD Table 1.4.3.3-2
15	Suppression Pool Scrubbing	Not Credited	Not Credited
16	Secondary Containment (RB) Free Air Volume	Zone I 1,488,600 ft^3 Zone II 1,598,600 ft^3 Zone III 2,668,000 ft^3 Total Volume = 5,755,200 ft^3	Zone I 1,488,600 ft^3 Zone II 1,598,600 ft^3 Zone III 2,668,000 ft^3 Total Volume = 5,755,200 ft^3
17	Secondary Containment Volume Mixing Fraction / Analysis Volume	50% mixing. RADTRAD Volume = 2,078,300 ft^3	50% mixing. RADTRAD Volume = 2,078,300 ft^3
18	SGTS at Full Flow Post LOCA	30 seconds	30 seconds
19	Post-LOCA RB Drawdown Time	10 minutes (Used in analysis)	10 minutes (Used in analysis)
20	RB Leakage Till End of Drawdown	140 %/day or 4041.1 cfm for two Zone (I&III) mixing	**225 %/day or 6494.7 cfm for two Zone (I & III) mixing**
21	RB Leakage After Drawdown	0 cfm	0 cfm
22	SGTS Flow Rate	11,110 cfm for the first 10 minutes and 4041.1 cfm thereafter	**11,110 cfm for the first 10 minutes and 6494.7 cfm thereafter**
23	SGTS Filter Bed Depth	8 in. Charcoal	8 in. Charcoal
24	SGTS Filter Bed Efficiency	99% for all iodine species	99% for all iodine species
25	MSIV Leak Rate	300 scfh (4 lines) modeled as: 100 scfh in one assumed faulted line 66.67 scfh each in the remaining lines	300 scfh (4 lines) modeled as: 100 scfh in one assumed faulted line 66.67 scfh each in the remaining lines

	Parameter	Current Design Basis	Revised Design Basis
26	MSL "C" Faulted Line Length to Condenser	NA Pipe not used for plateout.	NA Pipe not used for plateout.
27	MSL "A" Length/ IDs MSL "B" Length/ IDs MSL "D" Length/ IDs	20.5625 ft./23.647" + 2.5 ft./22.062" 22.5625 ft./23.647" + 2.5 ft./22.062" 20.5625 ft./23.647" + 2.5 ft./22.062"	20.5625 ft./23.647" + 2.5 ft./22.062" 22.5625 ft./23.647" + 2.5 ft./22.062" 20.5625 ft./23.647" + 2.5 ft./22.062"
28	MSL Volume – Reactor to Condenser	MSL "A" – 67.8 ft^3 MSL "B" – 73.9 ft^3 MSL "D" – 67.8 ft^3	MSL "A" – 67.8 ft^3 MSL "B" – 73.9 ft^3 MSL "D" – 67.8 ft^3
29	MSL Projected Internal Surface Area – For Aerosol Plateout	MSL "A" – 22.1 ft^2 MSL "B" – 24.0 ft^2 MSL "D" – 22.1 ft^2	MSL "A" – 22.1 ft^2 MSL "B" – 24.0 ft^2 MSL "D" – 22.1 ft^2
30	MSL Internal Surface Area – For Elemental Plateout	MSL "A" – 136.6 ft^2 MSL "B" – 151.0 ft^2 MSL "D" – 136.6 ft^2	MSL "A" – 136.6 ft^2 MSL "B" – 151.0 ft^2 MSL "D" – 136.6 ft^2
31	Leakage Split Between Drain Line and MSL/HPT Pathways to Condenser	98.7%, Drain Line 1.3%, MSL/HPT.	98.7%, Drain Line 1.3%, MSL/HPT.
32	RADTRAD model for Leakage Split Between Drain Line and MSL/HPT Pathways to Condenser	100%, Drain Line	100%, Drain Line
33	Minimum Drain Line Length Volume Surface Area for Aerosol Plateout Surface Area for Elemental Plateout	281.2 ft 18.828 ft^3 40.688 ft^2 255.65 ft^2	281.2 ft 18.828 ft^3 40.688 ft^2 255.65 ft^2
34	Effective Aerosol and Elemental Removal for MSIV Path	Table 6 of EC-RADN-1125	Table 6 of EC-RADN-1125 (Unchanged)
35	Effective Condenser Volume for Each Pathway	98,601 ft^3	98,601 ft^3

Parameter		Current Design Basis	Revised Design Basis
36	Effective Removal Efficiency in Condenser for Drain Line Pathway	99.6%, effective on aerosols and elemental iodine No organic iodine removal.	99.6%, effective on aerosols and elemental iodine No organic iodine removal.
37	Modeled MSIV Leakage – MSL Inlet, Initial Pressure and Temperature.	Drywell Peak Accident Values MSL Pressure = 50 psia MSL Temperature = 340 °F	Drywell Peak Accident Values MSL Pressure = 50 psia MSL Temperature = 340 °F
38	MSIV Leakage Pressure and Temperature into Condenser	Pressure = 1 atm, Temperature = 100 °F	Pressure = 1 atm, Temperature = 100 °F
39	MSIV source release timing	Instantaneous	Instantaneous
40	Minimum Suppression Pool Volume Post LOCA	122,410 ft^3 (Low volume based on 22 feet pool level) 610,000 lbm (reactor water mass) 610,000 lbm/62.4 lb/ft^3 = 9776 ft^3 Total: 132,000 ft^3	122,410 ft^3 (Low volume based on 22 feet pool level) 610,000 lbm (reactor water mass) 610,000 lbm/62.4 lb/ft^3 = 9776 ft^3 Total: 132,000 ft^3
41	ESF System Leakage Source Term to Environment	Iodine only	Iodine only
42	ESF Leakage into RB	20 gpm or 2.674 cfm	**5 gpm or 0.668 cfm**
43	ESF Leakage Outside of the RB	None	None
44	ESF Leakage post-LOCA Time	Begins at 0 Sec - Ends at 30 Days	Begins at 0 Sec - Ends at 30 Days
45	SSES post-LOCA Suppression Pool maximum temperature	< 212 °F	< 212 °F
46	ESF Flash Fraction	10%	10%
47	SP Iodine Species	97% Elemental 3% Organic	97% Elemental 3% Organic
48	Iodine Re-evolution	None Assumed Since pH >7	None Assumed Since pH >7
49	RB Sump Iodine Species	97% Elemental 3% Organic	97% Elemental 3% Organic
50	Control Structure Habitability Envelope Total Volume	518,000 ft^3	518,000 ft^3
51	Control Room Free Air Volume	110,000 ft^3	110,000 ft^3
52	Geometry Correction Factor	$GF = 1173/V^{0.338}$ V= CRHE or Control Room Volume	$GF = 1173/V^{0.338}$ V= CRHE or Control Room Volume

	Parameter	Current Design Basis	Revised Design Basis
53	CR Isolation Time	0	0
54	Emergency Intake Air Flow, Total into Control Structure	5229 cfm	5229 cfm
55	Unfiltered Air Inleakage ingress/egress	10 cfm	10 cfm
56	Other Unfiltered Air Inleakage	500 cfm	**600 cfm**
57	CR Exhaust Flow	5739 cfm	**5839 cfm**
58	Emergency Filter Bed Depth	4 in Charcoal	4 in Charcoal
59	Emergency Filter Bed Removal Efficiency	99%	99%
60	Operator Breathing Rates Offsite Breathing Rates	3.5E-04 m^3/sec (0 – 30 days) 3.5E-04 m^3/sec (0 – 8 hours) 1.8E-04 m^3/sec (8 – 24 hours) 2.3E-04 m^3/sec (1 – 30 days)	3.5E-04 m^3/sec (0 – 30 days) 3.5E-04 m^3/sec (0 – 8 hours) 1.8E-04 m^3/sec (8 – 24 hours) 2.3E-04 m^3/sec (1 – 30 days)
61	Operator Occupancy Factors	1.0 0-24 hrs 0.6 1-4 days 0.4 4-30 days	1.0 0-24 hrs 0.6 1-4 days 0.4 4-30 days
62	χ/Q	EAB: (0 - 2 hrs) 8.3E-04 sec/m3 LPZ: (0 - 8 hrs) 4.9E-05 sec/m3 (8 - 24 hrs) 3.50E-05 sec/m3 (24 - 96 hrs) 1.70E-05 sec/m3 (96 - 720 hrs) 6.10E-06 sec/m3 CRHE χ/Q values listed on Table 15 of EC-RADN-1125.	EAB: (0 - 2 hrs) 8.3E-04 sec/m3 LPZ: (0 - 8 hrs) 4.9E-05 sec/m3 (8 - 24 hrs) 3.50E-05 sec/m3 (24 - 96 hrs) 1.70E-05 sec/m3 (96 - 720 hrs) 6.10E-06 sec/m3 CRHE χ/Q values listed on Table 15 of EC-RADN-1125. (Unchanged)

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5.5 Programs and Manuals

5.5.1 ODCM (continued)

shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Primary Coolant Sources Outside Containment

This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include Core Spray, High Pressure Coolant Injection, Residual Heat Removal, Reactor Core Isolation Cooling, Reactor Water Cleanup, Standby Gas Treatment, ~~Scram Discharge,~~ Post Accident Sampling (until such time as a modification eliminates the PASS penetration as a potential leakage path) and Containment Air Monitoring Systems. The program shall include the following:

a. Preventive maintenance and periodic visual inspection requirements; and

b. Integrated leak test requirements for each system at least once per 24 months.

The provisions of SR 3.0.2 are applicable.

5.5.3 Not Used

5.5.4 Radioactive Effluent Controls Program

This program conforms to 10 CFR 50.36a for the control of radioactive effluents and for maintaining the doses to members of the public from radioactive effluents as low as reasonably

5.5 Programs and Manuals

5.5.1 ODCM (continued)

shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Primary Coolant Sources Outside Containment

This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include Core Spray, High Pressure Coolant Injection, Residual Heat Removal, Reactor Core Isolation Cooling, Reactor Water Cleanup, Standby Gas Treatment~~, Scram Discharge~~, Post Accident Sampling (until such time as a modification eliminates the PASS penetration as a potential leakage path) and Containment Air Monitoring Systems. The program shall include the following:

a. Preventive maintenance and periodic visual inspection requirements; and

b. Integrated leak test requirements for each system at least once per 24 months.

The provisions of SR 3.0.2 are applicable.

5.5.3 Not Used

5.5.4 Radioactive Effluent Controls Program

This program conforms to 10 CFR 50.36a for the control of radioactive effluents and for maintaining the doses to members of the public from radioactive effluents as low as reasonably

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5.5 Programs and Manuals

5.5.1 ODCM (continued)

shall indicate the date (i.e., month and year) the change was implemented.

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a. Preventive maintenance and periodic visual inspection requirements; and

b. Integrated leak test requirements for each system at least once per 24 months.

The provisions of SR 3.0.2 are applicable.

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5.5 Programs and Manuals

5.5.1 ODCM (continued)

shall indicate the date (i.e., month and year) the change was implemented.

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a. Preventive maintenance and periodic visual inspection requirements; and

b. Integrated leak test requirements for each system at least once per 24 months.

The provisions of SR 3.0.2 are applicable.

5.5.3 Not Used

5.5.4 Radioactive Effluent Controls Program

This program conforms to 10 CFR 50.36a for the control of radioactive effluents and for maintaining the doses to members of the public from radioactive effluents as low as reasonably

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(Provided for Information Only)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.1.4 and SR 3.6.4.1.5

The SGT System exhausts the secondary containment atmosphere to the environment through appropriate treatment equipment. To ensure that all fission products are treated, SR 3.6.4.1.4 verifies that the SGT System will rapidly establish and maintain a pressure in the secondary containment that is less than the pressure external to the secondary containment boundary. This is confirmed by demonstrating that one SGT subsystem will draw down the secondary containment to ≥ 0.25 inches of vacuum water gauge in less than or equal to the maximum time allowed. This cannot be accomplished if the secondary containment boundary is not intact. SR 3.6.4.1.5 demonstrates that one SGT subsystem can maintain ≥ 0.25 inches of vacuum water gauge for at least 1 hour at less than or equal to the maximum flow rate permitted for the secondary containment configuration that is operable. The 1 hour test period allows secondary containment to be in thermal equilibrium at steady state conditions. As noted, both SR 3.6.4.1.4 and SR 3.6.4.1.5 acceptance limits are dependent upon the secondary containment configuration when testing is being performed. The acceptance criteria for the SRs based on secondary containment configuration is defined as follows:

SECONDARY CONTAINMENT TEST CONFIGURATION	MAXIMUM DRAWDOWN TIME (SEC) (SR 3.6.4.1.4 ACCEPTANCE CRITERIA)	MAXIMUM FLOW RATE (CFM) (SR 3.6.4.1.5 ACCEPTANCE CRITERIA)
Group 1		
Zones I, II and III (Unit 1 Railroad Bay aligned to Secondary Containment).	≤ 300 Seconds (Zones I, II, and III)	≤ ~~5400~~ 6400 CFM (From Zones I, II, and III)
Zones I and III (Unit 1 Railroad Bay aligned to Secondary Containment).	≤ 300 Seconds (Zones I and III)	≤ ~~3900~~ 6200 CFM (From Zones I and III)
Group 2		
Zones I, II and III (Unit 1 Railroad Bay not aligned to Secondary Containment).	≤ 300 Seconds (Zones I, II, and III)	≤ ~~5300~~ 6400 CFM (From Zones I, II, and III)
Zones I and III (Unit 1 Railroad Bay not aligned to Secondary Containment).	≤ 300 Seconds (Zones I and III)	≤ ~~3800~~ 6000 CFM (From Zones I and III)

Only one of the above listed configurations needs to be tested to confirm secondary containment OPERABILITY.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.4.1.4 and SR 3.6.4.1.5

SECONDARY CONTAINMENT TEST CONFIGURATION	MAXIMUM DRAWDOWN TIME (SEC) (SR 3.6.4.1.4 ACCEPTANCE CRITERIA)	MAXIMUM FLOW RATE (CFM) (SR 3.6.4.1.5 ACCEPTANCE CRITERIA)
Group 1		
Zones I, II and III (Unit 1 Railroad Bay aligned to Secondary Containment).	≤ 300 Seconds (Zones I, II, and III)	≤ ~~5400~~ 6400 CFM (From Zones I, II, and III)
Zones II and III (Unit 1 Railroad Bay aligned to Zone III).	≤ 300 Seconds (Zones II and III)	≤ ~~4000~~ 6300 CFM (From Zones II and III)
Group 2		
Zones I, II and III (Unit 1 Railroad Bay not aligned to Secondary Containment).	≤ 300 Seconds (Zones I, II, and III)	≤ ~~5300~~ 6400 CFM (From Zones I, II, and III)
Zones II and III (Unit 1 Railroad Bay not aligned to Secondary Containment).	≤ 300 Seconds (Zones II and III)	≤ ~~3900~~ 6100 CFM (From Zones II and III)

Only one of the above listed configurations needs to be tested to confirm secondary containment OPERABILITY.

The secondary containment testing configurations are discussed in further detail to ensure the appropriate configurations are tested. Three zone testing (Zones, I, II and III aligned to the recirculation plenum) should be performed with the Railroad Bay aligned to secondary containment and another test with the Railroad Bay not aligned to secondary containment. Each test should be performed with each division on a STAGGERED TEST BASIS.

Two zone testing (Zones II and III aligned to the recirculation plenum) should be performed with the Railroad Bay aligned to secondary containment and another test with the Railroad Bay not aligned to secondary containment. Each test should be performed with each division on a STAGGERED TEST BASIS. The normal operating fans of the non-tested HVAC zone (Zone I fans 1V202A&B, 1V205A&B and 1V206A&B) should not be in operation. Additionally, a controlled opening of adequate size should be maintained in Zone I Secondary Containment during testing to assure that atmospheric conditions are maintained in that zone.

Enclosure 6 of PLA-7823

Calculation Excerpts

EC-RADN-1125, Revision 7

EC-RADN-1129, Revision 7

(Provided for Information Only)

5.0 RESULTS

DBA-LOCA doses to the Control Room Habitability Envelope (CRHE) are as follows:

SUMMARY OF CONTROL ROOM HABITABILITY ENVELOPE DBA-LOCA DOSES		
DBA-LOCA Source	**DBA-LOCA Dose (1) (Rem) TEDE**	
	Main Control Room (Room C-409) Elevation 729'-1" and Technical Support Center (Room C-410) Elevation 741'-1"	**Computer Room (Room C-202) Elevation 698'-0"**
Intake Or Infiltration Of Radioactive Material Contained In The Effluent Plume	4.11	4.11
Radiation Shine From The Radioactive Effluent Plume	0.0577	0.0577
Intake Or Infiltration Of Airborne Radioactive Material From Areas And Structures Adjacent To The Control Room Envelope	0	0
Shine From Containment	Negligible	Negligible
Shine From The Reactor Building	0.0320	0.0320
Shine From The Turbine Building	0.0163	0.0163
Shine From Radioactive Material In Systems And Components - Piping	0.0597	0.0640
Shine From Radioactive Material In Systems And Components - SGTS Filter	Negligible	Negligible
TOTAL	4.28	4.28

Notes:
(1) Radiation shine doses given in this Table are actually Rem EDE. However, since the shine sources are located outside the CRHE, there is no CEDE dose component for these sources. Therefore, the shine dose is equivalent to Rem TEDE.

7

5.0 RESULTS

The RADTRAD output files are provided on Attachments 11, 12, 13, 14, 15, 16 and 19. 7

5.1 Protected CRHE Doses from Infiltration

The protected CRHE doses from the RADTRAD runs for activity infiltrating the CRHE are summarized in Table 18. The CRHE dose acceptance criterion is 5 Rem TEDE.

Table 18 CRHE Dose Results from Infiltration

Release Path	Rem TEDE	Rem CEDE	Rem EDE	Adjusted Rem EDE (1)	Adjusted Rem TEDE (2)	Attachment
RB SGTS						
CREOAS 5839 cfm 0-2 hr	0.431	0.223	0.207	0.122	0.346	11
CREOAS 5839 cfm 2-720	1.571	0.331	1.240	0.731	1.063	19
ESF						
CREOAS 5839 cfm 0-720 hr	0.473	0.331	0.143	0.084	0.415	12
Bypass						
CREOAS 5839 cfm 0-2 hr	0.868	0.851	0.017	0.010	0.861	13
CREOAS 5839 cfm 2-720 hr	1.090	1.031	0.059	0.035	1.066	14
MSIV						
CREOAS 5839 cfm 0-2hr	0.014	0.002	0.012	0.007	0.009	15
CREOAS 5839 cfm 2-720 hr	0.447	0.211	0.236	0.139	0.350	16
TOTAL					4.11	

7

1. TEDE = CEDE + EDE. Adjusted Rem EDE equals the Rem EDE from RADTRAD times the finite volume correction of 0.59 (See Section 3.24).
2. Adjusted Rem TEDE equals the Rem CEDE from RADTRAD plus the Adjusted Rem EDE.

Table 23 EAB and LPZ Dose Results			
Release Path	EAB Dose Rem TEDE	LPZ Dose Rem TEDE	Attachment
Acceptance Criterion	25	25	
RB SGTS			
CREOAS 5839 cfm 0-2 hr	2.32	0.32	11
CREOAS 5839 cfm 2-720 hr	4.29	1.96	19
ESF			
CREOAS 5839 cfm 0-720 hr	0.50	0.45	12
Bypass			
CREOAS 5839 cfm 0-2 hr	5.73	0.34	13
CREOAS 5939 cfm 2-720 hr	NA	0.64	14
MSIV			
CREOAS 5839 cfm 0-2hr	NA	0.01	15
CREOAS 5839 cfm 2-720 hr	0.34	0.47	16
TOTAL	**13.2**	**4.19**	

7

5.5 Activity Released to Environment

The isotopic activity released to the environment as a function of time is shown in Table 24. The activities are taken from Attachments 11 through 16 and 19.

Attachment 11 RADTRAD Output:
Attch 11 SGTS_Atrium11_600cfm_11110cfm_6495cfm_0-2hr drywell vol.o0

7

All Attachment 11 Pages Revised for Rev 7

```
 ######################################################################
     ALION RADTRAD Version 3.10 Rev 4 run on 09/16/2019  at 11:57:51

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

             LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

 Input File Name      = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 11
SGTS_Atrium11_600cfm_11110cfm_6495cfm_0-2hr drywell vol.psf
 Output File Name     = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 11
SGTS_Atrium11_600cfm_11110cfm_6495cfm_0-2hr drywell vol.o0

 Inventory file       =  c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Release file         =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
 Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp




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


   Radtrad 3.10  Rev. 4
   LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS
 Dose Conversion Factor File:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
 Release Fraction & Timing Files:
   1
   c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
 Nuclide Inventory Files:
   1
   1 c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Plant Power Level:
   4.032E+03
 Number of Compartments:
   4
 Compartment 1:
   Primary Containment
   3
   2.396E+05
   0
   0
   0
   1
   0
 Compartment 2:
   Secondary Containment
   3
   2.078E+06
   0
   0
   0
   0
   0
 Compartment 3:
   Environment
   2
```

```
  0.00E+00
  0
  0
  0
  0
  0
Compartment 4:
  Control Room
  1
  5.18E+05
  0
  0
  0
  0
  0
Number of Pathways:
  7
Pathway 1:
  Primary Containment to Secondary Containment - Primary Leakage
  1
  2
  4
Pathway 2:
  Secondary Containment to Environment - SGTS Leakage
  2
  3
  2
Pathway 3:
  Environment to Control Room - Emergency Filtered Air Intake
  3
  4
  2
Pathway 4:
  Environment to Control Room - Unfiltered Inleakage
  3
  4
  2
Pathway 5:
  Control Room to Environment - CR Exhaust
  4
  3
  2
Pathway 6:
  Environment to  Control Room ingress/egress
  3
  4
  2
Pathway 7:
  Secondary Containment to  Environment
  2
  3
  2
  End of Plant Model
Source Term Input:
  1
  1  1  1  1
  0.00E+00
  0.00E+00   7.2E+02
  1
  2   9.5E-01   4.85E-02   1.5E-03
Overlying Pool:
  0
  0.00E+00
  0
  0
  0
  0
Compartments:
  4
Compartment 1:
```

```
  0
  1
  0
  0
  0
  0
  0
  3
  3
  1.00E+01
  1
  1
  0.00E+00   0.00E+00
Compartment 2:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  7
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  4
  0.00E+00   9.777E-01
  1.667E-01   9.777E-01
  2.00E+00   0.00E+00
  7.2E+02   0.00E+00
  0
Pathway 2:
  1
  0
  0
  0
  0
  1
```

```
  3
  0.00E+00   1.111E+04   0.00E+00   0.00E+00   0.00E+00
  1.667E-01   6.495E+03   9.9E+01   9.9E+01   9.9E+01
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.229E+03   9.9E+01   9.9E+01   9.9E+01
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 4:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   6.00E+02   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.839E+03   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
```

```
Pathway 6:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   1.00E+01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 7:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   6.495E+03   0.00E+00   0.00E+00   0.00E+00
  1.667E-01   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  4
Location 1:
  EAB with LOCA
  3
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 2:
  LOCA @ LPZ
  3
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 3:
  LOCA @ Unprotected CR
  3
  1
  2
  0.00E+00   3.5E-04
  7.2E+02   0.00E+00
  0
Location 4:
```

```
   LOCA @ CR
   4
   1
   2
   0.00E+00   3.5E-04
   7.2E+02   0.00E+00
   1
   4
   0.00E+00   1.00E+00
   2.4E+01   6.00E-01
   9.6E+01   4.00E-01
   7.2E+02   0.00E+00
 X/Q Tables:
   4
   EAB with LOCA
   2
   0.00E+00   8.3E-04
   7.2E+02   0.00E+00
   LOCA @ LPZ
   5
   0.00E+00   4.9E-05
   8.00E+00   3.5E-05
   2.4E+01   1.7E-05
   9.6E+01   6.1E-06
   7.2E+02   0.00E+00
   LOCA @ Unprotected CR
   6
   0.00E+00   4.15E-03
   2.00E+00   3.61E-03
   8.00E+00   1.57E-03
   2.4E+01   1.12E-03
   9.6E+01   8.86E-04
   7.2E+02   0.00E+00
   LOCA @ CR
   6
   0.00E+00   1.16E-03
   2.00E+00   8.64E-04
   8.00E+00   3.09E-04
   2.4E+01   1.87E-04
   9.6E+01   1.6E-04
   7.2E+02   0.00E+00
 Inflow Pathways:
   3  3 4 6
 Exhaust Pathways:
   3  2 5 7
 X/Q table ID for Exhaust-Inflow paths:
   4 4 4
   -1 -1 -1
   4 4 4
 Simulation Parameters:
   5
   0.00E+00   0.00E+00
   9.6E+01   1.2E+02
   2.4E+02   2.4E+02
   4.8E+02   2.4E+02
   7.2E+02   0.00E+00
 Output Filename:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 11
SGTS_Atrium11_600cfm_11110cfm_6495cfm_0-2hr drywell vol.o0
   1
   1
   1
   1
   0
   End of Scenario File
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/16/2019  at 11:57:51

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

            LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

Number of Nuclides =  60

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

Number of compartments    =   4

Compartment information

Compartment number  1
Name: Primary Containment
Compartment volume =   2.3960E+05 (Cubic feet)
Compartment type is Normal
Removal devices within compartment:
     Deposition
Pathways into and out of compartment  1
   Exit Pathway Number    1: Primary Containment to Secondary Containment -

Compartment number  2
Name: Secondary Containment
Compartment volume =   2.0780E+06 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  2
   Inlet Pathway Number   1: Primary Containment to Secondary Containment -
   Exit Pathway Number    2: Secondary Containment to Environment - SGTS Lea
   Exit Pathway Number    7: Secondary Containment to  Environment

Compartment number  3
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Secondary Containment to Environment - SGTS Lea
   Inlet Pathway Number   5: Control Room to Environment - CR Exhaust
   Inlet Pathway Number   7: Secondary Containment to  Environment
   Exit Pathway Number    3: Environment to Control Room - Emergency Filtere
   Exit Pathway Number    4: Environment to Control Room - Unfiltered Inleak
   Exit Pathway Number    6: Environment to  Control Room ingress/egress

Compartment number  4
Name: Control Room
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  4
   Inlet Pathway Number   3: Environment to Control Room - Emergency Filtere
   Inlet Pathway Number   4: Environment to Control Room - Unfiltered Inleak
   Inlet Pathway Number   6: Environment to  Control Room ingress/egress
   Exit Pathway Number    5: Control Room to Environment - CR Exhaust

Total number of pathways =   7
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/16/2019  at 11:57:51

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            LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

Power Ratio                              =   4.0320E+03

End Time                                 =   7.2000E+02 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Source Number  1 is used in Compartment  1  Primary Containment
   Nuclide Distribution given in Ci/MWt
Fraction of Nuclide Distribution in this Compartment   1.00000

Iodine fractions for source number 1
     Aerosol     =   9.5000E-01
     Elemental   =   4.8500E-02
     Organic     =   1.5000E-03

Inventory file =     c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
Release from file =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
```

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Co-58	7	1.070E+02	6.117E+06	4.760E-14	8.720E-10	2.940E-09
Co-60	7	4.390E+00	1.663E+08	1.260E-13	1.620E-08	5.910E-08
Kr-85	1	4.150E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	6.940E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.320E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	1.780E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
Rb-86	3	6.120E+01	1.612E+06	4.810E-15	1.330E-09	1.790E-09
Sr-89	5	2.480E+04	4.363E+06	7.730E-17	7.960E-12	1.120E-08
Sr-90	5	3.310E+03	9.190E+08	7.530E-18	2.690E-10	3.510E-07
Sr-91	5	3.120E+04	3.420E+04	4.924E-14	9.930E-12	4.547E-10
Sr-92	5	3.370E+04	9.756E+03	6.790E-14	3.920E-12	2.180E-10
Y-90	9	3.490E+03	2.304E+05	1.900E-16	5.170E-13	2.280E-09
Y-91	9	3.230E+04	5.055E+06	2.600E-16	8.500E-12	1.320E-08
Y-92	9	3.410E+04	1.274E+04	1.300E-14	1.050E-12	2.110E-10
Y-93	9	3.870E+04	3.636E+04	4.800E-15	9.260E-13	5.820E-10
Zr-95	9	4.680E+04	5.528E+06	3.600E-14	1.440E-09	6.390E-09
Zr-97	9	4.750E+04	6.084E+04	4.432E-14	2.315E-11	1.171E-09
Nb-95	9	4.690E+04	3.037E+06	3.740E-14	3.580E-10	1.570E-09
Mo-99	7	4.980E+04	2.376E+05	7.280E-15	1.520E-11	1.070E-09
Tc-99m	7	4.370E+04	2.167E+04	5.890E-15	5.010E-11	8.800E-12
Ru-103	7	4.300E+04	3.394E+06	2.251E-14	2.570E-10	2.421E-09
Ru-105	7	2.990E+04	1.598E+04	3.810E-14	4.150E-12	1.230E-10
Ru-106	7	1.670E+04	3.181E+07	1.040E-14	1.720E-09	1.290E-07
Rh-105	7	2.780E+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	7.630E+03	1.555E+04	7.140E-14	9.720E-12	1.740E-10
Te-127	4	2.300E+03	3.366E+04	2.420E-16	1.840E-12	8.600E-11
Te-127m	4	1.810E+02	9.418E+06	1.470E-16	9.660E-11	5.810E-09
Te-129	4	7.280E+03	4.176E+03	2.750E-15	5.090E-13	2.090E-11
Te-129m	4	1.250E+03	2.903E+06	3.337E-15	1.563E-10	6.484E-09
Te-131m	4	5.230E+03	1.080E+05	7.463E-14	3.669E-08	1.758E-09
Te-132	4	3.820E+04	2.815E+05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.690E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09

I-132	2	3.920E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.490E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.150E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.240E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.380E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	1.450E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Cs-134	3	5.840E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.480E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.480E+03	9.467E+08	2.725E-14	7.930E-09	8.630E-09
Ba-139	6	4.850E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	4.690E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09
La-140	9	4.910E+04	1.450E+05	1.170E-13	6.870E-11	1.310E-09
La-141	9	4.390E+04	1.415E+04	2.390E-15	9.400E-12	1.570E-10
La-142	9	4.230E+04	5.550E+03	1.440E-13	8.740E-12	6.840E-11
Ce-141	8	4.420E+04	2.808E+06	3.430E-15	2.550E-11	2.420E-09
Ce-143	8	4.100E+04	1.188E+05	1.290E-14	6.230E-12	9.160E-10
Ce-144	8	3.680E+04	2.456E+07	2.773E-15	2.920E-10	1.010E-07
Pr-143	9	4.000E+04	1.172E+06	2.100E-17	1.680E-18	2.190E-09
Nd-147	9	1.750E+04	9.487E+05	6.190E-15	1.820E-11	1.850E-09
Np-239	8	5.060E+05	2.035E+05	7.690E-15	7.620E-12	6.780E-10
Pu-238	8	1.090E+02	2.769E+09	4.880E-18	3.860E-10	7.790E-05
Pu-239	8	1.020E+01	7.594E+11	4.240E-18	3.750E-10	8.330E-05
Pu-240	8	1.820E+01	2.063E+11	4.750E-18	3.760E-10	8.330E-05
Pu-241	8	4.340E+03	4.544E+08	7.250E-20	9.150E-12	1.340E-06
Am-241	9	5.360E+00	1.364E+10	8.180E-16	1.600E-09	1.200E-04
Cm-242	9	1.900E+03	1.407E+07	5.690E-18	9.410E-10	4.670E-06
Cm-244	9	9.700E+01	5.715E+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-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00

Release Fractions and Timings

BWR, RG 1.183, Table 1 Section 3.2
Duration (h): Design Basis Accident

	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	5.458E+03
IODINE	5.0000E-02	2.5000E-01	0.0000E+00	3.465E+02
CESIUM	5.0000E-02	2.0000E-01	0.0000E+00	5.649E+04
TELLURIUM	0.0000E+00	5.0000E-02	0.0000E+00	4.137E+01
STRONTIUM	0.0000E+00	2.0000E-02	0.0000E+00	2.027E+03
BARIUM	0.0000E+00	2.0000E-02	0.0000E+00	5.190E+01
RUTHENIUM	0.0000E+00	2.5000E-03	0.0000E+00	6.533E+01
CERIUM	0.0000E+00	5.0000E-04	0.0000E+00	6.205E+02
LANTHANUM	0.0000E+00	2.0000E-04	0.0000E+00	7.245E+00
AEROSOL	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00

COMPARTMENT DATA

Compartment number 1: Primary Containment

Natural Deposition (Powers' model): Aerosol data
Reactor type: BWRDBA
Percentile = 10 (%)

Natural Deposition: Elemental Removal Data

Time (hr)	Removal Coef. (hr^-1)
0.0000E+00	0.0000E+00

Compartment number 2: Secondary Containment

Compartment number 3: Environment

Compartment number 4: Control Room

PATHWAY DATA

Pathway number 1: Primary Containment to Secondary Containment -

Convection Data

Time (hr)	Flow Rate (% / day)
0.0000E+00	9.7770E-01
1.6670E-01	9.7770E-01
2.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00

Pathway number 2: Secondary Containment to Environment - SGTS Lea

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.1110E+04	0.0000E+00	0.0000E+00	0.0000E+00
1.6670E-01	6.4950E+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 3: Environment to Control Room - Emergency Filtere

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.2290E+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 4: Environment to Control Room - Unfiltered Inleak

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.0000E+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  5: Control Room to Environment - CR Exhaust

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    5.8390E+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  6: Environment to  Control Room ingress/egress

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    1.0000E+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  7: Secondary Containment to  Environment

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    6.4950E+03   0.0000E+00   0.0000E+00   0.0000E+00
       1.6670E-01    0.0000E+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

DOSE INFORMATION
Number_Dose_Locations =  4

Dose Location Name = EAB with LOCA
         Located in compartment  3 the Environment

EAB with LOCA 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

Dose Location Name = LOCA @ LPZ
         Located in compartment  3 the Environment

LOCA @ LPZ 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

Dose Location Name = LOCA @ Unprotected CR
         Located in compartment  3 the Environment

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

Dose Location Name = LOCA @ CR
         Located in compartment  4 the Control Room

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

LOCA @ CR 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

 X/Q, ATMOSPHERIC DISPERSION INFORMATION

 X/Q Table Name =    EAB with LOCA

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

 X/Q Table Name =    LOCA @ LPZ

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.9000E-05
        8.0000E+00          3.5000E-05
        2.4000E+01          1.7000E-05
        9.6000E+01          6.1000E-06
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ Unprotected CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.1500E-03
        2.0000E+00          3.6100E-03
        8.0000E+00          1.5700E-03
        2.4000E+01          1.1200E-03
        9.6000E+01          8.8600E-04
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          1.1600E-03
        2.0000E+00          8.6400E-04
        8.0000E+00          3.0900E-04
        2.4000E+01          1.8700E-04
        9.6000E+01          1.6000E-04
        7.2000E+02          0.0000E+00

 This X/Q Table is used for these connected pathways
  Path  2  Secondary Containment to Environment - SGTS Lea and Path  3  Environment to Control Room -
Emergency Filtere
  Path  7  Secondary Containment to  Environment and Path  3  Environment to Control Room - Emergency
Filtere
  Path  2  Secondary Containment to Environment - SGTS Lea and Path  4  Environment to Control Room -
Unfiltered Inleak
  Path  7  Secondary Containment to  Environment and Path  4  Environment to Control Room - Unfiltered
Inleak
  Path  2  Secondary Containment to Environment - SGTS Lea and Path  6  Environment to  Control Room
ingress/egress
  Path  7  Secondary Containment to  Environment and Path  6  Environment to  Control Room
ingress/egress

 USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
         Time (hr)      Time step (hr)
        0.0000E+00        0.0000E+00
        9.6000E+01        1.2000E+02
        2.4000E+02        2.4000E+02
        4.8000E+02        2.4000E+02
        7.2000E+02        0.0000E+00

  EDIT EACH MAJOR TIME STEP
```

```
EDIT SUPPLEMENTAL TIME STEPS

EDIT MODEL DECONTAMINATION RESULTS

     Masses in Atoms and kg in detailed output
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/16/2019  at 11:57:51

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




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


            LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

Detailed model information at time (hr) =    0.0000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.0002E+00

#######################################################################
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EAB with LOCA Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.6283E-10  2.8605E-08  1.3532E-09
Accumulated dose (rem)  1.6283E-10  2.8605E-08  1.3532E-09

LOCA @ LPZ Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.6127E-12  1.6887E-09  7.9885E-11
Accumulated dose (rem)  9.6127E-12  1.6887E-09  7.9885E-11

LOCA @ Unprotected CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.1414E-10  1.4302E-07  6.7658E-09
Accumulated dose (rem)  8.1414E-10  1.4302E-07  6.7658E-09

LOCA @ CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        6.8423E-16  8.5181E-13  3.6131E-14  1.6055E-14
Accumulated dose (rem)  6.8423E-16  8.5181E-13  3.6131E-14  1.6055E-14

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

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:
```

```
                          Pathway
Time (h) =   0.0006      Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.9965E+10
Elemental I (atoms)      0.0000E+00   1.4362E+08
Organic I (atoms)        0.0000E+00   4.4418E+06
Aerosol I (atoms)        0.0000E+00   2.8128E+09
All Aerosols (kg)        0.0000E+00   1.2716E-13

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.8113E+08
Elemental I (atoms)      6.4497E+05   1.3030E+04
Organic I (atoms)        1.9947E+04   4.0298E+02
Aerosol I (atoms)        1.2632E+07   2.5518E+05
All Aerosols (kg)        5.7106E-16   1.1537E-17

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.0783E+07
Elemental I (atoms)      0.0000E+00   1.4951E+05
Organic I (atoms)        0.0000E+00   4.6240E+03
Aerosol I (atoms)        0.0000E+00   2.9281E+06
All Aerosols (kg)        0.0000E+00   1.3238E-16

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      Filtered    Transported
Noble gases (atoms)      8.4434E+03   0.0000E+00
Elemental I (atoms)      6.8893E+00   0.0000E+00
Organic I (atoms)        2.1307E-01   0.0000E+00
Aerosol I (atoms)        1.3493E+02   0.0000E+00
All Aerosols (kg)        6.1001E-21   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.4639E+05
Elemental I (atoms)      0.0000E+00   2.4918E+03
Organic I (atoms)        0.0000E+00   7.7066E+01
Aerosol I (atoms)        0.0000E+00   4.8802E+04
All Aerosols (kg)        0.0000E+00   2.2063E-18

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.1671E+10
Elemental I (atoms)      0.0000E+00   8.3961E+07
Organic I (atoms)        0.0000E+00   2.5967E+06
Aerosol I (atoms)        0.0000E+00   1.6444E+09
All Aerosols (kg)        0.0000E+00   7.4340E-14

Detailed model information at time (hr) =    0.1478

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.0646E+00

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

EAB with LOCA Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.9934E-03	7.3284E-01	3.4477E-02
Accumulated dose (rem)	3.9934E-03	7.3284E-01	3.4477E-02

LOCA @ LPZ Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.3575E-04	4.3264E-02	2.0354E-03
Accumulated dose (rem)	2.3575E-04	4.3264E-02	2.0354E-03

LOCA @ Unprotected CR Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.9967E-02	3.6642E+00	1.7239E-01
Accumulated dose (rem)	1.9967E-02	3.6642E+00	1.7239E-01

LOCA @ CR Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	2.6941E-06	3.4511E-03	1.4626E-04	6.3259E-05
Accumulated dose (rem)	2.6941E-06	3.4511E-03	1.4626E-04	6.3259E-05

****

Environment Integral Nuclide Release (Ci): at Time (h) = 0.1667

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Kr-85	2.6195E-02	0.00000	0.00000
Kr-85m	4.2892E-01	0.00018	0.00011
Kr-87	7.7377E-01	0.00179	0.00105
Kr-88	1.0868E+00	0.00624	0.00365
Rb-86	3.7424E-03	0.00013	0.00008
I-131	1.6472E+00	0.28976	0.16940
I-132	2.3474E+00	0.01955	0.01143
I-133	3.3480E+00	0.10960	0.06407
I-134	3.3853E+00	0.02712	0.01585
I-135	3.1646E+00	0.03542	0.02071
Xe-133	3.3958E+00	0.00030	0.00017
Xe-135	9.3440E-01	0.00063	0.00037
Cs-134	3.5719E-01	0.08935	0.05224
Cs-136	9.0493E-02	0.00406	0.00238
Cs-137	2.7401E-01	0.04694	0.02744

Environment Compartment Group Inventory Distribution:

Time (h) = 0.1667	Total Release	Release Rate/s
Noble gases (atoms)	5.5796E+17	9.2974E+14
Elemental I (atoms)	4.0021E+15	6.6688E+12
Organic I (atoms)	1.2378E+14	2.0625E+11
Aerosol I (atoms)	7.5961E+16	1.2658E+14
All Aerosols (kg)	3.4441E-06	5.7390E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 0.1667	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6333E+17
Elemental I (atoms)	0.0000E+00	2.6031E+15
Organic I (atoms)	0.0000E+00	8.0507E+13
Aerosol I (atoms)	0.0000E+00	4.9414E+16
All Aerosols (kg)	0.0000E+00	2.2402E-06

```
Environment to Control Room - Emergency Filtere Transport Group Inventory:

                            Pathway
Time (h) =   0.1667       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.2487E+15
Elemental I (atoms)      1.5878E+13   1.6065E+11
Organic I (atoms)        4.9108E+11   4.9686E+09
Aerosol I (atoms)        3.0170E+14   3.0525E+12
All Aerosols (kg)        1.3697E-08   1.3835E-10

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                            Pathway
Time (h) =   0.1667       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.5800E+14
Elemental I (atoms)      0.0000E+00   1.8434E+12
Organic I (atoms)        0.0000E+00   5.7012E+10
Aerosol I (atoms)        0.0000E+00   3.5026E+13
All Aerosols (kg)        0.0000E+00   1.5875E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   0.1667       Filtered    Transported
Noble gases (atoms)      5.2724E+13   5.6403E+08
Elemental I (atoms)      4.2847E+10   0.0000E+00
Organic I (atoms)        1.3252E+09   0.0000E+00
Aerosol I (atoms)        8.1840E+11   0.0000E+00
All Aerosols (kg)        3.7110E-11   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   0.1667       Filtered    Transported
Noble gases (atoms)      0.0000E+00   4.3000E+12
Elemental I (atoms)      0.0000E+00   3.0723E+10
Organic I (atoms)        0.0000E+00   9.5020E+08
Aerosol I (atoms)        0.0000E+00   5.8376E+11
All Aerosols (kg)        0.0000E+00   2.6459E-11

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   0.1667       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =    0.4667

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2018E+00

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EAB with LOCA Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.7117E-03  6.5382E-02  7.4293E-03
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Accumulated dose (rem)  8.7051E-03  7.9823E-01  4.1906E-02

LOCA @ LPZ Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.7816E-04  3.8599E-03  4.3859E-04
Accumulated dose (rem)  5.1392E-04  4.7124E-02  2.4740E-03

LOCA @ Unprotected CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.3559E-02  3.2691E-01  3.7146E-02
Accumulated dose (rem)  4.3526E-02  3.9911E+00  2.0953E-01

LOCA @ CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        5.0254E-05  2.3496E-02  1.0276E-03  1.2600E-03
Accumulated dose (rem)  5.2948E-05  2.6947E-02  1.1738E-03  1.3232E-03

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

Environment Integral Nuclide Release (Ci): at Time (h) =   0.5000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Kr-85     2.7559E-01     0.00000      0.00000
  Kr-85m    4.3482E+00     0.00225      0.00009
  Kr-87     7.1519E+00     0.02031      0.00087
  Kr-88     1.0786E+01     0.07603      0.00301
  Rb-86     4.0764E-03     0.00012      0.00006
  I-131     1.7946E+00     0.27254      0.14000
  I-132     2.5471E+00     0.01827      0.00945
  I-133     3.6454E+00     0.10299      0.05296
  I-134     3.6318E+00     0.02493      0.01310
  I-135     3.4404E+00     0.03321      0.01712
  Xe-133    3.5746E+01     0.00386      0.00014
  Xe-135    1.0410E+01     0.00859      0.00030
  Cs-134    3.8909E-01     0.08401      0.04317
  Cs-136    9.8570E-02     0.00382      0.00196
  Cs-137    2.9848E-01     0.04413      0.02268

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =   0.5000      Release     Rate/s
Noble gases (atoms)    5.8709E+18  3.2616E+15
Elemental I (atoms)    4.3810E+15  2.4339E+12
Organic I (atoms)      1.3549E+14  7.5275E+10
Aerosol I (atoms)      8.2708E+16  4.5949E+13
All Aerosols (kg)      3.7517E-06  2.0843E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

                            Pathway
Time (h) =   0.5000        Filtered    Transported
Noble gases (atoms)      0.0000E+00   5.6931E+18
Elemental I (atoms)      3.7500E+16   2.9830E+15
Organic I (atoms)        1.1598E+15   9.2257E+13
Aerosol I (atoms)        6.6768E+17   5.6179E+16
All Aerosols (kg)        3.0532E-05   2.5487E-06

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                            Pathway
Time (h) =   0.5000        Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.9498E+16
Elemental I (atoms)      1.6965E+13   1.7283E+11
Organic I (atoms)        5.2469E+11   5.3452E+09
Aerosol I (atoms)        3.2105E+14   3.2707E+12
```

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All Aerosols (kg)        1.4680E-08   1.4829E-10

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                           Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.2371E+15
Elemental I (atoms)      0.0000E+00   1.9831E+12
Organic I (atoms)        0.0000E+00   6.1333E+10
Aerosol I (atoms)        0.0000E+00   3.7530E+13
All Aerosols (kg)        0.0000E+00   1.7016E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      1.6651E+15   1.9412E+10
Elemental I (atoms)      3.3654E+11   0.0000E+00
Organic I (atoms)        1.0408E+10   0.0000E+00
Aerosol I (atoms)        6.3826E+12   0.0000E+00
All Aerosols (kg)        2.9054E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.7285E+13
Elemental I (atoms)      0.0000E+00   3.3052E+10
Organic I (atoms)        0.0000E+00   1.0222E+09
Aerosol I (atoms)        0.0000E+00   6.2549E+11
All Aerosols (kg)        0.0000E+00   2.8360E-11

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =    1.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 3.2982E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.3953E+00

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EAB with LOCA Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.8622E-01  4.6536E+00  9.2467E-01
Accumulated dose (rem)  6.9493E-01  5.4519E+00  9.6657E-01

LOCA @ LPZ Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.0512E-02  2.7473E-01  5.4589E-02
Accumulated dose (rem)  4.1026E-02  3.2186E-01  5.7063E-02
```

LOCA @ Unprotected CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.4311E+00	2.3268E+01	4.6233E+00
Accumulated dose (rem)	3.4746E+00	2.7259E+01	4.8329E+00

LOCA @ CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	1.5485E-02	2.4920E-01	2.7396E-02	3.9287E-01
Accumulated dose (rem)	1.5538E-02	2.7615E-01	2.8570E-02	3.9419E-01

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Environment Integral Nuclide Release (Ci): at Time (h) = 2.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	2.4978E-04	0.00000	0.00000
Co-60	1.0255E-05	0.00000	0.00000
Kr-85	5.1361E+01	0.00002	0.00000
Kr-85m	6.7107E+02	0.01589	0.00000
Kr-87	6.9361E+02	0.09047	0.00004
Kr-88	1.4945E+03	0.48264	0.00013
Rb-86	2.4575E-02	0.00005	0.00000
Sr-89	4.6302E-01	0.00575	0.00000
Sr-90	6.1856E-02	0.02407	0.00000
Sr-91	5.1763E-01	0.00034	0.00000
Sr-92	4.1581E-01	0.00019	0.00000
Y-90	1.1243E-03	0.00000	0.00000
Y-91	6.1112E-03	0.00009	0.00000
Y-92	6.4135E-02	0.00002	0.00000
Y-93	6.4661E-03	0.00000	0.00000
Zr-95	8.7394E-03	0.00006	0.00000
Zr-97	8.3017E-03	0.00001	0.00000
Nb-95	8.7644E-03	0.00002	0.00000
Mo-99	1.1435E-01	0.00014	0.00000
Tc-99m	1.0201E-01	0.00000	0.00000
Ru-103	1.0033E-01	0.00028	0.00000
Ru-105	5.4174E-02	0.00001	0.00000
Ru-106	3.9005E-02	0.00558	0.00000
Rh-105	6.4828E-02	0.00002	0.00000
Sb-127	1.1814E-01	0.00023	0.00000
Sb-129	2.7455E-01	0.00012	0.00000
Te-127	1.0727E-01	0.00001	0.00000
Te-127m	8.4618E-03	0.00005	0.00000
Te-129	3.0060E-01	0.00001	0.00000
Te-129m	5.8413E-02	0.00042	0.00000
Te-131m	2.3529E-01	0.00051	0.00000
Te-132	1.7590E+00	0.00503	0.00000
I-131	1.2156E+01	0.11475	0.00621
I-132	1.4545E+01	0.00643	0.00042
I-133	2.3833E+01	0.04179	0.00235
I-134	1.0939E+01	0.00440	0.00058
I-135	2.0700E+01	0.01235	0.00076
Xe-133	6.6450E+03	0.03282	0.00001
Xe-135	2.0553E+03	0.07744	0.00001
Cs-134	2.3497E+00	0.03135	0.00191
Cs-136	5.9380E-01	0.00142	0.00009
Cs-137	1.8026E+00	0.01647	0.00101
Ba-139	4.0304E-01	0.00002	0.00000
Ba-140	8.7321E-01	0.00100	0.00000
La-140	1.9749E-02	0.00004	0.00000
La-141	6.1577E-03	0.00000	0.00000
La-142	3.8259E-03	0.00000	0.00000
Ce-141	2.0639E-02	0.00006	0.00000
Ce-143	1.8509E-02	0.00002	0.00000
Ce-144	1.7190E-02	0.00192	0.00000
Pr-143	7.4923E-03	0.00002	0.00000
Nd-147	3.2563E-03	0.00001	0.00000

Np-239	2.3171E-01	0.00018	0.00000
Pu-238	5.0925E-05	0.00440	0.00000
Pu-239	4.7666E-06	0.00044	0.00000
Pu-240	8.5029E-06	0.00079	0.00000
Pu-241	2.0276E-03	0.00301	0.00000
Am-241	1.0021E-06	0.00013	0.00000
Cm-242	3.5496E-04	0.00184	0.00000
Cm-244	1.8127E-05	0.00135	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 2.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.0934E+21	1.5186E+17
Elemental I (atoms)	3.3807E+16	4.6955E+12
Organic I (atoms)	1.0456E+15	1.4522E+11
Aerosol I (atoms)	5.4571E+17	7.5793E+13
All Aerosols (kg)	2.3319E-05	3.2388E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0937E+21
Elemental I (atoms)	2.9258E+18	3.2416E+16
Organic I (atoms)	9.0489E+16	1.0026E+15
Aerosol I (atoms)	4.6103E+19	5.1929E+17
All Aerosols (kg)	1.9681E-03	2.2121E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.2721E+18
Elemental I (atoms)	1.0196E+14	1.0434E+12
Organic I (atoms)	3.1535E+12	3.2271E+10
Aerosol I (atoms)	1.6609E+15	1.7012E+13
All Aerosols (kg)	7.2086E-08	7.2820E-10

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.7546E+17
Elemental I (atoms)	0.0000E+00	1.1973E+13
Organic I (atoms)	0.0000E+00	3.7030E+11
Aerosol I (atoms)	0.0000E+00	1.9521E+14
All Aerosols (kg)	0.0000E+00	8.3557E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	8.0160E+17	5.7404E+12
Elemental I (atoms)	3.7847E+12	0.0000E+00
Organic I (atoms)	1.1705E+11	0.0000E+00
Aerosol I (atoms)	6.3828E+13	0.0000E+00
All Aerosols (kg)	2.8075E-09	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.2576E+15
Elemental I (atoms)	0.0000E+00	1.9955E+11
Organic I (atoms)	0.0000E+00	6.1716E+09
Aerosol I (atoms)	0.0000E+00	3.2535E+12
All Aerosols (kg)	0.0000E+00	1.3926E-10

Secondary Containment to Environment Transport Group Inventory:

```
                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =    4.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 1.0673E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.4301E+01

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EAB with LOCA Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.9349E+00  1.6059E+01  2.7979E+00
Accumulated dose (rem)  2.6298E+00  2.1510E+01  3.7645E+00

LOCA @ LPZ Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.1423E-01  9.4803E-01  1.6518E-01
Accumulated dose (rem)  1.5525E-01  1.2699E+00  2.2224E-01

LOCA @ Unprotected CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.4156E+00  6.9845E+01  1.2169E+01
Accumulated dose (rem)  1.1890E+01  9.7104E+01  1.7002E+01

LOCA @ CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.1262E-01  1.6464E+00  2.0005E-01  2.8688E+00
Accumulated dose (rem)  1.2815E-01  1.9225E+00  2.2862E-01  3.2630E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =   5.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     1.3255E-03     0.00000      0.00000
  Co-60     5.4447E-05     0.00000      0.00000
  Kr-85     2.6386E+02     0.00003      0.00000
  Kr-85m    2.7946E+03     0.01691      0.00000
  Kr-87     1.8796E+03     0.06264      0.00001
  Kr-88     5.5719E+03     0.45970      0.00003
  Rb-86     9.4127E-02     0.00005      0.00000
  Sr-89     2.4565E+00     0.00779      0.00000
  Sr-90     3.2843E-01     0.03264      0.00000
  Sr-91     2.4844E+00     0.00042      0.00000
  Sr-92     1.5852E+00     0.00018      0.00000
  Y-90      1.0469E-02     0.00001      0.00000
  Y-91      3.3106E-02     0.00012      0.00000
  Y-92      6.1091E-01     0.00004      0.00000
  Y-93      3.1216E-02     0.00001      0.00000
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Zr-95	4.6373E-02	0.00009	0.00000
Zr-97	4.1619E-02	0.00002	0.00000
Nb-95	4.6535E-02	0.00002	0.00000
Mo-99	5.9821E-01	0.00018	0.00000
Tc-99m	5.3975E-01	0.00000	0.00000
Ru-103	5.3214E-01	0.00037	0.00000
Ru-105	2.3322E-01	0.00002	0.00000
Ru-106	2.0708E-01	0.00756	0.00000
Rh-105	3.4151E-01	0.00003	0.00000
Sb-127	6.2067E-01	0.00030	0.00000
Sb-129	1.1755E+00	0.00013	0.00000
Te-127	5.6813E-01	0.00001	0.00000
Te-127m	4.4954E-02	0.00007	0.00000
Te-129	1.3712E+00	0.00001	0.00000
Te-129m	3.1011E-01	0.00057	0.00000
Te-131m	1.2093E+00	0.00067	0.00000
Te-132	9.2232E+00	0.00674	0.00000
I-131	4.8410E+01	0.12109	0.00159
I-132	4.4137E+01	0.00519	0.00011
I-133	9.0727E+01	0.04219	0.00060
I-134	1.8081E+01	0.00195	0.00015
I-135	7.1003E+01	0.01126	0.00019
Xe-133	3.4013E+04	0.04292	0.00000
Xe-135	1.0770E+04	0.10367	0.00000
Cs-134	9.0207E+00	0.03202	0.00049
Cs-136	2.2720E+00	0.00145	0.00002
Cs-137	6.9207E+00	0.01682	0.00026
Ba-139	1.1816E+00	0.00002	0.00000
Ba-140	4.6215E+00	0.00135	0.00000
La-140	2.0440E-01	0.00010	0.00000
La-141	2.5843E-02	0.00000	0.00000
La-142	1.1817E-02	0.00000	0.00000
Ce-141	1.0949E-01	0.00008	0.00000
Ce-143	9.5407E-02	0.00003	0.00000
Ce-144	9.1258E-02	0.00261	0.00000
Pr-143	3.9937E-02	0.00002	0.00000
Nd-147	1.7225E-02	0.00001	0.00000
Np-239	1.2091E+00	0.00024	0.00000
Pu-238	2.7039E-04	0.00596	0.00000
Pu-239	2.5315E-05	0.00060	0.00000
Pu-240	4.5147E-05	0.00106	0.00000
Pu-241	1.0766E-02	0.00408	0.00000
Am-241	5.3232E-06	0.00018	0.00000
Cm-242	1.8842E-03	0.00249	0.00000
Cm-244	9.6247E-05	0.00183	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 5.0000	Total Release	Release Rate/s
Noble gases (atoms)	5.6123E+21	3.1180E+17
Elemental I (atoms)	1.3810E+17	7.6724E+12
Organic I (atoms)	4.2713E+15	2.3729E+11
Aerosol I (atoms)	2.1281E+18	1.1823E+14
All Aerosols (kg)	9.0492E-05	5.0274E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 5.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.6127E+21
Elemental I (atoms)	1.2899E+19	1.3671E+17
Organic I (atoms)	3.9894E+17	4.2282E+15
Aerosol I (atoms)	1.9734E+20	2.1017E+18
All Aerosols (kg)	8.6168E-03	8.9294E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 5.0000	Pathway Filtered	Transported

```
Noble gases (atoms)      0.0000E+00   1.2855E+19
Elemental I (atoms)      3.1200E+14   3.2572E+12
Organic I (atoms)        9.6494E+12   1.0074E+11
Aerosol I (atoms)        4.8423E+15   5.0593E+13
All Aerosols (kg)        2.1318E-07   2.1538E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4750E+18
Elemental I (atoms)      0.0000E+00   3.7375E+13
Organic I (atoms)        0.0000E+00   1.1559E+12
Aerosol I (atoms)        0.0000E+00   5.8053E+14
All Aerosols (kg)        0.0000E+00   2.4713E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      9.6817E+18   2.2767E+14
Elemental I (atoms)      2.8028E+13   0.0000E+00
Organic I (atoms)        8.6685E+11   0.0000E+00
Aerosol I (atoms)        4.3620E+14   0.0000E+00
All Aerosols (kg)        1.8765E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.4584E+16
Elemental I (atoms)      0.0000E+00   6.2291E+11
Organic I (atoms)        0.0000E+00   1.9265E+10
Aerosol I (atoms)        0.0000E+00   9.6755E+12
All Aerosols (kg)        0.0000E+00   4.1189E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =    7.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 6.3781E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.3244E+02

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EAB with LOCA Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.1973E-01  8.7968E+00  1.0989E+00
Accumulated dose (rem)  3.2495E+00  3.0307E+01  4.8634E+00

LOCA @ LPZ Doses:
```

```
Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.6586E-02  5.1933E-01  6.4873E-02
Accumulated dose (rem)  1.9184E-01  1.7892E+00  2.8711E-01

LOCA @ Unprotected CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.6954E+00  3.8261E+01  4.7795E+00
Accumulated dose (rem)  1.4586E+01  1.3537E+02  2.1782E+01

LOCA @ CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        5.6580E-02  1.3137E+00  1.2800E-01  1.5306E+00
Accumulated dose (rem)  1.8473E-01  3.2362E+00  3.5661E-01  4.7936E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =   8.0000
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Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	1.9376E-03	0.00000	0.00000
Co-60	7.9623E-05	0.00000	0.00000
Kr-85	3.8493E+02	0.00003	0.00000
Kr-85m	3.5551E+03	0.01654	0.00000
Kr-87	2.0113E+03	0.05155	0.00001
Kr-88	6.6889E+03	0.42443	0.00003
Rb-86	1.3357E-01	0.00005	0.00000
Sr-89	3.5902E+00	0.00876	0.00000
Sr-90	4.8030E-01	0.03671	0.00000
Sr-91	3.3846E+00	0.00044	0.00000
Sr-92	1.8945E+00	0.00017	0.00000
Y-90	2.0478E-02	0.00001	0.00000
Y-91	4.9089E-02	0.00014	0.00000
Y-92	9.8341E-01	0.00005	0.00000
Y-93	4.2693E-02	0.00001	0.00000
Zr-95	6.7785E-02	0.00010	0.00000
Zr-97	5.8403E-02	0.00002	0.00000
Nb-95	6.8053E-02	0.00002	0.00000
Mo-99	8.6532E-01	0.00021	0.00000
Tc-99m	7.8606E-01	0.00000	0.00000
Ru-103	7.7761E-01	0.00042	0.00000
Ru-105	2.9708E-01	0.00001	0.00000
Ru-106	3.0282E-01	0.00851	0.00000
Rh-105	4.9479E-01	0.00003	0.00000
Sb-127	9.0060E-01	0.00034	0.00000
Sb-129	1.4927E+00	0.00012	0.00000
Te-127	8.2870E-01	0.00002	0.00000
Te-127m	6.5769E-02	0.00008	0.00000
Te-129	1.7960E+00	0.00001	0.00000
Te-129m	4.5337E-01	0.00064	0.00000
Te-131m	1.7270E+00	0.00074	0.00000
Te-132	1.3364E+01	0.00751	0.00000
I-131	6.8848E+01	0.13292	0.00122
I-132	5.3462E+01	0.00485	0.00008
I-133	1.2521E+02	0.04494	0.00046
I-134	1.8461E+01	0.00153	0.00011
I-135	9.1927E+01	0.01125	0.00015
Xe-133	4.9511E+04	0.04805	0.00000
Xe-135	1.5897E+04	0.11768	0.00000
Cs-134	1.2821E+01	0.03515	0.00038
Cs-136	3.2219E+00	0.00159	0.00002
Cs-137	9.8365E+00	0.01847	0.00020
Ba-139	1.2797E+00	0.00001	0.00000
Ba-140	6.7426E+00	0.00152	0.00000
La-140	4.1142E-01	0.00015	0.00000
La-141	3.2450E-02	0.00000	0.00000
La-142	1.2999E-02	0.00000	0.00000
Ce-141	1.6000E-01	0.00008	0.00000

Ce-143	1.3654E-01	0.00003	0.00000
Ce-144	1.3344E-01	0.00293	0.00000
Pr-143	5.8573E-02	0.00003	0.00000
Nd-147	2.5121E-02	0.00001	0.00000
Np-239	1.7459E+00	0.00027	0.00000
Pu-238	3.9543E-04	0.00671	0.00000
Pu-239	3.7027E-05	0.00067	0.00000
Pu-240	6.6024E-05	0.00120	0.00000
Pu-241	1.5744E-02	0.00459	0.00000
Am-241	7.7878E-06	0.00020	0.00000
Cm-242	2.7551E-03	0.00280	0.00000
Cm-244	1.4075E-04	0.00205	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 8.0000	Total Release	Release Rate/s
Noble gases (atoms)	8.1837E+21	2.8416E+17
Elemental I (atoms)	1.9528E+17	6.7806E+12
Organic I (atoms)	6.0397E+15	2.0971E+11
Aerosol I (atoms)	2.9956E+18	1.0401E+14
All Aerosols (kg)	1.2875E-04	4.4706E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.1841E+21
Elemental I (atoms)	1.8015E+19	1.9389E+17
Organic I (atoms)	5.5717E+17	5.9967E+15
Aerosol I (atoms)	2.7491E+20	2.9692E+18
All Aerosols (kg)	1.2402E-02	1.2756E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8300E+19
Elemental I (atoms)	4.1928E+14	4.4708E+12
Organic I (atoms)	1.2967E+13	1.3827E+11
Aerosol I (atoms)	6.4661E+15	6.9003E+13
All Aerosols (kg)	2.9351E-07	2.9657E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0998E+18
Elemental I (atoms)	0.0000E+00	5.1300E+13
Organic I (atoms)	0.0000E+00	1.5866E+12
Aerosol I (atoms)	0.0000E+00	7.9178E+14
All Aerosols (kg)	0.0000E+00	3.4030E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.7345E+19	7.3235E+14
Elemental I (atoms)	4.7597E+13	0.0000E+00
Organic I (atoms)	1.4721E+12	0.0000E+00
Aerosol I (atoms)	7.3370E+14	0.0000E+00
All Aerosols (kg)	3.1861E-08	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.4997E+16
Elemental I (atoms)	0.0000E+00	8.5499E+11
Organic I (atoms)	0.0000E+00	2.6443E+10

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Aerosol I (atoms)        0.0000E+00   1.3196E+13
All Aerosols (kg)        0.0000E+00   5.6717E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =    8.3000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.8678E+02

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EAB with LOCA Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.6979E-02  3.5517E-01  5.6480E-02
Accumulated dose (rem)  3.2865E+00  3.0662E+01  4.9198E+00

LOCA @ LPZ Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.5593E-03  1.4977E-02  2.3817E-03
Accumulated dose (rem)  1.9340E-01  1.8042E+00  2.8950E-01

LOCA @ Unprotected CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.9948E-02  1.3063E+00  1.4167E-01
Accumulated dose (rem)  1.4656E+01  1.3667E+02  2.1923E+01

LOCA @ CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.4018E-03  1.0362E-01  9.0866E-03  9.7836E-02
Accumulated dose (rem)  1.8814E-01  3.3398E+00  3.6570E-01  4.8914E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =   8.3333

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     1.9867E-03     0.00000      0.00000
  Co-60     8.1643E-05     0.00000      0.00000
  Kr-85     3.9464E+02     0.00003      0.00000
  Kr-85m    3.6009E+03     0.01650      0.00000
  Kr-87     2.0148E+03     0.05103      0.00001
  Kr-88     6.7454E+03     0.42213      0.00003
  Rb-86     1.3672E-01     0.00005      0.00000
  Sr-89     3.6811E+00     0.00881      0.00000
  Sr-90     4.9249E-01     0.03695      0.00000
  Sr-91     3.4478E+00     0.00044      0.00000
  Sr-92     1.9098E+00     0.00017      0.00000
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Y-90	2.1502E-02	0.00001	0.00000
Y-91	5.0396E-02	0.00014	0.00000
Y-92	1.0104E+00	0.00005	0.00000
Y-93	4.3506E-02	0.00001	0.00000
Zr-95	6.9502E-02	0.00010	0.00000
Zr-97	5.9653E-02	0.00002	0.00000
Nb-95	6.9779E-02	0.00003	0.00000
Mo-99	8.8635E-01	0.00021	0.00000
Tc-99m	8.0562E-01	0.00000	0.00000
Ru-103	7.9728E-01	0.00042	0.00000
Ru-105	3.0091E-01	0.00001	0.00000
Ru-106	3.1050E-01	0.00856	0.00000
Rh-105	5.0682E-01	0.00003	0.00000
Sb-127	9.2276E-01	0.00034	0.00000
Sb-129	1.5115E+00	0.00012	0.00000
Te-127	8.4949E-01	0.00002	0.00000
Te-127m	6.7440E-02	0.00008	0.00000
Te-129	1.8233E+00	0.00001	0.00000
Te-129m	4.6485E-01	0.00065	0.00000
Te-131m	1.7669E+00	0.00074	0.00000
Te-132	1.3691E+01	0.00755	0.00000
I-131	7.0477E+01	0.13365	0.00121
I-132	5.4027E+01	0.00483	0.00008
I-133	1.2782E+02	0.04510	0.00046
I-134	1.8467E+01	0.00151	0.00011
I-135	9.3311E+01	0.01124	0.00015
Xe-133	5.0751E+04	0.04835	0.00000
Xe-135	1.6316E+04	0.11854	0.00000
Cs-134	1.3126E+01	0.03535	0.00037
Cs-136	3.2978E+00	0.00159	0.00002
Cs-137	1.0070E+01	0.01857	0.00020
Ba-139	1.2826E+00	0.00001	0.00000
Ba-140	6.9121E+00	0.00153	0.00000
La-140	4.3274E-01	0.00015	0.00000
La-141	3.2831E-02	0.00000	0.00000
La-142	1.3038E-02	0.00000	0.00000
Ce-141	1.6404E-01	0.00009	0.00000
Ce-143	1.3972E-01	0.00003	0.00000
Ce-144	1.3683E-01	0.00295	0.00000
Pr-143	6.0076E-02	0.00003	0.00000
Nd-147	2.5752E-02	0.00001	0.00000
Np-239	1.7880E+00	0.00027	0.00000
Pu-238	4.0547E-04	0.00675	0.00000
Pu-239	3.7967E-05	0.00068	0.00000
Pu-240	6.7699E-05	0.00121	0.00000
Pu-241	1.6143E-02	0.00462	0.00000
Am-241	7.9857E-06	0.00020	0.00000
Cm-242	2.8249E-03	0.00282	0.00000
Cm-244	1.4432E-04	0.00207	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 8.3333	Total Release	Release Rate/s
Noble gases (atoms)	8.3900E+21	2.7967E+17
Elemental I (atoms)	1.9978E+17	6.6593E+12
Organic I (atoms)	6.1787E+15	2.0596E+11
Aerosol I (atoms)	3.0638E+18	1.0213E+14
All Aerosols (kg)	1.3182E-04	4.3941E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 8.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.3903E+21
Elemental I (atoms)	1.8396E+19	1.9839E+17
Organic I (atoms)	5.6893E+17	6.1357E+15
Aerosol I (atoms)	2.8068E+20	3.0374E+18
All Aerosols (kg)	1.2706E-02	1.3062E-04

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Environment to Control Room - Emergency Filtere Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.8456E+19
Elemental I (atoms)      4.2117E+14   4.5049E+12
Organic I (atoms)        1.3026E+13   1.3933E+11
Aerosol I (atoms)        6.4943E+15   6.9521E+13
All Aerosols (kg)        2.9581E-07   2.9890E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1177E+18
Elemental I (atoms)      0.0000E+00   5.1691E+13
Organic I (atoms)        0.0000E+00   1.5987E+12
Aerosol I (atoms)        0.0000E+00   7.9772E+14
All Aerosols (kg)        0.0000E+00   3.4298E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      1.7965E+19   7.9838E+14
Elemental I (atoms)      4.9149E+13   0.0000E+00
Organic I (atoms)        1.5201E+12   0.0000E+00
Aerosol I (atoms)        7.5726E+14   0.0000E+00
All Aerosols (kg)        3.2915E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.5295E+16
Elemental I (atoms)      0.0000E+00   8.6152E+11
Organic I (atoms)        0.0000E+00   2.6645E+10
Aerosol I (atoms)        0.0000E+00   1.3295E+13
All Aerosols (kg)        0.0000E+00   5.7163E-10

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =   11.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.2581E+03

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EAB with LOCA Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2777E-01  2.6835E+00  3.7624E-01
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Accumulated dose (rem)  3.5143E+00  3.3346E+01  5.2961E+00

LOCA @ LPZ Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.6046E-03  1.1316E-01  1.5865E-02
Accumulated dose (rem)  2.0300E-01  1.9174E+00  3.0536E-01

LOCA @ Unprotected CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.3084E-01  9.8700E+00  9.7691E-01
Accumulated dose (rem)  1.5086E+01  1.4654E+02  2.2900E+01

LOCA @ CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.4409E-02  5.3076E-01  4.3732E-02  4.3599E-01
Accumulated dose (rem)  2.0254E-01  3.8706E+00  4.0943E-01  5.3274E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  12.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     2.3647E-03     0.00000      0.00000
  Co-60     9.7214E-05     0.00000      0.00000
  Kr-85     4.6952E+02     0.00003      0.00000
  Kr-85m    3.8717E+03     0.01610      0.00000
  Kr-87     2.0268E+03     0.04743      0.00001
  Kr-88     7.0356E+03     0.40277      0.00002
  Rb-86     1.6098E-01     0.00005      0.00000
  Sr-89     4.3809E+00     0.00927      0.00000
  Sr-90     5.8642E-01     0.03889      0.00000
  Sr-91     3.8766E+00     0.00044      0.00000
  Sr-92     1.9869E+00     0.00016      0.00000
  Y-90      3.1040E-02     0.00001      0.00000
  Y-91      6.0626E-02     0.00015      0.00000
  Y-92      1.1844E+00     0.00006      0.00000
  Y-93      4.9057E-02     0.00001      0.00000
  Zr-95     8.2723E-02     0.00010      0.00000
  Zr-97     6.8613E-02     0.00002      0.00000
  Nb-95     8.3087E-02     0.00003      0.00000
  Mo-99     1.0454E+00     0.00022      0.00000
  Tc-99m    9.5466E-01     0.00000      0.00000
  Ru-103    9.4869E-01     0.00045      0.00000
  Ru-105    3.2354E-01     0.00001      0.00000
  Ru-106    3.6969E-01     0.00901      0.00000
  Rh-105    5.9721E-01     0.00003      0.00000
  Sb-127    1.0913E+00     0.00036      0.00000
  Sb-129    1.6222E+00     0.00012      0.00000
  Te-127    1.0087E+00     0.00002      0.00000
  Te-127m   8.0330E-02     0.00009      0.00000
  Te-129    1.9979E+00     0.00001      0.00000
  Te-129m   5.5328E-01     0.00068      0.00000
  Te-131m   2.0616E+00     0.00077      0.00000
  Te-132    1.6172E+01     0.00790      0.00000
  I-131     8.2959E+01     0.13959      0.00112
  I-132     5.7662E+01     0.00469      0.00008
  I-133     1.4674E+02     0.04622      0.00042
  I-134     1.8482E+01     0.00140      0.00010
  I-135     1.0220E+02     0.01113      0.00014
  Xe-133    6.0311E+04     0.05082      0.00000
  Xe-135    1.9638E+04     0.12579      0.00000
  Cs-134    1.5476E+01     0.03697      0.00034
  Cs-136    3.8806E+00     0.00167      0.00002
  Cs-137    1.1874E+01     0.01942      0.00018
  Ba-139    1.2930E+00     0.00001      0.00000
  Ba-140    8.2132E+00     0.00161      0.00000
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La-140	6.3140E-01	0.00019	0.00000
La-141	3.5010E-02	0.00000	0.00000
La-142	1.3188E-02	0.00000	0.00000
Ce-141	1.9519E-01	0.00009	0.00000
Ce-143	1.6331E-01	0.00003	0.00000
Ce-144	1.6291E-01	0.00311	0.00000
Pr-143	7.1701E-02	0.00003	0.00000
Nd-147	3.0589E-02	0.00001	0.00000
Np-239	2.1057E+00	0.00028	0.00000
Pu-238	4.8280E-04	0.00711	0.00000
Pu-239	4.5214E-05	0.00071	0.00000
Pu-240	8.0611E-05	0.00127	0.00000
Pu-241	1.9222E-02	0.00487	0.00000
Am-241	9.5120E-06	0.00022	0.00000
Cm-242	3.3631E-03	0.00297	0.00000
Cm-244	1.7185E-04	0.00218	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 12.0000	Total Release	Release Rate/s
Noble gases (atoms)	9.9796E+21	2.3101E+17
Elemental I (atoms)	2.3381E+17	5.4122E+12
Organic I (atoms)	7.2312E+15	1.6739E+11
Aerosol I (atoms)	3.5801E+18	8.2872E+13
All Aerosols (kg)	1.5548E-04	3.5991E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.9799E+21
Elemental I (atoms)	2.1043E+19	2.3242E+17
Organic I (atoms)	6.5083E+17	7.1882E+15
Aerosol I (atoms)	3.2079E+20	3.5537E+18
All Aerosols (kg)	1.5045E-02	1.5428E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9656E+19
Elemental I (atoms)	4.3123E+14	4.7630E+12
Organic I (atoms)	1.3337E+13	1.4731E+11
Aerosol I (atoms)	6.6433E+15	7.3437E+13
All Aerosols (kg)	3.1351E-07	3.1684E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2554E+18
Elemental I (atoms)	0.0000E+00	5.4653E+13
Organic I (atoms)	0.0000E+00	1.6903E+12
Aerosol I (atoms)	0.0000E+00	8.4265E+14
All Aerosols (kg)	0.0000E+00	3.6356E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	2.1195E+19	1.5713E+15
Elemental I (atoms)	5.7181E+13	0.0000E+00
Organic I (atoms)	1.7685E+12	0.0000E+00
Aerosol I (atoms)	8.7921E+14	0.0000E+00
All Aerosols (kg)	3.8411E-08	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Pathway

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Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.7590E+16
Elemental I (atoms)      0.0000E+00   9.1088E+11
Organic I (atoms)        0.0000E+00   2.8171E+10
Aerosol I (atoms)        0.0000E+00   1.4044E+13
All Aerosols (kg)        0.0000E+00   6.0594E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =   19.2000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.2996E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.1672E+05

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EAB with LOCA Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0974E-01  1.9446E+00  2.1944E-01
Accumulated dose (rem)  3.6240E+00  3.5290E+01  5.5155E+00

LOCA @ LPZ Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.6278E-03  8.2000E-02  9.2536E-03
Accumulated dose (rem)  2.0763E-01  1.9994E+00  3.1461E-01

LOCA @ Unprotected CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.0759E-01  7.1522E+00  6.1106E-01
Accumulated dose (rem)  1.5294E+01  1.5369E+02  2.3511E+01

LOCA @ CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        4.2905E-03  2.4091E-01  1.7873E-02  1.4901E-01
Accumulated dose (rem)  2.0683E-01  4.1115E+00  4.2731E-01  5.4764E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  19.4444

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     2.6517E-03     0.00000      0.00000
  Co-60     1.0906E-04     0.00000      0.00000
  Kr-85     5.2648E+02     0.00003      0.00000
  Kr-85m    3.9742E+03     0.01562      0.00000
  Kr-87     2.0278E+03     0.04515      0.00001
  Kr-88     7.1107E+03     0.38624      0.00002
  Rb-86     1.7930E-01     0.00006      0.00000
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Sr-89	4.9119E+00	0.00963	0.00000
Sr-90	6.5788E-01	0.04041	0.00000
Sr-91	4.1093E+00	0.00044	0.00000
Sr-92	2.0059E+00	0.00015	0.00000
Y-90	4.1491E-02	0.00002	0.00000
Y-91	6.8657E-02	0.00016	0.00000
Y-92	1.2573E+00	0.00006	0.00000
Y-93	5.2131E-02	0.00001	0.00000
Zr-95	9.2760E-02	0.00011	0.00000
Zr-97	7.4243E-02	0.00002	0.00000
Nb-95	9.3211E-02	0.00003	0.00000
Mo-99	1.1606E+00	0.00022	0.00000
Tc-99m	1.0640E+00	0.00000	0.00000
Ru-103	1.0635E+00	0.00046	0.00000
Ru-105	3.3205E-01	0.00001	0.00000
Ru-106	4.1471E-01	0.00936	0.00000
Rh-105	6.6096E-01	0.00003	0.00000
Sb-127	1.2150E+00	0.00037	0.00000
Sb-129	1.6631E+00	0.00012	0.00000
Te-127	1.1273E+00	0.00002	0.00000
Te-127m	9.0153E-02	0.00009	0.00000
Te-129	2.0849E+00	0.00001	0.00000
Te-129m	6.2034E-01	0.00071	0.00000
Te-131m	2.2628E+00	0.00079	0.00000
Te-132	1.7982E+01	0.00815	0.00000
I-131	9.2298E+01	0.14415	0.00106
I-132	5.9752E+01	0.00458	0.00007
I-133	1.5906E+02	0.04676	0.00040
I-134	1.8482E+01	0.00133	0.00010
I-135	1.0639E+02	0.01091	0.00013
Xe-133	6.7693E+04	0.05282	0.00000
Xe-135	2.2511E+04	0.13293	0.00000
Cs-134	1.7263E+01	0.03826	0.00033
Cs-136	4.3194E+00	0.00172	0.00001
Cs-137	1.3246E+01	0.02010	0.00017
Ba-139	1.2939E+00	0.00001	0.00000
Ba-140	9.1926E+00	0.00167	0.00000
La-140	8.4729E-01	0.00023	0.00000
La-141	3.5761E-02	0.00000	0.00000
La-142	1.3205E-02	0.00000	0.00000
Ce-141	2.1880E-01	0.00009	0.00000
Ce-143	1.7958E-01	0.00003	0.00000
Ce-144	1.8274E-01	0.00323	0.00000
Pr-143	8.0627E-02	0.00003	0.00000
Nd-147	3.4224E-02	0.00001	0.00000
Np-239	2.3338E+00	0.00029	0.00000
Pu-238	5.4164E-04	0.00738	0.00000
Pu-239	5.0732E-05	0.00074	0.00000
Pu-240	9.0435E-05	0.00132	0.00000
Pu-241	2.1565E-02	0.00506	0.00000
Am-241	1.0675E-05	0.00022	0.00000
Cm-242	3.7723E-03	0.00308	0.00000
Cm-244	1.9279E-04	0.00226	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 19.4444	Total Release	Release Rate/s
Noble gases (atoms)	1.1192E+22	1.5989E+17
Elemental I (atoms)	2.5860E+17	3.6943E+12
Organic I (atoms)	7.9981E+15	1.1426E+11
Aerosol I (atoms)	3.9563E+18	5.6518E+13
All Aerosols (kg)	1.7348E-04	2.4782E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1193E+22
Elemental I (atoms)	2.2135E+19	2.5723E+17

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Organic I (atoms)        6.8460E+17   7.9556E+15
Aerosol I (atoms)        3.3727E+20   3.9302E+18
All Aerosols (kg)        1.6822E-02   1.7229E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.0532E+19
Elemental I (atoms)      4.2244E+14   4.9441E+12
Organic I (atoms)        1.3065E+13   1.5291E+11
Aerosol I (atoms)        6.5036E+15   7.6183E+13
All Aerosols (kg)        3.2640E-07   3.2998E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                           Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.3559E+18
Elemental I (atoms)      0.0000E+00   5.6731E+13
Organic I (atoms)        0.0000E+00   1.7546E+12
Aerosol I (atoms)        0.0000E+00   8.7416E+14
All Aerosols (kg)        0.0000E+00   3.7864E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      2.2734E+19   3.2048E+15
Elemental I (atoms)      6.1063E+13   0.0000E+00
Organic I (atoms)        1.8885E+12   0.0000E+00
Aerosol I (atoms)        9.3816E+14   0.0000E+00
All Aerosols (kg)        4.1032E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.9265E+16
Elemental I (atoms)      0.0000E+00   9.4552E+11
Organic I (atoms)        0.0000E+00   2.9243E+10
Aerosol I (atoms)        0.0000E+00   1.4569E+13
All Aerosols (kg)        0.0000E+00   6.3106E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =   23.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.1344E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2105E+06

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EAB with LOCA Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.3759E-02	3.4615E-01	3.3785E-02
Accumulated dose (rem)	3.6378E+00	3.5637E+01	5.5493E+00

LOCA @ LPZ Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.8020E-04	1.4597E-02	1.4247E-03
Accumulated dose (rem)	2.0821E-01	2.0140E+00	3.1604E-01

LOCA @ Unprotected CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.6026E-02	1.2732E+00	9.9682E-02
Accumulated dose (rem)	1.5320E+01	1.5497E+02	2.3611E+01

LOCA @ CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	5.0137E-04	3.9476E-02	2.7851E-03	1.9476E-02
Accumulated dose (rem)	2.0734E-01	4.1510E+00	4.3009E-01	5.4959E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 24.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	2.7058E-03	0.00000	0.00000
Co-60	1.1130E-04	0.00000	0.00000
Kr-85	5.3725E+02	0.00003	0.00000
Kr-85m	3.9811E+03	0.01549	0.00000
Kr-87	2.0278E+03	0.04473	0.00001
Kr-88	7.1135E+03	0.38278	0.00002
Rb-86	1.8273E-01	0.00006	0.00000
Sr-89	5.0118E+00	0.00969	0.00000
Sr-90	6.7138E-01	0.04067	0.00000
Sr-91	4.1366E+00	0.00044	0.00000
Sr-92	2.0065E+00	0.00015	0.00000
Y-90	4.4250E-02	0.00002	0.00000
Y-91	7.0217E-02	0.00016	0.00000
Y-92	1.2621E+00	0.00006	0.00000
Y-93	5.2501E-02	0.00001	0.00000
Zr-95	9.4652E-02	0.00011	0.00000
Zr-97	7.5057E-02	0.00002	0.00000
Nb-95	9.5124E-02	0.00003	0.00000
Mo-99	1.1810E+00	0.00022	0.00000
Tc-99m	1.0835E+00	0.00000	0.00000
Ru-103	1.0851E+00	0.00047	0.00000
Ru-105	3.3262E-01	0.00001	0.00000
Ru-106	4.2321E-01	0.00942	0.00000
Rh-105	6.7169E-01	0.00003	0.00000
Sb-127	1.2373E+00	0.00037	0.00000
Sb-129	1.6657E+00	0.00011	0.00000
Te-127	1.1490E+00	0.00002	0.00000
Te-127m	9.2014E-02	0.00009	0.00000
Te-129	2.0960E+00	0.00001	0.00000
Te-129m	6.3294E-01	0.00071	0.00000
Te-131m	2.2955E+00	0.00079	0.00000
Te-132	1.8305E+01	0.00819	0.00000
I-131	9.4023E+01	0.14489	0.00105
I-132	6.0091E+01	0.00456	0.00007
I-133	1.6093E+02	0.04675	0.00040
I-134	1.8482E+01	0.00132	0.00010
I-135	1.0679E+02	0.01084	0.00013
Xe-133	6.9192E+04	0.05323	0.00000
Xe-135	2.3223E+04	0.13496	0.00000
Cs-134	1.7601E+01	0.03849	0.00032

Cs-136	4.4011E+00	0.00173	0.00001
Cs-137	1.3505E+01	0.02022	0.00017
Ba-139	1.2939E+00	0.00001	0.00000
Ba-140	9.3750E+00	0.00168	0.00000
La-140	9.0324E-01	0.00024	0.00000
La-141	3.5805E-02	0.00000	0.00000
La-142	1.3205E-02	0.00000	0.00000
Ce-141	2.2323E-01	0.00009	0.00000
Ce-143	1.8226E-01	0.00003	0.00000
Ce-144	1.8649E-01	0.00325	0.00000
Pr-143	8.2330E-02	0.00003	0.00000
Nd-147	3.4900E-02	0.00001	0.00000
Np-239	2.3736E+00	0.00029	0.00000
Pu-238	5.5276E-04	0.00743	0.00000
Pu-239	5.1775E-05	0.00074	0.00000
Pu-240	9.2292E-05	0.00133	0.00000
Pu-241	2.2007E-02	0.00509	0.00000
Am-241	1.0896E-05	0.00023	0.00000
Cm-242	3.8495E-03	0.00310	0.00000
Cm-244	1.9675E-04	0.00228	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 24.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.1424E+22	1.3222E+17
Elemental I (atoms)	2.6305E+17	3.0446E+12
Organic I (atoms)	8.1357E+15	9.4163E+10
Aerosol I (atoms)	4.0238E+18	4.6572E+13
All Aerosols (kg)	1.7688E-04	2.0472E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1425E+22
Elemental I (atoms)	2.1846E+19	2.6169E+17
Organic I (atoms)	6.7565E+17	8.0934E+15
Aerosol I (atoms)	3.3283E+20	3.9977E+18
All Aerosols (kg)	1.7156E-02	1.7569E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0696E+19
Elemental I (atoms)	4.1180E+14	4.9764E+12
Organic I (atoms)	1.2736E+13	1.5391E+11
Aerosol I (atoms)	6.3391E+15	7.6673E+13
All Aerosols (kg)	3.2878E-07	3.3245E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.3746E+18
Elemental I (atoms)	0.0000E+00	5.7102E+13
Organic I (atoms)	0.0000E+00	1.7660E+12
Aerosol I (atoms)	0.0000E+00	8.7978E+14
All Aerosols (kg)	0.0000E+00	3.8146E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	2.3000E+19	4.2102E+15
Elemental I (atoms)	6.1829E+13	0.0000E+00
Organic I (atoms)	1.9122E+12	0.0000E+00
Aerosol I (atoms)	9.4982E+14	0.0000E+00
All Aerosols (kg)	4.1489E-08	0.0000E+00

```
Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.9577E+16
Elemental I (atoms)      0.0000E+00   9.5170E+11
Organic I (atoms)        0.0000E+00   2.9434E+10
Aerosol I (atoms)        0.0000E+00   1.4663E+13
All Aerosols (kg)        0.0000E+00   6.3577E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =   95.5000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2106E+06

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EAB with LOCA Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.7604E-03  3.0812E-01  2.6079E-02
Accumulated dose (rem)  3.6456E+00  3.5945E+01  5.5754E+00

LOCA @ LPZ Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.5895E-04  6.3109E-03  5.3416E-04
Accumulated dose (rem)  2.0837E-01  2.0203E+00  3.1657E-01

LOCA @ Unprotected CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0472E-02  6.3270E-01  4.8089E-02
Accumulated dose (rem)  1.5331E+01  1.5560E+02  2.3659E+01

LOCA @ CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.3510E-04  1.1831E-02  8.3712E-04  5.4472E-03
Accumulated dose (rem)  2.0747E-01  4.1628E+00  4.3093E-01  5.5014E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  96.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     2.7458E-03     0.00000      0.00000
  Co-60     1.1296E-04     0.00000      0.00000
  Kr-85     5.4523E+02     0.00003      0.00000
```

Kr-85m	3.9829E+03	0.01543	0.00000
Kr-87	2.0278E+03	0.04453	0.00001
Kr-88	7.1139E+03	0.38106	0.00002
Rb-86	1.8524E-01	0.00006	0.00000
Sr-89	5.0856E+00	0.00970	0.00000
Sr-90	6.8139E-01	0.04071	0.00000
Sr-91	4.1486E+00	0.00044	0.00000
Sr-92	2.0066E+00	0.00015	0.00000
Y-90	4.6937E-02	0.00002	0.00000
Y-91	7.1392E-02	0.00016	0.00000
Y-92	1.2632E+00	0.00005	0.00000
Y-93	5.2668E-02	0.00001	0.00000
Zr-95	9.6048E-02	0.00011	0.00000
Zr-97	7.5501E-02	0.00002	0.00000
Nb-95	9.6541E-02	0.00003	0.00000
Mo-99	1.1948E+00	0.00022	0.00000
Tc-99m	1.0969E+00	0.00000	0.00000
Ru-103	1.1010E+00	0.00047	0.00000
Ru-105	3.3277E-01	0.00001	0.00000
Ru-106	4.2951E-01	0.00943	0.00000
Rh-105	6.7855E-01	0.00003	0.00000
Sb-127	1.2529E+00	0.00037	0.00000
Sb-129	1.6664E+00	0.00011	0.00000
Te-127	1.1644E+00	0.00002	0.00000
Te-127m	9.3395E-02	0.00009	0.00000
Te-129	2.1028E+00	0.00001	0.00000
Te-129m	6.4222E-01	0.00071	0.00000
Te-131m	2.3158E+00	0.00079	0.00000
Te-132	1.8528E+01	0.00819	0.00000
I-131	9.5266E+01	0.14496	0.00105
I-132	6.0322E+01	0.00455	0.00007
I-133	1.6201E+02	0.04666	0.00040
I-134	1.8482E+01	0.00132	0.00010
I-135	1.0693E+02	0.01080	0.00013
Xe-133	7.1365E+04	0.05361	0.00000
Xe-135	2.4212E+04	0.13653	0.00000
Cs-134	1.7851E+01	0.03852	0.00032
Cs-136	4.4607E+00	0.00173	0.00001
Cs-137	1.3697E+01	0.02024	0.00017
Ba-139	1.2939E+00	0.00001	0.00000
Ba-140	9.5077E+00	0.00168	0.00000
La-140	9.5612E-01	0.00024	0.00000
La-141	3.5815E-02	0.00000	0.00000
La-142	1.3205E-02	0.00000	0.00000
Ce-141	2.2650E-01	0.00009	0.00000
Ce-143	1.8395E-01	0.00003	0.00000
Ce-144	1.8926E-01	0.00325	0.00000
Pr-143	8.3601E-02	0.00003	0.00000
Nd-147	3.5390E-02	0.00001	0.00000
Np-239	2.4004E+00	0.00029	0.00000
Pu-238	5.6100E-04	0.00744	0.00000
Pu-239	5.2549E-05	0.00075	0.00000
Pu-240	9.3667E-05	0.00133	0.00000
Pu-241	2.2335E-02	0.00509	0.00000
Am-241	1.1059E-05	0.00023	0.00000
Cm-242	3.9067E-03	0.00311	0.00000
Cm-244	1.9968E-04	0.00228	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 96.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.1622E+22	3.3629E+16
Elemental I (atoms)	2.6618E+17	7.7020E+11
Organic I (atoms)	8.2324E+15	2.3821E+10
Aerosol I (atoms)	4.0713E+18	1.1780E+13
All Aerosols (kg)	1.7939E-04	5.1908E-10

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

```
                          Pathway
Time (h) =  96.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   1.1624E+22
Elemental I (atoms)     1.5589E+19   2.6482E+17
Organic I (atoms)       4.8213E+17   8.1902E+15
Aerosol I (atoms)       2.3749E+20   4.0452E+18
All Aerosols (kg)       1.7370E-02   1.7821E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =  96.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   2.0769E+19
Elemental I (atoms)     2.9057E+14   4.9902E+12
Organic I (atoms)       8.9868E+12   1.5433E+11
Aerosol I (atoms)       4.4727E+15   7.6881E+13
All Aerosols (kg)       3.2922E-07   3.3355E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                          Pathway
Time (h) =  96.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   2.3830E+18
Elemental I (atoms)     0.0000E+00   5.7259E+13
Organic I (atoms)       0.0000E+00   1.7709E+12
Aerosol I (atoms)       0.0000E+00   8.8217E+14
All Aerosols (kg)       0.0000E+00   3.8273E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =  96.0000      Filtered    Transported
Noble gases (atoms)     2.3141E+19   2.0111E+16
Elemental I (atoms)     6.4831E+13   0.0000E+00
Organic I (atoms)       2.0051E+12   0.0000E+00
Aerosol I (atoms)       9.9587E+14   0.0000E+00
All Aerosols (kg)       4.1750E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =  96.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   3.9717E+16
Elemental I (atoms)     0.0000E+00   9.5432E+11
Organic I (atoms)       0.0000E+00   2.9515E+10
Aerosol I (atoms)       0.0000E+00   1.4703E+13
All Aerosols (kg)       0.0000E+00   6.3788E-10

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) =  96.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   2.1241E+17
Elemental I (atoms)     0.0000E+00   1.5218E+15
Organic I (atoms)       0.0000E+00   4.7065E+13
Aerosol I (atoms)       0.0000E+00   2.8888E+16
All Aerosols (kg)       0.0000E+00   1.3097E-06

Detailed model information at time (hr) =  119.6500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2106E+06

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EAB with LOCA Doses:

Time (h) = 120.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.4036E-09	2.8459E-07	2.4911E-08
Accumulated dose (rem)	3.6456E+00	3.5945E+01	5.5754E+00

LOCA @ LPZ Doses:

Time (h) = 120.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.2364E-11	2.0916E-09	1.8308E-10
Accumulated dose (rem)	2.0837E-01	2.0203E+00	3.1657E-01

LOCA @ Unprotected CR Doses:

Time (h) = 120.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.7007E-09	4.6229E-07	3.8014E-08
Accumulated dose (rem)	1.5331E+01	1.5560E+02	2.3659E+01

LOCA @ CR Doses:

Time (h) = 120.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	8.9367E-08	5.5000E-09	8.9763E-08	3.8783E-06
Accumulated dose (rem)	2.0747E-01	4.1628E+00	4.3093E-01	5.5014E+00

****

Environment Integral Nuclide Release (Ci): at Time (h) = 120.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	2.7458E-03	0.00000	0.00000
Co-60	1.1296E-04	0.00000	0.00000
Kr-85	5.4523E+02	0.00003	0.00000
Kr-85m	3.9829E+03	0.01543	0.00000
Kr-87	2.0278E+03	0.04453	0.00001
Kr-88	7.1139E+03	0.38105	0.00002
Rb-86	1.8524E-01	0.00006	0.00000
Sr-89	5.0856E+00	0.00970	0.00000
Sr-90	6.8139E-01	0.04071	0.00000
Sr-91	4.1486E+00	0.00044	0.00000
Sr-92	2.0066E+00	0.00015	0.00000
Y-90	4.6937E-02	0.00002	0.00000
Y-91	7.1392E-02	0.00016	0.00000
Y-92	1.2632E+00	0.00005	0.00000
Y-93	5.2668E-02	0.00001	0.00000
Zr-95	9.6048E-02	0.00011	0.00000
Zr-97	7.5501E-02	0.00002	0.00000
Nb-95	9.6541E-02	0.00003	0.00000
Mo-99	1.1948E+00	0.00022	0.00000
Tc-99m	1.0969E+00	0.00000	0.00000
Ru-103	1.1010E+00	0.00047	0.00000
Ru-105	3.3277E-01	0.00001	0.00000
Ru-106	4.2951E-01	0.00943	0.00000
Rh-105	6.7855E-01	0.00003	0.00000
Sb-127	1.2529E+00	0.00037	0.00000
Sb-129	1.6664E+00	0.00011	0.00000
Te-127	1.1644E+00	0.00002	0.00000
Te-127m	9.3395E-02	0.00009	0.00000
Te-129	2.1028E+00	0.00001	0.00000
Te-129m	6.4222E-01	0.00071	0.00000
Te-131m	2.3158E+00	0.00079	0.00000
Te-132	1.8528E+01	0.00819	0.00000
I-131	9.5266E+01	0.14496	0.00105
I-132	6.0322E+01	0.00455	0.00007
I-133	1.6201E+02	0.04665	0.00040
I-134	1.8482E+01	0.00132	0.00010

I-135	1.0693E+02	0.01080	0.00013
Xe-133	7.1435E+04	0.05362	0.00000
Xe-135	2.4213E+04	0.13653	0.00000
Cs-134	1.7851E+01	0.03852	0.00032
Cs-136	4.4607E+00	0.00173	0.00001
Cs-137	1.3697E+01	0.02024	0.00017
Ba-139	1.2939E+00	0.00001	0.00000
Ba-140	9.5077E+00	0.00168	0.00000
La-140	9.5612E-01	0.00024	0.00000
La-141	3.5815E-02	0.00000	0.00000
La-142	1.3205E-02	0.00000	0.00000
Ce-141	2.2650E-01	0.00009	0.00000
Ce-143	1.8395E-01	0.00003	0.00000
Ce-144	1.8926E-01	0.00325	0.00000
Pr-143	8.3601E-02	0.00003	0.00000
Nd-147	3.5390E-02	0.00001	0.00000
Np-239	2.4004E+00	0.00029	0.00000
Pu-238	5.6100E-04	0.00744	0.00000
Pu-239	5.2549E-05	0.00075	0.00000
Pu-240	9.3667E-05	0.00133	0.00000
Pu-241	2.2335E-02	0.00509	0.00000
Am-241	1.1059E-05	0.00023	0.00000
Cm-242	3.9067E-03	0.00311	0.00000
Cm-244	1.9968E-04	0.00228	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 120.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.1624E+22	2.6907E+16
Elemental I (atoms)	2.6618E+17	6.1616E+11
Organic I (atoms)	8.2324E+15	1.9057E+10
Aerosol I (atoms)	4.0713E+18	9.4242E+12
All Aerosols (kg)	1.7939E-04	4.1526E-10

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1625E+22
Elemental I (atoms)	1.4211E+19	2.6482E+17
Organic I (atoms)	4.3952E+17	8.1902E+15
Aerosol I (atoms)	2.1650E+20	4.0452E+18
All Aerosols (kg)	1.7362E-02	1.7821E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0769E+19
Elemental I (atoms)	2.6489E+14	4.9902E+12
Organic I (atoms)	8.1926E+12	1.5433E+11
Aerosol I (atoms)	4.0774E+15	7.6881E+13
All Aerosols (kg)	3.2906E-07	3.3355E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.3830E+18
Elemental I (atoms)	0.0000E+00	5.7259E+13
Organic I (atoms)	0.0000E+00	1.7709E+12
Aerosol I (atoms)	0.0000E+00	8.8217E+14
All Aerosols (kg)	0.0000E+00	3.8273E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	2.3141E+19	2.5411E+16

```
Elemental I (atoms)      6.5731E+13   0.0000E+00
Organic I (atoms)        2.0329E+12   0.0000E+00
Aerosol I (atoms)        1.0097E+15   0.0000E+00
All Aerosols (kg)        4.1757E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.9717E+16
Elemental I (atoms)      0.0000E+00   9.5432E+11
Organic I (atoms)        0.0000E+00   2.9515E+10
Aerosol I (atoms)        0.0000E+00   1.4703E+13
All Aerosols (kg)        0.0000E+00   6.3788E-10

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =  239.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2106E+06

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EAB with LOCA Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.3311E-11  2.8984E-09  2.6391E-10
Accumulated dose (rem)  3.6456E+00  3.5945E+01  5.5754E+00

LOCA @ LPZ Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.1831E-13  2.1302E-11  1.9396E-12
Accumulated dose (rem)  2.0837E-01  2.0203E+00  3.1657E-01

LOCA @ Unprotected CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.6233E-11  4.7083E-09  4.0457E-10
Accumulated dose (rem)  1.5331E+01  1.5560E+02  2.3659E+01

LOCA @ CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        6.8514E-08  5.3424E-11  6.8518E-08  2.9955E-06
Accumulated dose (rem)  2.0747E-01  4.1628E+00  4.3093E-01  5.5014E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 240.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
```

	Atmosphere	Pathway 2	Pathway 7
Co-58	2.7458E-03	0.00000	0.00000
Co-60	1.1296E-04	0.00000	0.00000
Kr-85	5.4523E+02	0.00003	0.00000
Kr-85m	3.9829E+03	0.01543	0.00000
Kr-87	2.0278E+03	0.04453	0.00001
Kr-88	7.1139E+03	0.38105	0.00002
Rb-86	1.8524E-01	0.00006	0.00000
Sr-89	5.0856E+00	0.00970	0.00000
Sr-90	6.8139E-01	0.04071	0.00000
Sr-91	4.1486E+00	0.00044	0.00000
Sr-92	2.0066E+00	0.00015	0.00000
Y-90	4.6937E-02	0.00002	0.00000
Y-91	7.1392E-02	0.00016	0.00000
Y-92	1.2632E+00	0.00005	0.00000
Y-93	5.2668E-02	0.00001	0.00000
Zr-95	9.6048E-02	0.00011	0.00000
Zr-97	7.5501E-02	0.00002	0.00000
Nb-95	9.6541E-02	0.00003	0.00000
Mo-99	1.1948E+00	0.00022	0.00000
Tc-99m	1.0969E+00	0.00000	0.00000
Ru-103	1.1010E+00	0.00047	0.00000
Ru-105	3.3277E-01	0.00001	0.00000
Ru-106	4.2951E-01	0.00943	0.00000
Rh-105	6.7855E-01	0.00003	0.00000
Sb-127	1.2529E+00	0.00037	0.00000
Sb-129	1.6664E+00	0.00011	0.00000
Te-127	1.1644E+00	0.00002	0.00000
Te-127m	9.3395E-02	0.00009	0.00000
Te-129	2.1028E+00	0.00001	0.00000
Te-129m	6.4222E-01	0.00071	0.00000
Te-131m	2.3158E+00	0.00079	0.00000
Te-132	1.8528E+01	0.00819	0.00000
I-131	9.5266E+01	0.14496	0.00105
I-132	6.0322E+01	0.00455	0.00007
I-133	1.6201E+02	0.04665	0.00040
I-134	1.8482E+01	0.00132	0.00010
I-135	1.0693E+02	0.01080	0.00013
Xe-133	7.1491E+04	0.05363	0.00000
Xe-135	2.4213E+04	0.13652	0.00000
Cs-134	1.7851E+01	0.03852	0.00032
Cs-136	4.4607E+00	0.00173	0.00001
Cs-137	1.3697E+01	0.02024	0.00017
Ba-139	1.2939E+00	0.00001	0.00000
Ba-140	9.5077E+00	0.00168	0.00000
La-140	9.5612E-01	0.00024	0.00000
La-141	3.5815E-02	0.00000	0.00000
La-142	1.3205E-02	0.00000	0.00000
Ce-141	2.2650E-01	0.00009	0.00000
Ce-143	1.8395E-01	0.00003	0.00000
Ce-144	1.8926E-01	0.00325	0.00000
Pr-143	8.3601E-02	0.00003	0.00000
Nd-147	3.5390E-02	0.00001	0.00000
Np-239	2.4004E+00	0.00029	0.00000
Pu-238	5.6100E-04	0.00744	0.00000
Pu-239	5.2549E-05	0.00075	0.00000
Pu-240	9.3667E-05	0.00133	0.00000
Pu-241	2.2335E-02	0.00509	0.00000
Am-241	1.1059E-05	0.00023	0.00000
Cm-242	3.9067E-03	0.00311	0.00000
Cm-244	1.9968E-04	0.00228	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 240.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.1625E+22	1.3455E+16
Elemental I (atoms)	2.6618E+17	3.0808E+11
Organic I (atoms)	8.2324E+15	9.5283E+09
Aerosol I (atoms)	4.0713E+18	4.7121E+12

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All Aerosols (kg)      1.7939E-04  2.0763E-10

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.1627E+22
Elemental I (atoms)      9.1772E+18   2.6482E+17
Organic I (atoms)        2.8383E+17   8.1902E+15
Aerosol I (atoms)        1.3981E+20   4.0452E+18
All Aerosols (kg)        1.7327E-02   1.7821E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.0769E+19
Elemental I (atoms)      1.7106E+14   4.9902E+12
Organic I (atoms)        5.2906E+12   1.5433E+11
Aerosol I (atoms)        2.6331E+15   7.6881E+13
All Aerosols (kg)        3.2840E-07   3.3355E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.3830E+18
Elemental I (atoms)      0.0000E+00   5.7259E+13
Organic I (atoms)        0.0000E+00   1.7709E+12
Aerosol I (atoms)        0.0000E+00   8.8217E+14
All Aerosols (kg)        0.0000E+00   3.8273E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      2.3141E+19   5.1913E+16
Elemental I (atoms)      7.0234E+13   0.0000E+00
Organic I (atoms)        2.1722E+12   0.0000E+00
Aerosol I (atoms)        1.0789E+15   0.0000E+00
All Aerosols (kg)        4.1789E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.9717E+16
Elemental I (atoms)      0.0000E+00   9.5432E+11
Organic I (atoms)        0.0000E+00   2.9515E+10
Aerosol I (atoms)        0.0000E+00   1.4703E+13
All Aerosols (kg)        0.0000E+00   6.3788E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =  479.7000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
```

```
     1.0000E+00 1.0000E+00 1.0000E+00 1.2107E+06

#######################################################################
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EAB with LOCA Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.9070E-21  3.1419E-19  3.5373E-20
Accumulated dose (rem)  3.6456E+00  3.5945E+01  5.5754E+00

LOCA @ LPZ Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.8714E-23  2.3091E-21  2.5997E-22
Accumulated dose (rem)  2.0837E-01  2.0203E+00  3.1657E-01

LOCA @ Unprotected CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.1706E-21  5.1038E-19  5.5284E-20
Accumulated dose (rem)  1.5331E+01  1.5560E+02  2.3659E+01

LOCA @ CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.2726E-09  5.7910E-21  1.2726E-09  5.5692E-08
Accumulated dose (rem)  2.0747E-01  4.1628E+00  4.3093E-01  5.5014E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 480.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     2.7458E-03     0.00000      0.00000
  Co-60     1.1296E-04     0.00000      0.00000
  Kr-85     5.4523E+02     0.00003      0.00000
  Kr-85m    3.9829E+03     0.01543      0.00000
  Kr-87     2.0278E+03     0.04453      0.00001
  Kr-88     7.1139E+03     0.38105      0.00002
  Rb-86     1.8524E-01     0.00006      0.00000
  Sr-89     5.0856E+00     0.00970      0.00000
  Sr-90     6.8139E-01     0.04071      0.00000
  Sr-91     4.1486E+00     0.00044      0.00000
  Sr-92     2.0066E+00     0.00015      0.00000
  Y-90      4.6937E-02     0.00002      0.00000
  Y-91      7.1392E-02     0.00016      0.00000
  Y-92      1.2632E+00     0.00005      0.00000
  Y-93      5.2668E-02     0.00001      0.00000
  Zr-95     9.6048E-02     0.00011      0.00000
  Zr-97     7.5501E-02     0.00002      0.00000
  Nb-95     9.6541E-02     0.00003      0.00000
  Mo-99     1.1948E+00     0.00022      0.00000
  Tc-99m    1.0969E+00     0.00000      0.00000
  Ru-103    1.1010E+00     0.00047      0.00000
  Ru-105    3.3277E-01     0.00001      0.00000
  Ru-106    4.2951E-01     0.00943      0.00000
  Rh-105    6.7855E-01     0.00003      0.00000
  Sb-127    1.2529E+00     0.00037      0.00000
  Sb-129    1.6664E+00     0.00011      0.00000
  Te-127    1.1644E+00     0.00002      0.00000
  Te-127m   9.3395E-02     0.00009      0.00000
  Te-129    2.1028E+00     0.00001      0.00000
  Te-129m   6.4222E-01     0.00071      0.00000
  Te-131m   2.3158E+00     0.00079      0.00000
  Te-132    1.8528E+01     0.00819      0.00000
```

I-131	9.5266E+01	0.14496	0.00105
I-132	6.0322E+01	0.00455	0.00007
I-133	1.6201E+02	0.04665	0.00040
I-134	1.8482E+01	0.00132	0.00010
I-135	1.0693E+02	0.01080	0.00013
Xe-133	7.1492E+04	0.05363	0.00000
Xe-135	2.4213E+04	0.13652	0.00000
Cs-134	1.7851E+01	0.03852	0.00032
Cs-136	4.4607E+00	0.00173	0.00001
Cs-137	1.3697E+01	0.02024	0.00017
Ba-139	1.2939E+00	0.00001	0.00000
Ba-140	9.5077E+00	0.00168	0.00000
La-140	9.5612E-01	0.00024	0.00000
La-141	3.5815E-02	0.00000	0.00000
La-142	1.3205E-02	0.00000	0.00000
Ce-141	2.2650E-01	0.00009	0.00000
Ce-143	1.8395E-01	0.00003	0.00000
Ce-144	1.8926E-01	0.00325	0.00000
Pr-143	8.3601E-02	0.00003	0.00000
Nd-147	3.5390E-02	0.00001	0.00000
Np-239	2.4004E+00	0.00029	0.00000
Pu-238	5.6100E-04	0.00744	0.00000
Pu-239	5.2549E-05	0.00075	0.00000
Pu-240	9.3667E-05	0.00133	0.00000
Pu-241	2.2335E-02	0.00509	0.00000
Am-241	1.1059E-05	0.00023	0.00000
Cm-242	3.9067E-03	0.00311	0.00000
Cm-244	1.9968E-04	0.00228	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 480.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.1625E+22	6.7277E+15
Elemental I (atoms)	2.6618E+17	1.5404E+11
Organic I (atoms)	8.2324E+15	4.7641E+09
Aerosol I (atoms)	4.0713E+18	2.3561E+12
All Aerosols (kg)	1.7939E-04	1.0382E-10

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1627E+22
Elemental I (atoms)	3.8727E+18	2.6482E+17
Organic I (atoms)	1.1977E+17	8.1902E+15
Aerosol I (atoms)	5.8998E+19	4.0452E+18
All Aerosols (kg)	1.7278E-02	1.7821E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0769E+19
Elemental I (atoms)	7.2188E+13	4.9902E+12
Organic I (atoms)	2.2326E+12	1.5433E+11
Aerosol I (atoms)	1.1112E+15	7.6881E+13
All Aerosols (kg)	3.2748E-07	3.3355E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.3830E+18
Elemental I (atoms)	0.0000E+00	5.7259E+13
Organic I (atoms)	0.0000E+00	1.7709E+12
Aerosol I (atoms)	0.0000E+00	8.8217E+14
All Aerosols (kg)	0.0000E+00	3.8273E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

```
                          Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      2.3141E+19   1.0492E+17
Elemental I (atoms)      7.9240E+13   0.0000E+00
Organic I (atoms)        2.4507E+12   0.0000E+00
Aerosol I (atoms)        1.2172E+15   0.0000E+00
All Aerosols (kg)        4.1855E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.9717E+16
Elemental I (atoms)      0.0000E+00   9.5432E+11
Organic I (atoms)        0.0000E+00   2.9515E+10
Aerosol I (atoms)        0.0000E+00   1.4703E+13
All Aerosols (kg)        0.0000E+00   6.3788E-10

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

Detailed model information at time (hr) =  719.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2107E+06

#######################################################################
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EAB with LOCA Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.5019E-41  3.8579E-39  7.5791E-40
Accumulated dose (rem)  3.6456E+00  3.5945E+01  5.5754E+00

LOCA @ LPZ Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.5737E-43  2.8353E-41  5.5701E-42
Accumulated dose (rem)  2.0837E-01  2.0203E+00  3.1657E-01

LOCA @ Unprotected CR Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.7381E-41  6.2667E-39  1.2116E-39
Accumulated dose (rem)  1.5331E+01  1.5560E+02  2.3659E+01

LOCA @ CR Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        4.2772E-13  7.1107E-41  4.2772E-13  1.8718E-11
Accumulated dose (rem)  2.0747E-01  4.1628E+00  4.3093E-01  5.5014E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 720.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	2.7458E-03	0.00000	0.00000
Co-60	1.1296E-04	0.00000	0.00000
Kr-85	5.4523E+02	0.00003	0.00000
Kr-85m	3.9829E+03	0.01543	0.00000
Kr-87	2.0278E+03	0.04453	0.00001
Kr-88	7.1139E+03	0.38105	0.00002
Rb-86	1.8524E-01	0.00006	0.00000
Sr-89	5.0856E+00	0.00970	0.00000
Sr-90	6.8139E-01	0.04071	0.00000
Sr-91	4.1486E+00	0.00044	0.00000
Sr-92	2.0066E+00	0.00015	0.00000
Y-90	4.6937E-02	0.00002	0.00000
Y-91	7.1392E-02	0.00016	0.00000
Y-92	1.2632E+00	0.00005	0.00000
Y-93	5.2668E-02	0.00001	0.00000
Zr-95	9.6048E-02	0.00011	0.00000
Zr-97	7.5501E-02	0.00002	0.00000
Nb-95	9.6541E-02	0.00003	0.00000
Mo-99	1.1948E+00	0.00022	0.00000
Tc-99m	1.0969E+00	0.00000	0.00000
Ru-103	1.1010E+00	0.00047	0.00000
Ru-105	3.3277E-01	0.00001	0.00000
Ru-106	4.2951E-01	0.00943	0.00000
Rh-105	6.7855E-01	0.00003	0.00000
Sb-127	1.2529E+00	0.00037	0.00000
Sb-129	1.6664E+00	0.00011	0.00000
Te-127	1.1644E+00	0.00002	0.00000
Te-127m	9.3395E-02	0.00009	0.00000
Te-129	2.1028E+00	0.00001	0.00000
Te-129m	6.4222E-01	0.00071	0.00000
Te-131m	2.3158E+00	0.00079	0.00000
Te-132	1.8528E+01	0.00819	0.00000
I-131	9.5266E+01	0.14496	0.00105
I-132	6.0322E+01	0.00455	0.00007
I-133	1.6201E+02	0.04665	0.00040
I-134	1.8482E+01	0.00132	0.00010
I-135	1.0693E+02	0.01080	0.00013
Xe-133	7.1492E+04	0.05363	0.00000
Xe-135	2.4214E+04	0.13652	0.00000
Cs-134	1.7851E+01	0.03852	0.00032
Cs-136	4.4607E+00	0.00173	0.00001
Cs-137	1.3697E+01	0.02024	0.00017
Ba-139	1.2939E+00	0.00001	0.00000
Ba-140	9.5077E+00	0.00168	0.00000
La-140	9.5612E-01	0.00024	0.00000
La-141	3.5815E-02	0.00000	0.00000
La-142	1.3205E-02	0.00000	0.00000
Ce-141	2.2650E-01	0.00009	0.00000
Ce-143	1.8395E-01	0.00003	0.00000
Ce-144	1.8926E-01	0.00325	0.00000
Pr-143	8.3601E-02	0.00003	0.00000
Nd-147	3.5390E-02	0.00001	0.00000
Np-239	2.4004E+00	0.00029	0.00000
Pu-238	5.6100E-04	0.00744	0.00000
Pu-239	5.2549E-05	0.00075	0.00000
Pu-240	9.3667E-05	0.00133	0.00000
Pu-241	2.2335E-02	0.00509	0.00000
Am-241	1.1059E-05	0.00023	0.00000
Cm-242	3.9067E-03	0.00311	0.00000
Cm-244	1.9968E-04	0.00228	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 720.0000	Total Release	Release Rate/s

```
Noble gases (atoms)    1.1625E+22  4.4851E+15
Elemental I (atoms)    2.6618E+17  1.0269E+11
Organic I (atoms)      8.2324E+15  3.1761E+09
Aerosol I (atoms)      4.0713E+18  1.5707E+12
All Aerosols (kg)      1.7939E-04  6.9210E-11

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

                          Pathway
Time (h) = 720.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.1627E+22
Elemental I (atoms)      1.6351E+18   2.6482E+17
Organic I (atoms)        5.0569E+16   8.1902E+15
Aerosol I (atoms)        2.4909E+19   4.0452E+18
All Aerosols (kg)        1.7242E-02   1.7821E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) = 720.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.0769E+19
Elemental I (atoms)      3.0478E+13   4.9902E+12
Organic I (atoms)        9.4263E+11   1.5433E+11
Aerosol I (atoms)        4.6915E+14   7.6881E+13
All Aerosols (kg)        3.2682E-07   3.3355E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                          Pathway
Time (h) = 720.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.3830E+18
Elemental I (atoms)      0.0000E+00   5.7259E+13
Organic I (atoms)        0.0000E+00   1.7709E+12
Aerosol I (atoms)        0.0000E+00   8.8217E+14
All Aerosols (kg)        0.0000E+00   3.8273E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) = 720.0000       Filtered    Transported
Noble gases (atoms)      2.3141E+19   1.5792E+17
Elemental I (atoms)      8.8246E+13   0.0000E+00
Organic I (atoms)        2.7292E+12   0.0000E+00
Aerosol I (atoms)        1.3556E+15   0.0000E+00
All Aerosols (kg)        4.1920E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) = 720.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.9717E+16
Elemental I (atoms)      0.0000E+00   9.5432E+11
Organic I (atoms)        0.0000E+00   2.9515E+10
Aerosol I (atoms)        0.0000E+00   1.4703E+13
All Aerosols (kg)        0.0000E+00   6.3788E-10

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) = 720.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1241E+17
Elemental I (atoms)      0.0000E+00   1.5218E+15
Organic I (atoms)        0.0000E+00   4.7065E+13
Aerosol I (atoms)        0.0000E+00   2.8888E+16
All Aerosols (kg)        0.0000E+00   1.3097E-06

   1535

#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/16/2019  at 11:57:55
```

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

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

Time (hr)	Primary Containment I-131 (Curies)	Secondary Containment I-131 (Curies)	Environment I-131 (Curies)
0.000	6.0244E+03	6.8170E-04	6.4175E-08
0.167	1.7025E+06	5.7316E+01	1.6472E+00
0.367	3.4916E+06	2.6494E+02	1.7033E+00
0.500	4.5489E+06	4.7440E+02	1.7946E+00
0.700	7.5561E+06	9.4217E+02	2.0532E+00
0.900	1.0424E+07	1.6272E+03	2.5286E+00
1.100	1.3152E+07	2.5101E+03	3.2987E+00
1.300	1.5746E+07	3.5726E+03	4.4342E+00
1.500	1.8210E+07	4.7973E+03	5.9991E+00
1.700	2.0551E+07	6.1681E+03	8.0514E+00
1.900	2.2774E+07	7.6699E+03	1.0643E+01
2.000	2.3843E+07	8.4654E+03	1.2156E+01
2.200	1.9557E+07	8.1480E+03	1.5271E+01
2.400	1.6097E+07	7.8426E+03	1.8270E+01
2.600	1.3303E+07	7.5486E+03	2.1156E+01
2.800	1.1048E+07	7.2656E+03	2.3934E+01
3.000	9.2275E+06	6.9932E+03	2.6608E+01
3.200	7.7577E+06	6.7310E+03	2.9182E+01
3.400	6.5710E+06	6.4787E+03	3.1659E+01
3.600	5.6129E+06	6.2358E+03	3.4043E+01
3.800	4.8393E+06	6.0020E+03	3.6338E+01
4.000	4.2145E+06	5.7770E+03	3.8547E+01
4.200	3.7101E+06	5.5604E+03	4.0673E+01
4.400	3.3026E+06	5.3519E+03	4.2720E+01
4.600	2.9735E+06	5.1513E+03	4.4689E+01
4.800	2.7076E+06	4.9582E+03	4.6585E+01
5.000	2.4927E+06	4.7723E+03	4.8410E+01
5.200	2.3839E+06	4.5934E+03	5.0166E+01
5.400	2.2880E+06	4.4212E+03	5.1857E+01
5.600	2.2035E+06	4.2554E+03	5.3484E+01
5.800	2.1290E+06	4.0959E+03	5.5050E+01
6.000	2.0634E+06	3.9423E+03	5.6557E+01
6.200	2.0055E+06	3.7945E+03	5.8008E+01
6.400	1.9545E+06	3.6523E+03	5.9405E+01
6.600	1.9095E+06	3.5153E+03	6.0749E+01
6.800	1.8697E+06	3.3835E+03	6.2043E+01
7.000	1.8346E+06	3.2567E+03	6.3288E+01
7.200	1.8036E+06	3.1346E+03	6.4486E+01
7.400	1.7762E+06	3.0171E+03	6.5640E+01
7.600	1.7520E+06	2.9040E+03	6.6750E+01
7.800	1.7305E+06	2.7951E+03	6.7819E+01
8.000	1.7115E+06	2.6903E+03	6.8848E+01
8.200	1.6946E+06	2.5894E+03	6.9838E+01
8.333	1.6847E+06	2.5243E+03	7.0477E+01
8.533	1.6723E+06	2.4297E+03	7.1406E+01
8.733	1.6610E+06	2.3386E+03	7.2301E+01
8.933	1.6509E+06	2.2509E+03	7.3161E+01
9.133	1.6417E+06	2.1665E+03	7.3990E+01
9.333	1.6333E+06	2.0853E+03	7.4787E+01
9.533	1.6258E+06	2.0071E+03	7.5554E+01
9.733	1.6189E+06	1.9319E+03	7.6293E+01
9.933	1.6127E+06	1.8594E+03	7.7004E+01
10.133	1.6070E+06	1.7897E+03	7.7688E+01
12.000	1.5716E+06	1.2528E+03	8.2959E+01
19.444	1.5175E+06	3.0210E+02	9.2298E+01
24.000	1.4926E+06	1.2651E+02	9.4023E+01
96.000	1.1524E+06	1.3382E-04	9.5266E+01
720.000	1.2250E+05	2.1433E-56	9.5266E+01

Control Room

Time (hr)	I-131 (Curies)
0.000	2.3266E-11
0.167	5.8046E-04
0.367	5.2598E-04
0.500	5.1220E-04
0.700	5.3541E-04
0.900	6.2947E-04
1.100	8.1175E-04
1.300	1.0950E-03
1.500	1.4880E-03
1.700	1.9965E-03
1.900	2.6233E-03
2.000	2.9813E-03
2.200	3.3886E-03
2.400	3.7146E-03
2.600	3.9707E-03
2.800	4.1670E-03
3.000	4.3121E-03
3.200	4.4134E-03
3.400	4.4775E-03
3.600	4.5100E-03
3.800	4.5158E-03
4.000	4.4992E-03
4.200	4.4638E-03
4.400	4.4127E-03
4.600	4.3488E-03
4.800	4.2744E-03
5.000	4.1915E-03
5.200	4.1019E-03
5.400	4.0070E-03
5.600	3.9082E-03
5.800	3.8066E-03
6.000	3.7031E-03
6.200	3.5985E-03
6.400	3.4934E-03
6.600	3.3885E-03
6.800	3.2842E-03
7.000	3.1810E-03
7.200	3.0790E-03
7.400	2.9787E-03
7.600	2.8803E-03
7.800	2.7838E-03
8.000	2.6895E-03
8.200	2.4370E-03
8.333	2.2848E-03
8.533	2.0782E-03
8.733	1.8947E-03
8.933	1.7315E-03
9.133	1.5861E-03
9.333	1.4564E-03
9.533	1.3405E-03
9.733	1.2368E-03
9.933	1.1437E-03
10.133	1.0601E-03
12.000	5.7581E-04
19.444	1.1265E-04
24.000	4.6910E-05
96.000	3.0010E-11
720.000	4.1125E-63

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

	EAB with LOCA		LOCA @ LPZ		LOCA @ Unprotected 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
0.167	7.3284E-01	3.4477E-02	4.3264E-02	2.0354E-03	3.6642E+00	1.7239E-01
0.367	7.5776E-01	3.7316E-02	4.4735E-02	2.2030E-03	3.7888E+00	1.8658E-01

0.500	7.9823E-01	4.1906E-02	4.7124E-02	2.4740E-03	3.9911E+00	2.0953E-01
0.700	9.1288E-01	5.6226E-02	5.3893E-02	3.3194E-03	4.5644E+00	2.8113E-01
0.900	1.1249E+00	8.9012E-02	6.6409E-02	5.2549E-03	5.6245E+00	4.4506E-01
1.100	1.4698E+00	1.5028E-01	8.6774E-02	8.8719E-03	7.3492E+00	7.5140E-01
1.300	1.9798E+00	2.4828E-01	1.1688E-01	1.4657E-02	9.8989E+00	1.2414E+00
1.500	2.6835E+00	3.8974E-01	1.5842E-01	2.3009E-02	1.3417E+01	1.9487E+00
1.700	3.6066E+00	5.8011E-01	2.1292E-01	3.4247E-02	1.8033E+01	2.9005E+00
1.900	4.7719E+00	8.2371E-01	2.8172E-01	4.8629E-02	2.3860E+01	4.1186E+00
2.000	5.4519E+00	9.6657E-01	3.2186E-01	5.7063E-02	2.7259E+01	4.8329E+00
2.200	6.8504E+00	1.2560E+00	4.0442E-01	7.4148E-02	3.3342E+01	6.0916E+00
2.400	8.1935E+00	1.5251E+00	4.8371E-01	9.0038E-02	3.9184E+01	7.2623E+00
2.600	9.4834E+00	1.7757E+00	5.5986E-01	1.0483E-01	4.4794E+01	8.3521E+00
2.800	1.0722E+01	2.0092E+00	6.3299E-01	1.1862E-01	5.0182E+01	9.3676E+00
3.000	1.1912E+01	2.2270E+00	7.0324E-01	1.3147E-01	5.5357E+01	1.0315E+01
3.200	1.3055E+01	2.4302E+00	7.7070E-01	1.4347E-01	6.0327E+01	1.1199E+01
3.400	1.4152E+01	2.6201E+00	8.3550E-01	1.5468E-01	6.5101E+01	1.2025E+01
3.600	1.5207E+01	2.7977E+00	8.9774E-01	1.6516E-01	6.9686E+01	1.2797E+01
3.800	1.6219E+01	2.9638E+00	9.5752E-01	1.7497E-01	7.4091E+01	1.3520E+01
4.000	1.7192E+01	3.1194E+00	1.0149E+00	1.8416E-01	7.8322E+01	1.4197E+01
4.200	1.8126E+01	3.2653E+00	1.0701E+00	1.9277E-01	8.2386E+01	1.4831E+01
4.400	1.9024E+01	3.4021E+00	1.1231E+00	2.0085E-01	8.6290E+01	1.5426E+01
4.600	1.9886E+01	3.5305E+00	1.1740E+00	2.0843E-01	9.0040E+01	1.5984E+01
4.800	2.0715E+01	3.6511E+00	1.2229E+00	2.1555E-01	9.3643E+01	1.6509E+01
5.000	2.1510E+01	3.7645E+00	1.2699E+00	2.2224E-01	9.7104E+01	1.7002E+01
5.200	2.2275E+01	3.8711E+00	1.3150E+00	2.2854E-01	1.0043E+02	1.7466E+01
5.400	2.3009E+01	3.9715E+00	1.3584E+00	2.3446E-01	1.0362E+02	1.7903E+01
5.600	2.3715E+01	4.0661E+00	1.4000E+00	2.4004E-01	1.0669E+02	1.8314E+01
5.800	2.4393E+01	4.1552E+00	1.4401E+00	2.4531E-01	1.0964E+02	1.8701E+01
6.000	2.5044E+01	4.2392E+00	1.4785E+00	2.5027E-01	1.1247E+02	1.9067E+01
6.200	2.5670E+01	4.3185E+00	1.5155E+00	2.5495E-01	1.1520E+02	1.9412E+01
6.400	2.6271E+01	4.3934E+00	1.5510E+00	2.5937E-01	1.1781E+02	1.9737E+01
6.600	2.6849E+01	4.4641E+00	1.5851E+00	2.6354E-01	1.2032E+02	2.0045E+01
6.800	2.7404E+01	4.5310E+00	1.6178E+00	2.6749E-01	1.2274E+02	2.0336E+01
7.000	2.7938E+01	4.5942E+00	1.6493E+00	2.7122E-01	1.2506E+02	2.0611E+01
7.200	2.8450E+01	4.6540E+00	1.6796E+00	2.7476E-01	1.2729E+02	2.0871E+01
7.400	2.8942E+01	4.7107E+00	1.7087E+00	2.7810E-01	1.2943E+02	2.1117E+01
7.600	2.9416E+01	4.7643E+00	1.7366E+00	2.8127E-01	1.3149E+02	2.1351E+01
7.800	2.9870E+01	4.8152E+00	1.7634E+00	2.8427E-01	1.3346E+02	2.1572E+01
8.000	3.0307E+01	4.8634E+00	1.7892E+00	2.8711E-01	1.3537E+02	2.1782E+01
8.200	3.0523E+01	4.8979E+00	1.7983E+00	2.8857E-01	1.3616E+02	2.1868E+01
8.333	3.0662E+01	4.9198E+00	1.8042E+00	2.8950E-01	1.3667E+02	2.1923E+01
8.533	3.0864E+01	4.9513E+00	1.8127E+00	2.9082E-01	1.3741E+02	2.2002E+01
8.733	3.1059E+01	4.9810E+00	1.8209E+00	2.9207E-01	1.3813E+02	2.2078E+01
8.933	3.1245E+01	5.0091E+00	1.8288E+00	2.9326E-01	1.3882E+02	2.2149E+01
9.133	3.1425E+01	5.0357E+00	1.8363E+00	2.9438E-01	1.3947E+02	2.2217E+01
9.333	3.1597E+01	5.0609E+00	1.8436E+00	2.9544E-01	1.4011E+02	2.2282E+01
9.533	3.1763E+01	5.0847E+00	1.8506E+00	2.9645E-01	1.4072E+02	2.2343E+01
9.733	3.1922E+01	5.1073E+00	1.8573E+00	2.9740E-01	1.4130E+02	2.2402E+01
9.933	3.2075E+01	5.1288E+00	1.8638E+00	2.9831E-01	1.4187E+02	2.2458E+01
10.133	3.2222E+01	5.1491E+00	1.8700E+00	2.9916E-01	1.4241E+02	2.2511E+01
12.000	3.3346E+01	5.2961E+00	1.9174E+00	3.0536E-01	1.4654E+02	2.2900E+01
19.444	3.5290E+01	5.5155E+00	1.9994E+00	3.1461E-01	1.5369E+02	2.3511E+01
24.000	3.5637E+01	5.5493E+00	2.0140E+00	3.1604E-01	1.5497E+02	2.3611E+01
96.000	3.5945E+01	5.5754E+00	2.0203E+00	3.1657E-01	1.5560E+02	2.3659E+01
720.000	3.5945E+01	5.5754E+00	2.0203E+00	3.1657E-01	1.5560E+02	2.3659E+01

LOCA @ CR

Time (hr)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00
0.167	3.4511E-03	1.4626E-04
0.367	1.7908E-02	7.6701E-04
0.500	2.6947E-02	1.1738E-03
0.700	4.0521E-02	1.8465E-03
0.900	5.5573E-02	2.7623E-03
1.100	7.4232E-02	4.2205E-03
1.300	9.9028E-02	6.6028E-03
1.500	1.3277E-01	1.0339E-02
1.700	1.7846E-01	1.5880E-02
1.900	2.3918E-01	2.3681E-02

2.000	2.7615E-01	2.8570E-02
2.200	3.6041E-01	3.9838E-02
2.400	4.5422E-01	5.2375E-02
2.600	5.5555E-01	6.5800E-02
2.800	6.6266E-01	7.9808E-02
3.000	7.7405E-01	9.4152E-02
3.200	8.8846E-01	1.0864E-01
3.400	1.0048E+00	1.2311E-01
3.600	1.1222E+00	1.3745E-01
3.800	1.2399E+00	1.5157E-01
4.000	1.3572E+00	1.6538E-01
4.200	1.4736E+00	1.7885E-01
4.400	1.5887E+00	1.9193E-01
4.600	1.7020E+00	2.0460E-01
4.800	1.8134E+00	2.1683E-01
5.000	1.9225E+00	2.2862E-01
5.200	2.0292E+00	2.3996E-01
5.400	2.1333E+00	2.5086E-01
5.600	2.2348E+00	2.6132E-01
5.800	2.3335E+00	2.7134E-01
6.000	2.4295E+00	2.8095E-01
6.200	2.5226E+00	2.9014E-01
6.400	2.6128E+00	2.9894E-01
6.600	2.7003E+00	3.0735E-01
6.800	2.7849E+00	3.1538E-01
7.000	2.8668E+00	3.2307E-01
7.200	2.9459E+00	3.3041E-01
7.400	3.0224E+00	3.3742E-01
7.600	3.0962E+00	3.4411E-01
7.800	3.1675E+00	3.5051E-01
8.000	3.2362E+00	3.5661E-01
8.200	3.3004E+00	3.6226E-01
8.333	3.3398E+00	3.6570E-01
8.533	3.3943E+00	3.7042E-01
8.733	3.4439E+00	3.7467E-01
8.933	3.4891E+00	3.7851E-01
9.133	3.5303E+00	3.8199E-01
9.333	3.5681E+00	3.8515E-01
9.533	3.6028E+00	3.8802E-01
9.733	3.6347E+00	3.9065E-01
9.933	3.6641E+00	3.9306E-01
10.133	3.6913E+00	3.9527E-01
12.000	3.8706E+00	4.0943E-01
19.444	4.1115E+00	4.2731E-01
24.000	4.1510E+00	4.3009E-01
96.000	4.1628E+00	4.3093E-01
720.000	4.1628E+00	4.3093E-01

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/16/2019  at 11:57:55

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

            LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

EAB with LOCA
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
    1.5   1.6788E+00   1.1996E+01   2.3191E+00

#####################################################################
                          Final Doses
#####################################################################

LOCA @ LPZ
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   2.0837E-01   2.0203E+00   3.1657E-01

LOCA @ Unprotected CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   1.5331E+01   1.5560E+02   2.3659E+01

LOCA @ CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   2.0747E-01   4.1628E+00   4.3093E-01
```

Attachment 12 RADTRAD Output:
Attch 12 ESF_Atrium11_5gpm_600cfm_11110cfm_6495cfm.o0

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All Attachment 12 Pages Revised for Rev 7

```
 ######################################################################
     ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 09:57:32

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

             LOCA PPL-SSES   ESF Leakage to RB to Env. w/ SGTS

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

 Input File Name      = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 12
ESF_Atrium11_5gpm_600cfm_11110cfm_6495cfm.psf
 Output File Name     = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 12
ESF_Atrium11_5gpm_600cfm_11110cfm_6495cfm.o0

 Inventory file       =  c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\ppl-esf_atrium11.nif
 Release file         =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_esf.rft
 Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp




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


   Radtrad 3.10  Rev. 4
   LOCA PPL-SSES   ESF Leakage to RB to Env. w/ SGTS
 Dose Conversion Factor File:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
 Release Fraction & Timing Files:
   1
   c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_esf.rft
 Nuclide Inventory Files:
   1
   1 c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\ppl-esf_atrium11.nif
 Plant Power Level:
   4.032E+03
 Number of Compartments:
   4
 Compartment 1:
   Suppression Pool
   3
   1.32E+05
   0
   0
   0
   0
   0
 Compartment 2:
   Secondary Containment
   3
   2.0783E+06
   0
   0
   0
   0
   0
 Compartment 3:
   Environment
   2
```

```
  0.00E+00
  0
  0
  0
  0
  0
Compartment 4:
  Control Room
  1
  5.18E+05
  0
  0
  0
  0
  0
Number of Pathways:
  7
Pathway 1:
  Suppression Pool to Secondary Containment - ESF Leakage
  1
  2
  2
Pathway 2:
  Secondary Containment to Environment - SGTS Discharge
  2
  3
  2
Pathway 3:
  Environment to Control Room - CREOAS Filtered Air Intake
  3
  4
  2
Pathway 4:
  Environment to Control Room - Unfiltered Inleakage
  3
  4
  2
Pathway 5:
  Control Room to Environment - CR Exhaust
  4
  3
  2
Pathway 6:
  Environment to  Control Room ingress/egress
  3
  4
  2
Pathway 7:
  Secondary Containment to  Environment
  2
  3
  2
  End of Plant Model
Source Term Input:
  1
  1  1  1  1
  0.00E+00
  0.00E+00   7.2E+02
  1
  3   0.00E+00   9.7E-01   3.00E-02
Overlying Pool:
  0
  0.00E+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:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  7
Pathway 1:
  0
  0
  0
  0
  0
  1
  2
  0.00E+00   6.68E-01   1.00E+02   9.00E+01   9.00E+01
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   1.111E+04   0.00E+00   0.00E+00   0.00E+00
  1.667E-01   6.495E+03   9.9E+01   9.9E+01   9.9E+01
```

```
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.229E+03   9.9E+01   9.9E+01   9.9E+01
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 4:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   6.00E+02   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.839E+03   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  1
  0
```

```
  0
  0
  0
  1
  2
  0.00E+00   1.00E+01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 7:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   6.495E+03   0.00E+00   0.00E+00   0.00E+00
  1.667E-01   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  4
Location 1:
  EAB LOCA
  3
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 2:
  LOCA @ LPZ
  3
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 3:
  LOCA @ Unprotected CR
  3
  1
  2
  0.00E+00   3.5E-04
  7.2E+02   0.00E+00
  0
Location 4:
  LOCA @ CR
  4
  1
```

```
   2
   0.00E+00   3.5E-04
   7.2E+02   0.00E+00
   1
   4
   0.00E+00   1.00E+00
   2.4E+01   6.00E-01
   9.6E+01   4.00E-01
   7.2E+02   0.00E+00
 X/Q Tables:
   4
   EAB LOCA
   2
   0.00E+00   8.3E-04
   7.2E+02   0.00E+00
   LOCA @ LPZ
   5
   0.00E+00   4.9E-05
   8.00E+00   3.5E-05
   2.4E+01   1.7E-05
   9.6E+01   6.1E-06
   7.2E+02   0.00E+00
   LOCA @ Unprotected CR
   6
   0.00E+00   4.15E-03
   2.00E+00   3.61E-03
   8.00E+00   1.57E-03
   2.4E+01   1.12E-03
   9.6E+01   8.86E-04
   7.2E+02   0.00E+00
   LOCA @ CR
   6
   0.00E+00   1.16E-03
   2.00E+00   8.64E-04
   8.00E+00   3.09E-04
   2.4E+01   1.87E-04
   9.6E+01   1.6E-04
   7.2E+02   0.00E+00
 Inflow Pathways:
   3  3 4 6
 Exhaust Pathways:
   3  2 5 7
 X/Q table ID for Exhaust-Inflow paths:
   4 4 4
   -1 -1 -1
   4 4 4
 Simulation Parameters:
   5
   0.00E+00   0.00E+00
   9.6E+01   1.2E+02
   2.4E+02   2.4E+02
   4.8E+02   2.4E+02
   7.2E+02   0.00E+00
 Output Filename:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 12
ESF_Atrium11_5gpm_600cfm_11110cfm_6495cfm.o0
   1
   1
   1
   1
   0
   End of Scenario File
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 09:57:32

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

            LOCA PPL-SSES   ESF Leakage to RB to Env. w/ SGTS

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

Number of Nuclides =  60

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

Number of compartments    =   4

Compartment information

Compartment number  1
Name: Suppression Pool
Compartment volume =   1.3200E+05 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  1
   Exit Pathway Number    1: Suppression Pool to Secondary Containment - ESF

Compartment number  2
Name: Secondary Containment
Compartment volume =   2.0783E+06 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  2
   Inlet Pathway Number   1: Suppression Pool to Secondary Containment - ESF
   Exit Pathway Number    2: Secondary Containment to Environment - SGTS Dis
   Exit Pathway Number    7: Secondary Containment to  Environment

Compartment number  3
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Secondary Containment to Environment - SGTS Dis
   Inlet Pathway Number   5: Control Room to Environment - CR Exhaust
   Inlet Pathway Number   7: Secondary Containment to  Environment
   Exit Pathway Number    3: Environment to Control Room - CREOAS Filtered A
   Exit Pathway Number    4: Environment to Control Room - Unfiltered Inleak
   Exit Pathway Number    6: Environment to  Control Room ingress/egress

Compartment number  4
Name: Control Room
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  4
   Inlet Pathway Number   3: Environment to Control Room - CREOAS Filtered A
   Inlet Pathway Number   4: Environment to Control Room - Unfiltered Inleak
   Inlet Pathway Number   6: Environment to  Control Room ingress/egress
   Exit Pathway Number    5: Control Room to Environment - CR Exhaust

Total number of pathways =   7
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 09:57:32

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

            LOCA PPL-SSES   ESF Leakage to RB to Env. w/ SGTS

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

Power Ratio                              =   4.0320E+03

End Time                                 =   7.2000E+02 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Source Number  1 is used in Compartment  1  Suppression Pool
   Nuclide Distribution given in Ci/MWt
Fraction of Nuclide Distribution in this Compartment   1.00000

Iodine fractions for source number 1
     Aerosol     =   0.0000E+00
     Elemental   =   9.7000E-01
     Organic     =   3.0000E-02

Inventory file =     c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\ppl-esf_atrium11.nif
Release from file =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_esf.rft
Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp


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)
 I-131     2   2.690E+04  6.947E+05   1.820E-14   2.920E-07   8.890E-09
 I-132     2   3.920E+04  8.280E+03   1.120E-13   1.740E-09   1.030E-10
 I-133     2   5.490E+04  7.488E+04   2.940E-14   4.860E-08   1.580E-09
 I-134     2   6.150E+04  3.156E+03   1.300E-13   2.880E-10   3.550E-11
 I-135     2   5.240E+04  2.380E+04   8.294E-14   8.460E-09   3.320E-10

Nuclide    Daughter  Fraction   Daughter  Fraction   Daughter  Fraction
 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

Release Fractions and Timings
 BWR, NUREG-1465, Tables 3.11 & 3.13, June 1992
 Duration (h):   Design Basis Accident
                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        3.465E+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
AEROSOL     0.0000E+00     0.0000E+00      0.0000E+00        0.000E+00

COMPARTMENT DATA

Compartment number   1: Suppression Pool

Compartment number   2: Secondary Containment
```

Compartment number 3: Environment

Compartment number 4: Control Room

PATHWAY DATA

Pathway number 1: Suppression Pool to Secondary Containment - ESF

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.6800E-01	1.0000E+02	9.0000E+01	9.0000E+01
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 2: Secondary Containment to Environment - SGTS Dis

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.1110E+04	0.0000E+00	0.0000E+00	0.0000E+00
1.6670E-01	6.4950E+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 3: Environment to Control Room - CREOAS Filtered A

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.2290E+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 4: Environment to Control Room - Unfiltered Inleak

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.0000E+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 5: Control Room to Environment - CR Exhaust

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.8390E+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 6: Environment to Control Room ingress/egress

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.0000E+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 7: Secondary Containment to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.4950E+03	0.0000E+00	0.0000E+00	0.0000E+00
1.6670E-01	0.0000E+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

```
DOSE INFORMATION
Number_Dose_Locations =  4

Dose Location Name = EAB LOCA
         Located in compartment  3 the Environment

EAB LOCA 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

Dose Location Name = LOCA @ LPZ
         Located in compartment  3 the Environment

LOCA @ LPZ 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

Dose Location Name = LOCA @ Unprotected CR
         Located in compartment  3 the Environment

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

Dose Location Name = LOCA @ CR
         Located in compartment  4 the Control Room

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

LOCA @ CR 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

X/Q, ATMOSPHERIC DISPERSION INFORMATION

X/Q Table Name =    EAB LOCA

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

X/Q Table Name =    LOCA @ LPZ

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       0.0000E+00          4.9000E-05
       8.0000E+00          3.5000E-05
       2.4000E+01          1.7000E-05
       9.6000E+01          6.1000E-06
       7.2000E+02          0.0000E+00

X/Q Table Name =    LOCA @ Unprotected CR

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
```

```
        0.0000E+00          4.1500E-03
        2.0000E+00          3.6100E-03
        8.0000E+00          1.5700E-03
        2.4000E+01          1.1200E-03
        9.6000E+01          8.8600E-04
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          1.1600E-03
        2.0000E+00          8.6400E-04
        8.0000E+00          3.0900E-04
        2.4000E+01          1.8700E-04
        9.6000E+01          1.6000E-04
        7.2000E+02          0.0000E+00

 This X/Q Table is used for these connected pathways
  Path  2  Secondary Containment to Environment - SGTS Dis and Path  3  Environment to Control Room -
CREOAS Filtered A
  Path  7  Secondary Containment to  Environment and Path  3  Environment to Control Room - CREOAS
Filtered A
  Path  2  Secondary Containment to Environment - SGTS Dis and Path  4  Environment to Control Room -
Unfiltered Inleak
  Path  7  Secondary Containment to  Environment and Path  4  Environment to Control Room - Unfiltered
Inleak
  Path  2  Secondary Containment to Environment - SGTS Dis and Path  6  Environment to  Control Room
ingress/egress
  Path  7  Secondary Containment to  Environment and Path  6  Environment to  Control Room
ingress/egress

 USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
         Time (hr)      Time step (hr)
        0.0000E+00        0.0000E+00
        9.6000E+01        1.2000E+02
        2.4000E+02        2.4000E+02
        4.8000E+02        2.4000E+02
        7.2000E+02        0.0000E+00

  EDIT EACH MAJOR TIME STEP

  EDIT SUPPLEMENTAL TIME STEPS

  EDIT MODEL DECONTAMINATION RESULTS

       Masses in Atoms and kg in detailed output
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 09:57:32

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




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


            LOCA PPL-SSES   ESF Leakage to RB to Env. w/ SGTS

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

Detailed model information at time (hr) =    0.0000

#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 09:57:32

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

EAB LOCA Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0285E-11  2.1123E-09  7.7081E-11
Accumulated dose (rem)  1.0285E-11  2.1123E-09  7.7081E-11

LOCA @ LPZ Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.0718E-13  1.2470E-10  4.5506E-12
Accumulated dose (rem)  6.0718E-13  1.2470E-10  4.5506E-12

LOCA @ Unprotected CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.1425E-11  1.0561E-08  3.8540E-10
Accumulated dose (rem)  5.1425E-11  1.0561E-08  3.8540E-10

LOCA @ CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.2296E-17  6.2901E-14  2.0114E-15  4.5130E-16
Accumulated dose (rem)  2.2296E-17  6.2901E-14  2.0114E-15  4.5130E-16

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

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

                           Pathway
Time (h) =   0.0006       Filtered    Transported
Noble gases (atoms)      0.0000E+00   0.0000E+00
Elemental I (atoms)      0.0000E+00   2.1406E+08
Organic I (atoms)        0.0000E+00   6.6204E+06
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00
```

```
Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       Filtered    Transported
Noble gases (atoms)      0.0000E+00   0.0000E+00
Elemental I (atoms)      9.6131E+05   1.9420E+04
Organic I (atoms)        2.9731E+04   6.0063E+02
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       Filtered    Transported
Noble gases (atoms)      0.0000E+00   0.0000E+00
Elemental I (atoms)      0.0000E+00   2.2284E+05
Organic I (atoms)        0.0000E+00   6.8920E+03
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       Filtered    Transported
Noble gases (atoms)      0.0000E+00   0.0000E+00
Elemental I (atoms)      1.0268E+01   0.0000E+00
Organic I (atoms)        3.1758E-01   0.0000E+00
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       Filtered    Transported
Noble gases (atoms)      0.0000E+00   0.0000E+00
Elemental I (atoms)      0.0000E+00   3.7140E+03
Organic I (atoms)        0.0000E+00   1.1487E+02
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       Filtered    Transported
Noble gases (atoms)      0.0000E+00   0.0000E+00
Elemental I (atoms)      0.0000E+00   1.2514E+08
Organic I (atoms)        0.0000E+00   3.8704E+06
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    0.1478

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EAB LOCA Doses:

Time (h) =   0.1667    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.5725E-04  5.5745E-02  2.0186E-03
Accumulated dose (rem)  2.5725E-04  5.5745E-02  2.0186E-03

LOCA @ LPZ Doses:

Time (h) =   0.1667    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.5187E-05  3.2910E-03  1.1917E-04
Accumulated dose (rem)  1.5187E-05  3.2910E-03  1.1917E-04
```

LOCA @ Unprotected CR Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.2863E-03	2.7872E-01	1.0093E-02
Accumulated dose (rem)	1.2863E-03	2.7872E-01	1.0093E-02

LOCA @ CR Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	8.8517E-08	2.6120E-04	8.3412E-06	1.8113E-06
Accumulated dose (rem)	8.8517E-08	2.6120E-04	8.3412E-06	1.8113E-06

****

Environment Integral Nuclide Release (Ci): at Time (h) = 0.1667

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
I-131	1.2647E-01	0.38001	0.22216
I-132	1.7699E-01	0.02516	0.01471
I-133	2.5708E-01	0.14374	0.08403
I-134	2.5991E-01	0.03556	0.02079
I-135	2.4299E-01	0.04646	0.02716
Xe-133	1.0388E-03	0.00000	0.00000
Xe-135	1.1912E-02	0.00013	0.00008

Environment Compartment Group Inventory Distribution:

Time (h) = 0.1667	Total Release	Release Rate/s
Noble gases (atoms)	4.5937E+13	7.6547E+10
Elemental I (atoms)	5.9635E+15	9.9372E+12
Organic I (atoms)	1.8444E+14	3.0734E+11
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

Time (h) = 0.1667	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.8966E+13
Elemental I (atoms)	0.0000E+00	3.8834E+15
Organic I (atoms)	0.0000E+00	1.2011E+14
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

Time (h) = 0.1667	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.7795E+11
Elemental I (atoms)	2.3756E+13	2.4035E+11
Organic I (atoms)	7.3471E+11	7.4334E+09
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 0.1667	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8440E+10
Elemental I (atoms)	0.0000E+00	2.7579E+12
Organic I (atoms)	0.0000E+00	8.5295E+10
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 0.1667	Pathway Filtered	Transported

```
Noble gases (atoms)      3.4672E+09   3.7950E+07
Elemental I (atoms)      6.3910E+10   0.0000E+00
Organic I (atoms)        1.9766E+09   0.0000E+00
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   0.1667       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.0733E+08
Elemental I (atoms)      0.0000E+00   4.5964E+10
Organic I (atoms)        0.0000E+00   1.4216E+09
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =   0.1667       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6934E+13
Elemental I (atoms)      0.0000E+00   2.2703E+15
Organic I (atoms)        0.0000E+00   7.0215E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    0.4667

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EAB LOCA Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.5705E-05  5.2829E-03  2.0237E-04
Accumulated dose (rem)  2.9296E-04  6.1028E-02  2.2210E-03

LOCA @ LPZ Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.1079E-06  3.1188E-04  1.1947E-05
Accumulated dose (rem)  1.7295E-05  3.6028E-03  1.3112E-04

LOCA @ Unprotected CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.7852E-04  2.6415E-02  1.0119E-03
Accumulated dose (rem)  1.4648E-03  3.0514E-01  1.1105E-02

LOCA @ CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        6.5397E-07  1.7904E-03  5.7158E-05  1.4854E-05
Accumulated dose (rem)  7.4249E-07  2.0516E-03  6.5499E-05  1.6665E-05

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

Environment Integral Nuclide Release (Ci): at Time (h) =   0.5000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  I-131     1.3850E-01     0.39688      0.20237
  I-132     1.9255E-01     0.02602      0.01340
  I-133     2.8134E-01     0.14997      0.07655
  I-134     2.8000E-01     0.03625      0.01894
  I-135     2.6549E-01     0.04836      0.02474
  Xe-133    3.5885E-02     0.00007      0.00000
```

```
  Xe-135    4.0378E-01     0.00638      0.00007

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =   0.5000     Release     Rate/s
Noble gases (atoms)    1.5734E+15  8.7410E+11
Elemental I (atoms)    6.5280E+15  3.6266E+12
Organic I (atoms)      2.0190E+14  1.1216E+11
Aerosol I (atoms)      0.0000E+00  0.0000E+00
All Aerosols (kg)      0.0000E+00  0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5562E+15
Elemental I (atoms)      5.5888E+16   4.4496E+15
Organic I (atoms)        1.7285E+15   1.3762E+14
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   4.7746E+12
Elemental I (atoms)      2.5393E+13   2.5868E+11
Organic I (atoms)        7.8534E+11   8.0003E+09
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   5.3646E+11
Elemental I (atoms)      0.0000E+00   2.9682E+12
Organic I (atoms)        0.0000E+00   9.1799E+10
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      3.3184E+11   1.1146E+09
Elemental I (atoms)      5.0155E+11   0.0000E+00
Organic I (atoms)        1.5512E+10   0.0000E+00
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.9410E+09
Elemental I (atoms)      0.0000E+00   4.9469E+10
Organic I (atoms)        0.0000E+00   1.5300E+09
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6934E+13
Elemental I (atoms)      0.0000E+00   2.2703E+15
Organic I (atoms)        0.0000E+00   7.0215E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
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```
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    1.9500

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EAB LOCA Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.8781E-03  4.1090E-01  1.7780E-02
Accumulated dose (rem)  5.1710E-03  4.7193E-01  2.0001E-02

LOCA @ LPZ Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.8798E-04  2.4258E-02  1.0497E-03
Accumulated dose (rem)  3.0528E-04  2.7861E-02  1.1808E-03

LOCA @ Unprotected CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.4390E-02  2.0545E+00  8.8902E-02
Accumulated dose (rem)  2.5855E-02  2.3597E+00  1.0001E-01

LOCA @ CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        8.4976E-05  2.1064E-02  7.4647E-04  2.9991E-03
Accumulated dose (rem)  8.5719E-05  2.3116E-02  8.1197E-04  3.0158E-03

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

Environment Integral Nuclide Release (Ci): at Time (h) =   2.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  I-131     1.0881E+00     0.49538      0.02284
  I-132     1.0680E+00     0.02259      0.00151
  I-133     2.1317E+00     0.18032      0.00864
  I-134     9.4477E-01     0.01845      0.00214
  I-135     1.8465E+00     0.05319      0.00279
  Xe-133    1.0194E+01     0.00241      0.00000
  Xe-135    1.0519E+02     0.18972      0.00001

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =   2.0000     Release     Rate/s
Noble gases (atoms)    4.3034E+17  5.9770E+13
Elemental I (atoms)    5.0288E+16  6.9844E+12
Organic I (atoms)      1.5553E+15  2.1601E+11
Aerosol I (atoms)      0.0000E+00  0.0000E+00
All Aerosols (kg)      0.0000E+00  0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

                           Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   4.3031E+17
Elemental I (atoms)      4.3514E+18   4.8222E+16
Organic I (atoms)        1.3458E+17   1.4914E+15
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:
```

```
                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.2007E+15
Elemental I (atoms)      1.5236E+14   1.5591E+12
Organic I (atoms)        4.7121E+12   4.8220E+10
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.3765E+14
Elemental I (atoms)      0.0000E+00   1.7890E+13
Organic I (atoms)        0.0000E+00   5.5330E+11
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      2.8045E+14   3.4642E+10
Elemental I (atoms)      5.6328E+12   0.0000E+00
Organic I (atoms)        1.7421E+11   0.0000E+00
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.2942E+12
Elemental I (atoms)      0.0000E+00   2.9816E+11
Organic I (atoms)        0.0000E+00   9.2216E+09
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6934E+13
Elemental I (atoms)      0.0000E+00   2.2703E+15
Organic I (atoms)        0.0000E+00   7.0215E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    7.9500

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EAB LOCA Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.1936E-01  1.1852E+01  7.8861E-01
Accumulated dose (rem)  4.2453E-01  1.2324E+01  8.0861E-01

LOCA @ LPZ Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.4757E-02  6.9968E-01  4.6557E-02
Accumulated dose (rem)  2.5063E-02  7.2754E-01  4.7737E-02

LOCA @ Unprotected CR Doses:
```

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.8240E+00	5.1548E+01	3.4300E+00
Accumulated dose (rem)	1.8498E+00	5.3908E+01	3.5300E+00

LOCA @ CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	1.8320E-02	1.0073E+00	4.9693E-02	6.6071E-01
Accumulated dose (rem)	1.8406E-02	1.0305E+00	5.0505E-02	6.6372E-01

****

Environment Integral Nuclide Release (Ci): at Time (h) = 8.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
I-131	2.9642E+01	0.34365	0.00056
I-132	9.9414E+00	0.00543	0.00004
I-133	5.1550E+01	0.11118	0.00021
I-134	2.7265E+00	0.00139	0.00005
I-135	3.3871E+01	0.02496	0.00007
Xe-133	1.5136E+03	0.00876	0.00000
Xe-135	1.1410E+04	0.50371	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 8.0000	Total Release	Release Rate/s
Noble gases (atoms)	5.6545E+19	1.9634E+15
Elemental I (atoms)	1.3125E+18	4.5572E+13
Organic I (atoms)	4.0592E+16	1.4095E+12
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.6545E+19
Elemental I (atoms)	1.2540E+20	1.3104E+18
Organic I (atoms)	3.8784E+18	4.0528E+16
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1581E+17
Elemental I (atoms)	2.7415E+15	2.8603E+13
Organic I (atoms)	8.4789E+13	8.8464E+11
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3281E+16
Elemental I (atoms)	0.0000E+00	3.2821E+14
Organic I (atoms)	0.0000E+00	1.0151E+13
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	7.7396E+16	4.8550E+12
Elemental I (atoms)	2.5105E+14	0.0000E+00

```
Organic I (atoms)        7.7643E+12   0.0000E+00
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.2136E+14
Elemental I (atoms)      0.0000E+00   5.4702E+12
Organic I (atoms)        0.0000E+00   1.6918E+11
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6934E+13
Elemental I (atoms)      0.0000E+00   2.2703E+15
Organic I (atoms)        0.0000E+00   7.0215E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =   23.6000

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EAB LOCA Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.0308E+00  2.6834E+01  3.8598E+00
Accumulated dose (rem)  3.4553E+00  3.9157E+01  4.6684E+00

LOCA @ LPZ Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.2780E-01  1.1315E+00  1.6276E-01
Accumulated dose (rem)  1.5287E-01  1.8591E+00  2.1050E-01

LOCA @ Unprotected CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.7329E+00  9.8695E+01  8.7821E+00
Accumulated dose (rem)  7.5828E+00  1.5260E+02  1.2312E+01

LOCA @ CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        7.6784E-02  2.3892E+00  1.5063E-01  2.7845E+00
Accumulated dose (rem)  9.5190E-02  3.4197E+00  2.0113E-01  3.4482E+00

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

Environment Integral Nuclide Release (Ci): at Time (h) =  24.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  I-131     1.6538E+02     0.28714      0.00011
  I-132     1.3508E+01     0.00133      0.00001
  I-133     2.2473E+02     0.07396      0.00004
  I-134     2.7657E+00     0.00028      0.00001
  I-135     9.1167E+01     0.01079      0.00001
  Xe-133    2.4836E+04     0.02056      0.00000
  Xe-135    9.3728E+04     0.60577      0.00000
```

Environment Compartment Group Inventory Distribution:

Time (h) = 24.0000	Total Release	Release Rate/s
Noble gases (atoms)	7.6450E+20	8.8484E+15
Elemental I (atoms)	6.9383E+18	8.0304E+13
Organic I (atoms)	2.1459E+17	2.4836E+12
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.6460E+20
Elemental I (atoms)	6.3255E+20	6.9360E+18
Organic I (atoms)	1.9563E+19	2.1452E+17
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.2892E+17
Elemental I (atoms)	6.3905E+15	7.1594E+13
Organic I (atoms)	1.9764E+14	2.2142E+12
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.2118E+16
Elemental I (atoms)	0.0000E+00	8.2150E+14
Organic I (atoms)	0.0000E+00	2.5407E+13
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	6.1686E+17	6.6030E+13
Elemental I (atoms)	8.3981E+14	0.0000E+00
Organic I (atoms)	2.5974E+13	0.0000E+00
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2020E+15
Elemental I (atoms)	0.0000E+00	1.3692E+13
Organic I (atoms)	0.0000E+00	4.2346E+11
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Secondary Containment to Environment Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6934E+13
Elemental I (atoms)	0.0000E+00	2.2703E+15
Organic I (atoms)	0.0000E+00	7.0215E+13
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

```
Detailed model information at time (hr) =   95.5000

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EAB LOCA Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.7928E+00  1.2522E+02  7.6233E+00
Accumulated dose (rem)  7.2481E+00  1.6438E+02  1.2292E+01

LOCA @ LPZ Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.7684E-02  2.5647E+00  1.5614E-01
Accumulated dose (rem)  2.3055E-01  4.4238E+00  3.6664E-01

LOCA @ Unprotected CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.1180E+00  2.5713E+02  1.2984E+01
Accumulated dose (rem)  1.2701E+01  4.0973E+02  2.5296E+01

LOCA @ CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.7360E-02  2.9698E+00  1.2822E-01  1.4152E+00
Accumulated dose (rem)  1.3255E-01  6.3895E+00  3.2935E-01  4.8635E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  96.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  I-131     7.3121E+02     0.40745      0.00006
  I-132     1.3545E+01     0.00074      0.00000
  I-133     4.7025E+02     0.06114      0.00002
  I-134     2.7657E+00     0.00015      0.00001
  I-135     1.0613E+02     0.00642      0.00001
  Xe-133    2.2336E+05     0.05477      0.00000
  Xe-135    1.7318E+05     0.46923      0.00000

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =  96.0000     Release     Rate/s
Noble gases (atoms)    5.7057E+21  1.6510E+16
Elemental I (atoms)    2.8261E+19  8.1773E+13
Organic I (atoms)      8.7404E+17  2.5290E+12
Aerosol I (atoms)      0.0000E+00  0.0000E+00
All Aerosols (kg)      0.0000E+00  0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   5.7068E+21
Elemental I (atoms)      2.2296E+21   2.8258E+19
Organic I (atoms)        6.8958E+19   8.7397E+17
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
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Noble gases (atoms)      0.0000E+00   2.8212E+18
Elemental I (atoms)      1.2727E+16   1.6999E+14
Organic I (atoms)        3.9361E+14   5.2574E+12
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.2356E+17
Elemental I (atoms)      0.0000E+00   1.9505E+15
Organic I (atoms)        0.0000E+00   6.0326E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      3.0927E+18   5.3451E+14
Elemental I (atoms)      2.1061E+15   0.0000E+00
Organic I (atoms)        6.5138E+13   0.0000E+00
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   5.3927E+15
Elemental I (atoms)      0.0000E+00   3.2509E+13
Organic I (atoms)        0.0000E+00   1.0054E+12
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6934E+13
Elemental I (atoms)      0.0000E+00   2.2703E+15
Organic I (atoms)        0.0000E+00   7.0215E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =  119.6500

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EAB LOCA Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.7554E-01  3.2665E+01  1.2710E+00
Accumulated dose (rem)  7.5237E+00  1.9704E+02  1.3563E+01

LOCA @ LPZ Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.0250E-03  2.4007E-01  9.3409E-03
Accumulated dose (rem)  2.3258E-01  4.6639E+00  3.7598E-01

LOCA @ Unprotected CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.9413E-01  5.3061E+01  1.9111E+00
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Accumulated dose (rem)  1.2995E+01  4.6279E+02  2.7207E+01

LOCA @ CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.5172E-03  4.3973E-01  1.4918E-02  6.5724E-02
Accumulated dose (rem)  1.3407E-01  6.8292E+00  3.4427E-01  4.9292E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 120.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  I-131     8.8738E+02     0.41968      0.00006
  I-132     1.3545E+01     0.00072      0.00000
  I-133     4.8353E+02     0.05977      0.00002
  I-134     2.7657E+00     0.00015      0.00001
  I-135     1.0614E+02     0.00623      0.00001
  Xe-133    2.7697E+05     0.05729      0.00000
  Xe-135    1.7352E+05     0.45606      0.00000

Environment Compartment Group Inventory Distribution:

                         Total      Release
Time (h) = 120.0000     Release     Rate/s
Noble gases (atoms)    7.0031E+21  1.6211E+16
Elemental I (atoms)    3.3929E+19  7.8540E+13
Organic I (atoms)      1.0494E+18  2.4291E+12
Aerosol I (atoms)      0.0000E+00  0.0000E+00
All Aerosols (kg)      0.0000E+00  0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.0044E+21
Elemental I (atoms)      2.5676E+21   3.3927E+19
Organic I (atoms)        7.9411E+19   1.0493E+18
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.3233E+18
Elemental I (atoms)      1.3714E+16   1.9237E+14
Organic I (atoms)        4.2414E+14   5.9496E+12
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.8116E+17
Elemental I (atoms)      0.0000E+00   2.2073E+15
Organic I (atoms)        0.0000E+00   6.8268E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      3.6645E+18   7.0612E+14
Elemental I (atoms)      2.3928E+15   0.0000E+00
Organic I (atoms)        7.4006E+13   0.0000E+00
Aerosol I (atoms)        0.0000E+00   0.0000E+00
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All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   6.3527E+15
Elemental I (atoms)      0.0000E+00   3.6789E+13
Organic I (atoms)        0.0000E+00   1.1378E+12
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6934E+13
Elemental I (atoms)      0.0000E+00   2.2703E+15
Organic I (atoms)        0.0000E+00   7.0215E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =  239.9000

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EAB LOCA Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.4248E-01  1.2308E+02  4.5905E+00
Accumulated dose (rem)  8.3661E+00  3.2012E+02  1.8153E+01

LOCA @ LPZ Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.1917E-03  9.0458E-01  3.3737E-02
Accumulated dose (rem)  2.3877E-01  5.5685E+00  4.0972E-01

LOCA @ Unprotected CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.9932E-01  1.9994E+02  6.9876E+00
Accumulated dose (rem)  1.3894E+01  6.6273E+02  3.4195E+01

LOCA @ CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        4.5651E-03  1.6389E+00  5.4470E-02  1.9922E-01
Accumulated dose (rem)  1.3863E-01  8.4681E+00  3.9874E-01  5.1284E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 240.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  I-131     1.4824E+03     0.46240      0.00005
  I-132     1.3545E+01     0.00065      0.00000
  I-133     4.9404E+02     0.05441      0.00002
  I-134     2.7657E+00     0.00013      0.00001
  I-135     1.0614E+02     0.00565      0.00001
  Xe-133    4.4602E+05     0.06354      0.00000
  Xe-135    1.7358E+05     0.41312      0.00000

Environment Compartment Group Inventory Distribution:
```

Time (h) = 240.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.1092E+22	1.2838E+16
Elemental I (atoms)	5.5371E+19	6.4087E+13
Organic I (atoms)	1.7125E+18	1.9821E+12
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.1094E+22
Elemental I (atoms)	3.3497E+21	5.5369E+19
Organic I (atoms)	1.0360E+20	1.7124E+18
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.9263E+18
Elemental I (atoms)	1.5536E+16	2.7703E+14
Organic I (atoms)	4.8048E+14	8.5679E+12
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.6509E+17
Elemental I (atoms)	0.0000E+00	3.1788E+15
Organic I (atoms)	0.0000E+00	9.8312E+13
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	5.4614E+18	1.5748E+15
Elemental I (atoms)	3.4657E+15	0.0000E+00
Organic I (atoms)	1.0719E+14	0.0000E+00
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.4182E+15
Elemental I (atoms)	0.0000E+00	5.2979E+13
Organic I (atoms)	0.0000E+00	1.6385E+12
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Secondary Containment to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6934E+13
Elemental I (atoms)	0.0000E+00	2.2703E+15
Organic I (atoms)	0.0000E+00	7.0215E+13
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Detailed model information at time (hr) = 479.7000

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EAB LOCA Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.1431E-01  1.2508E+02  4.4224E+00
Accumulated dose (rem)  8.9804E+00  4.4520E+02  2.2576E+01

LOCA @ LPZ Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.5148E-03  9.1925E-01  3.2502E-02
Accumulated dose (rem)  2.4328E-01  6.4877E+00  4.4222E-01

LOCA @ Unprotected CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.5576E-01  2.0318E+02  6.8416E+00
Accumulated dose (rem)  1.4550E+01  8.6591E+02  4.1036E+01

LOCA @ CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.2813E-03  1.6654E+00  5.3986E-02  1.4314E-01
Accumulated dose (rem)  1.4191E-01  1.0134E+01  4.5272E-01  5.2715E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 480.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  I-131     2.0888E+03     0.50013      0.00005
  I-132     1.3545E+01     0.00060      0.00000
  I-133     4.9423E+02     0.04982      0.00002
  I-134     2.7657E+00     0.00012      0.00000
  I-135     1.0614E+02     0.00517      0.00001
  Xe-133    5.6719E+05     0.06582      0.00000
  Xe-135    1.7358E+05     0.37825      0.00000

Environment Compartment Group Inventory Distribution:

                        Total      Release
Time (h) = 480.0000     Release     Rate/s
Noble gases (atoms)    1.4024E+22  8.1155E+15
Elemental I (atoms)    7.7184E+19  4.4667E+13
Organic I (atoms)      2.3871E+18  1.3814E+12
Aerosol I (atoms)      0.0000E+00  0.0000E+00
All Aerosols (kg)      0.0000E+00  0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

                          Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4025E+22
Elemental I (atoms)      2.7665E+21   7.7181E+19
Organic I (atoms)        8.5563E+19   2.3871E+18
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

                          Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   6.0832E+18
Elemental I (atoms)      1.1898E+16   3.6315E+14
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Organic I (atoms)        3.6798E+14   1.1231E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   6.9784E+17
Elemental I (atoms)      0.0000E+00   4.1669E+15
Organic I (atoms)        0.0000E+00   1.2887E+14
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      6.7542E+18   3.3162E+15
Elemental I (atoms)      4.5570E+15   0.0000E+00
Organic I (atoms)        1.4094E+14   0.0000E+00
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.1631E+16
Elemental I (atoms)      0.0000E+00   6.9449E+13
Organic I (atoms)        0.0000E+00   2.1479E+12
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6934E+13
Elemental I (atoms)      0.0000E+00   2.2703E+15
Organic I (atoms)        0.0000E+00   7.0215E+13
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =  719.8000

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EAB LOCA Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.5694E-01  4.9102E+01  1.6518E+00
Accumulated dose (rem)  9.1374E+00  4.9430E+02  2.4227E+01

LOCA @ LPZ Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.1534E-03  3.6087E-01  1.2140E-02
Accumulated dose (rem)  2.4444E-01  6.8486E+00  4.5436E-01

LOCA @ Unprotected CR Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.6753E-01  7.9761E+01  2.5959E+00
Accumulated dose (rem)  1.4717E+01  9.4567E+02  4.3632E+01
```

LOCA @ CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	8.1510E-04	6.5380E-01	2.0720E-02	3.5491E-02
Accumulated dose (rem)	1.4273E-01	1.0787E+01	4.7344E-01	5.3070E+00

****

Environment Integral Nuclide Release (Ci): at Time (h) = 720.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
I-131	2.3269E+03	0.51381	0.00005
I-132	1.3545E+01	0.00058	0.00000
I-133	4.9423E+02	0.04828	0.00002
I-134	2.7657E+00	0.00012	0.00000
I-135	1.0614E+02	0.00501	0.00001
Xe-133	5.9717E+05	0.06561	0.00000
Xe-135	1.7358E+05	0.36651	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 720.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.4749E+22	5.6901E+15
Elemental I (atoms)	8.5747E+19	3.3081E+13
Organic I (atoms)	2.6520E+18	1.0231E+12
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Secondary Containment to Environment - SGTS Dis Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4750E+22
Elemental I (atoms)	1.6991E+21	8.5744E+19
Organic I (atoms)	5.2550E+19	2.6519E+18
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - CREOAS Filtered A Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.3696E+18
Elemental I (atoms)	7.1202E+15	3.9696E+14
Organic I (atoms)	2.2021E+14	1.2277E+13
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.3070E+17
Elemental I (atoms)	0.0000E+00	4.5548E+15
Organic I (atoms)	0.0000E+00	1.4087E+14
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	7.0741E+18	5.0576E+15
Elemental I (atoms)	4.9854E+15	0.0000E+00
Organic I (atoms)	1.5419E+14	0.0000E+00
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2178E+16
Elemental I (atoms)	0.0000E+00	7.5914E+13
Organic I (atoms)	0.0000E+00	2.3479E+12
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Secondary Containment to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6934E+13
Elemental I (atoms)	0.0000E+00	2.2703E+15
Organic I (atoms)	0.0000E+00	7.0215E+13
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

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#################################################################
                              I-131 Summary
#################################################################
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Time (hr)	Suppression Pool I-131 (Curies)	Secondary Containment I-131 (Curies)	Environment I-131 (Curies)
0.000	6.0256E+03	5.0817E-05	4.7831E-09
0.167	1.8067E+06	4.4459E+00	1.2647E-01
0.367	3.9712E+06	2.1534E+01	1.3096E-01
0.500	5.4120E+06	3.9755E+01	1.3850E-01
0.700	9.0133E+06	8.1309E+01	1.6057E-01
0.900	1.2609E+07	1.4275E+02	2.0198E-01
1.100	1.6200E+07	2.2329E+02	2.7004E-01
1.300	1.9785E+07	3.2219E+02	3.7176E-01
1.500	2.3365E+07	4.3872E+02	5.1391E-01
1.700	2.6939E+07	5.7220E+02	7.0297E-01
1.900	3.0508E+07	7.2195E+02	9.4516E-01
2.000	3.2291E+07	8.0273E+02	1.0881E+00
2.200	3.2266E+07	9.6495E+02	1.4197E+00
2.400	3.2240E+07	1.1209E+03	1.8111E+00
2.600	3.2215E+07	1.2709E+03	2.2598E+00
2.800	3.2190E+07	1.4151E+03	2.7637E+00
3.000	3.2165E+07	1.5538E+03	3.3206E+00
3.200	3.2140E+07	1.6871E+03	3.9285E+00
3.400	3.2115E+07	1.8152E+03	4.5854E+00
3.600	3.2090E+07	1.9384E+03	5.2895E+00
3.800	3.2065E+07	2.0569E+03	6.0389E+00
4.000	3.2040E+07	2.1707E+03	6.8318E+00
4.200	3.2015E+07	2.2801E+03	7.6666E+00
4.400	3.1990E+07	2.3853E+03	8.5416E+00
4.600	3.1965E+07	2.4864E+03	9.4553E+00
4.800	3.1940E+07	2.5835E+03	1.0406E+01
5.000	3.1915E+07	2.6769E+03	1.1393E+01
5.200	3.1891E+07	2.7666E+03	1.2414E+01
5.400	3.1866E+07	2.8528E+03	1.3468E+01
5.600	3.1841E+07	2.9356E+03	1.4553E+01
5.800	3.1816E+07	3.0151E+03	1.5669E+01
6.000	3.1791E+07	3.0916E+03	1.6814E+01
6.200	3.1767E+07	3.1650E+03	1.7988E+01
6.400	3.1742E+07	3.2355E+03	1.9188E+01
6.600	3.1717E+07	3.3032E+03	2.0414E+01
6.800	3.1692E+07	3.3682E+03	2.1665E+01

7.000	3.1668E+07	3.4307E+03	2.2941E+01
7.200	3.1643E+07	3.4907E+03	2.4239E+01
7.400	3.1618E+07	3.5482E+03	2.5559E+01
7.600	3.1594E+07	3.6035E+03	2.6900E+01
7.800	3.1569E+07	3.6565E+03	2.8261E+01
8.000	3.1545E+07	3.7074E+03	2.9642E+01
8.200	3.1520E+07	3.7563E+03	3.1042E+01
8.400	3.1496E+07	3.8031E+03	3.2460E+01
8.600	3.1471E+07	3.8481E+03	3.3894E+01
8.800	3.1446E+07	3.8912E+03	3.5346E+01
9.000	3.1422E+07	3.9326E+03	3.6813E+01
9.200	3.1398E+07	3.9723E+03	3.8296E+01
9.400	3.1373E+07	4.0103E+03	3.9793E+01
9.600	3.1349E+07	4.0468E+03	4.1303E+01
9.800	3.1324E+07	4.0817E+03	4.2828E+01
10.000	3.1300E+07	4.1152E+03	4.4365E+01
10.200	3.1275E+07	4.1473E+03	4.5915E+01
24.000	2.9638E+07	4.7410E+03	1.6538E+02
96.000	2.2389E+07	3.6314E+03	7.3121E+02
720.000	1.9691E+06	3.1938E+02	2.3269E+03

Time (hr)	Control Room I-131 (Curies)
0.000	1.7341E-12
0.167	4.4577E-05
0.367	4.0453E-05
0.500	3.9576E-05
0.700	4.2085E-05
0.900	5.0859E-05
1.100	6.7577E-05
1.300	9.3611E-05
1.500	1.3006E-04
1.700	1.7780E-04
1.900	2.3751E-04
2.000	2.7201E-04
2.200	3.2134E-04
2.400	3.7946E-04
2.600	4.4466E-04
2.800	5.1550E-04
3.000	5.9071E-04
3.200	6.6923E-04
3.400	7.5014E-04
3.600	8.3266E-04
3.800	9.1612E-04
4.000	9.9995E-04
4.200	1.0837E-03
4.400	1.1669E-03
4.600	1.2494E-03
4.800	1.3307E-03
5.000	1.4107E-03
5.200	1.4892E-03
5.400	1.5660E-03
5.600	1.6411E-03
5.800	1.7143E-03
6.000	1.7856E-03
6.200	1.8549E-03
6.400	1.9222E-03
6.600	1.9874E-03
6.800	2.0507E-03
7.000	2.1120E-03
7.200	2.1712E-03
7.400	2.2285E-03
7.600	2.2838E-03
7.800	2.3373E-03
8.000	2.3888E-03
8.200	2.2115E-03
8.400	2.0584E-03
8.600	1.9262E-03
8.800	1.8124E-03
9.000	1.7145E-03

9.200	1.6303E-03
9.400	1.5582E-03
9.600	1.4966E-03
9.800	1.4439E-03
10.000	1.3992E-03
10.200	1.3612E-03
24.000	1.2633E-03
96.000	5.8872E-04
720.000	4.4302E-05

##
Cumulative Dose Summary
##

	EAB LOCA		LOCA @ LPZ		LOCA @ Unprotected 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
0.167	5.5745E-02	2.0186E-03	3.2910E-03	1.1917E-04	2.7872E-01	1.0093E-02
0.367	5.7716E-02	2.0931E-03	3.4073E-03	1.2357E-04	2.8858E-01	1.0466E-02
0.500	6.1028E-02	2.2210E-03	3.6028E-03	1.3112E-04	3.0514E-01	1.1105E-02
0.700	7.0689E-02	2.6012E-03	4.1732E-03	1.5357E-04	3.5345E-01	1.3006E-02
0.900	8.8770E-02	3.3268E-03	5.2406E-03	1.9640E-04	4.4385E-01	1.6634E-02
1.100	1.1841E-01	4.5402E-03	6.9905E-03	2.6804E-04	5.9206E-01	2.2701E-02
1.300	1.6261E-01	6.3872E-03	9.5997E-03	3.7708E-04	8.1304E-01	3.1936E-02
1.500	2.2421E-01	9.0162E-03	1.3237E-02	5.3228E-04	1.1211E+00	4.5081E-02
1.700	3.0595E-01	1.2578E-02	1.8062E-02	7.4254E-04	1.5297E+00	6.2889E-02
1.900	4.1040E-01	1.7224E-02	2.4229E-02	1.0168E-03	2.0520E+00	8.6119E-02
2.000	4.7193E-01	2.0001E-02	2.7861E-02	1.1808E-03	2.3597E+00	1.0001E-01
2.200	6.1449E-01	2.6541E-02	3.6277E-02	1.5669E-03	2.9797E+00	1.2845E-01
2.400	7.8231E-01	3.4426E-02	4.6184E-02	2.0324E-03	3.7096E+00	1.6274E-01
2.600	9.7429E-01	4.3681E-02	5.7518E-02	2.5788E-03	4.5446E+00	2.0300E-01
2.800	1.1894E+00	5.4330E-02	7.0218E-02	3.2074E-03	5.4802E+00	2.4931E-01
3.000	1.4266E+00	6.6387E-02	8.4223E-02	3.9192E-03	6.5120E+00	3.0176E-01
3.200	1.6850E+00	7.9865E-02	9.9477E-02	4.7149E-03	7.6359E+00	3.6038E-01
3.400	1.9637E+00	9.4773E-02	1.1593E-01	5.5950E-03	8.8478E+00	4.2522E-01
3.600	2.2617E+00	1.1111E-01	1.3352E-01	6.5598E-03	1.0144E+01	4.9629E-01
3.800	2.5782E+00	1.2889E-01	1.5221E-01	7.6091E-03	1.1521E+01	5.7361E-01
4.000	2.9124E+00	1.4810E-01	1.7194E-01	8.7431E-03	1.2974E+01	6.5714E-01
4.200	3.2636E+00	1.6873E-01	1.9267E-01	9.9611E-03	1.4502E+01	7.4688E-01
4.400	3.6309E+00	1.9078E-01	2.1435E-01	1.1263E-02	1.6099E+01	8.4279E-01
4.600	4.0137E+00	2.1424E-01	2.3695E-01	1.2648E-02	1.7764E+01	9.4481E-01
4.800	4.4113E+00	2.3908E-01	2.6043E-01	1.4115E-02	1.9494E+01	1.0529E+00
5.000	4.8231E+00	2.6531E-01	2.8474E-01	1.5663E-02	2.1285E+01	1.1669E+00
5.200	5.2483E+00	2.9289E-01	3.0984E-01	1.7291E-02	2.3134E+01	1.2869E+00
5.400	5.6865E+00	3.2182E-01	3.3571E-01	1.8999E-02	2.5040E+01	1.4127E+00
5.600	6.1370E+00	3.5206E-01	3.6230E-01	2.0784E-02	2.6999E+01	1.5443E+00
5.800	6.5993E+00	3.8360E-01	3.8959E-01	2.2646E-02	2.9010E+01	1.6814E+00
6.000	7.0728E+00	4.1641E-01	4.1755E-01	2.4583E-02	3.1069E+01	1.8241E+00
6.200	7.5570E+00	4.5047E-01	4.4614E-01	2.6594E-02	3.3175E+01	1.9723E+00
6.400	8.0515E+00	4.8575E-01	4.7533E-01	2.8677E-02	3.5326E+01	2.1257E+00
6.600	8.5557E+00	5.2222E-01	5.0510E-01	3.0830E-02	3.7519E+01	2.2844E+00
6.800	9.0693E+00	5.5987E-01	5.3542E-01	3.3052E-02	3.9753E+01	2.4481E+00
7.000	9.5918E+00	5.9865E-01	5.6626E-01	3.5342E-02	4.2026E+01	2.6168E+00
7.200	1.0123E+01	6.3854E-01	5.9761E-01	3.7697E-02	4.4335E+01	2.7903E+00
7.400	1.0662E+01	6.7951E-01	6.2943E-01	4.0116E-02	4.6679E+01	2.9685E+00
7.600	1.1209E+01	7.2153E-01	6.6171E-01	4.2596E-02	4.9057E+01	3.1512E+00
7.800	1.1763E+01	7.6458E-01	6.9442E-01	4.5138E-02	5.1467E+01	3.3385E+00
8.000	1.2324E+01	8.0861E-01	7.2754E-01	4.7737E-02	5.3908E+01	3.5300E+00
8.200	1.2616E+01	8.4505E-01	7.3986E-01	4.9274E-02	5.4982E+01	3.6151E+00
8.400	1.2911E+01	8.8231E-01	7.5231E-01	5.0845E-02	5.6068E+01	3.7020E+00
8.600	1.3209E+01	9.2040E-01	7.6489E-01	5.2451E-02	5.7165E+01	3.7906E+00
8.800	1.3511E+01	9.5926E-01	7.7759E-01	5.4090E-02	5.8273E+01	3.8808E+00
9.000	1.3815E+01	9.9889E-01	7.9041E-01	5.5761E-02	5.9391E+01	3.9726E+00
9.200	1.4121E+01	1.0392E+00	8.0335E-01	5.7463E-02	6.0520E+01	4.0660E+00
9.400	1.4431E+01	1.0803E+00	8.1639E-01	5.9195E-02	6.1657E+01	4.1608E+00
9.600	1.4742E+01	1.1221E+00	8.2953E-01	6.0955E-02	6.2804E+01	4.2570E+00
9.800	1.5056E+01	1.1645E+00	8.4277E-01	6.2744E-02	6.3958E+01	4.3546E+00
10.000	1.5372E+01	1.2075E+00	8.5610E-01	6.4559E-02	6.5121E+01	4.4536E+00
10.200	1.5691E+01	1.2512E+00	8.6952E-01	6.6399E-02	6.6291E+01	4.5537E+00

24.000	3.9157E+01	4.6684E+00	1.8591E+00	2.1050E-01	1.5260E+02	1.2312E+01
96.000	1.6438E+02	1.2292E+01	4.4238E+00	3.6664E-01	4.0973E+02	2.5296E+01
720.000	4.9430E+02	2.4227E+01	6.8486E+00	4.5436E-01	9.4567E+02	4.3632E+01

LOCA @ CR

Time (hr)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00
0.167	2.6120E-04	8.3412E-06
0.367	1.3615E-03	4.3452E-05
0.500	2.0516E-03	6.5499E-05
0.700	3.0983E-03	9.9170E-05
0.900	4.2843E-03	1.3797E-04
1.100	5.7924E-03	1.8849E-04
1.300	7.8436E-03	2.5894E-04
1.500	1.0689E-02	3.5893E-04
1.700	1.4601E-02	4.9931E-04
1.900	1.9874E-02	6.9201E-04
2.000	2.3116E-02	8.1197E-04
2.200	3.0638E-02	1.0932E-03
2.400	3.9510E-02	1.4295E-03
2.600	4.9925E-02	1.8302E-03
2.800	6.2037E-02	2.3037E-03
3.000	7.5964E-02	2.8573E-03
3.200	9.1796E-02	3.4972E-03
3.400	1.0960E-01	4.2290E-03
3.600	1.2940E-01	5.0571E-03
3.800	1.5125E-01	5.9856E-03
4.000	1.7513E-01	7.0176E-03
4.200	2.0105E-01	8.1558E-03
4.400	2.2899E-01	9.4022E-03
4.600	2.5894E-01	1.0758E-02
4.800	2.9084E-01	1.2226E-02
5.000	3.2468E-01	1.3804E-02
5.200	3.6041E-01	1.5495E-02
5.400	3.9797E-01	1.7298E-02
5.600	4.3733E-01	1.9213E-02
5.800	4.7844E-01	2.1238E-02
6.000	5.2123E-01	2.3375E-02
6.200	5.6567E-01	2.5620E-02
6.400	6.1168E-01	2.7974E-02
6.600	6.5923E-01	3.0435E-02
6.800	7.0825E-01	3.3001E-02
7.000	7.5870E-01	3.5670E-02
7.200	8.1052E-01	3.8441E-02
7.400	8.6365E-01	4.1313E-02
7.600	9.1805E-01	4.4282E-02
7.800	9.7367E-01	4.7347E-02
8.000	1.0305E+00	5.0505E-02
8.200	1.0856E+00	5.3585E-02
8.400	1.1367E+00	5.6442E-02
8.600	1.1843E+00	5.9107E-02
8.800	1.2289E+00	6.1611E-02
9.000	1.2709E+00	6.3978E-02
9.200	1.3107E+00	6.6229E-02
9.400	1.3485E+00	6.8383E-02
9.600	1.3847E+00	7.0455E-02
9.800	1.4195E+00	7.2460E-02
10.000	1.4531E+00	7.4409E-02
10.200	1.4857E+00	7.6312E-02
24.000	3.4197E+00	2.0113E-01
96.000	6.3895E+00	3.2935E-01
720.000	1.0787E+01	4.7344E-01

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 09:57:35

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

            LOCA PPL-SSES   ESF Leakage to RB to Env. w/ SGTS

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

EAB LOCA
   Time   Whole Body    Thyroid        TEDE
   (hr)     (rem)        (rem)         (rem)
   10.2   3.9025E-01   3.4010E+00   4.9526E-01

#####################################################################
                          Final Doses
#####################################################################

LOCA @ LPZ
   Time   Whole Body    Thyroid        TEDE
   (hr)     (rem)        (rem)         (rem)
  720.0   2.4444E-01   6.8486E+00   4.5436E-01

LOCA @ Unprotected CR
   Time   Whole Body    Thyroid        TEDE
   (hr)     (rem)        (rem)         (rem)
  720.0   1.4717E+01   9.4567E+02   4.3632E+01

LOCA @ CR
   Time   Whole Body    Thyroid        TEDE
   (hr)     (rem)        (rem)         (rem)
  720.0   1.4273E-01   1.0787E+01   4.7344E-01
```

Attachment 13 RADTRAD Output:
Attch 13 BYPASS_Atrium11_600cfm_Drywell Only 0-2hr.o0

7

All Attachment 13 Pages Revised for Rev 7

```
 ######################################################################
     ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:01:15

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

             LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

 Input File Name      = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 13
BYPASS_Atrium11_600cfm_Drywell Only 0-2hr.psf
 Output File Name     = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 13
BYPASS_Atrium11_600cfm_Drywell Only 0-2hr.o0

 Inventory file       =  c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Release file         =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
 Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp




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


   Radtrad 3.10  Rev. 4
   LOCA PPL-SSES   Primary Containment Leakage directly to Env.
 Dose Conversion Factor File:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
 Release Fraction & Timing Files:
   1
   c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
 Nuclide Inventory Files:
   1
   1 c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Plant Power Level:
   4.032E+03
 Number of Compartments:
   3
 Compartment 1:
   Primary Containment
   3
   2.396E+05
   0
   0
   0
   1
   0
 Compartment 2:
   Environment
   2
   0.00E+00
   0
   0
   0
   0
   0
 Compartment 3:
   Control Room
   1
```

```
  5.18E+05
  0
  0
  0
  0
  0
Number of Pathways:
  5
Pathway 1:
  Primary Containment to Environment - Bypass Leakage
  1
  2
  4
Pathway 2:
  Environment to Control Room - Emergency Filtered Air Intake
  2
  3
  2
Pathway 3:
  Environment to Control Room - Unfiltered Air Inleakage
  2
  3
  2
Pathway 4:
  Control Room to Environment - CR Exhaust
  3
  2
  2
Pathway 5:
  Environment to  Control Room ingress/egress
  2
  3
  2
  End of Plant Model
Source Term Input:
  1
  1  1  1  1
  0.00E+00
  0.00E+00   7.2E+02
  1
  2   9.5E-01   4.85E-02   1.5E-03
Overlying Pool:
  0
  0.00E+00
  0
  0
  0
  0
Compartments:
  3
Compartment 1:
  0
  1
  0
  0
  0
  0
  0
  3
  3
  1.00E+01
  1
  1
  0.00E+00   0.00E+00
Compartment 2:
  1
  1
  0
  0
  0
```

```
  0
  0
  0
  0
Compartment 3:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  5
Pathway 1:
  1
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   2.23E-02
  2.00E+00   0.00E+00
  7.2E+02   0.00E+00
  0
Pathway 2:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   5.229E+03   9.9E+01   9.9E+01   9.9E+01
  2.00E+00   5.229E+03   1.00E+02   1.00E+02   1.00E+02
  7.2E+02   5.229E+03   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   6.00E+02   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   6.00E+02   1.00E+02   1.00E+02   1.00E+02
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
```

```
  0
  0
  0
Pathway 4:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.839E+03   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   1.00E+01   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   1.00E+01   1.00E+02   1.00E+02   1.00E+02
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  4
Location 1:
  EAB LOCA
  2
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 2:
  LOCA @ LPZ
  2
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 3:
  LOCA @ Unprotected CR
  2
  1
  2
  0.00E+00   3.5E-04
```

```
   7.2E+02   0.00E+00
   0
 Location 4:
   LOCA @ CR
   3
   1
   2
   0.00E+00   3.5E-04
   7.2E+02   0.00E+00
   1
   4
   0.00E+00   1.00E+00
   2.4E+01   6.00E-01
   9.6E+01   4.00E-01
   7.2E+02   0.00E+00
 X/Q Tables:
   4
   EAB LOCA
   2
   0.00E+00   8.3E-04
   7.2E+02   0.00E+00
   LOCA @ LPZ
   5
   0.00E+00   4.9E-05
   8.00E+00   3.5E-05
   2.4E+01   1.7E-05
   9.6E+01   6.1E-06
   7.2E+02   0.00E+00
   LOCA @ Unprotected CR
   6
   0.00E+00   4.72E-03
   2.00E+00   4.25E-03
   8.00E+00   1.84E-03
   2.4E+01   1.32E-03
   9.6E+01   1.03E-03
   7.2E+02   0.00E+00
   LOCA @ CR
   6
   0.00E+00   1.21E-03
   2.00E+00   8.76E-04
   8.00E+00   3.16E-04
   2.4E+01   1.92E-04
   9.6E+01   1.61E-04
   7.2E+02   0.00E+00
 Inflow Pathways:
   3  2 3 5
 Exhaust Pathways:
   2  1 4
 X/Q table ID for Exhaust-Inflow paths:
   4 4 4
   -1 -1 -1
 Simulation Parameters:
   5
   0.00E+00   0.00E+00
   9.6E+01   1.2E+02
   2.4E+02   2.4E+02
   4.8E+02   2.4E+02
   7.2E+02   0.00E+00
 Output Filename:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 13 BYPASS_Atrium11_600cfm_Drywell Only 0-
2hr.o0
   1
   1
   1
   1
   0
   End of Scenario File
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:01:15

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

            LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

Number of Nuclides =  60

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

Number of compartments    =   3

Compartment information

Compartment number  1
Name: Primary Containment
Compartment volume =   2.3960E+05 (Cubic feet)
Compartment type is Normal
Removal devices within compartment:
     Deposition
Pathways into and out of compartment  1
   Exit Pathway Number    1: Primary Containment to Environment - Bypass Lea

Compartment number  2
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  2
   Inlet Pathway Number   1: Primary Containment to Environment - Bypass Lea
   Inlet Pathway Number   4: Control Room to Environment - CR Exhaust
   Exit Pathway Number    2: Environment to Control Room - Emergency Filtere
   Exit Pathway Number    3: Environment to Control Room - Unfiltered Air In
   Exit Pathway Number    5: Environment to  Control Room ingress/egress

Compartment number  3
Name: Control Room
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Environment to Control Room - Emergency Filtere
   Inlet Pathway Number   3: Environment to Control Room - Unfiltered Air In
   Inlet Pathway Number   5: Environment to  Control Room ingress/egress
   Exit Pathway Number    4: Control Room to Environment - CR Exhaust

Total number of pathways =   5
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:01:15

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            LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

Power Ratio                              =   4.0320E+03

End Time                                 =   7.2000E+02 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Source Number  1 is used in Compartment  1  Primary Containment
   Nuclide Distribution given in Ci/MWt
Fraction of Nuclide Distribution in this Compartment   1.00000

Iodine fractions for source number 1
     Aerosol     =   9.5000E-01
     Elemental   =   4.8500E-02
     Organic     =   1.5000E-03

Inventory file =     c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
Release from file =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
```

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Co-58	7	1.070E+02	6.117E+06	4.760E-14	8.720E-10	2.940E-09
Co-60	7	4.390E+00	1.663E+08	1.260E-13	1.620E-08	5.910E-08
Kr-85	1	4.150E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	6.940E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.320E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	1.780E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
Rb-86	3	6.120E+01	1.612E+06	4.810E-15	1.330E-09	1.790E-09
Sr-89	5	2.480E+04	4.363E+06	7.730E-17	7.960E-12	1.120E-08
Sr-90	5	3.310E+03	9.190E+08	7.530E-18	2.690E-10	3.510E-07
Sr-91	5	3.120E+04	3.420E+04	4.924E-14	9.930E-12	4.547E-10
Sr-92	5	3.370E+04	9.756E+03	6.790E-14	3.920E-12	2.180E-10
Y-90	9	3.490E+03	2.304E+05	1.900E-16	5.170E-13	2.280E-09
Y-91	9	3.230E+04	5.055E+06	2.600E-16	8.500E-12	1.320E-08
Y-92	9	3.410E+04	1.274E+04	1.300E-14	1.050E-12	2.110E-10
Y-93	9	3.870E+04	3.636E+04	4.800E-15	9.260E-13	5.820E-10
Zr-95	9	4.680E+04	5.528E+06	3.600E-14	1.440E-09	6.390E-09
Zr-97	9	4.750E+04	6.084E+04	4.432E-14	2.315E-11	1.171E-09
Nb-95	9	4.690E+04	3.037E+06	3.740E-14	3.580E-10	1.570E-09
Mo-99	7	4.980E+04	2.376E+05	7.280E-15	1.520E-11	1.070E-09
Tc-99m	7	4.370E+04	2.167E+04	5.890E-15	5.010E-11	8.800E-12
Ru-103	7	4.300E+04	3.394E+06	2.251E-14	2.570E-10	2.421E-09
Ru-105	7	2.990E+04	1.598E+04	3.810E-14	4.150E-12	1.230E-10
Ru-106	7	1.670E+04	3.181E+07	1.040E-14	1.720E-09	1.290E-07
Rh-105	7	2.780E+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	7.630E+03	1.555E+04	7.140E-14	9.720E-12	1.740E-10
Te-127	4	2.300E+03	3.366E+04	2.420E-16	1.840E-12	8.600E-11
Te-127m	4	1.810E+02	9.418E+06	1.470E-16	9.660E-11	5.810E-09
Te-129	4	7.280E+03	4.176E+03	2.750E-15	5.090E-13	2.090E-11
Te-129m	4	1.250E+03	2.903E+06	3.337E-15	1.563E-10	6.484E-09
Te-131m	4	5.230E+03	1.080E+05	7.463E-14	3.669E-08	1.758E-09
Te-132	4	3.820E+04	2.815E+05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.690E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09

I-132	2	3.920E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.490E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.150E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.240E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.380E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	1.450E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Cs-134	3	5.840E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.480E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.480E+03	9.467E+08	2.725E-14	7.930E-09	8.630E-09
Ba-139	6	4.850E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	4.690E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09
La-140	9	4.910E+04	1.450E+05	1.170E-13	6.870E-11	1.310E-09
La-141	9	4.390E+04	1.415E+04	2.390E-15	9.400E-12	1.570E-10
La-142	9	4.230E+04	5.550E+03	1.440E-13	8.740E-12	6.840E-11
Ce-141	8	4.420E+04	2.808E+06	3.430E-15	2.550E-11	2.420E-09
Ce-143	8	4.100E+04	1.188E+05	1.290E-14	6.230E-12	9.160E-10
Ce-144	8	3.680E+04	2.456E+07	2.773E-15	2.920E-10	1.010E-07
Pr-143	9	4.000E+04	1.172E+06	2.100E-17	1.680E-18	2.190E-09
Nd-147	9	1.750E+04	9.487E+05	6.190E-15	1.820E-11	1.850E-09
Np-239	8	5.060E+05	2.035E+05	7.690E-15	7.620E-12	6.780E-10
Pu-238	8	1.090E+02	2.769E+09	4.880E-18	3.860E-10	7.790E-05
Pu-239	8	1.020E+01	7.594E+11	4.240E-18	3.750E-10	8.330E-05
Pu-240	8	1.820E+01	2.063E+11	4.750E-18	3.760E-10	8.330E-05
Pu-241	8	4.340E+03	4.544E+08	7.250E-20	9.150E-12	1.340E-06
Am-241	9	5.360E+00	1.364E+10	8.180E-16	1.600E-09	1.200E-04
Cm-242	9	1.900E+03	1.407E+07	5.690E-18	9.410E-10	4.670E-06
Cm-244	9	9.700E+01	5.715E+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-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00

Release Fractions and Timings

BWR, RG 1.183, Table 1 Section 3.2
Duration (h): Design Basis Accident

	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	5.458E+03
IODINE	5.0000E-02	2.5000E-01	0.0000E+00	3.465E+02
CESIUM	5.0000E-02	2.0000E-01	0.0000E+00	5.649E+04
TELLURIUM	0.0000E+00	5.0000E-02	0.0000E+00	4.137E+01
STRONTIUM	0.0000E+00	2.0000E-02	0.0000E+00	2.027E+03
BARIUM	0.0000E+00	2.0000E-02	0.0000E+00	5.190E+01
RUTHENIUM	0.0000E+00	2.5000E-03	0.0000E+00	6.533E+01
CERIUM	0.0000E+00	5.0000E-04	0.0000E+00	6.205E+02
LANTHANUM	0.0000E+00	2.0000E-04	0.0000E+00	7.245E+00
AEROSOL	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00

COMPARTMENT DATA

Compartment number 1: Primary Containment

Natural Deposition (Powers' model): Aerosol data
Reactor type: BWRDBA
Percentile = 10 (%)

Natural Deposition: Elemental Removal Data

Time (hr)	Removal Coef. (hr^-1)
0.0000E+00	0.0000E+00

Compartment number 2: Environment

Compartment number 3: Control Room

PATHWAY DATA

Pathway number 1: Primary Containment to Environment - Bypass Lea

Convection Data

Time (hr)	Flow Rate (% / day)
0.0000E+00	2.2300E-02
2.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00

Pathway number 2: Environment to Control Room - Emergency Filtere

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.2290E+03	9.9000E+01	9.9000E+01	9.9000E+01
2.0000E+00	5.2290E+03	1.0000E+02	1.0000E+02	1.0000E+02
7.2000E+02	5.2290E+03	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 3: Environment to Control Room - Unfiltered Air In

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.0000E+02	0.0000E+00	0.0000E+00	0.0000E+00
2.0000E+00	6.0000E+02	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: Control Room to Environment - CR Exhaust

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.8390E+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  5: Environment to  Control Room ingress/egress

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    1.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00
       2.0000E+00    1.0000E+01   1.0000E+02   1.0000E+02   1.0000E+02
       7.2000E+02    0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00

DOSE INFORMATION
Number_Dose_Locations =  4

Dose Location Name = EAB LOCA
         Located in compartment  2 the Environment

EAB LOCA 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

Dose Location Name = LOCA @ LPZ
         Located in compartment  2 the Environment

LOCA @ LPZ 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

Dose Location Name = LOCA @ Unprotected CR
         Located in compartment  2 the Environment

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

Dose Location Name = LOCA @ CR
         Located in compartment  3 the Control Room

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

LOCA @ CR 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

X/Q, ATMOSPHERIC DISPERSION INFORMATION

X/Q Table Name =    EAB LOCA

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

X/Q Table Name =    LOCA @ LPZ

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       0.0000E+00          4.9000E-05
```

```
        8.0000E+00          3.5000E-05
        2.4000E+01          1.7000E-05
        9.6000E+01          6.1000E-06
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ Unprotected CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.7200E-03
        2.0000E+00          4.2500E-03
        8.0000E+00          1.8400E-03
        2.4000E+01          1.3200E-03
        9.6000E+01          1.0300E-03
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          1.2100E-03
        2.0000E+00          8.7600E-04
        8.0000E+00          3.1600E-04
        2.4000E+01          1.9200E-04
        9.6000E+01          1.6100E-04
        7.2000E+02          0.0000E+00

 This X/Q Table is used for these connected pathways
  Path  1  Primary Containment to Environment - Bypass Lea and Path  2  Environment to Control Room -
Emergency Filtere
  Path  1  Primary Containment to Environment - Bypass Lea and Path  3  Environment to Control Room -
Unfiltered Air In
  Path  1  Primary Containment to Environment - Bypass Lea and Path  5  Environment to  Control Room
ingress/egress

 USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
         Time (hr)      Time step (hr)
        0.0000E+00        0.0000E+00
        9.6000E+01        1.2000E+02
        2.4000E+02        2.4000E+02
        4.8000E+02        2.4000E+02
        7.2000E+02        0.0000E+00

  EDIT EACH MAJOR TIME STEP

  EDIT SUPPLEMENTAL TIME STEPS

  EDIT MODEL DECONTAMINATION RESULTS

       Masses in Atoms and kg in detailed output
```

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


            LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

Detailed model information at time (hr) =    0.0000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.0002E+00

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EAB LOCA Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.9454E-08  6.9311E-06  3.2788E-07
Accumulated dose (rem)  3.9454E-08  6.9311E-06  3.2788E-07

LOCA @ LPZ Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.3292E-09  4.0919E-07  1.9357E-08
Accumulated dose (rem)  2.3292E-09  4.0919E-07  1.9357E-08

LOCA @ Unprotected CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2437E-07  3.9416E-05  1.8646E-06
Accumulated dose (rem)  2.2437E-07  3.9416E-05  1.8646E-06

LOCA @ CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.7294E-13  2.1529E-10  9.1319E-12  4.0579E-12
Accumulated dose (rem)  1.7294E-13  2.1529E-10  9.1319E-12  4.0579E-12

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

Environment Integral Nuclide Release (Ci): at Time (h) =   0.0006
```

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Kr-85m	4.0123E-06	0.00028
Kr-87	7.6316E-06	0.00295
Kr-88	1.0291E-05	0.00983
I-131	1.5550E-05	0.45583
I-132	2.2660E-05	0.03142
I-133	3.1736E-05	0.17312
I-134	3.5551E-05	0.04742
I-135	3.0291E-05	0.05650
Xe-133	3.1104E-05	0.00045
Xe-135	8.3831E-06	0.00093
Cs-134	3.3759E-06	0.14073
Cs-137	2.5897E-06	0.07393

Environment Compartment Group Inventory Distribution:

Time (h) = 0.0006	Total Release	Release Rate/s
Noble gases (atoms)	5.1107E+12	2.5554E+12
Elemental I (atoms)	3.6765E+10	1.8382E+10
Organic I (atoms)	1.1371E+09	5.6853E+08
Aerosol I (atoms)	7.2004E+11	3.6002E+11
All Aerosols (kg)	3.2552E-11	1.6276E-11

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 0.0006	Leakage Transport
Noble gases (atoms)	5.1107E+12
Elemental I (atoms)	3.6762E+10
Organic I (atoms)	1.1370E+09
Aerosol I (atoms)	7.1999E+11
All Aerosols (kg)	3.2550E-11

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 0.0006	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0522E+10
Elemental I (atoms)	1.0868E+08	2.1956E+06
Organic I (atoms)	3.3614E+06	6.7906E+04
Aerosol I (atoms)	2.1284E+09	4.2998E+07
All Aerosols (kg)	9.6223E-14	1.9439E-15

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 0.0006	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.5022E+09
Elemental I (atoms)	0.0000E+00	2.5194E+07
Organic I (atoms)	0.0000E+00	7.7919E+05
Aerosol I (atoms)	0.0000E+00	4.9338E+08
All Aerosols (kg)	0.0000E+00	2.2305E-14

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 0.0006	Pathway Filtered	Transported
Noble gases (atoms)	2.1341E+06	0.0000E+00
Elemental I (atoms)	1.7413E+03	0.0000E+00
Organic I (atoms)	5.3855E+01	0.0000E+00
Aerosol I (atoms)	3.4103E+04	0.0000E+00
All Aerosols (kg)	1.5418E-18	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 0.0006	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.8370E+07
Elemental I (atoms)	0.0000E+00	4.1990E+05

```
Organic I (atoms)        0.0000E+00   1.2987E+04
Aerosol I (atoms)        0.0000E+00   8.2231E+06
All Aerosols (kg)        0.0000E+00   3.7175E-16

Detailed model information at time (hr) =    0.4500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2018E+00

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EAB LOCA Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.5619E-02  4.9706E+00  2.3215E-01
Accumulated dose (rem)  2.5619E-02  4.9706E+00  2.3215E-01

LOCA @ LPZ Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.5124E-03  2.9344E-01  1.3705E-02
Accumulated dose (rem)  1.5124E-03  2.9344E-01  1.3705E-02

LOCA @ Unprotected CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.4569E-01  2.8266E+01  1.3202E+00
Accumulated dose (rem)  1.4569E-01  2.8266E+01  1.3202E+00

LOCA @ CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        6.6308E-05  8.7948E-02  3.7218E-03  1.5604E-03
Accumulated dose (rem)  6.6308E-05  8.7948E-02  3.7218E-03  1.5604E-03

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

Environment Integral Nuclide Release (Ci): at Time (h) =   0.5000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Kr-85     1.9435E-01     0.00000
  Kr-85m    3.0777E+00     0.00030
  Kr-87     5.1100E+00     0.00279
  Kr-88     7.6504E+00     0.01033
  Rb-86     2.5337E-02     0.00021
  I-131     1.1203E+01     0.46381
  I-132     1.5595E+01     0.03054
  I-133     2.2625E+01     0.17432
  I-134     1.9555E+01     0.03684
  I-135     2.1065E+01     0.05549
  Xe-133    2.5194E+01     0.00052
  Xe-135    7.1530E+00     0.00113
  Cs-134    2.4191E+00     0.14242
  Cs-136    6.1259E-01     0.00647
  Cs-137    1.8558E+00     0.07482

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =   0.5000     Release     Rate/s
```

```
Noble gases (atoms)    4.1395E+18  2.2997E+15
Elemental I (atoms)    2.9564E+16  1.6425E+13
Organic I (atoms)      9.1436E+14  5.0798E+11
Aerosol I (atoms)      5.1230E+17  2.8461E+14
All Aerosols (kg)      2.3325E-05  1.2958E-08

Primary Containment to Environment - Bypass Lea Transport Group Inventory:
Time (h) =   0.5000    Leakage Transport

Noble gases (atoms)        4.1395E+18
Elemental I (atoms)        2.9549E+16
Organic I (atoms)          9.1390E+14
Aerosol I (atoms)          5.1203E+17
All Aerosols (kg)          2.3312E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.3555E+16
Elemental I (atoms)      9.4476E+13   9.5844E+11
Organic I (atoms)        2.9219E+12   2.9642E+10
Aerosol I (atoms)        1.6437E+15   1.6677E+13
All Aerosols (kg)        7.5111E-08   7.5872E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5549E+15
Elemental I (atoms)      0.0000E+00   1.0998E+13
Organic I (atoms)        0.0000E+00   3.4013E+11
Aerosol I (atoms)        0.0000E+00   1.9136E+14
All Aerosols (kg)        0.0000E+00   8.7059E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      1.4390E+15   3.8208E+10
Elemental I (atoms)      1.1639E+12   0.0000E+00
Organic I (atoms)        3.5996E+10   0.0000E+00
Aerosol I (atoms)        2.0760E+13   0.0000E+00
All Aerosols (kg)        9.4616E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.5916E+13
Elemental I (atoms)      0.0000E+00   1.8329E+11
Organic I (atoms)        0.0000E+00   5.6688E+09
Aerosol I (atoms)        0.0000E+00   3.1893E+12
All Aerosols (kg)        0.0000E+00   1.4510E-10

Detailed model information at time (hr) =    1.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 3.2982E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.3952E+00

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

EAB LOCA Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	4.8083E-01	9.3499E+01	5.4966E+00
Accumulated dose (rem)	5.0645E-01	9.8470E+01	5.7287E+00

LOCA @ LPZ Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.8386E-02	5.5198E+00	3.2450E-01
Accumulated dose (rem)	2.9899E-02	5.8133E+00	3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.7343E+00	5.3171E+02	3.1258E+01
Accumulated dose (rem)	2.8800E+00	5.5997E+02	3.2578E+01

LOCA @ CR Doses:

Time (h) = 2.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	6.1216E-03	5.1368E+00	2.7128E-01	1.4999E-01
Accumulated dose (rem)	6.1879E-03	5.2248E+00	2.7500E-01	1.5155E-01

****

Environment Integral Nuclide Release (Ci): at Time (h) = 2.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Co-58	6.2774E-03	0.00000
Co-60	2.5770E-04	0.00000
Kr-85	1.2438E+01	0.00000
Kr-85m	1.6568E+02	0.00066
Kr-87	1.8066E+02	0.00399
Kr-88	3.7329E+02	0.02041
Rb-86	4.1755E-01	0.00014
Sr-89	1.1637E+01	0.02445
Sr-90	1.5545E+00	0.10237
Sr-91	1.3133E+01	0.00147
Sr-92	1.0817E+01	0.00084
Y-90	2.3921E-02	0.00001
Y-91	1.5287E-01	0.00038
Y-92	1.0944E+00	0.00005
Y-93	1.6396E-01	0.00002
Zr-95	2.1964E-01	0.00027
Zr-97	2.0974E-01	0.00005
Nb-95	2.2025E-01	0.00007
Mo-99	2.8776E+00	0.00059
Tc-99m	2.5639E+00	0.00001
Ru-103	2.5215E+00	0.00118
Ru-105	1.3900E+00	0.00006
Ru-106	9.8023E-01	0.02373
Rh-105	1.6297E+00	0.00008
Sb-127	2.9719E+00	0.00096
Sb-129	7.0484E+00	0.00050
Te-127	2.6963E+00	0.00004
Te-127m	2.1264E-01	0.00023
Te-129	7.6538E+00	0.00004
Te-129m	1.4679E+00	0.00179
Te-131m	5.9308E+00	0.00219
Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6092E+03	0.00135
Xe-135	4.9086E+02	0.00313

Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 2.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.6479E+20	3.6776E+16
Elemental I (atoms)	6.3872E+17	8.8711E+13
Organic I (atoms)	1.9754E+16	2.7436E+12
Aerosol I (atoms)	9.7345E+18	1.3520E+15
All Aerosols (kg)	4.0164E-04	5.5784E-08

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 2.0000	Leakage Transport
Noble gases (atoms)	2.6479E+20
Elemental I (atoms)	6.3866E+17
Organic I (atoms)	1.9752E+16
Aerosol I (atoms)	9.7337E+18
All Aerosols (kg)	4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.1554E+17
Elemental I (atoms)	1.9106E+15	1.9523E+13
Organic I (atoms)	5.9092E+13	6.0379E+11
Aerosol I (atoms)	2.9161E+16	2.9810E+14
All Aerosols (kg)	1.2162E-06	1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.3557E+16
Elemental I (atoms)	0.0000E+00	2.2401E+14
Organic I (atoms)	0.0000E+00	6.9282E+12
Aerosol I (atoms)	0.0000E+00	3.4205E+15
All Aerosols (kg)	0.0000E+00	1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 2.0000	Pathway Filtered	Transported
Noble gases (atoms)	2.5028E+17	8.4452E+12
Elemental I (atoms)	7.5738E+13	0.0000E+00
Organic I (atoms)	2.3424E+12	0.0000E+00
Aerosol I (atoms)	1.1885E+15	0.0000E+00
All Aerosols (kg)	5.0061E-08	0.0000E+00

```
Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =    4.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 1.0673E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.4299E+01

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EAB LOCA Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        9.6425E-03  9.3643E+00  5.1713E-01  2.3854E-01
Accumulated dose (rem)  1.5830E-02  1.4589E+01  7.9213E-01  3.9009E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) =   5.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.2774E-03     0.00000
  Co-60     2.5770E-04     0.00000
  Kr-85     1.2438E+01     0.00000
  Kr-85m    1.6568E+02     0.00066
  Kr-87     1.8066E+02     0.00399
  Kr-88     3.7329E+02     0.02041
  Rb-86     4.1755E-01     0.00014
  Sr-89     1.1637E+01     0.02445
  Sr-90     1.5545E+00     0.10237
  Sr-91     1.3133E+01     0.00147
  Sr-92     1.0817E+01     0.00084
  Y-90      2.3921E-02     0.00001
  Y-91      1.5287E-01     0.00038
```

Y-92	1.0944E+00	0.00005
Y-93	1.6396E-01	0.00002
Zr-95	2.1964E-01	0.00027
Zr-97	2.0974E-01	0.00005
Nb-95	2.2025E-01	0.00007
Mo-99	2.8776E+00	0.00059
Tc-99m	2.5639E+00	0.00001
Ru-103	2.5215E+00	0.00118
Ru-105	1.3900E+00	0.00006
Ru-106	9.8023E-01	0.02373
Rh-105	1.6297E+00	0.00008
Sb-127	2.9719E+00	0.00096
Sb-129	7.0484E+00	0.00050
Te-127	2.6963E+00	0.00004
Te-127m	2.1264E-01	0.00023
Te-129	7.6538E+00	0.00004
Te-129m	1.4679E+00	0.00179
Te-131m	5.9308E+00	0.00219
Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6092E+03	0.00135
Xe-135	4.9088E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 5.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.6479E+20	1.4710E+16
Elemental I (atoms)	6.3872E+17	3.5484E+13
Organic I (atoms)	1.9754E+16	1.0974E+12
Aerosol I (atoms)	9.7345E+18	5.4081E+14
All Aerosols (kg)	4.0164E-04	2.2314E-08

Primary Containment to Environment - Bypass Lea Transport Group Inventory:
Time (h) = 5.0000 Leakage Transport

Noble gases (atoms)	2.6479E+20
Elemental I (atoms)	6.3866E+17
Organic I (atoms)	1.9752E+16
Aerosol I (atoms)	9.7337E+18
All Aerosols (kg)	4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Pathway

```
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.1631E+17
Elemental I (atoms)      1.8314E+15   1.9523E+13
Organic I (atoms)        5.6641E+13   6.0379E+11
Aerosol I (atoms)        2.7952E+16   2.9810E+14
All Aerosols (kg)        1.2159E-06   1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.3557E+16
Elemental I (atoms)      0.0000E+00   2.2401E+14
Organic I (atoms)        0.0000E+00   6.9282E+12
Aerosol I (atoms)        0.0000E+00   3.4205E+15
All Aerosols (kg)        0.0000E+00   1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      7.9934E+17   1.1188E+14
Elemental I (atoms)      2.1623E+14   0.0000E+00
Organic I (atoms)        6.6875E+12   0.0000E+00
Aerosol I (atoms)        3.2997E+15   0.0000E+00
All Aerosols (kg)        1.3852E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =    7.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 6.3781E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.3243E+02

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EAB LOCA Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01
```

LOCA @ CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	8.5357E-04	1.1831E+00	6.5852E-02	2.3341E-02
Accumulated dose (rem)	1.6684E-02	1.5772E+01	8.5798E-01	4.1343E-01

****

Environment Integral Nuclide Release (Ci): at Time (h) = 8.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Co-58	6.2774E-03	0.00000
Co-60	2.5770E-04	0.00000
Kr-85	1.2438E+01	0.00000
Kr-85m	1.6568E+02	0.00066
Kr-87	1.8066E+02	0.00399
Kr-88	3.7329E+02	0.02041
Rb-86	4.1755E-01	0.00014
Sr-89	1.1637E+01	0.02445
Sr-90	1.5545E+00	0.10237
Sr-91	1.3133E+01	0.00147
Sr-92	1.0817E+01	0.00084
Y-90	2.3921E-02	0.00001
Y-91	1.5287E-01	0.00038
Y-92	1.0944E+00	0.00005
Y-93	1.6396E-01	0.00002
Zr-95	2.1964E-01	0.00027
Zr-97	2.0974E-01	0.00005
Nb-95	2.2025E-01	0.00007
Mo-99	2.8776E+00	0.00059
Tc-99m	2.5639E+00	0.00001
Ru-103	2.5215E+00	0.00118
Ru-105	1.3900E+00	0.00006
Ru-106	9.8023E-01	0.02373
Rh-105	1.6297E+00	0.00008
Sb-127	2.9719E+00	0.00096
Sb-129	7.0484E+00	0.00050
Te-127	2.6963E+00	0.00004
Te-127m	2.1264E-01	0.00023
Te-129	7.6538E+00	0.00004
Te-129m	1.4679E+00	0.00179
Te-131m	5.9308E+00	0.00219
Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6092E+03	0.00135
Xe-135	4.9090E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281

```
  Am-241    2.5180E-05     0.00057
  Cm-242    8.9205E-03     0.00782
  Cm-244    4.5554E-04     0.00573

Environment Compartment Group Inventory Distribution:

                         Total      Release
Time (h) =   8.0000     Release     Rate/s
Noble gases (atoms)    2.6479E+20  9.1940E+15
Elemental I (atoms)    6.3872E+17  2.2178E+13
Organic I (atoms)      1.9754E+16  6.8591E+11
Aerosol I (atoms)      9.7345E+18  3.3801E+14
All Aerosols (kg)      4.0164E-04  1.3946E-08

Primary Containment to Environment - Bypass Lea Transport Group Inventory:
Time (h) =   8.0000    Leakage Transport

Noble gases (atoms)        2.6479E+20
Elemental I (atoms)        6.3866E+17
Organic I (atoms)          1.9752E+16
Aerosol I (atoms)          9.7337E+18
All Aerosols (kg)          4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.1695E+17
Elemental I (atoms)      1.7691E+15   1.9523E+13
Organic I (atoms)        5.4714E+13   6.0379E+11
Aerosol I (atoms)        2.7001E+16   2.9810E+14
All Aerosols (kg)        1.2156E-06   1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.3557E+16
Elemental I (atoms)      0.0000E+00   2.2401E+14
Organic I (atoms)        0.0000E+00   6.9282E+12
Aerosol I (atoms)        0.0000E+00   3.4205E+15
All Aerosols (kg)        0.0000E+00   1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      8.7185E+17   2.4649E+14
Elemental I (atoms)      2.3438E+14   0.0000E+00
Organic I (atoms)        7.2488E+12   0.0000E+00
Aerosol I (atoms)        3.5725E+15   0.0000E+00
All Aerosols (kg)        1.5015E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =    8.3000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
```

```
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.8677E+02

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EAB LOCA Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.9862E-05  3.5223E-02  1.9837E-03  9.3492E-04
Accumulated dose (rem)  1.6714E-02  1.5807E+01  8.5996E-01  4.1437E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) =   8.3333

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.2774E-03     0.00000
  Co-60     2.5770E-04     0.00000
  Kr-85     1.2438E+01     0.00000
  Kr-85m    1.6568E+02     0.00066
  Kr-87     1.8066E+02     0.00399
  Kr-88     3.7329E+02     0.02041
  Rb-86     4.1755E-01     0.00014
  Sr-89     1.1637E+01     0.02445
  Sr-90     1.5545E+00     0.10237
  Sr-91     1.3133E+01     0.00147
  Sr-92     1.0817E+01     0.00084
  Y-90      2.3921E-02     0.00001
  Y-91      1.5287E-01     0.00038
  Y-92      1.0944E+00     0.00005
  Y-93      1.6396E-01     0.00002
  Zr-95     2.1964E-01     0.00027
  Zr-97     2.0974E-01     0.00005
  Nb-95     2.2025E-01     0.00007
  Mo-99     2.8776E+00     0.00059
  Tc-99m    2.5639E+00     0.00001
  Ru-103    2.5215E+00     0.00118
  Ru-105    1.3900E+00     0.00006
  Ru-106    9.8023E-01     0.02373
  Rh-105    1.6297E+00     0.00008
  Sb-127    2.9719E+00     0.00096
  Sb-129    7.0484E+00     0.00050
  Te-127    2.6963E+00     0.00004
  Te-127m   2.1264E-01     0.00023
  Te-129    7.6538E+00     0.00004
  Te-129m   1.4679E+00     0.00179
  Te-131m   5.9308E+00     0.00219
```

Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6092E+03	0.00135
Xe-135	4.9091E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 8.3333	Total Release	Release Rate/s
Noble gases (atoms)	2.6479E+20	8.8263E+15
Elemental I (atoms)	6.3872E+17	2.1291E+13
Organic I (atoms)	1.9754E+16	6.5847E+11
Aerosol I (atoms)	9.7345E+18	3.2448E+14
All Aerosols (kg)	4.0164E-04	1.3388E-08

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 8.3333	Leakage Transport
Noble gases (atoms)	2.6479E+20
Elemental I (atoms)	6.3866E+17
Organic I (atoms)	1.9752E+16
Aerosol I (atoms)	9.7337E+18
All Aerosols (kg)	4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 8.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.1702E+17
Elemental I (atoms)	1.7628E+15	1.9523E+13
Organic I (atoms)	5.4520E+13	6.0379E+11
Aerosol I (atoms)	2.6905E+16	2.9810E+14
All Aerosols (kg)	1.2156E-06	1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 8.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.3557E+16
Elemental I (atoms)	0.0000E+00	2.2401E+14
Organic I (atoms)	0.0000E+00	6.9282E+12
Aerosol I (atoms)	0.0000E+00	3.4205E+15
All Aerosols (kg)	0.0000E+00	1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

```
                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      8.7411E+17   2.6175E+14
Elemental I (atoms)      2.3496E+14   0.0000E+00
Organic I (atoms)        7.2667E+12   0.0000E+00
Aerosol I (atoms)        3.5812E+15   0.0000E+00
All Aerosols (kg)        1.5051E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =   11.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.2580E+03

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EAB LOCA Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.7849E-04  1.2575E-01  7.1938E-03  6.0473E-03
Accumulated dose (rem)  1.6892E-02  1.5933E+01  8.6716E-01  4.2041E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) =  12.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.2774E-03     0.00000
  Co-60     2.5770E-04     0.00000
  Kr-85     1.2438E+01     0.00000
  Kr-85m    1.6568E+02     0.00066
  Kr-87     1.8066E+02     0.00399
```

Kr-88	3.7329E+02	0.02041
Rb-86	4.1755E-01	0.00014
Sr-89	1.1637E+01	0.02445
Sr-90	1.5545E+00	0.10237
Sr-91	1.3133E+01	0.00147
Sr-92	1.0817E+01	0.00084
Y-90	2.3921E-02	0.00001
Y-91	1.5287E-01	0.00038
Y-92	1.0944E+00	0.00005
Y-93	1.6396E-01	0.00002
Zr-95	2.1964E-01	0.00027
Zr-97	2.0974E-01	0.00005
Nb-95	2.2025E-01	0.00007
Mo-99	2.8776E+00	0.00059
Tc-99m	2.5639E+00	0.00001
Ru-103	2.5215E+00	0.00118
Ru-105	1.3900E+00	0.00006
Ru-106	9.8023E-01	0.02373
Rh-105	1.6297E+00	0.00008
Sb-127	2.9719E+00	0.00096
Sb-129	7.0484E+00	0.00050
Te-127	2.6963E+00	0.00004
Te-127m	2.1264E-01	0.00023
Te-129	7.6538E+00	0.00004
Te-129m	1.4679E+00	0.00179
Te-131m	5.9308E+00	0.00219
Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6092E+03	0.00135
Xe-135	4.9094E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 12.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.6479E+20	6.1294E+15
Elemental I (atoms)	6.3872E+17	1.4785E+13
Organic I (atoms)	1.9754E+16	4.5727E+11
Aerosol I (atoms)	9.7345E+18	2.2534E+14
All Aerosols (kg)	4.0164E-04	9.2973E-09

Primary Containment to Environment - Bypass Lea Transport Group Inventory:
Time (h) = 12.0000 Leakage Transport

Noble gases (atoms) 2.6479E+20

```
Elemental I (atoms)        6.3866E+17
Organic I (atoms)          1.9752E+16
Aerosol I (atoms)          9.7337E+18
All Aerosols (kg)          4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.1766E+17
Elemental I (atoms)      1.7001E+15   1.9523E+13
Organic I (atoms)        5.2582E+13   6.0379E+11
Aerosol I (atoms)        2.5949E+16   2.9810E+14
All Aerosols (kg)        1.2153E-06   1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.3557E+16
Elemental I (atoms)      0.0000E+00   2.2401E+14
Organic I (atoms)        0.0000E+00   6.9282E+12
Aerosol I (atoms)        0.0000E+00   3.4205E+15
All Aerosols (kg)        0.0000E+00   1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      8.8271E+17   4.3034E+14
Elemental I (atoms)      2.3739E+14   0.0000E+00
Organic I (atoms)        7.3419E+12   0.0000E+00
Aerosol I (atoms)        3.6179E+15   0.0000E+00
All Aerosols (kg)        1.5180E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =   19.2000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.2996E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.1672E+05

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EAB LOCA Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
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```
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.5572E-04  1.1039E-02  7.8159E-04  5.6283E-03
Accumulated dose (rem)  1.7048E-02  1.5944E+01  8.6794E-01  4.2604E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) =  19.4444

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.2774E-03     0.00000
  Co-60     2.5770E-04     0.00000
  Kr-85     1.2438E+01     0.00000
  Kr-85m    1.6568E+02     0.00066
  Kr-87     1.8066E+02     0.00399
  Kr-88     3.7329E+02     0.02041
  Rb-86     4.1755E-01     0.00014
  Sr-89     1.1637E+01     0.02445
  Sr-90     1.5545E+00     0.10237
  Sr-91     1.3133E+01     0.00147
  Sr-92     1.0817E+01     0.00084
  Y-90      2.3921E-02     0.00001
  Y-91      1.5287E-01     0.00038
  Y-92      1.0944E+00     0.00005
  Y-93      1.6396E-01     0.00002
  Zr-95     2.1964E-01     0.00027
  Zr-97     2.0974E-01     0.00005
  Nb-95     2.2025E-01     0.00007
  Mo-99     2.8776E+00     0.00059
  Tc-99m    2.5639E+00     0.00001
  Ru-103    2.5215E+00     0.00118
  Ru-105    1.3900E+00     0.00006
  Ru-106    9.8023E-01     0.02373
  Rh-105    1.6297E+00     0.00008
  Sb-127    2.9719E+00     0.00096
  Sb-129    7.0484E+00     0.00050
  Te-127    2.6963E+00     0.00004
  Te-127m   2.1264E-01     0.00023
  Te-129    7.6538E+00     0.00004
  Te-129m   1.4679E+00     0.00179
  Te-131m   5.9308E+00     0.00219
  Te-132    4.4255E+01     0.02142
  I-131     2.1760E+02     0.36508
  I-132     2.7670E+02     0.02196
  I-133     4.2608E+02     0.13303
  I-134     1.7974E+02     0.01372
  I-135     3.6880E+02     0.03937
  Xe-133    1.6092E+03     0.00135
  Xe-135    4.9099E+02     0.00313
  Cs-134    3.9926E+01     0.09526
  Cs-136    1.0089E+01     0.00432
  Cs-137    3.0630E+01     0.05004
  Ba-139    1.0868E+01     0.00011
  Ba-140    2.1951E+01     0.00426
  La-140    3.9934E-01     0.00012
  La-141    1.5843E-01     0.00000
  La-142    1.0235E-01     0.00001
  Ce-141    5.1875E-01     0.00024
  Ce-143    4.6640E-01     0.00008
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Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 19.4444	Total Release	Release Rate/s
Noble gases (atoms)	2.6479E+20	3.7827E+15
Elemental I (atoms)	6.3872E+17	9.1245E+12
Organic I (atoms)	1.9754E+16	2.8220E+11
Aerosol I (atoms)	9.7345E+18	1.3906E+14
All Aerosols (kg)	4.0164E-04	5.7378E-09

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 19.4444	Leakage Transport
Noble gases (atoms)	2.6479E+20
Elemental I (atoms)	6.3866E+17
Organic I (atoms)	1.9752E+16
Aerosol I (atoms)	9.7337E+18
All Aerosols (kg)	4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.1864E+17
Elemental I (atoms)	1.5975E+15	1.9523E+13
Organic I (atoms)	4.9408E+13	6.0379E+11
Aerosol I (atoms)	2.4382E+16	2.9810E+14
All Aerosols (kg)	1.2149E-06	1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.3557E+16
Elemental I (atoms)	0.0000E+00	2.2401E+14
Organic I (atoms)	0.0000E+00	6.9282E+12
Aerosol I (atoms)	0.0000E+00	3.4205E+15
All Aerosols (kg)	0.0000E+00	1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	8.8444E+17	7.7325E+14
Elemental I (atoms)	2.3867E+14	0.0000E+00
Organic I (atoms)	7.3814E+12	0.0000E+00
Aerosol I (atoms)	3.6373E+15	0.0000E+00
All Aerosols (kg)	1.5192E-07	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5593E+15
Elemental I (atoms)	0.0000E+00	3.7335E+12
Organic I (atoms)	0.0000E+00	1.1547E+11
Aerosol I (atoms)	0.0000E+00	5.7009E+13
All Aerosols (kg)	0.0000E+00	2.3495E-09

```
Detailed model information at time (hr) =   23.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.1344E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2105E+06

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EAB LOCA Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        5.2060E-05  6.4748E-05  5.5838E-05  1.8949E-03
Accumulated dose (rem)  1.7100E-02  1.5944E+01  8.6800E-01  4.2794E-01

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Environment Integral Nuclide Release (Ci): at Time (h) =  24.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.2774E-03     0.00000
  Co-60     2.5770E-04     0.00000
  Kr-85     1.2438E+01     0.00000
  Kr-85m    1.6568E+02     0.00066
  Kr-87     1.8066E+02     0.00399
  Kr-88     3.7329E+02     0.02041
  Rb-86     4.1755E-01     0.00014
  Sr-89     1.1637E+01     0.02445
  Sr-90     1.5545E+00     0.10237
  Sr-91     1.3133E+01     0.00147
  Sr-92     1.0817E+01     0.00084
  Y-90      2.3921E-02     0.00001
  Y-91      1.5287E-01     0.00038
  Y-92      1.0944E+00     0.00005
  Y-93      1.6396E-01     0.00002
  Zr-95     2.1964E-01     0.00027
  Zr-97     2.0974E-01     0.00005
  Nb-95     2.2025E-01     0.00007
  Mo-99     2.8776E+00     0.00059
  Tc-99m    2.5639E+00     0.00001
  Ru-103    2.5215E+00     0.00118
  Ru-105    1.3900E+00     0.00006
  Ru-106    9.8023E-01     0.02373
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Rh-105	1.6297E+00	0.00008
Sb-127	2.9719E+00	0.00096
Sb-129	7.0484E+00	0.00050
Te-127	2.6963E+00	0.00004
Te-127m	2.1264E-01	0.00023
Te-129	7.6538E+00	0.00004
Te-129m	1.4679E+00	0.00179
Te-131m	5.9308E+00	0.00219
Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6092E+03	0.00135
Xe-135	4.9103E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 24.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.6479E+20	3.0647E+15
Elemental I (atoms)	6.3872E+17	7.3925E+12
Organic I (atoms)	1.9754E+16	2.2864E+11
Aerosol I (atoms)	9.7345E+18	1.1267E+14
All Aerosols (kg)	4.0164E-04	4.6487E-09

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 24.0000	Leakage Transport
Noble gases (atoms)	2.6479E+20
Elemental I (atoms)	6.3866E+17
Organic I (atoms)	1.9752E+16
Aerosol I (atoms)	9.7337E+18
All Aerosols (kg)	4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.1910E+17
Elemental I (atoms)	1.5455E+15	1.9523E+13
Organic I (atoms)	4.7798E+13	6.0379E+11
Aerosol I (atoms)	2.3588E+16	2.9810E+14
All Aerosols (kg)	1.2147E-06	1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Pathway

```
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.3557E+16
Elemental I (atoms)      0.0000E+00   2.2401E+14
Organic I (atoms)        0.0000E+00   6.9282E+12
Aerosol I (atoms)        0.0000E+00   3.4205E+15
All Aerosols (kg)        0.0000E+00   1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      8.8493E+17   9.8310E+14
Elemental I (atoms)      2.3935E+14   0.0000E+00
Organic I (atoms)        7.4025E+12   0.0000E+00
Aerosol I (atoms)        3.6477E+15   0.0000E+00
All Aerosols (kg)        1.5193E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =   95.5000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2105E+06

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EAB LOCA Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        5.7114E-05  1.7978E-06  5.7221E-05  2.1237E-03
Accumulated dose (rem)  1.7157E-02  1.5944E+01  8.6805E-01  4.3006E-01

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Environment Integral Nuclide Release (Ci): at Time (h) =  96.0000
```

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Co-58	6.2774E-03	0.00000
Co-60	2.5770E-04	0.00000
Kr-85	1.2438E+01	0.00000
Kr-85m	1.6568E+02	0.00066
Kr-87	1.8066E+02	0.00399
Kr-88	3.7329E+02	0.02041
Rb-86	4.1755E-01	0.00014
Sr-89	1.1637E+01	0.02445
Sr-90	1.5545E+00	0.10237
Sr-91	1.3133E+01	0.00147
Sr-92	1.0817E+01	0.00084
Y-90	2.3921E-02	0.00001
Y-91	1.5287E-01	0.00038
Y-92	1.0944E+00	0.00005
Y-93	1.6396E-01	0.00002
Zr-95	2.1964E-01	0.00027
Zr-97	2.0974E-01	0.00005
Nb-95	2.2025E-01	0.00007
Mo-99	2.8776E+00	0.00059
Tc-99m	2.5639E+00	0.00001
Ru-103	2.5215E+00	0.00118
Ru-105	1.3900E+00	0.00006
Ru-106	9.8023E-01	0.02373
Rh-105	1.6297E+00	0.00008
Sb-127	2.9719E+00	0.00096
Sb-129	7.0484E+00	0.00050
Te-127	2.6963E+00	0.00004
Te-127m	2.1264E-01	0.00023
Te-129	7.6538E+00	0.00004
Te-129m	1.4679E+00	0.00179
Te-131m	5.9308E+00	0.00219
Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6093E+03	0.00135
Xe-135	4.9159E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

	Total Release	Release Rate/s
Time (h) = 96.0000		
Noble gases (atoms)	2.6479E+20	7.6618E+14
Elemental I (atoms)	6.3872E+17	1.8481E+12

```
Organic I (atoms)      1.9754E+16  5.7159E+10
Aerosol I (atoms)      9.7345E+18  2.8167E+13
All Aerosols (kg)      4.0164E-04  1.1622E-09

Primary Containment to Environment - Bypass Lea Transport Group Inventory:
Time (h) =  96.0000    Leakage Transport

Noble gases (atoms)        2.6479E+20
Elemental I (atoms)        6.3866E+17
Organic I (atoms)          1.9752E+16
Aerosol I (atoms)          9.7337E+18
All Aerosols (kg)          4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.2135E+17
Elemental I (atoms)      1.0869E+15   1.9523E+13
Organic I (atoms)        3.3616E+13   6.0379E+11
Aerosol I (atoms)        1.6589E+16   2.9810E+14
All Aerosols (kg)        1.2122E-06   1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.3557E+16
Elemental I (atoms)      0.0000E+00   2.2401E+14
Organic I (atoms)        0.0000E+00   6.9282E+12
Aerosol I (atoms)        0.0000E+00   3.4205E+15
All Aerosols (kg)        0.0000E+00   1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      8.8733E+17   4.2998E+15
Elemental I (atoms)      2.5008E+14   0.0000E+00
Organic I (atoms)        7.7345E+12   0.0000E+00
Aerosol I (atoms)        3.8113E+15   0.0000E+00
All Aerosols (kg)        1.5201E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =  119.6500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2106E+06

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EAB LOCA Doses:
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```
Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.3140E-07  5.7394E-28  3.3140E-07  1.4382E-05
Accumulated dose (rem)  1.7157E-02  1.5944E+01  8.6805E-01  4.3007E-01

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Environment Integral Nuclide Release (Ci): at Time (h) = 120.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.2774E-03     0.00000
  Co-60     2.5770E-04     0.00000
  Kr-85     1.2438E+01     0.00000
  Kr-85m    1.6568E+02     0.00066
  Kr-87     1.8066E+02     0.00399
  Kr-88     3.7329E+02     0.02041
  Rb-86     4.1755E-01     0.00014
  Sr-89     1.1637E+01     0.02445
  Sr-90     1.5545E+00     0.10237
  Sr-91     1.3133E+01     0.00147
  Sr-92     1.0817E+01     0.00084
  Y-90      2.3921E-02     0.00001
  Y-91      1.5287E-01     0.00038
  Y-92      1.0944E+00     0.00005
  Y-93      1.6396E-01     0.00002
  Zr-95     2.1964E-01     0.00027
  Zr-97     2.0974E-01     0.00005
  Nb-95     2.2025E-01     0.00007
  Mo-99     2.8776E+00     0.00059
  Tc-99m    2.5639E+00     0.00001
  Ru-103    2.5215E+00     0.00118
  Ru-105    1.3900E+00     0.00006
  Ru-106    9.8023E-01     0.02373
  Rh-105    1.6297E+00     0.00008
  Sb-127    2.9719E+00     0.00096
  Sb-129    7.0484E+00     0.00050
  Te-127    2.6963E+00     0.00004
  Te-127m   2.1264E-01     0.00023
  Te-129    7.6538E+00     0.00004
  Te-129m   1.4679E+00     0.00179
  Te-131m   5.9308E+00     0.00219
  Te-132    4.4255E+01     0.02142
  I-131     2.1760E+02     0.36508
  I-132     2.7670E+02     0.02196
  I-133     4.2608E+02     0.13303
  I-134     1.7974E+02     0.01372
  I-135     3.6880E+02     0.03937
  Xe-133    1.6093E+03     0.00135
  Xe-135    4.9178E+02     0.00313
  Cs-134    3.9926E+01     0.09526
  Cs-136    1.0089E+01     0.00432
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Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 120.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.6479E+20	6.1295E+14
Elemental I (atoms)	6.3872E+17	1.4785E+12
Organic I (atoms)	1.9754E+16	4.5727E+10
Aerosol I (atoms)	9.7345E+18	2.2534E+13
All Aerosols (kg)	4.0164E-04	9.2973E-10

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 120.0000	Leakage Transport
Noble gases (atoms)	2.6479E+20
Elemental I (atoms)	6.3866E+17
Organic I (atoms)	1.9752E+16
Aerosol I (atoms)	9.7337E+18
All Aerosols (kg)	4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.2147E+17
Elemental I (atoms)	9.9085E+14	1.9523E+13
Organic I (atoms)	3.0645E+13	6.0379E+11
Aerosol I (atoms)	1.5123E+16	2.9810E+14
All Aerosols (kg)	1.2116E-06	1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.3557E+16
Elemental I (atoms)	0.0000E+00	2.2401E+14
Organic I (atoms)	0.0000E+00	6.9282E+12
Aerosol I (atoms)	0.0000E+00	3.4205E+15
All Aerosols (kg)	0.0000E+00	1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	8.8745E+17	5.4053E+15
Elemental I (atoms)	2.5366E+14	0.0000E+00
Organic I (atoms)	7.8452E+12	0.0000E+00
Aerosol I (atoms)	3.8658E+15	0.0000E+00
All Aerosols (kg)	1.5204E-07	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

```
                            Pathway
Time (h) = 120.0000        Filtered    Transported
Noble gases (atoms)       0.0000E+00   1.5593E+15
Elemental I (atoms)       0.0000E+00   3.7335E+12
Organic I (atoms)         0.0000E+00   1.1547E+11
Aerosol I (atoms)         0.0000E+00   5.7009E+13
All Aerosols (kg)         0.0000E+00   2.3495E-09

Detailed model information at time (hr) =  239.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2106E+06

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EAB LOCA Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.5417E-07  4.6472E-35  2.5417E-07  1.1112E-05
Accumulated dose (rem)  1.7158E-02  1.5944E+01  8.6805E-01  4.3009E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) = 240.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.2774E-03     0.00000
  Co-60     2.5770E-04     0.00000
  Kr-85     1.2438E+01     0.00000
  Kr-85m    1.6568E+02     0.00066
  Kr-87     1.8066E+02     0.00399
  Kr-88     3.7329E+02     0.02041
  Rb-86     4.1755E-01     0.00014
  Sr-89     1.1637E+01     0.02445
  Sr-90     1.5545E+00     0.10237
  Sr-91     1.3133E+01     0.00147
  Sr-92     1.0817E+01     0.00084
  Y-90      2.3921E-02     0.00001
  Y-91      1.5287E-01     0.00038
  Y-92      1.0944E+00     0.00005
  Y-93      1.6396E-01     0.00002
```

Zr-95	2.1964E-01	0.00027
Zr-97	2.0974E-01	0.00005
Nb-95	2.2025E-01	0.00007
Mo-99	2.8776E+00	0.00059
Tc-99m	2.5639E+00	0.00001
Ru-103	2.5215E+00	0.00118
Ru-105	1.3900E+00	0.00006
Ru-106	9.8023E-01	0.02373
Rh-105	1.6297E+00	0.00008
Sb-127	2.9719E+00	0.00096
Sb-129	7.0484E+00	0.00050
Te-127	2.6963E+00	0.00004
Te-127m	2.1264E-01	0.00023
Te-129	7.6538E+00	0.00004
Te-129m	1.4679E+00	0.00179
Te-131m	5.9308E+00	0.00219
Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6094E+03	0.00135
Xe-135	4.9272E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 240.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.6480E+20	3.0648E+14
Elemental I (atoms)	6.3872E+17	7.3925E+11
Organic I (atoms)	1.9754E+16	2.2864E+10
Aerosol I (atoms)	9.7345E+18	1.1267E+13
All Aerosols (kg)	4.0164E-04	4.6487E-10

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 240.0000	Leakage Transport
Noble gases (atoms)	2.6479E+20
Elemental I (atoms)	6.3866E+17
Organic I (atoms)	1.9752E+16
Aerosol I (atoms)	9.7337E+18
All Aerosols (kg)	4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.2156E+17

```
Elemental I (atoms)      6.3986E+14   1.9523E+13
Organic I (atoms)        1.9789E+13   6.0379E+11
Aerosol I (atoms)        9.7660E+15   2.9810E+14
All Aerosols (kg)        1.2092E-06   1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.3557E+16
Elemental I (atoms)      0.0000E+00   2.2401E+14
Organic I (atoms)        0.0000E+00   6.9282E+12
Aerosol I (atoms)        0.0000E+00   3.4205E+15
All Aerosols (kg)        0.0000E+00   1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      8.8755E+17   1.0933E+16
Elemental I (atoms)      2.7155E+14   0.0000E+00
Organic I (atoms)        8.3986E+12   0.0000E+00
Aerosol I (atoms)        4.1385E+15   0.0000E+00
All Aerosols (kg)        1.5217E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =  479.7000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2107E+06

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EAB LOCA Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:
```

Time (h) = 480.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	4.7209E-09	1.6876E-70	4.7209E-09	2.0660E-07
Accumulated dose (rem)	1.7158E-02	1.5944E+01	8.6805E-01	4.3009E-01

****

Environment Integral Nuclide Release (Ci): at Time (h) = 480.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Co-58	6.2774E-03	0.00000
Co-60	2.5770E-04	0.00000
Kr-85	1.2439E+01	0.00000
Kr-85m	1.6568E+02	0.00066
Kr-87	1.8066E+02	0.00399
Kr-88	3.7329E+02	0.02041
Rb-86	4.1755E-01	0.00014
Sr-89	1.1637E+01	0.02445
Sr-90	1.5545E+00	0.10237
Sr-91	1.3133E+01	0.00147
Sr-92	1.0817E+01	0.00084
Y-90	2.3921E-02	0.00001
Y-91	1.5287E-01	0.00038
Y-92	1.0944E+00	0.00005
Y-93	1.6396E-01	0.00002
Zr-95	2.1964E-01	0.00027
Zr-97	2.0974E-01	0.00005
Nb-95	2.2025E-01	0.00007
Mo-99	2.8776E+00	0.00059
Tc-99m	2.5639E+00	0.00001
Ru-103	2.5215E+00	0.00118
Ru-105	1.3900E+00	0.00006
Ru-106	9.8023E-01	0.02373
Rh-105	1.6297E+00	0.00008
Sb-127	2.9719E+00	0.00096
Sb-129	7.0484E+00	0.00050
Te-127	2.6963E+00	0.00004
Te-127m	2.1264E-01	0.00023
Te-129	7.6538E+00	0.00004
Te-129m	1.4679E+00	0.00179
Te-131m	5.9308E+00	0.00219
Te-132	4.4255E+01	0.02142
I-131	2.1760E+02	0.36508
I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6096E+03	0.00135
Xe-135	4.9460E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782

```
  Cm-244    4.5554E-04     0.00573

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) = 480.0000     Release     Rate/s
Noble gases (atoms)    2.6481E+20  1.5325E+14
Elemental I (atoms)    6.3872E+17  3.6963E+11
Organic I (atoms)      1.9754E+16  1.1432E+10
Aerosol I (atoms)      9.7345E+18  5.6334E+12
All Aerosols (kg)      4.0164E-04  2.3243E-10

Primary Containment to Environment - Bypass Lea Transport Group Inventory:
Time (h) = 480.0000    Leakage Transport

Noble gases (atoms)        2.6479E+20
Elemental I (atoms)        6.3866E+17
Organic I (atoms)          1.9752E+16
Aerosol I (atoms)          9.7337E+18
All Aerosols (kg)          4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.2156E+17
Elemental I (atoms)      2.7001E+14   1.9523E+13
Organic I (atoms)        8.3510E+12   6.0379E+11
Aerosol I (atoms)        4.1211E+15   2.9810E+14
All Aerosols (kg)        1.2058E-06   1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.3557E+16
Elemental I (atoms)      0.0000E+00   2.2401E+14
Organic I (atoms)        0.0000E+00   6.9282E+12
Aerosol I (atoms)        0.0000E+00   3.4205E+15
All Aerosols (kg)        0.0000E+00   1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      8.8755E+17   2.1989E+16
Elemental I (atoms)      3.0734E+14   0.0000E+00
Organic I (atoms)        9.5054E+12   0.0000E+00
Aerosol I (atoms)        4.6839E+15   0.0000E+00
All Aerosols (kg)        1.5244E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5593E+15
Elemental I (atoms)      0.0000E+00   3.7335E+12
Organic I (atoms)        0.0000E+00   1.1547E+11
Aerosol I (atoms)        0.0000E+00   5.7009E+13
All Aerosols (kg)        0.0000E+00   2.3495E-09

Detailed model information at time (hr) =  719.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2107E+06
```

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EAB LOCA Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  5.0645E-01  9.8470E+01  5.7287E+00

LOCA @ LPZ Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.9899E-02  5.8133E+00  3.3820E-01

LOCA @ Unprotected CR Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  2.8800E+00  5.5997E+02  3.2578E+01

LOCA @ CR Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.5867E-12  2.3375-141  1.5867E-12  6.9439E-11
Accumulated dose (rem)  1.7158E-02  1.5944E+01  8.6805E-01  4.3009E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) = 720.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.2774E-03     0.00000
  Co-60     2.5770E-04     0.00000
  Kr-85     1.2439E+01     0.00000
  Kr-85m    1.6568E+02     0.00066
  Kr-87     1.8066E+02     0.00399
  Kr-88     3.7329E+02     0.02041
  Rb-86     4.1755E-01     0.00014
  Sr-89     1.1637E+01     0.02445
  Sr-90     1.5545E+00     0.10237
  Sr-91     1.3133E+01     0.00147
  Sr-92     1.0817E+01     0.00084
  Y-90      2.3921E-02     0.00001
  Y-91      1.5287E-01     0.00038
  Y-92      1.0944E+00     0.00005
  Y-93      1.6396E-01     0.00002
  Zr-95     2.1964E-01     0.00027
  Zr-97     2.0974E-01     0.00005
  Nb-95     2.2025E-01     0.00007
  Mo-99     2.8776E+00     0.00059
  Tc-99m    2.5639E+00     0.00001
  Ru-103    2.5215E+00     0.00118
  Ru-105    1.3900E+00     0.00006
  Ru-106    9.8023E-01     0.02373
  Rh-105    1.6297E+00     0.00008
  Sb-127    2.9719E+00     0.00096
  Sb-129    7.0484E+00     0.00050
  Te-127    2.6963E+00     0.00004
  Te-127m   2.1264E-01     0.00023
  Te-129    7.6538E+00     0.00004
  Te-129m   1.4679E+00     0.00179
  Te-131m   5.9308E+00     0.00219
  Te-132    4.4255E+01     0.02142
  I-131     2.1760E+02     0.36508
```

I-132	2.7670E+02	0.02196
I-133	4.2608E+02	0.13303
I-134	1.7974E+02	0.01372
I-135	3.6880E+02	0.03937
Xe-133	1.6098E+03	0.00135
Xe-135	4.9647E+02	0.00313
Cs-134	3.9926E+01	0.09526
Cs-136	1.0089E+01	0.00432
Cs-137	3.0630E+01	0.05004
Ba-139	1.0868E+01	0.00011
Ba-140	2.1951E+01	0.00426
La-140	3.9934E-01	0.00012
La-141	1.5843E-01	0.00000
La-142	1.0235E-01	0.00001
Ce-141	5.1875E-01	0.00024
Ce-143	4.6640E-01	0.00008
Ce-144	4.3199E-01	0.00819
Pr-143	1.8813E-01	0.00008
Nd-147	8.1860E-02	0.00003
Np-239	5.8322E+00	0.00077
Pu-238	1.2798E-03	0.01870
Pu-239	1.1978E-04	0.00187
Pu-240	2.1368E-04	0.00334
Pu-241	5.0954E-02	0.01281
Am-241	2.5180E-05	0.00057
Cm-242	8.9205E-03	0.00782
Cm-244	4.5554E-04	0.00573

Environment Compartment Group Inventory Distribution:

Time (h) = 720.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.6482E+20	1.0217E+14
Elemental I (atoms)	6.3872E+17	2.4642E+11
Organic I (atoms)	1.9754E+16	7.6212E+09
Aerosol I (atoms)	9.7345E+18	3.7556E+12
All Aerosols (kg)	4.0164E-04	1.5496E-10

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 720.0000	Leakage Transport
Noble gases (atoms)	2.6479E+20
Elemental I (atoms)	6.3866E+17
Organic I (atoms)	1.9752E+16
Aerosol I (atoms)	9.7337E+18
All Aerosols (kg)	4.0161E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.2156E+17
Elemental I (atoms)	1.1400E+14	1.9523E+13
Organic I (atoms)	3.5258E+12	6.0379E+11
Aerosol I (atoms)	1.7400E+15	2.9810E+14
All Aerosols (kg)	1.2033E-06	1.2286E-08

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.3557E+16
Elemental I (atoms)	0.0000E+00	2.2401E+14
Organic I (atoms)	0.0000E+00	6.9282E+12
Aerosol I (atoms)	0.0000E+00	3.4205E+15
All Aerosols (kg)	0.0000E+00	1.4097E-07

Control Room to Environment - CR Exhaust Transport Group Inventory:

Pathway

Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	8.8755E+17	3.3044E+16
Elemental I (atoms)	3.4313E+14	0.0000E+00
Organic I (atoms)	1.0612E+13	0.0000E+00
Aerosol I (atoms)	5.2293E+15	0.0000E+00
All Aerosols (kg)	1.5271E-07	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

	Pathway	
Time (h) = 720.0000	Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5593E+15
Elemental I (atoms)	0.0000E+00	3.7335E+12
Organic I (atoms)	0.0000E+00	1.1547E+11
Aerosol I (atoms)	0.0000E+00	5.7009E+13
All Aerosols (kg)	0.0000E+00	2.3495E-09

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

Time (hr)	Primary Containment I-131 (Curies)	Environment I-131 (Curies)	Control Room I-131 (Curies)
0.000	6.0244E+03	1.5550E-05	5.8804E-09
0.200	2.0186E+06	1.9212E+00	6.9433E-04
0.400	3.7655E+06	7.3351E+00	2.5333E-03
0.500	4.5492E+06	1.1203E+01	3.7823E-03
0.700	7.5569E+06	2.2475E+01	7.3095E-03
0.900	1.0425E+07	3.9208E+01	1.2318E-02
1.100	1.3154E+07	6.1141E+01	1.8527E-02
1.300	1.5749E+07	8.8020E+01	2.5695E-02
1.500	1.8214E+07	1.1960E+02	3.3614E-02
1.700	2.0557E+07	1.5565E+02	4.2103E-02
1.900	2.2781E+07	1.9594E+02	5.1013E-02
2.000	2.3851E+07	2.1760E+02	5.5584E-02
2.200	1.9563E+07	2.1760E+02	4.8518E-02
2.400	1.6102E+07	2.1760E+02	4.2350E-02
2.600	1.3307E+07	2.1760E+02	3.6966E-02
2.800	1.1052E+07	2.1760E+02	3.2266E-02
3.000	9.2305E+06	2.1760E+02	2.8164E-02
3.200	7.7602E+06	2.1760E+02	2.4584E-02
3.400	6.5732E+06	2.1760E+02	2.1458E-02
3.600	5.6147E+06	2.1760E+02	1.8730E-02
3.800	4.8409E+06	2.1760E+02	1.6349E-02
4.000	4.2159E+06	2.1760E+02	1.4271E-02
4.200	3.7113E+06	2.1760E+02	1.2457E-02
4.400	3.3037E+06	2.1760E+02	1.0873E-02
4.600	2.9745E+06	2.1760E+02	9.4906E-03
4.800	2.7085E+06	2.1760E+02	8.2841E-03
5.000	2.4936E+06	2.1760E+02	7.2309E-03
5.200	2.3847E+06	2.1760E+02	6.3116E-03
5.400	2.2888E+06	2.1760E+02	5.5092E-03
5.600	2.2043E+06	2.1760E+02	4.8088E-03
5.800	2.1298E+06	2.1760E+02	4.1975E-03
6.000	2.0641E+06	2.1760E+02	3.6639E-03
6.200	2.0062E+06	2.1760E+02	3.1981E-03
6.400	1.9552E+06	2.1760E+02	2.7915E-03
6.600	1.9102E+06	2.1760E+02	2.4366E-03
6.800	1.8704E+06	2.1760E+02	2.1268E-03
7.000	1.8353E+06	2.1760E+02	1.8565E-03
7.200	1.8043E+06	2.1760E+02	1.6204E-03
7.400	1.7769E+06	2.1760E+02	1.4144E-03

7.600	1.7526E+06	2.1760E+02	1.2346E-03
7.800	1.7311E+06	2.1760E+02	1.0777E-03
8.000	1.7121E+06	2.1760E+02	9.4065E-04
8.200	1.6953E+06	2.1760E+02	8.2106E-04
8.333	1.6853E+06	2.1760E+02	7.4991E-04
8.533	1.6729E+06	2.1760E+02	6.5457E-04
8.733	1.6616E+06	2.1760E+02	5.7136E-04
8.933	1.6515E+06	2.1760E+02	4.9872E-04
9.133	1.6423E+06	2.1760E+02	4.3532E-04
9.333	1.6339E+06	2.1760E+02	3.7997E-04
9.533	1.6264E+06	2.1760E+02	3.3167E-04
9.733	1.6195E+06	2.1760E+02	2.8950E-04
9.933	1.6133E+06	2.1760E+02	2.5270E-04
10.133	1.6075E+06	2.1760E+02	2.2057E-04
12.000	1.5722E+06	2.1760E+02	6.2001E-05
19.444	1.5180E+06	2.1760E+02	3.9296E-07
24.000	1.4931E+06	2.1760E+02	1.7752E-08
96.000	1.1529E+06	2.1760E+02	9.7601E-30
720.000	1.2255E+05	2.1760E+02	5.3757-214

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

	EAB LOCA		LOCA @ LPZ		LOCA @ Unprotected 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
0.200	8.5470E-01	4.0203E-02	5.0458E-02	2.3734E-03	4.8605E+00	2.2863E-01
0.400	3.2573E+00	1.5247E-01	1.9230E-01	9.0011E-03	1.8524E+01	8.6704E-01
0.500	4.9706E+00	2.3215E-01	2.9344E-01	1.3705E-02	2.8266E+01	1.3202E+00
0.700	1.0019E+01	4.9149E-01	5.9146E-01	2.9016E-02	5.6973E+01	2.7950E+00
0.900	1.7584E+01	9.1401E-01	1.0381E+00	5.3960E-02	9.9998E+01	5.1978E+00
1.100	2.7534E+01	1.4892E+00	1.6255E+00	8.7917E-02	1.5658E+02	8.4688E+00
1.300	3.9737E+01	2.2076E+00	2.3459E+00	1.3033E-01	2.2597E+02	1.2554E+01
1.500	5.4071E+01	3.0604E+00	3.1921E+00	1.8067E-01	3.0749E+02	1.7404E+01
1.700	7.0417E+01	4.0395E+00	4.1572E+00	2.3848E-01	4.0045E+02	2.2972E+01
1.900	8.8666E+01	5.1375E+00	5.2345E+00	3.0330E-01	5.0422E+02	2.9215E+01
2.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
2.200	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
2.400	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
2.600	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
2.800	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
3.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
3.200	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
3.400	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
3.600	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
3.800	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
4.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
4.200	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
4.400	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
4.600	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
4.800	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
5.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
5.200	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
5.400	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
5.600	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
5.800	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
6.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
6.200	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
6.400	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
6.600	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
6.800	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
7.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
7.200	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
7.400	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
7.600	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
7.800	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
8.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
8.200	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01

8.333	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
8.533	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
8.733	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
8.933	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
9.133	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
9.333	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
9.533	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
9.733	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
9.933	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
10.133	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
12.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
19.444	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
24.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
96.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01
720.000	9.8470E+01	5.7287E+00	5.8133E+00	3.3820E-01	5.5997E+02	3.2578E+01

	LOCA @ CR	
Time (hr)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00
0.200	6.3884E-03	2.7071E-04
0.400	4.6740E-02	1.9788E-03
0.500	8.7948E-02	3.7218E-03
0.700	2.3009E-01	9.9153E-03
0.900	4.8640E-01	2.1928E-02
1.100	8.9326E-01	4.2104E-02
1.300	1.4796E+00	7.2304E-02
1.500	2.2681E+00	1.1398E-01
1.700	3.2758E+00	1.6826E-01
1.900	4.5153E+00	2.3594E-01
2.000	5.2248E+00	2.7500E-01
2.200	6.6069E+00	3.5127E-01
2.400	7.8106E+00	4.1769E-01
2.600	8.8589E+00	4.7554E-01
2.800	9.7720E+00	5.2593E-01
3.000	1.0567E+01	5.6983E-01
3.200	1.1260E+01	6.0807E-01
3.400	1.1863E+01	6.4139E-01
3.600	1.2389E+01	6.7042E-01
3.800	1.2847E+01	6.9572E-01
4.000	1.3246E+01	7.1776E-01
4.200	1.3593E+01	7.3698E-01
4.400	1.3896E+01	7.5372E-01
4.600	1.4159E+01	7.6832E-01
4.800	1.4389E+01	7.8104E-01
5.000	1.4589E+01	7.9213E-01
5.200	1.4763E+01	8.0180E-01
5.400	1.4915E+01	8.1022E-01
5.600	1.5048E+01	8.1757E-01
5.800	1.5163E+01	8.2398E-01
6.000	1.5263E+01	8.2957E-01
6.200	1.5351E+01	8.3444E-01
6.400	1.5427E+01	8.3869E-01
6.600	1.5494E+01	8.4239E-01
6.800	1.5552E+01	8.4563E-01
7.000	1.5602E+01	8.4845E-01
7.200	1.5646E+01	8.5090E-01
7.400	1.5684E+01	8.5305E-01
7.600	1.5718E+01	8.5492E-01
7.800	1.5747E+01	8.5656E-01
8.000	1.5772E+01	8.5798E-01
8.200	1.5794E+01	8.5922E-01
8.333	1.5807E+01	8.5996E-01
8.533	1.5825E+01	8.6096E-01
8.733	1.5840E+01	8.6182E-01
8.933	1.5854E+01	8.6258E-01
9.133	1.5865E+01	8.6324E-01
9.333	1.5875E+01	8.6381E-01
9.533	1.5884E+01	8.6432E-01
9.733	1.5892E+01	8.6476E-01

9.933	1.5899E+01	8.6514E-01
10.133	1.5904E+01	8.6548E-01
12.000	1.5933E+01	8.6716E-01
19.444	1.5944E+01	8.6794E-01
24.000	1.5944E+01	8.6800E-01
96.000	1.5944E+01	8.6805E-01
720.000	1.5944E+01	8.6805E-01

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:01:18

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

            LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

EAB LOCA
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
    0.0   5.0645E-01   9.8470E+01   5.7287E+00

#####################################################################
                          Final Doses
#####################################################################

LOCA @ LPZ
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   2.9899E-02   5.8133E+00   3.3820E-01

LOCA @ Unprotected CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   2.8800E+00   5.5997E+02   3.2578E+01

LOCA @ CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   1.7158E-02   1.5944E+01   8.6805E-01
```

Attachment 14 RADTRAD Output:
Attch 14 BYPASS_Atrium11_600cfm_Dywell+Wetwell 2-720hr.o0

7

All Attachment 14 Pages Revised for Rev 7

```
 ######################################################################
     ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:04:45

                  Copyright © 2018 Alion Science and Technology
 ######################################################################

             LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

 Input File Name      = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 14
BYPASS_Atrium11_600cfm_Dywell+Wetwell 2-720hr.psf
 Output File Name     = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 14
BYPASS_Atrium11_600cfm_Dywell+Wetwell 2-720hr.o0

 Inventory file       =  c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Release file         =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
 Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp




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


   Radtrad 3.10  Rev. 4
   LOCA PPL-SSES   Primary Containment Leakage directly to Env.
 Dose Conversion Factor File:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
 Release Fraction & Timing Files:
   1
   c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
 Nuclide Inventory Files:
   1
   1 c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Plant Power Level:
   4.032E+03
 Number of Compartments:
   3
 Compartment 1:
   Primary Containment
   3
   3.8819E+05
   0
   0
   0
   1
   0
 Compartment 2:
   Environment
   2
   0.00E+00
   0
   0
   0
   0
   0
 Compartment 3:
   Control Room
   1
```

```
  5.18E+05
  0
  0
  0
  0
  0
Number of Pathways:
  5
Pathway 1:
  Primary Containment to Environment - Bypass Leakage
  1
  2
  2
Pathway 2:
  Environment to Control Room - Emergency Filtered Air Intake
  2
  3
  2
Pathway 3:
  Environment to Control Room - Unfiltered Air Inleakage
  2
  3
  2
Pathway 4:
  Control Room to Environment - CR Exhaust
  3
  2
  2
Pathway 5:
  Environment to  Control Room ingress/egress
  2
  3
  2
  End of Plant Model
Source Term Input:
  1
  1  1  1  1
  0.00E+00
  0.00E+00   7.2E+02
  1
  2   9.5E-01   4.85E-02   1.5E-03
Overlying Pool:
  0
  0.00E+00
  0
  0
  0
  0
Compartments:
  3
Compartment 1:
  0
  1
  0
  0
  0
  0
  0
  3
  3
  1.00E+01
  1
  1
  0.00E+00   0.00E+00
Compartment 2:
  1
  1
  0
  0
  0
```

```
  0
  0
  0
  0
Compartment 3:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  5
Pathway 1:
  1
  0
  0
  0
  0
  1
  4
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   6.01E-02   0.00E+00   0.00E+00   0.00E+00
  2.4E+01   3.005E-02   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   5.229E+03   9.9E+01   9.9E+01   9.9E+01
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   6.00E+02   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
```

```
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 4:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   5.839E+03   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   1.00E+01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  4
Location 1:
  EAB LOCA
  2
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 2:
  LOCA @ LPZ
  2
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 3:
```

```
   LOCA @ Unprotected CR
   2
   1
   2
   0.00E+00   3.5E-04
   7.2E+02   0.00E+00
   0
 Location 4:
   LOCA @ CR
   3
   1
   2
   0.00E+00   3.5E-04
   7.2E+02   0.00E+00
   1
   4
   0.00E+00   1.00E+00
   2.4E+01   6.00E-01
   9.6E+01   4.00E-01
   7.2E+02   0.00E+00
 X/Q Tables:
   4
   EAB LOCA
   2
   0.00E+00   8.3E-04
   7.2E+02   0.00E+00
   LOCA @ LPZ
   5
   0.00E+00   4.9E-05
   8.00E+00   3.5E-05
   2.4E+01   1.7E-05
   9.6E+01   6.1E-06
   7.2E+02   0.00E+00
   LOCA @ Unprotected CR
   6
   0.00E+00   4.72E-03
   2.00E+00   4.25E-03
   8.00E+00   1.84E-03
   2.4E+01   1.32E-03
   9.6E+01   1.03E-03
   7.2E+02   0.00E+00
   LOCA @ CR
   6
   0.00E+00   1.21E-03
   2.00E+00   8.76E-04
   8.00E+00   3.16E-04
   2.4E+01   1.92E-04
   9.6E+01   1.61E-04
   7.2E+02   0.00E+00
 Inflow Pathways:
   3  2 3 5
 Exhaust Pathways:
   2  1 4
 X/Q table ID for Exhaust-Inflow paths:
   4 4 4
   -1 -1 -1
 Simulation Parameters:
   5
   0.00E+00   0.00E+00
   9.6E+01   1.2E+02
   2.4E+02   2.4E+02
   4.8E+02   2.4E+02
   7.2E+02   0.00E+00
 Output Filename:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 14 BYPASS_Atrium11_600cfm_Dywell+Wetwell
2-720hr.o0
   1
   1
   1
   1
```

```
0
End of Scenario File
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:04:45

                Copyright © 2018 Alion Science and Technology
#######################################################################

            LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

Number of Nuclides =  60

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

Number of compartments    =   3

Compartment information

Compartment number  1
Name: Primary Containment
Compartment volume =   3.8819E+05 (Cubic feet)
Compartment type is Normal
Removal devices within compartment:
     Deposition
Pathways into and out of compartment  1
   Exit Pathway Number    1: Primary Containment to Environment - Bypass Lea

Compartment number  2
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  2
   Inlet Pathway Number   1: Primary Containment to Environment - Bypass Lea
   Inlet Pathway Number   4: Control Room to Environment - CR Exhaust
   Exit Pathway Number    2: Environment to Control Room - Emergency Filtere
   Exit Pathway Number    3: Environment to Control Room - Unfiltered Air In
   Exit Pathway Number    5: Environment to  Control Room ingress/egress

Compartment number  3
Name: Control Room
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Environment to Control Room - Emergency Filtere
   Inlet Pathway Number   3: Environment to Control Room - Unfiltered Air In
   Inlet Pathway Number   5: Environment to  Control Room ingress/egress
   Exit Pathway Number    4: Control Room to Environment - CR Exhaust

Total number of pathways =   5
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:04:45

                Copyright © 2018 Alion Science and Technology
#######################################################################

            LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

Power Ratio                              =   4.0320E+03

End Time                                 =   7.2000E+02 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Source Number  1 is used in Compartment  1  Primary Containment
   Nuclide Distribution given in Ci/MWt
Fraction of Nuclide Distribution in this Compartment   1.00000

Iodine fractions for source number 1
     Aerosol     =   9.5000E-01
     Elemental   =   4.8500E-02
     Organic     =   1.5000E-03

Inventory file =     c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
Release from file =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
```

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Co-58	7	1.070E+02	6.117E+06	4.760E-14	8.720E-10	2.940E-09
Co-60	7	4.390E+00	1.663E+08	1.260E-13	1.620E-08	5.910E-08
Kr-85	1	4.150E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	6.940E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.320E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	1.780E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
Rb-86	3	6.120E+01	1.612E+06	4.810E-15	1.330E-09	1.790E-09
Sr-89	5	2.480E+04	4.363E+06	7.730E-17	7.960E-12	1.120E-08
Sr-90	5	3.310E+03	9.190E+08	7.530E-18	2.690E-10	3.510E-07
Sr-91	5	3.120E+04	3.420E+04	4.924E-14	9.930E-12	4.547E-10
Sr-92	5	3.370E+04	9.756E+03	6.790E-14	3.920E-12	2.180E-10
Y-90	9	3.490E+03	2.304E+05	1.900E-16	5.170E-13	2.280E-09
Y-91	9	3.230E+04	5.055E+06	2.600E-16	8.500E-12	1.320E-08
Y-92	9	3.410E+04	1.274E+04	1.300E-14	1.050E-12	2.110E-10
Y-93	9	3.870E+04	3.636E+04	4.800E-15	9.260E-13	5.820E-10
Zr-95	9	4.680E+04	5.528E+06	3.600E-14	1.440E-09	6.390E-09
Zr-97	9	4.750E+04	6.084E+04	4.432E-14	2.315E-11	1.171E-09
Nb-95	9	4.690E+04	3.037E+06	3.740E-14	3.580E-10	1.570E-09
Mo-99	7	4.980E+04	2.376E+05	7.280E-15	1.520E-11	1.070E-09
Tc-99m	7	4.370E+04	2.167E+04	5.890E-15	5.010E-11	8.800E-12
Ru-103	7	4.300E+04	3.394E+06	2.251E-14	2.570E-10	2.421E-09
Ru-105	7	2.990E+04	1.598E+04	3.810E-14	4.150E-12	1.230E-10
Ru-106	7	1.670E+04	3.181E+07	1.040E-14	1.720E-09	1.290E-07
Rh-105	7	2.780E+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	7.630E+03	1.555E+04	7.140E-14	9.720E-12	1.740E-10
Te-127	4	2.300E+03	3.366E+04	2.420E-16	1.840E-12	8.600E-11
Te-127m	4	1.810E+02	9.418E+06	1.470E-16	9.660E-11	5.810E-09
Te-129	4	7.280E+03	4.176E+03	2.750E-15	5.090E-13	2.090E-11
Te-129m	4	1.250E+03	2.903E+06	3.337E-15	1.563E-10	6.484E-09
Te-131m	4	5.230E+03	1.080E+05	7.463E-14	3.669E-08	1.758E-09
Te-132	4	3.820E+04	2.815E+05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.690E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09

I-132	2	3.920E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.490E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.150E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.240E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.380E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	1.450E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Cs-134	3	5.840E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.480E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.480E+03	9.467E+08	2.725E-14	7.930E-09	8.630E-09
Ba-139	6	4.850E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	4.690E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09
La-140	9	4.910E+04	1.450E+05	1.170E-13	6.870E-11	1.310E-09
La-141	9	4.390E+04	1.415E+04	2.390E-15	9.400E-12	1.570E-10
La-142	9	4.230E+04	5.550E+03	1.440E-13	8.740E-12	6.840E-11
Ce-141	8	4.420E+04	2.808E+06	3.430E-15	2.550E-11	2.420E-09
Ce-143	8	4.100E+04	1.188E+05	1.290E-14	6.230E-12	9.160E-10
Ce-144	8	3.680E+04	2.456E+07	2.773E-15	2.920E-10	1.010E-07
Pr-143	9	4.000E+04	1.172E+06	2.100E-17	1.680E-18	2.190E-09
Nd-147	9	1.750E+04	9.487E+05	6.190E-15	1.820E-11	1.850E-09
Np-239	8	5.060E+05	2.035E+05	7.690E-15	7.620E-12	6.780E-10
Pu-238	8	1.090E+02	2.769E+09	4.880E-18	3.860E-10	7.790E-05
Pu-239	8	1.020E+01	7.594E+11	4.240E-18	3.750E-10	8.330E-05
Pu-240	8	1.820E+01	2.063E+11	4.750E-18	3.760E-10	8.330E-05
Pu-241	8	4.340E+03	4.544E+08	7.250E-20	9.150E-12	1.340E-06
Am-241	9	5.360E+00	1.364E+10	8.180E-16	1.600E-09	1.200E-04
Cm-242	9	1.900E+03	1.407E+07	5.690E-18	9.410E-10	4.670E-06
Cm-244	9	9.700E+01	5.715E+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-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00

Release Fractions and Timings

BWR, RG 1.183, Table 1 Section 3.2
Duration (h): Design Basis Accident

	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	5.458E+03
IODINE	5.0000E-02	2.5000E-01	0.0000E+00	3.465E+02
CESIUM	5.0000E-02	2.0000E-01	0.0000E+00	5.649E+04
TELLURIUM	0.0000E+00	5.0000E-02	0.0000E+00	4.137E+01
STRONTIUM	0.0000E+00	2.0000E-02	0.0000E+00	2.027E+03
BARIUM	0.0000E+00	2.0000E-02	0.0000E+00	5.190E+01
RUTHENIUM	0.0000E+00	2.5000E-03	0.0000E+00	6.533E+01
CERIUM	0.0000E+00	5.0000E-04	0.0000E+00	6.205E+02
LANTHANUM	0.0000E+00	2.0000E-04	0.0000E+00	7.245E+00
AEROSOL	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00

COMPARTMENT DATA

Compartment number 1: Primary Containment

Natural Deposition (Powers' model): Aerosol data
Reactor type: BWRDBA
Percentile = 10 (%)

Natural Deposition: Elemental Removal Data

Time (hr)	Removal Coef. (hr^-1)
0.0000E+00	0.0000E+00

Compartment number 2: Environment

Compartment number 3: Control Room

PATHWAY DATA

Pathway number 1: Primary Containment to Environment - Bypass Lea

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
2.0000E+00	6.0100E-02	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	3.0050E-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 2: Environment to Control Room - Emergency Filtere

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
2.0000E+00	5.2290E+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 3: Environment to Control Room - Unfiltered Air In

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
2.0000E+00	6.0000E+02	0.0000E+00	0.0000E+00	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 4: Control Room to Environment - CR Exhaust

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
       2.0000E+00    5.8390E+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  5: Environment to  Control Room ingress/egress

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00
       2.0000E+00    1.0000E+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

DOSE INFORMATION
Number_Dose_Locations =  4

Dose Location Name = EAB LOCA
         Located in compartment  2 the Environment

EAB LOCA 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

Dose Location Name = LOCA @ LPZ
         Located in compartment  2 the Environment

LOCA @ LPZ 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

Dose Location Name = LOCA @ Unprotected CR
         Located in compartment  2 the Environment

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

Dose Location Name = LOCA @ CR
         Located in compartment  3 the Control Room

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

LOCA @ CR 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

X/Q, ATMOSPHERIC DISPERSION INFORMATION

X/Q Table Name =    EAB LOCA

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

X/Q Table Name =    LOCA @ LPZ
```

```
     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       0.0000E+00          4.9000E-05
       8.0000E+00          3.5000E-05
       2.4000E+01          1.7000E-05
       9.6000E+01          6.1000E-06
       7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ Unprotected CR

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       0.0000E+00          4.7200E-03
       2.0000E+00          4.2500E-03
       8.0000E+00          1.8400E-03
       2.4000E+01          1.3200E-03
       9.6000E+01          1.0300E-03
       7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ CR

     Location X/Q Data
      Time (hr)         X/Q (s * m^-3)
       0.0000E+00          1.2100E-03
       2.0000E+00          8.7600E-04
       8.0000E+00          3.1600E-04
       2.4000E+01          1.9200E-04
       9.6000E+01          1.6100E-04
       7.2000E+02          0.0000E+00

 This X/Q Table is used for these connected pathways
  Path  1  Primary Containment to Environment - Bypass Lea and Path  2  Environment to Control Room -
Emergency Filtere
  Path  1  Primary Containment to Environment - Bypass Lea and Path  3  Environment to Control Room -
Unfiltered Air In
  Path  1  Primary Containment to Environment - Bypass Lea and Path  5  Environment to  Control Room
ingress/egress

 USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
        Time (hr)      Time step (hr)
       0.0000E+00        0.0000E+00
       9.6000E+01        1.2000E+02
       2.4000E+02        2.4000E+02
       4.8000E+02        2.4000E+02
       7.2000E+02        0.0000E+00

  EDIT EACH MAJOR TIME STEP

  EDIT SUPPLEMENTAL TIME STEPS

  EDIT MODEL DECONTAMINATION RESULTS

       Masses in Atoms and kg in detailed output
```

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


            LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

Detailed model information at time (hr) =    0.0000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.0002E+00

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EAB LOCA Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ LPZ Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

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

Primary Containment to Environment - Bypass Lea Transport Group Inventory:
```

```
                          Pathway
Time (h) =   0.0006      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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =   0.0006      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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    0.4500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2018E+00

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EAB LOCA Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00
```

LOCA @ LPZ Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00

LOCA @ CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

****

Primary Containment to Environment - Bypass Lea 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Emergency Filtere 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Unfiltered Air In 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Control Room to Environment - CR Exhaust 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room ingress/egress 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

```
Detailed model information at time (hr) =    1.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 3.2982E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.3952E+00

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EAB LOCA Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ LPZ Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

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

Primary Containment to Environment - Bypass Lea 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Emergency Filtere 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Air In 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
```

```
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    4.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 1.0673E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.4300E+01

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EAB LOCA Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.6774E-01  1.0227E+02  6.0427E+00
Accumulated dose (rem)  6.6774E-01  1.0227E+02  6.0427E+00

LOCA @ LPZ Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.9421E-02  6.0377E+00  3.5674E-01
Accumulated dose (rem)  3.9421E-02  6.0377E+00  3.5674E-01

LOCA @ Unprotected CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.4192E+00  5.2368E+02  3.0941E+01
Accumulated dose (rem)  3.4192E+00  5.2368E+02  3.0941E+01

LOCA @ CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.7907E-02  8.6124E+00  4.8000E-01  4.5304E-01
Accumulated dose (rem)  1.7907E-02  8.6124E+00  4.8000E-01  4.5304E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) =   5.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     6.9804E-03     0.00000
  Co-60     2.8671E-04     0.00000
```

Kr-85	4.6632E+01	0.00000
Kr-85m	4.5608E+02	0.00173
Kr-87	2.4220E+02	0.00507
Kr-88	8.6517E+02	0.04484
Rb-86	3.6600E-01	0.00012
Sr-89	1.2937E+01	0.02578
Sr-90	1.7295E+00	0.10798
Sr-91	1.3273E+01	0.00141
Sr-92	8.6539E+00	0.00063
Y-90	4.5569E-02	0.00002
Y-91	1.7288E-01	0.00041
Y-92	2.6021E+00	0.00011
Y-93	1.6664E-01	0.00002
Zr-95	2.4422E-01	0.00028
Zr-97	2.2104E-01	0.00005
Nb-95	2.4505E-01	0.00007
Mo-99	3.1573E+00	0.00061
Tc-99m	2.8449E+00	0.00001
Ru-103	2.8026E+00	0.00124
Ru-105	1.2616E+00	0.00005
Ru-106	1.0905E+00	0.02503
Rh-105	1.8019E+00	0.00009
Sb-127	3.2737E+00	0.00100
Sb-129	6.3619E+00	0.00043
Te-127	2.9934E+00	0.00005
Te-127m	2.3670E-01	0.00024
Te-129	7.4012E+00	0.00004
Te-129m	1.6331E+00	0.00189
Te-131m	6.3994E+00	0.00224
Te-132	4.8662E+01	0.02233
I-131	2.2993E+02	0.36571
I-132	2.2549E+02	0.01697
I-133	4.2940E+02	0.12710
I-134	5.9379E+01	0.00430
I-135	3.3238E+02	0.03364
Xe-133	5.9896E+03	0.00475
Xe-135	1.7928E+03	0.01084
Cs-134	3.5075E+01	0.07934
Cs-136	8.8345E+00	0.00359
Cs-137	2.6910E+01	0.04168
Ba-139	6.4259E+00	0.00006
Ba-140	2.4349E+01	0.00448
La-140	8.6532E-01	0.00025
La-141	1.4012E-01	0.00000
La-142	6.4523E-02	0.00001
Ce-141	5.7673E-01	0.00025
Ce-143	5.0466E-01	0.00009
Ce-144	4.8057E-01	0.00863
Pr-143	2.0997E-01	0.00008
Nd-147	9.0759E-02	0.00003
Np-239	6.3841E+00	0.00079
Pu-238	1.4239E-03	0.01973
Pu-239	1.3330E-04	0.00198
Pu-240	2.3774E-04	0.00352
Pu-241	5.6691E-02	0.01351
Am-241	2.8027E-05	0.00060
Cm-242	9.9226E-03	0.00824
Cm-244	5.0682E-04	0.00604

Environment Compartment Group Inventory Distribution:

Time (h) = 5.0000	Total Release	Release Rate/s
Noble gases (atoms)	9.9104E+20	5.5058E+16
Elemental I (atoms)	2.0233E+18	1.1241E+14
Organic I (atoms)	6.2577E+16	3.4765E+12
Aerosol I (atoms)	8.6881E+18	4.8267E+14
All Aerosols (kg)	3.5672E-04	1.9818E-08

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

```
                          Pathway
Time (h) =   5.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   9.9104E+20
Elemental I (atoms)     0.0000E+00   2.0235E+18
Organic I (atoms)       0.0000E+00   6.2583E+16
Aerosol I (atoms)       0.0000E+00   8.6899E+18
All Aerosols (kg)       0.0000E+00   3.5680E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =   5.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   2.1428E+18
Elemental I (atoms)     4.1944E+15   4.3260E+13
Organic I (atoms)       1.2972E+14   1.3379E+12
Aerosol I (atoms)       1.7610E+16   1.8345E+14
All Aerosols (kg)       7.4351E-07   7.5117E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                          Pathway
Time (h) =   5.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   2.4583E+17
Elemental I (atoms)     0.0000E+00   4.9639E+14
Organic I (atoms)       0.0000E+00   1.5352E+13
Aerosol I (atoms)       0.0000E+00   2.1049E+15
All Aerosols (kg)       0.0000E+00   8.6193E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =   5.0000      Filtered    Transported
Noble gases (atoms)     1.3676E+18   4.6620E+13
Elemental I (atoms)     3.1548E+14   0.0000E+00
Organic I (atoms)       9.7571E+12   0.0000E+00
Aerosol I (atoms)       1.7476E+15   0.0000E+00
All Aerosols (kg)       7.2420E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =   5.0000      Filtered    Transported
Noble gases (atoms)     0.0000E+00   4.0972E+15
Elemental I (atoms)     0.0000E+00   8.2731E+12
Organic I (atoms)       0.0000E+00   2.5587E+11
Aerosol I (atoms)       0.0000E+00   3.5082E+13
All Aerosols (kg)       0.0000E+00   1.4365E-09

Detailed model information at time (hr) =    7.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 6.3781E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.3244E+02

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EAB LOCA Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.6568E-01  2.3061E+01  1.1150E+00
Accumulated dose (rem)  9.3342E-01  1.2533E+02  7.1577E+00
```

LOCA @ LPZ Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5685E-02	1.3615E+00	6.5824E-02
Accumulated dose (rem)	5.5106E-02	7.3992E+00	4.2256E-01

LOCA @ Unprotected CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.3604E+00	1.1809E+02	5.7093E+00
Accumulated dose (rem)	4.7796E+00	6.4176E+02	3.6651E+01

LOCA @ CR Doses:

Time (h) = 8.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	1.7062E-02	4.5970E+00	2.2928E-01	4.6341E-01
Accumulated dose (rem)	3.4969E-02	1.3209E+01	7.0927E-01	9.1645E-01

****

Environment Integral Nuclide Release (Ci): at Time (h) = 8.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Co-58	7.4021E-03	0.00000
Co-60	3.0406E-04	0.00000
Kr-85	9.3263E+01	0.00000
Kr-85m	7.4280E+02	0.00238
Kr-87	2.8941E+02	0.00512
Kr-88	1.2812E+03	0.05606
Rb-86	3.8803E-01	0.00011
Sr-89	1.3718E+01	0.02307
Sr-90	1.8341E+00	0.09668
Sr-91	1.3907E+01	0.00124
Sr-92	8.8837E+00	0.00055
Y-90	5.1835E-02	0.00002
Y-91	1.8380E-01	0.00036
Y-92	2.8450E+00	0.00011
Y-93	1.7472E-01	0.00002
Zr-95	2.5897E-01	0.00025
Zr-97	2.3275E-01	0.00005
Nb-95	2.5987E-01	0.00007
Mo-99	3.3419E+00	0.00055
Tc-99m	3.0148E+00	0.00001
Ru-103	2.9718E+00	0.00111
Ru-105	1.3077E+00	0.00005
Ru-106	1.1564E+00	0.02241
Rh-105	1.9078E+00	0.00008
Sb-127	3.4670E+00	0.00090
Sb-129	6.5913E+00	0.00037
Te-127	3.1730E+00	0.00004
Te-127m	2.5104E-01	0.00022
Te-129	7.7048E+00	0.00003
Te-129m	1.7318E+00	0.00169
Te-131m	6.7587E+00	0.00200
Te-132	5.1522E+01	0.01996
I-131	2.8531E+02	0.38311
I-132	2.4898E+02	0.01582
I-133	5.2270E+02	0.13061
I-134	6.0376E+01	0.00369
I-135	3.8879E+02	0.03322
Xe-133	1.1906E+04	0.00797
Xe-135	3.4003E+03	0.01736
Cs-134	3.7197E+01	0.07103
Cs-136	9.3651E+00	0.00321
Cs-137	2.8537E+01	0.03732
Ba-139	6.5037E+00	0.00005
Ba-140	2.5811E+01	0.00401
La-140	9.9436E-01	0.00025

La-141	1.4492E-01	0.00000
La-142	6.5447E-02	0.00000
Ce-141	6.1153E-01	0.00022
Ce-143	5.3318E-01	0.00008
Ce-144	5.0963E-01	0.00773
Pr-143	2.2278E-01	0.00007
Nd-147	9.6203E-02	0.00003
Np-239	6.7552E+00	0.00071
Pu-238	1.5100E-03	0.01767
Pu-239	1.4137E-04	0.00177
Pu-240	2.5212E-04	0.00315
Pu-241	6.0120E-02	0.01210
Am-241	2.9725E-05	0.00054
Cm-242	1.0523E-02	0.00738
Cm-244	5.3748E-04	0.00541

Environment Compartment Group Inventory Distribution:

Time (h) = 8.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.9795E+21	6.8733E+16
Elemental I (atoms)	3.9689E+18	1.3781E+14
Organic I (atoms)	1.2275E+17	4.2621E+12
Aerosol I (atoms)	9.1912E+18	3.1914E+14
All Aerosols (kg)	3.7829E-04	1.3135E-08

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9795E+21
Elemental I (atoms)	0.0000E+00	3.9691E+18
Organic I (atoms)	0.0000E+00	1.2275E+17
Aerosol I (atoms)	0.0000E+00	9.1930E+18
All Aerosols (kg)	0.0000E+00	3.7837E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.2802E+18
Elemental I (atoms)	8.1383E+15	8.5278E+13
Organic I (atoms)	2.5170E+14	2.6375E+12
Aerosol I (atoms)	1.8045E+16	1.9419E+14
All Aerosols (kg)	7.8878E-07	7.9707E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.9103E+17
Elemental I (atoms)	0.0000E+00	9.7852E+14
Organic I (atoms)	0.0000E+00	3.0264E+13
Aerosol I (atoms)	0.0000E+00	2.2282E+15
All Aerosols (kg)	0.0000E+00	9.1459E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	3.6191E+18	1.9238E+14
Elemental I (atoms)	8.1925E+14	0.0000E+00
Organic I (atoms)	2.5338E+13	0.0000E+00
Aerosol I (atoms)	2.3570E+15	0.0000E+00
All Aerosols (kg)	9.8391E-08	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported

```
Noble gases (atoms)      0.0000E+00   8.1838E+15
Elemental I (atoms)      0.0000E+00   1.6309E+13
Organic I (atoms)        0.0000E+00   5.0439E+11
Aerosol I (atoms)        0.0000E+00   3.7137E+13
All Aerosols (kg)        0.0000E+00   1.5243E-09

Detailed model information at time (hr) =    8.3000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.8678E+02

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EAB LOCA Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2150E-02  1.1009E+00  5.8592E-02
Accumulated dose (rem)  9.5557E-01  1.2643E+02  7.2162E+00

LOCA @ LPZ Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.3404E-04  4.6423E-02  2.4707E-03
Accumulated dose (rem)  5.6040E-02  7.4456E+00  4.2503E-01

LOCA @ Unprotected CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.9104E-02  4.7455E+00  2.0619E-01
Accumulated dose (rem)  4.8287E+00  6.4651E+02  3.6857E+01

LOCA @ CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.3933E-03  3.1813E-01  1.4068E-02  4.0145E-02
Accumulated dose (rem)  3.6362E-02  1.3528E+01  7.2334E-01  9.5660E-01

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Environment Integral Nuclide Release (Ci): at Time (h) =   8.3333

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     7.4161E-03     0.00000
  Co-60     3.0463E-04     0.00000
  Kr-85     9.8445E+01     0.00000
  Kr-85m    7.6719E+02     0.00242
  Kr-87     2.9131E+02     0.00509
  Kr-88     1.3113E+03     0.05648
  Rb-86     3.8876E-01     0.00010
  Sr-89     1.3744E+01     0.02289
  Sr-90     1.8376E+00     0.09592
  Sr-91     1.3925E+01     0.00123
  Sr-92     8.8881E+00     0.00054
  Y-90      5.2117E-02     0.00002
  Y-91      1.8417E-01     0.00036
  Y-92      2.8524E+00     0.00011
  Y-93      1.7495E-01     0.00002
  Zr-95     2.5946E-01     0.00025
  Zr-97     2.3310E-01     0.00004
  Nb-95     2.6036E-01     0.00006
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Mo-99	3.3479E+00	0.00054
Tc-99m	3.0204E+00	0.00001
Ru-103	2.9774E+00	0.00110
Ru-105	1.3088E+00	0.00005
Ru-106	1.1586E+00	0.02223
Rh-105	1.9113E+00	0.00008
Sb-127	3.4733E+00	0.00089
Sb-129	6.5967E+00	0.00037
Te-127	3.1789E+00	0.00004
Te-127m	2.5152E-01	0.00022
Te-129	7.7126E+00	0.00003
Te-129m	1.7351E+00	0.00168
Te-131m	6.7700E+00	0.00198
Te-132	5.1615E+01	0.01980
I-131	2.9057E+02	0.38458
I-132	2.5034E+02	0.01573
I-133	5.3111E+02	0.13090
I-134	6.0395E+01	0.00366
I-135	3.9326E+02	0.03318
Xe-133	1.2558E+04	0.00820
Xe-135	3.5668E+03	0.01780
Cs-134	3.7267E+01	0.07048
Cs-136	9.3826E+00	0.00319
Cs-137	2.8591E+01	0.03703
Ba-139	6.5045E+00	0.00005
Ba-140	2.5859E+01	0.00398
La-140	1.0002E+00	0.00024
La-141	1.4503E-01	0.00000
La-142	6.5458E-02	0.00000
Ce-141	6.1268E-01	0.00022
Ce-143	5.3409E-01	0.00008
Ce-144	5.1059E-01	0.00767
Pr-143	2.2321E-01	0.00007
Nd-147	9.6383E-02	0.00003
Np-239	6.7672E+00	0.00070
Pu-238	1.5129E-03	0.01753
Pu-239	1.4163E-04	0.00175
Pu-240	2.5260E-04	0.00313
Pu-241	6.0234E-02	0.01200
Am-241	2.9781E-05	0.00053
Cm-242	1.0542E-02	0.00732
Cm-244	5.3850E-04	0.00537

Environment Compartment Group Inventory Distribution:

Time (h) = 8.3333	Total Release	Release Rate/s
Noble gases (atoms)	2.0892E+21	6.9640E+16
Elemental I (atoms)	4.1809E+18	1.3936E+14
Organic I (atoms)	1.2931E+17	4.3102E+12
Aerosol I (atoms)	9.2074E+18	3.0691E+14
All Aerosols (kg)	3.7901E-04	1.2634E-08

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 8.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.0892E+21
Elemental I (atoms)	0.0000E+00	4.1811E+18
Organic I (atoms)	0.0000E+00	1.2931E+17
Aerosol I (atoms)	0.0000E+00	9.2093E+18
All Aerosols (kg)	0.0000E+00	3.7909E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 8.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.3658E+18
Elemental I (atoms)	8.2725E+15	8.6931E+13
Organic I (atoms)	2.5585E+14	2.6886E+12

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Aerosol I (atoms)        1.7993E+16   1.9432E+14
All Aerosols (kg)        7.8931E-07   7.9762E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   5.0085E+17
Elemental I (atoms)      0.0000E+00   9.9749E+14
Organic I (atoms)        0.0000E+00   3.0850E+13
Aerosol I (atoms)        0.0000E+00   2.2297E+15
All Aerosols (kg)        0.0000E+00   9.1522E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      3.8620E+18   2.1292E+14
Elemental I (atoms)      8.7271E+14   0.0000E+00
Organic I (atoms)        2.6991E+13   0.0000E+00
Aerosol I (atoms)        2.3814E+15   0.0000E+00
All Aerosols (kg)        9.9441E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.3474E+15
Elemental I (atoms)      0.0000E+00   1.6625E+13
Organic I (atoms)        0.0000E+00   5.1417E+11
Aerosol I (atoms)        0.0000E+00   3.7161E+13
All Aerosols (kg)        0.0000E+00   1.5254E-09

Detailed model information at time (hr) =   11.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.2582E+03

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EAB LOCA Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.9019E-01  1.1304E+01  5.5013E-01
Accumulated dose (rem)  1.1458E+00  1.3774E+02  7.7664E+00

LOCA @ LPZ Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.0202E-03  4.7668E-01  2.3198E-02
Accumulated dose (rem)  6.4060E-02  7.9223E+00  4.4823E-01

LOCA @ Unprotected CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.2163E-01  4.8728E+01  1.9732E+00
Accumulated dose (rem)  5.2503E+00  6.9524E+02  3.8830E+01

LOCA @ CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE        Skin
```

Delta dose (rem)	7.2871E-03	1.7746E+00	7.3120E-02	2.2226E-01
Accumulated dose (rem)	4.3649E-02	1.5302E+01	7.9646E-01	1.1789E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 12.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Co-58	7.4746E-03	0.00000
Co-60	3.0704E-04	0.00000
Kr-85	1.5544E+02	0.00001
Kr-85m	9.6692E+02	0.00264
Kr-87	2.9956E+02	0.00477
Kr-88	1.5216E+03	0.05789
Rb-86	3.9180E-01	0.00010
Sr-89	1.3852E+01	0.02116
Sr-90	1.8521E+00	0.08866
Sr-91	1.3993E+01	0.00114
Sr-92	8.9011E+00	0.00050
Y-90	5.3498E-02	0.00002
Y-91	1.8574E-01	0.00033
Y-92	2.8792E+00	0.00010
Y-93	1.7583E-01	0.00001
Zr-95	2.6151E-01	0.00023
Zr-97	2.3451E-01	0.00004
Nb-95	2.6242E-01	0.00006
Mo-99	3.3726E+00	0.00050
Tc-99m	3.0435E+00	0.00001
Ru-103	3.0008E+00	0.00102
Ru-105	1.3125E+00	0.00004
Ru-106	1.1678E+00	0.02055
Rh-105	1.9253E+00	0.00007
Sb-127	3.4994E+00	0.00082
Sb-129	6.6148E+00	0.00034
Te-127	3.2036E+00	0.00004
Te-127m	2.5351E-01	0.00020
Te-129	7.7406E+00	0.00003
Te-129m	1.7487E+00	0.00155
Te-131m	6.8160E+00	0.00183
Te-132	5.2000E+01	0.01830
I-131	3.4554E+02	0.40148
I-132	2.5882E+02	0.01481
I-133	6.1399E+02	0.13378
I-134	6.0453E+01	0.00336
I-135	4.3169E+02	0.03264
Xe-133	1.9678E+04	0.01064
Xe-135	5.2390E+03	0.02191
Cs-134	3.7561E+01	0.06514
Cs-136	9.4557E+00	0.00294
Cs-137	2.8817E+01	0.03422
Ba-139	6.5064E+00	0.00005
Ba-140	2.6060E+01	0.00368
La-140	1.0290E+00	0.00023
La-141	1.4539E-01	0.00000
La-142	6.5485E-02	0.00000
Ce-141	6.1750E-01	0.00020
Ce-143	5.3777E-01	0.00007
Ce-144	5.1462E-01	0.00709
Pr-143	2.2501E-01	0.00007
Nd-147	9.7131E-02	0.00002
Np-239	6.8166E+00	0.00065
Pu-238	1.5248E-03	0.01620
Pu-239	1.4276E-04	0.00162
Pu-240	2.5459E-04	0.00289
Pu-241	6.0710E-02	0.01109
Am-241	3.0017E-05	0.00049
Cm-242	1.0626E-02	0.00677
Cm-244	5.4276E-04	0.00496

Environment Compartment Group Inventory Distribution:

Time (h) = 12.0000	Total Release	Release Rate/s
Noble gases (atoms)	3.2938E+21	7.6245E+16
Elemental I (atoms)	6.4652E+18	1.4966E+14
Organic I (atoms)	1.9995E+17	4.6286E+12
Aerosol I (atoms)	9.2746E+18	2.1469E+14
All Aerosols (kg)	3.8200E-04	8.8426E-09

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.2938E+21
Elemental I (atoms)	0.0000E+00	6.4654E+18
Organic I (atoms)	0.0000E+00	1.9996E+17
Aerosol I (atoms)	0.0000E+00	9.2764E+18
All Aerosols (kg)	0.0000E+00	3.8208E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.3058E+18
Elemental I (atoms)	9.7081E+15	1.0474E+14
Organic I (atoms)	3.0025E+14	3.2395E+12
Aerosol I (atoms)	1.7399E+16	1.9483E+14
All Aerosols (kg)	7.9140E-07	7.9991E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.0863E+17
Elemental I (atoms)	0.0000E+00	1.2019E+15
Organic I (atoms)	0.0000E+00	3.7171E+13
Aerosol I (atoms)	0.0000E+00	2.2356E+15
All Aerosols (kg)	0.0000E+00	9.1786E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	5.4446E+18	4.6542E+14
Elemental I (atoms)	1.2162E+15	0.0000E+00
Organic I (atoms)	3.7614E+13	0.0000E+00
Aerosol I (atoms)	2.4776E+15	0.0000E+00
All Aerosols (kg)	1.0350E-07	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0144E+16
Elemental I (atoms)	0.0000E+00	2.0031E+13
Organic I (atoms)	0.0000E+00	6.1952E+11
Aerosol I (atoms)	0.0000E+00	3.7260E+13
All Aerosols (kg)	0.0000E+00	1.5298E-09

Detailed model information at time (hr) = 19.2000

Natural deposition - Powers' Model, Compartment 1

Deposition Lambda (1 / Hours)

Noble	Elemental	Organic	Aerosol
0.0000E+00	0.0000E+00	0.0000E+00	5.2996E-01

Deposition Net DF

Noble	Elemental	Organic	Aerosol
1.0000E+00	1.0000E+00	1.0000E+00	1.1673E+05

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EAB LOCA Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.3776E-01  2.1125E+01  8.9189E-01
Accumulated dose (rem)  1.3835E+00  1.5886E+02  8.6583E+00

LOCA @ LPZ Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0026E-02  8.9082E-01  3.7610E-02
Accumulated dose (rem)  7.4086E-02  8.8131E+00  4.8584E-01

LOCA @ Unprotected CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.2708E-01  9.1061E+01  3.3468E+00
Accumulated dose (rem)  5.7774E+00  7.8630E+02  4.2177E+01

LOCA @ CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        6.0430E-03  1.8532E+00  6.4542E-02  2.1315E-01
Accumulated dose (rem)  4.9692E-02  1.7155E+01  8.6100E-01  1.3920E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  19.4444

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     7.4834E-03     0.00000
  Co-60     3.0740E-04     0.00000
  Kr-85     2.7114E+02     0.00001
  Kr-85m    1.1515E+03     0.00266
  Kr-87     3.0095E+02     0.00421
  Kr-88     1.6492E+03     0.05410
  Rb-86     3.9226E-01     0.00008
  Sr-89     1.3869E+01     0.01862
  Sr-90     1.8543E+00     0.07803
  Sr-91     1.4001E+01     0.00100
  Sr-92     8.9019E+00     0.00044
  Y-90      5.3792E-02     0.00001
  Y-91      1.8598E-01     0.00029
  Y-92      2.8817E+00     0.00009
  Y-93      1.7593E-01     0.00001
  Zr-95     2.6181E-01     0.00020
  Zr-97     2.3469E-01     0.00004
  Nb-95     2.6273E-01     0.00005
  Mo-99     3.3761E+00     0.00044
  Tc-99m    3.0469E+00     0.00001
  Ru-103    3.0043E+00     0.00090
  Ru-105    1.3128E+00     0.00004
  Ru-106    1.1692E+00     0.01809
  Rh-105    1.9273E+00     0.00006
  Sb-127    3.5033E+00     0.00072
  Sb-129    6.6163E+00     0.00030
  Te-127    3.2073E+00     0.00003
  Te-127m   2.5381E-01     0.00018
  Te-129    7.7435E+00     0.00003
  Te-129m   1.7508E+00     0.00136
  Te-131m   6.8223E+00     0.00161
  Te-132    5.2057E+01     0.01610
  I-131     4.5222E+02     0.43498
  I-132     2.6281E+02     0.01317
```

I-133	7.5143E+02	0.13728
I-134	6.0457E+01	0.00296
I-135	4.7586E+02	0.03086
Xe-133	3.3796E+04	0.01476
Xe-135	7.8294E+03	0.02683
Cs-134	3.7606E+01	0.05733
Cs-136	9.4667E+00	0.00259
Cs-137	2.8852E+01	0.03012
Ba-139	6.5064E+00	0.00004
Ba-140	2.6091E+01	0.00324
La-140	1.0351E+00	0.00020
La-141	1.4542E-01	0.00000
La-142	6.5485E-02	0.00000
Ce-141	6.1823E-01	0.00018
Ce-143	5.3828E-01	0.00006
Ce-144	5.1523E-01	0.00624
Pr-143	2.2528E-01	0.00006
Nd-147	9.7243E-02	0.00002
Np-239	6.8237E+00	0.00057
Pu-238	1.5266E-03	0.01426
Pu-239	1.4292E-04	0.00143
Pu-240	2.5490E-04	0.00255
Pu-241	6.0782E-02	0.00976
Am-241	3.0053E-05	0.00043
Cm-242	1.0638E-02	0.00596
Cm-244	5.4340E-04	0.00436

Environment Compartment Group Inventory Distribution:

Time (h) = 19.4444	Total Release	Release Rate/s
Noble gases (atoms)	5.7295E+21	8.1849E+16
Elemental I (atoms)	1.0882E+19	1.5546E+14
Organic I (atoms)	3.3655E+17	4.8079E+12
Aerosol I (atoms)	9.2844E+18	1.3263E+14
All Aerosols (kg)	3.8245E-04	5.4636E-09

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.7295E+21
Elemental I (atoms)	0.0000E+00	1.0882E+19
Organic I (atoms)	0.0000E+00	3.3656E+17
Aerosol I (atoms)	0.0000E+00	9.2862E+18
All Aerosols (kg)	0.0000E+00	3.8254E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.2063E+18
Elemental I (atoms)	1.2421E+16	1.3918E+14
Organic I (atoms)	3.8416E+14	4.3046E+12
Aerosol I (atoms)	1.6352E+16	1.9491E+14
All Aerosols (kg)	7.9141E-07	8.0023E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.2658E+17
Elemental I (atoms)	0.0000E+00	1.5970E+15
Organic I (atoms)	0.0000E+00	4.9393E+13
Aerosol I (atoms)	0.0000E+00	2.2364E+15
All Aerosols (kg)	0.0000E+00	9.1822E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Pathway

```
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      7.6146E+18   1.0396E+15
Elemental I (atoms)      1.6681E+15   0.0000E+00
Organic I (atoms)        5.1592E+13   0.0000E+00
Aerosol I (atoms)        2.4972E+15   0.0000E+00
All Aerosols (kg)        1.0397E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.3776E+16
Elemental I (atoms)      0.0000E+00   2.6617E+13
Organic I (atoms)        0.0000E+00   8.2322E+11
Aerosol I (atoms)        0.0000E+00   3.7274E+13
All Aerosols (kg)        0.0000E+00   1.5304E-09

Detailed model information at time (hr) =   23.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.1344E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2107E+06

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EAB LOCA Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0105E-01  1.2202E+01  4.7698E-01
Accumulated dose (rem)  1.4846E+00  1.7107E+02  9.1353E+00

LOCA @ LPZ Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.2611E-03  5.1456E-01  2.0114E-02
Accumulated dose (rem)  7.8347E-02  9.3276E+00  5.0595E-01

LOCA @ Unprotected CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2401E-01  5.2600E+01  1.8445E+00
Accumulated dose (rem)  6.0014E+00  8.3890E+02  4.4021E+01

LOCA @ CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.4981E-03  1.0253E+00  3.4096E-02  9.6719E-02
Accumulated dose (rem)  5.2190E-02  1.8181E+01  8.9510E-01  1.4887E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  24.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     7.4836E-03     0.00000
  Co-60     3.0741E-04     0.00000
  Kr-85     3.4194E+02     0.00001
  Kr-85m    1.1949E+03     0.00257
  Kr-87     3.0097E+02     0.00395
  Kr-88     1.6660E+03     0.05113
  Rb-86     3.9226E-01     0.00008
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Sr-89	1.3869E+01	0.01746
Sr-90	1.8543E+00	0.07317
Sr-91	1.4001E+01	0.00094
Sr-92	8.9019E+00	0.00041
Y-90	5.3800E-02	0.00001
Y-91	1.8599E-01	0.00028
Y-92	2.8817E+00	0.00008
Y-93	1.7593E-01	0.00001
Zr-95	2.6182E-01	0.00019
Zr-97	2.3469E-01	0.00003
Nb-95	2.6274E-01	0.00005
Mo-99	3.3762E+00	0.00041
Tc-99m	3.0470E+00	0.00001
Ru-103	3.0044E+00	0.00084
Ru-105	1.3128E+00	0.00003
Ru-106	1.1692E+00	0.01696
Rh-105	1.9274E+00	0.00006
Sb-127	3.5033E+00	0.00068
Sb-129	6.6163E+00	0.00028
Te-127	3.2073E+00	0.00003
Te-127m	2.5382E-01	0.00017
Te-129	7.7436E+00	0.00003
Te-129m	1.7508E+00	0.00128
Te-131m	6.8224E+00	0.00151
Te-132	5.2058E+01	0.01510
I-131	5.1598E+02	0.45378
I-132	2.6317E+02	0.01236
I-133	8.2008E+02	0.13793
I-134	6.0457E+01	0.00277
I-135	4.9005E+02	0.02958
Xe-133	4.2203E+04	0.01686
Xe-135	8.9511E+03	0.02823
Cs-134	3.7607E+01	0.05376
Cs-136	9.4669E+00	0.00243
Cs-137	2.8852E+01	0.02824
Ba-139	6.5064E+00	0.00004
Ba-140	2.6091E+01	0.00303
La-140	1.0352E+00	0.00019
La-141	1.4542E-01	0.00000
La-142	6.5485E-02	0.00000
Ce-141	6.1824E-01	0.00017
Ce-143	5.3829E-01	0.00006
Ce-144	5.1525E-01	0.00585
Pr-143	2.2528E-01	0.00006
Nd-147	9.7246E-02	0.00002
Np-239	6.8238E+00	0.00054
Pu-238	1.5267E-03	0.01337
Pu-239	1.4293E-04	0.00134
Pu-240	2.5490E-04	0.00239
Pu-241	6.0783E-02	0.00916
Am-241	3.0054E-05	0.00041
Cm-242	1.0638E-02	0.00559
Cm-244	5.4341E-04	0.00409

Environment Compartment Group Inventory Distribution:

Time (h) = 24.0000	Total Release	Release Rate/s
Noble gases (atoms)	7.2133E+21	8.3487E+16
Elemental I (atoms)	1.3459E+19	1.5577E+14
Organic I (atoms)	4.1625E+17	4.8177E+12
Aerosol I (atoms)	9.2845E+18	1.0746E+14
All Aerosols (kg)	3.8246E-04	4.4266E-09

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.2133E+21
Elemental I (atoms)	0.0000E+00	1.3459E+19

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Organic I (atoms)        0.0000E+00   4.1626E+17
Aerosol I (atoms)        0.0000E+00   9.2864E+18
All Aerosols (kg)        0.0000E+00   3.8255E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.3639E+18
Elemental I (atoms)      1.3969E+16   1.5928E+14
Organic I (atoms)        4.3202E+14   4.9261E+12
Aerosol I (atoms)        1.5818E+16   1.9491E+14
All Aerosols (kg)        7.9126E-07   8.0024E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.5935E+17
Elemental I (atoms)      0.0000E+00   1.8276E+15
Organic I (atoms)        0.0000E+00   5.6525E+13
Aerosol I (atoms)        0.0000E+00   2.2365E+15
All Aerosols (kg)        0.0000E+00   9.1823E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      8.9073E+18   1.4090E+15
Elemental I (atoms)      1.9266E+15   0.0000E+00
Organic I (atoms)        5.9586E+13   0.0000E+00
Aerosol I (atoms)        2.5026E+15   0.0000E+00
All Aerosols (kg)        1.0398E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.5989E+16
Elemental I (atoms)      0.0000E+00   3.0460E+13
Organic I (atoms)        0.0000E+00   9.4208E+11
Aerosol I (atoms)        0.0000E+00   3.7274E+13
All Aerosols (kg)        0.0000E+00   1.5304E-09

Detailed model information at time (hr) =   95.5000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2112E+06

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EAB LOCA Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.6897E-01  9.7408E+01  3.3487E+00
Accumulated dose (rem)  1.8535E+00  2.6847E+02  1.2484E+01

LOCA @ LPZ Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.5571E-03  1.9951E+00  6.8589E-02
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Accumulated dose (rem)  8.5904E-02  1.1323E+01  5.7454E-01

LOCA @ Unprotected CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.8679E-01  2.3574E+02  7.7982E+00
Accumulated dose (rem)  6.5882E+00  1.0746E+03  5.1819E+01

LOCA @ CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.6724E-03  2.4698E+00  7.9248E-02  1.5638E-01
Accumulated dose (rem)  5.5863E-02  2.0650E+01  9.7435E-01  1.6451E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  96.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     7.4839E-03     0.00000
  Co-60     3.0742E-04     0.00000
  Kr-85     9.0114E+02     0.00002
  Kr-85m    1.2161E+03     0.00219
  Kr-87     3.0098E+02     0.00335
  Kr-88     1.6701E+03     0.04342
  Rb-86     3.9228E-01     0.00007
  Sr-89     1.3870E+01     0.01482
  Sr-90     1.8544E+00     0.06209
  Sr-91     1.4001E+01     0.00080
  Sr-92     8.9019E+00     0.00035
  Y-90      5.3837E-02     0.00001
  Y-91      1.8599E-01     0.00023
  Y-92      2.8817E+00     0.00007
  Y-93      1.7593E-01     0.00001
  Zr-95     2.6183E-01     0.00016
  Zr-97     2.3469E-01     0.00003
  Nb-95     2.6275E-01     0.00004
  Mo-99     3.3763E+00     0.00035
  Tc-99m    3.0470E+00     0.00001
  Ru-103    3.0045E+00     0.00071
  Ru-105    1.3128E+00     0.00003
  Ru-106    1.1692E+00     0.01439
  Rh-105    1.9274E+00     0.00005
  Sb-127    3.5034E+00     0.00058
  Sb-129    6.6163E+00     0.00024
  Te-127    3.2074E+00     0.00003
  Te-127m   2.5383E-01     0.00014
  Te-129    7.7436E+00     0.00002
  Te-129m   1.7509E+00     0.00108
  Te-131m   6.8225E+00     0.00128
  Te-132    5.2059E+01     0.01281
  I-131     9.5624E+02     0.51574
  I-132     2.6324E+02     0.01049
  I-133     1.0105E+03     0.12756
  I-134     6.0457E+01     0.00235
  I-135     5.0164E+02     0.02532
  Xe-133    9.7323E+04     0.02246
  Xe-135    1.0543E+04     0.02575
  Cs-134    3.7608E+01     0.04562
  Cs-136    9.4672E+00     0.00206
  Cs-137    2.8853E+01     0.02397
  Ba-139    6.5064E+00     0.00003
  Ba-140    2.6092E+01     0.00257
  La-140    1.0359E+00     0.00016
  La-141    1.4542E-01     0.00000
  La-142    6.5485E-02     0.00000
  Ce-141    6.1827E-01     0.00014
  Ce-143    5.3829E-01     0.00005
  Ce-144    5.1527E-01     0.00496
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Pr-143	2.2529E-01	0.00005
Nd-147	9.7249E-02	0.00002
Np-239	6.8240E+00	0.00046
Pu-238	1.5267E-03	0.01135
Pu-239	1.4293E-04	0.00114
Pu-240	2.5491E-04	0.00203
Pu-241	6.0786E-02	0.00777
Am-241	3.0055E-05	0.00034
Cm-242	1.0639E-02	0.00474
Cm-244	5.4344E-04	0.00347

Environment Compartment Group Inventory Distribution:

Time (h) = 96.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.8648E+22	5.3958E+16
Elemental I (atoms)	3.0046E+19	8.6940E+13
Organic I (atoms)	9.2927E+17	2.6889E+12
Aerosol I (atoms)	9.2848E+18	2.6866E+13
All Aerosols (kg)	3.8248E-04	1.1067E-09

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8648E+22
Elemental I (atoms)	0.0000E+00	3.0047E+19
Organic I (atoms)	0.0000E+00	9.2928E+17
Aerosol I (atoms)	0.0000E+00	9.2867E+18
All Aerosols (kg)	0.0000E+00	3.8256E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3785E+19
Elemental I (atoms)	1.6405E+16	2.3787E+14
Organic I (atoms)	5.0737E+14	7.3569E+12
Aerosol I (atoms)	1.1119E+16	1.9491E+14
All Aerosols (kg)	7.8960E-07	8.0024E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5810E+18
Elemental I (atoms)	0.0000E+00	2.7295E+15
Organic I (atoms)	0.0000E+00	8.4416E+13
Aerosol I (atoms)	0.0000E+00	2.2365E+15
All Aerosols (kg)	0.0000E+00	9.1824E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.5254E+19	7.4303E+15
Elemental I (atoms)	3.0508E+15	0.0000E+00
Organic I (atoms)	9.4354E+13	0.0000E+00
Aerosol I (atoms)	2.5758E+15	0.0000E+00
All Aerosols (kg)	1.0403E-07	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6350E+16
Elemental I (atoms)	0.0000E+00	4.5491E+13
Organic I (atoms)	0.0000E+00	1.4069E+12
Aerosol I (atoms)	0.0000E+00	3.7274E+13
All Aerosols (kg)	0.0000E+00	1.5304E-09

```
Detailed model information at time (hr) =  119.6500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2113E+06

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EAB LOCA Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.6025E-02  2.5764E+01  8.6118E-01
Accumulated dose (rem)  1.9296E+00  2.9424E+02  1.3345E+01

LOCA @ LPZ Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.5874E-04  1.8935E-01  6.3292E-03
Accumulated dose (rem)  8.6463E-02  1.1512E+01  5.8087E-01

LOCA @ Unprotected CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.4345E-02  4.8654E+01  1.5771E+00
Accumulated dose (rem)  6.6825E+00  1.1233E+03  5.3397E+01

LOCA @ CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.9567E-04  3.4936E-01  1.1043E-02  1.7775E-02
Accumulated dose (rem)  5.6258E-02  2.1000E+01  9.8539E-01  1.6629E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 120.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     7.4840E-03     0.00000
  Co-60     3.0743E-04     0.00000
  Kr-85     1.0874E+03     0.00002
  Kr-85m    1.2161E+03     0.00216
  Kr-87     3.0098E+02     0.00331
  Kr-88     1.6701E+03     0.04282
  Rb-86     3.9228E-01     0.00007
  Sr-89     1.3870E+01     0.01461
  Sr-90     1.8544E+00     0.06123
  Sr-91     1.4001E+01     0.00079
  Sr-92     8.9019E+00     0.00035
  Y-90      5.3855E-02     0.00001
  Y-91      1.8600E-01     0.00023
  Y-92      2.8817E+00     0.00007
  Y-93      1.7593E-01     0.00001
  Zr-95     2.6183E-01     0.00016
  Zr-97     2.3469E-01     0.00003
  Nb-95     2.6275E-01     0.00004
  Mo-99     3.3763E+00     0.00035
  Tc-99m    3.0471E+00     0.00001
  Ru-103    3.0045E+00     0.00070
  Ru-105    1.3128E+00     0.00003
  Ru-106    1.1693E+00     0.01419
```

Rh-105	1.9274E+00	0.00005
Sb-127	3.5035E+00	0.00057
Sb-129	6.6163E+00	0.00024
Te-127	3.2075E+00	0.00003
Te-127m	2.5383E-01	0.00014
Te-129	7.7436E+00	0.00002
Te-129m	1.7509E+00	0.00107
Te-131m	6.8225E+00	0.00127
Te-132	5.2059E+01	0.01263
I-131	1.0794E+03	0.52151
I-132	2.6324E+02	0.01034
I-133	1.0209E+03	0.12599
I-134	6.0457E+01	0.00232
I-135	5.0164E+02	0.02497
Xe-133	1.1149E+05	0.02289
Xe-135	1.0550E+04	0.02540
Cs-134	3.7609E+01	0.04499
Cs-136	9.4673E+00	0.00203
Cs-137	2.8854E+01	0.02363
Ba-139	6.5064E+00	0.00003
Ba-140	2.6092E+01	0.00254
La-140	1.0361E+00	0.00016
La-141	1.4542E-01	0.00000
La-142	6.5485E-02	0.00000
Ce-141	6.1828E-01	0.00014
Ce-143	5.3829E-01	0.00005
Ce-144	5.1528E-01	0.00490
Pr-143	2.2530E-01	0.00005
Nd-147	9.7250E-02	0.00002
Np-239	6.8240E+00	0.00045
Pu-238	1.5267E-03	0.01119
Pu-239	1.4294E-04	0.00112
Pu-240	2.5492E-04	0.00200
Pu-241	6.0787E-02	0.00766
Am-241	3.0055E-05	0.00034
Cm-242	1.0639E-02	0.00467
Cm-244	5.4344E-04	0.00342

Environment Compartment Group Inventory Distribution:

Time (h) = 120.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.2355E+22	5.1747E+16
Elemental I (atoms)	3.4517E+19	7.9901E+13
Organic I (atoms)	1.0675E+18	2.4712E+12
Aerosol I (atoms)	9.2849E+18	2.1493E+13
All Aerosols (kg)	3.8248E-04	8.8538E-10

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2355E+22
Elemental I (atoms)	0.0000E+00	3.4518E+19
Organic I (atoms)	0.0000E+00	1.0676E+18
Aerosol I (atoms)	0.0000E+00	9.2867E+18
All Aerosols (kg)	0.0000E+00	3.8257E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5258E+19
Elemental I (atoms)	1.6632E+16	2.5564E+14
Organic I (atoms)	5.1439E+14	7.9063E+12
Aerosol I (atoms)	1.0136E+16	1.9491E+14
All Aerosols (kg)	7.8919E-07	8.0025E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

```
                          Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.7500E+18
Elemental I (atoms)      0.0000E+00   2.9333E+15
Organic I (atoms)        0.0000E+00   9.0720E+13
Aerosol I (atoms)        0.0000E+00   2.2365E+15
All Aerosols (kg)        0.0000E+00   9.1824E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      1.6919E+19   9.4505E+15
Elemental I (atoms)      3.3052E+15   0.0000E+00
Organic I (atoms)        1.0222E+14   0.0000E+00
Aerosol I (atoms)        2.5975E+15   0.0000E+00
All Aerosols (kg)        1.0405E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.9167E+16
Elemental I (atoms)      0.0000E+00   4.8888E+13
Organic I (atoms)        0.0000E+00   1.5120E+12
Aerosol I (atoms)        0.0000E+00   3.7275E+13
All Aerosols (kg)        0.0000E+00   1.5304E-09

Detailed model information at time (hr) =  239.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2120E+06

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EAB LOCA Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.6063E-01  9.9064E+01  3.2773E+00
Accumulated dose (rem)  2.1902E+00  3.9330E+02  1.6623E+01

LOCA @ LPZ Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.9154E-03  7.2806E-01  2.4086E-02
Accumulated dose (rem)  8.8378E-02  1.2240E+01  6.0496E-01

LOCA @ Unprotected CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.2343E-01  1.8707E+02  6.0203E+00
Accumulated dose (rem)  7.0060E+00  1.3104E+03  5.9417E+01

LOCA @ CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.3347E-03  1.3267E+00  4.1736E-02  6.0880E-02
Accumulated dose (rem)  5.7593E-02  2.2326E+01  1.0271E+00  1.7238E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 240.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Co-58	7.4845E-03	0.00000
Co-60	3.0745E-04	0.00000
Kr-85	2.0181E+03	0.00002
Kr-85m	1.2161E+03	0.00205
Kr-87	3.0098E+02	0.00314
Kr-88	1.6701E+03	0.04067
Rb-86	3.9231E-01	0.00006
Sr-89	1.3871E+01	0.01388
Sr-90	1.8546E+00	0.05815
Sr-91	1.4001E+01	0.00075
Sr-92	8.9019E+00	0.00033
Y-90	5.3968E-02	0.00001
Y-91	1.8601E-01	0.00022
Y-92	2.8817E+00	0.00006
Y-93	1.7593E-01	0.00001
Zr-95	2.6185E-01	0.00015
Zr-97	2.3469E-01	0.00003
Nb-95	2.6277E-01	0.00004
Mo-99	3.3763E+00	0.00033
Tc-99m	3.0471E+00	0.00001
Ru-103	3.0047E+00	0.00067
Ru-105	1.3128E+00	0.00003
Ru-106	1.1693E+00	0.01348
Rh-105	1.9274E+00	0.00005
Sb-127	3.5035E+00	0.00054
Sb-129	6.6163E+00	0.00022
Te-127	3.2075E+00	0.00002
Te-127m	2.5385E-01	0.00013
Te-129	7.7437E+00	0.00002
Te-129m	1.7511E+00	0.00102
Te-131m	6.8225E+00	0.00120
Te-132	5.2060E+01	0.01200
I-131	1.5583E+03	0.54302
I-132	2.6324E+02	0.00982
I-133	1.0293E+03	0.11980
I-134	6.0457E+01	0.00220
I-135	5.0164E+02	0.02371
Xe-133	1.6006E+05	0.02415
Xe-135	1.0552E+04	0.02412
Cs-134	3.7612E+01	0.04272
Cs-136	9.4678E+00	0.00193
Cs-137	2.8856E+01	0.02244
Ba-139	6.5064E+00	0.00003
Ba-140	2.6094E+01	0.00241
La-140	1.0375E+00	0.00015
La-141	1.4542E-01	0.00000
La-142	6.5485E-02	0.00000
Ce-141	6.1831E-01	0.00013
Ce-143	5.3830E-01	0.00005
Ce-144	5.1531E-01	0.00465
Pr-143	2.2531E-01	0.00004
Nd-147	9.7255E-02	0.00002
Np-239	6.8241E+00	0.00043
Pu-238	1.5269E-03	0.01062
Pu-239	1.4295E-04	0.00106
Pu-240	2.5494E-04	0.00190
Pu-241	6.0791E-02	0.00728
Am-241	3.0058E-05	0.00032
Cm-242	1.0640E-02	0.00444
Cm-244	5.4348E-04	0.00325

Environment Compartment Group Inventory Distribution:

Time (h) = 240.0000	Total Release	Release Rate/s
Noble gases (atoms)	4.0336E+22	4.6685E+16

```
Elemental I (atoms)    5.1775E+19  5.9925E+13
Organic I (atoms)      1.6013E+18  1.8534E+12
Aerosol I (atoms)      9.2852E+18  1.0747E+13
All Aerosols (kg)      3.8251E-04  4.4272E-10

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   4.0336E+22
Elemental I (atoms)      0.0000E+00   5.1775E+19
Organic I (atoms)        0.0000E+00   1.6013E+18
Aerosol I (atoms)        0.0000E+00   9.2870E+18
All Aerosols (kg)        0.0000E+00   3.8259E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.2402E+19
Elemental I (atoms)      1.6157E+16   3.2421E+14
Organic I (atoms)        4.9970E+14   1.0027E+13
Aerosol I (atoms)        6.5464E+15   1.9491E+14
All Aerosols (kg)        7.8752E-07   8.0025E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.5698E+18
Elemental I (atoms)      0.0000E+00   3.7201E+15
Organic I (atoms)        0.0000E+00   1.1505E+14
Aerosol I (atoms)        0.0000E+00   2.2365E+15
All Aerosols (kg)        0.0000E+00   9.1825E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      2.4897E+19   1.9560E+16
Elemental I (atoms)      4.3164E+15   0.0000E+00
Organic I (atoms)        1.3350E+14   0.0000E+00
Aerosol I (atoms)        2.6961E+15   0.0000E+00
All Aerosols (kg)        1.0413E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   4.2830E+16
Elemental I (atoms)      0.0000E+00   6.2001E+13
Organic I (atoms)        0.0000E+00   1.9176E+12
Aerosol I (atoms)        0.0000E+00   3.7275E+13
All Aerosols (kg)        0.0000E+00   1.5304E-09

Detailed model information at time (hr) =  479.7000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2135E+06

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EAB LOCA Doses:

Time (h) = 480.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.1160E-01	1.0582E+02	3.4335E+00
Accumulated dose (rem)	2.4018E+00	4.9912E+02	2.0056E+01

LOCA @ LPZ Doses:

Time (h) = 480.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5552E-03	7.7771E-01	2.5234E-02
Accumulated dose (rem)	8.9934E-02	1.3018E+01	6.3019E-01

LOCA @ Unprotected CR Doses:

Time (h) = 480.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.6259E-01	1.9983E+02	6.3469E+00
Accumulated dose (rem)	7.2686E+00	1.5102E+03	6.5764E+01

LOCA @ CR Doses:

Time (h) = 480.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	1.0516E-03	1.4172E+00	4.4201E-02	5.1303E-02
Accumulated dose (rem)	5.8645E-02	2.3744E+01	1.0713E+00	1.7751E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 480.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 1
Co-58	7.4854E-03	0.00000
Co-60	3.0749E-04	0.00000
Kr-85	3.8754E+03	0.00002
Kr-85m	1.2161E+03	0.00195
Kr-87	3.0098E+02	0.00298
Kr-88	1.6701E+03	0.03862
Rb-86	3.9234E-01	0.00006
Sr-89	1.3872E+01	0.01318
Sr-90	1.8548E+00	0.05522
Sr-91	1.4001E+01	0.00071
Sr-92	8.9019E+00	0.00031
Y-90	5.4226E-02	0.00001
Y-91	1.8604E-01	0.00021
Y-92	2.8817E+00	0.00006
Y-93	1.7593E-01	0.00001
Zr-95	2.6188E-01	0.00014
Zr-97	2.3469E-01	0.00003
Nb-95	2.6281E-01	0.00004
Mo-99	3.3764E+00	0.00031
Tc-99m	3.0471E+00	0.00001
Ru-103	3.0051E+00	0.00063
Ru-105	1.3128E+00	0.00003
Ru-106	1.1695E+00	0.01280
Rh-105	1.9274E+00	0.00004
Sb-127	3.5036E+00	0.00051
Sb-129	6.6163E+00	0.00021
Te-127	3.2076E+00	0.00002
Te-127m	2.5389E-01	0.00013
Te-129	7.7438E+00	0.00002
Te-129m	1.7512E+00	0.00096
Te-131m	6.8225E+00	0.00114
Te-132	5.2060E+01	0.01139
I-131	2.0714E+03	0.56425
I-132	2.6324E+02	0.00933
I-133	1.0295E+03	0.11377
I-134	6.0457E+01	0.00209
I-135	5.0164E+02	0.02252
Xe-133	1.9810E+05	0.02473
Xe-135	1.0554E+04	0.02290

Cs-134	3.7617E+01	0.04057
Cs-136	9.4684E+00	0.00183
Cs-137	2.8860E+01	0.02131
Ba-139	6.5064E+00	0.00003
Ba-140	2.6095E+01	0.00229
La-140	1.0394E+00	0.00014
La-141	1.4542E-01	0.00000
La-142	6.5485E-02	0.00000
Ce-141	6.1838E-01	0.00013
Ce-143	5.3830E-01	0.00004
Ce-144	5.1538E-01	0.00442
Pr-143	2.2533E-01	0.00004
Nd-147	9.7260E-02	0.00002
Np-239	6.8241E+00	0.00041
Pu-238	1.5271E-03	0.01009
Pu-239	1.4297E-04	0.00101
Pu-240	2.5497E-04	0.00180
Pu-241	6.0800E-02	0.00691
Am-241	3.0062E-05	0.00031
Cm-242	1.0641E-02	0.00421
Cm-244	5.4356E-04	0.00309

Environment Compartment Group Inventory Distribution:

Time (h) = 480.0000	Total Release	Release Rate/s
Noble gases (atoms)	7.4796E+22	4.3285E+16
Elemental I (atoms)	7.0229E+19	4.0642E+13
Organic I (atoms)	2.1720E+18	1.2570E+12
Aerosol I (atoms)	9.2855E+18	5.3735E+12
All Aerosols (kg)	3.8257E-04	2.2139E-10

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4796E+22
Elemental I (atoms)	0.0000E+00	7.0229E+19
Organic I (atoms)	0.0000E+00	2.1720E+18
Aerosol I (atoms)	0.0000E+00	9.2873E+18
All Aerosols (kg)	0.0000E+00	3.8265E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6094E+19
Elemental I (atoms)	1.1389E+16	3.9752E+14
Organic I (atoms)	3.5223E+14	1.2295E+13
Aerosol I (atoms)	2.7635E+15	1.9491E+14
All Aerosols (kg)	7.8521E-07	8.0027E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.1408E+18
Elemental I (atoms)	0.0000E+00	4.5614E+15
Organic I (atoms)	0.0000E+00	1.4107E+14
Aerosol I (atoms)	0.0000E+00	2.2365E+15
All Aerosols (kg)	0.0000E+00	9.1827E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	4.0186E+19	3.9782E+16
Elemental I (atoms)	5.5543E+15	0.0000E+00
Organic I (atoms)	1.7178E+14	0.0000E+00
Aerosol I (atoms)	2.8688E+15	0.0000E+00

```
All Aerosols (kg)        1.0430E-07   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) = 480.0000        Filtered    Transported
Noble gases (atoms)       0.0000E+00   6.9014E+16
Elemental I (atoms)       0.0000E+00   7.6023E+13
Organic I (atoms)         0.0000E+00   2.3512E+12
Aerosol I (atoms)         0.0000E+00   3.7275E+13
All Aerosols (kg)         0.0000E+00   1.5305E-09

Detailed model information at time (hr) =  719.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2148E+06

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EAB LOCA Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.1327E-02  4.4632E+01  1.4204E+00
Accumulated dose (rem)  2.4631E+00  5.4375E+02  2.1476E+01

LOCA @ LPZ Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.5071E-04  3.2802E-01  1.0439E-02
Accumulated dose (rem)  9.0384E-02  1.3346E+01  6.4063E-01

LOCA @ Unprotected CR Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.6104E-02  8.4284E+01  2.6425E+00
Accumulated dose (rem)  7.3447E+00  1.5945E+03  6.8406E+01

LOCA @ CR Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.8583E-04  5.9773E-01  1.8487E-02  1.8001E-02
Accumulated dose (rem)  5.8931E-02  2.4341E+01  1.0898E+00  1.7931E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 720.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  1
  Co-58     7.4863E-03     0.00000
  Co-60     3.0754E-04     0.00000
  Kr-85     5.7274E+03     0.00003
  Kr-85m    1.2161E+03     0.00191
  Kr-87     3.0098E+02     0.00292
  Kr-88     1.6701E+03     0.03782
  Rb-86     3.9236E-01     0.00006
  Sr-89     1.3874E+01     0.01291
  Sr-90     1.8551E+00     0.05408
  Sr-91     1.4001E+01     0.00069
  Sr-92     8.9019E+00     0.00031
  Y-90      5.4491E-02     0.00001
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Y-91	1.8606E-01	0.00020
Y-92	2.8817E+00	0.00006
Y-93	1.7593E-01	0.00001
Zr-95	2.6191E-01	0.00014
Zr-97	2.3469E-01	0.00003
Nb-95	2.6284E-01	0.00004
Mo-99	3.3764E+00	0.00031
Tc-99m	3.0471E+00	0.00001
Ru-103	3.0053E+00	0.00062
Ru-105	1.3128E+00	0.00003
Ru-106	1.1697E+00	0.01254
Rh-105	1.9274E+00	0.00004
Sb-127	3.5036E+00	0.00050
Sb-129	6.6163E+00	0.00021
Te-127	3.2076E+00	0.00002
Te-127m	2.5392E-01	0.00012
Te-129	7.7439E+00	0.00002
Te-129m	1.7514E+00	0.00094
Te-131m	6.8225E+00	0.00112
Te-132	5.2060E+01	0.01116
I-131	2.2878E+03	0.57272
I-132	2.6324E+02	0.00914
I-133	1.0295E+03	0.11143
I-134	6.0457E+01	0.00205
I-135	5.0164E+02	0.02206
Xe-133	2.0824E+05	0.02469
Xe-135	1.0555E+04	0.02243
Cs-134	3.7622E+01	0.03974
Cs-136	9.4688E+00	0.00180
Cs-137	2.8864E+01	0.02088
Ba-139	6.5064E+00	0.00003
Ba-140	2.6096E+01	0.00224
La-140	1.0405E+00	0.00014
La-141	1.4542E-01	0.00000
La-142	6.5485E-02	0.00000
Ce-141	6.1843E-01	0.00012
Ce-143	5.3830E-01	0.00004
Ce-144	5.1545E-01	0.00432
Pr-143	2.2534E-01	0.00004
Nd-147	9.7263E-02	0.00002
Np-239	6.8241E+00	0.00040
Pu-238	1.5273E-03	0.00988
Pu-239	1.4299E-04	0.00099
Pu-240	2.5501E-04	0.00176
Pu-241	6.0809E-02	0.00677
Am-241	3.0068E-05	0.00030
Cm-242	1.0643E-02	0.00413
Cm-244	5.4364E-04	0.00303

Environment Compartment Group Inventory Distribution:

Time (h) = 720.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.0848E+23	4.1853E+16
Elemental I (atoms)	7.8012E+19	3.0097E+13
Organic I (atoms)	2.4127E+18	9.3084E+11
Aerosol I (atoms)	9.2856E+18	3.5824E+12
All Aerosols (kg)	3.8262E-04	1.4762E-10

Primary Containment to Environment - Bypass Lea Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0848E+23
Elemental I (atoms)	0.0000E+00	7.8012E+19
Organic I (atoms)	0.0000E+00	2.4127E+18
Aerosol I (atoms)	0.0000E+00	9.2874E+18
All Aerosols (kg)	0.0000E+00	3.8270E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.9479E+19
Elemental I (atoms)	6.7360E+15	4.2845E+14
Organic I (atoms)	2.0833E+14	1.3251E+13
Aerosol I (atoms)	1.1669E+15	1.9491E+14
All Aerosols (kg)	7.8356E-07	8.0030E-09

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.6767E+18
Elemental I (atoms)	0.0000E+00	4.9162E+15
Organic I (atoms)	0.0000E+00	1.5205E+14
Aerosol I (atoms)	0.0000E+00	2.2365E+15
All Aerosols (kg)	0.0000E+00	9.1830E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	5.5132E+19	6.0004E+16
Elemental I (atoms)	6.2677E+15	0.0000E+00
Organic I (atoms)	1.9385E+14	0.0000E+00
Aerosol I (atoms)	3.0287E+15	0.0000E+00
All Aerosols (kg)	1.0445E-07	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.4611E+16
Elemental I (atoms)	0.0000E+00	8.1937E+13
Organic I (atoms)	0.0000E+00	2.5341E+12
Aerosol I (atoms)	0.0000E+00	3.7275E+13
All Aerosols (kg)	0.0000E+00	1.5305E-09

1537

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:04:48

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

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

Time (hr)	Primary Containment I-131 (Curies)	Environment I-131 (Curies)	Control Room I-131 (Curies)
0.000	6.0244E+03	0.0000E+00	0.0000E+00
0.200	2.0186E+06	0.0000E+00	0.0000E+00
0.400	3.7655E+06	0.0000E+00	0.0000E+00
0.500	4.5492E+06	0.0000E+00	0.0000E+00
0.700	7.5569E+06	0.0000E+00	0.0000E+00
0.900	1.0425E+07	0.0000E+00	0.0000E+00
1.100	1.3154E+07	0.0000E+00	0.0000E+00
1.300	1.5749E+07	0.0000E+00	0.0000E+00
1.500	1.8215E+07	0.0000E+00	0.0000E+00
1.700	2.0557E+07	0.0000E+00	0.0000E+00
1.900	2.2781E+07	0.0000E+00	0.0000E+00
2.000	2.3851E+07	0.0000E+00	0.0000E+00
2.200	1.9563E+07	4.0190E+01	1.0265E-02
2.400	1.6102E+07	7.3208E+01	1.7394E-02
2.600	1.3307E+07	1.0044E+02	2.2138E-02
2.800	1.1052E+07	1.2299E+02	2.5085E-02
3.000	9.2305E+06	1.4177E+02	2.6694E-02

3.200	7.7602E+06	1.5751E+02	2.7321E-02
3.400	6.5731E+06	1.7079E+02	2.7240E-02
3.600	5.6147E+06	1.8208E+02	2.6662E-02
3.800	4.8408E+06	1.9176E+02	2.5748E-02
4.000	4.2159E+06	2.0016E+02	2.4620E-02
4.200	3.7112E+06	2.0751E+02	2.3368E-02
4.400	3.3037E+06	2.1401E+02	2.2060E-02
4.600	2.9744E+06	2.1983E+02	2.0744E-02
4.800	2.7085E+06	2.2510E+02	1.9454E-02
5.000	2.4935E+06	2.2993E+02	1.8215E-02
5.200	2.3846E+06	2.3446E+02	1.7058E-02
5.400	2.2887E+06	2.3880E+02	1.6000E-02
5.600	2.2042E+06	2.4297E+02	1.5034E-02
5.800	2.1297E+06	2.4699E+02	1.4152E-02
6.000	2.0641E+06	2.5089E+02	1.3350E-02
6.200	2.0062E+06	2.5467E+02	1.2620E-02
6.400	1.9551E+06	2.5835E+02	1.1957E-02
6.600	1.9101E+06	2.6194E+02	1.1355E-02
6.800	1.8703E+06	2.6545E+02	1.0810E-02
7.000	1.8352E+06	2.6889E+02	1.0317E-02
7.200	1.8042E+06	2.7227E+02	9.8704E-03
7.400	1.7768E+06	2.7560E+02	9.4668E-03
7.600	1.7525E+06	2.7888E+02	9.1023E-03
7.800	1.7311E+06	2.8211E+02	8.7732E-03
8.000	1.7120E+06	2.8531E+02	8.4764E-03
8.200	1.6952E+06	2.8847E+02	7.6910E-03
8.333	1.6853E+06	2.9057E+02	7.2221E-03
8.533	1.6728E+06	2.9369E+02	6.5919E-03
8.733	1.6615E+06	2.9678E+02	6.0398E-03
8.933	1.6514E+06	2.9986E+02	5.5561E-03
9.133	1.6422E+06	3.0292E+02	5.1322E-03
9.333	1.6338E+06	3.0597E+02	4.7607E-03
9.533	1.6263E+06	3.0899E+02	4.4351E-03
9.733	1.6194E+06	3.1201E+02	4.1496E-03
9.933	1.6131E+06	3.1501E+02	3.8993E-03
10.133	1.6074E+06	3.1800E+02	3.6798E-03
12.000	1.5720E+06	3.4554E+02	2.5710E-03
19.444	1.5178E+06	4.5222E+02	2.0626E-03
24.000	1.4929E+06	5.1598E+02	2.0254E-03
96.000	1.1523E+06	9.5624E+02	4.7488E-04
720.000	1.2213E+05	2.2878E+03	4.2206E-05

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

	EAB LOCA		LOCA @ LPZ		LOCA @ Unprotected CR	
Time	Thyroid	TEDE	Thyroid	TEDE	Thyroid	TEDE
(hr)	(rem)	(rem)	(rem)	(rem)	(rem)	(rem)
0.000	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.200	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.400	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
0.700	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.900	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.100	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.300	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.500	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
1.900	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
2.200	1.8150E+01	1.0943E+00	1.0715E+00	6.4601E-02	9.2936E+01	5.6031E+00
2.400	3.3016E+01	1.9886E+00	1.9491E+00	1.1740E-01	1.6906E+02	1.0182E+01
2.600	4.5236E+01	2.7218E+00	2.6705E+00	1.6068E-01	2.3163E+02	1.3937E+01
2.800	5.5324E+01	3.3252E+00	3.2661E+00	1.9631E-01	2.8329E+02	1.7027E+01
3.000	6.3696E+01	3.8240E+00	3.7603E+00	2.2575E-01	3.2615E+02	1.9581E+01
3.200	7.0683E+01	4.2383E+00	4.1729E+00	2.5021E-01	3.6193E+02	2.1702E+01
3.400	7.6555E+01	4.5845E+00	4.5195E+00	2.7065E-01	3.9200E+02	2.3475E+01
3.600	8.1529E+01	4.8756E+00	4.8132E+00	2.8784E-01	4.1747E+02	2.4965E+01
3.800	8.5778E+01	5.1221E+00	5.0640E+00	3.0239E-01	4.3923E+02	2.6228E+01

4.000	8.9443E+01	5.3327E+00	5.2804E+00	3.1482E-01	4.5799E+02	2.7306E+01
4.200	9.2636E+01	5.5140E+00	5.4689E+00	3.2552E-01	4.7434E+02	2.8234E+01
4.400	9.5449E+01	5.6716E+00	5.6349E+00	3.3483E-01	4.8875E+02	2.9041E+01
4.600	9.7955E+01	5.8100E+00	5.7829E+00	3.4300E-01	5.0158E+02	2.9750E+01
4.800	1.0021E+02	5.9327E+00	5.9162E+00	3.5024E-01	5.1314E+02	3.0378E+01
5.000	1.0227E+02	6.0427E+00	6.0377E+00	3.5674E-01	5.2368E+02	3.0941E+01
5.200	1.0419E+02	6.1439E+00	6.1513E+00	3.6271E-01	5.3353E+02	3.1460E+01
5.400	1.0603E+02	6.2392E+00	6.2597E+00	3.6834E-01	5.4293E+02	3.1948E+01
5.600	1.0779E+02	6.3294E+00	6.3636E+00	3.7366E-01	5.5195E+02	3.2409E+01
5.800	1.0948E+02	6.4148E+00	6.4635E+00	3.7871E-01	5.6061E+02	3.2847E+01
6.000	1.1112E+02	6.4961E+00	6.5599E+00	3.8351E-01	5.6897E+02	3.3263E+01
6.200	1.1270E+02	6.5737E+00	6.6532E+00	3.8809E-01	5.7706E+02	3.3661E+01
6.400	1.1423E+02	6.6480E+00	6.7436E+00	3.9247E-01	5.8491E+02	3.4041E+01
6.600	1.1572E+02	6.7194E+00	6.8317E+00	3.9669E-01	5.9255E+02	3.4406E+01
6.800	1.1718E+02	6.7881E+00	6.9176E+00	4.0074E-01	5.9999E+02	3.4758E+01
7.000	1.1860E+02	6.8544E+00	7.0015E+00	4.0465E-01	6.0728E+02	3.5098E+01
7.200	1.1999E+02	6.9185E+00	7.0838E+00	4.0844E-01	6.1441E+02	3.5426E+01
7.400	1.2136E+02	6.9807E+00	7.1645E+00	4.1212E-01	6.2141E+02	3.5745E+01
7.600	1.2270E+02	7.0412E+00	7.2439E+00	4.1569E-01	6.2830E+02	3.6055E+01
7.800	1.2403E+02	7.1002E+00	7.3221E+00	4.1917E-01	6.3508E+02	3.6356E+01
8.000	1.2533E+02	7.1577E+00	7.3992E+00	4.2256E-01	6.4176E+02	3.6651E+01
8.200	1.2600E+02	7.1931E+00	7.4271E+00	4.2405E-01	6.4462E+02	3.6775E+01
8.333	1.2643E+02	7.2162E+00	7.4456E+00	4.2503E-01	6.4651E+02	3.6857E+01
8.533	1.2708E+02	7.2504E+00	7.4730E+00	4.2647E-01	6.4932E+02	3.6977E+01
8.733	1.2773E+02	7.2839E+00	7.5003E+00	4.2788E-01	6.5210E+02	3.7096E+01
8.933	1.2837E+02	7.3168E+00	7.5272E+00	4.2927E-01	6.5486E+02	3.7212E+01
9.133	1.2901E+02	7.3491E+00	7.5540E+00	4.3063E-01	6.5759E+02	3.7327E+01
9.333	1.2964E+02	7.3809E+00	7.5806E+00	4.3197E-01	6.6031E+02	3.7440E+01
9.533	1.3026E+02	7.4122E+00	7.6070E+00	4.3329E-01	6.6301E+02	3.7551E+01
9.733	1.3088E+02	7.4430E+00	7.6333E+00	4.3459E-01	6.6570E+02	3.7661E+01
9.933	1.3150E+02	7.4733E+00	7.6594E+00	4.3587E-01	6.6836E+02	3.7770E+01
10.133	1.3212E+02	7.5033E+00	7.6853E+00	4.3713E-01	6.7102E+02	3.7877E+01
12.000	1.3774E+02	7.7664E+00	7.9223E+00	4.4823E-01	6.9524E+02	3.8830E+01
19.444	1.5886E+02	8.6583E+00	8.8131E+00	4.8584E-01	7.8630E+02	4.2177E+01
24.000	1.7107E+02	9.1353E+00	9.3276E+00	5.0595E-01	8.3890E+02	4.4021E+01
96.000	2.6847E+02	1.2484E+01	1.1323E+01	5.7454E-01	1.0746E+03	5.1819E+01
720.000	5.4375E+02	2.1476E+01	1.3346E+01	6.4063E-01	1.5945E+03	6.8406E+01

LOCA @ CR

Time (hr)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00
0.200	0.0000E+00	0.0000E+00
0.400	0.0000E+00	0.0000E+00
0.500	0.0000E+00	0.0000E+00
0.700	0.0000E+00	0.0000E+00
0.900	0.0000E+00	0.0000E+00
1.100	0.0000E+00	0.0000E+00
1.300	0.0000E+00	0.0000E+00
1.500	0.0000E+00	0.0000E+00
1.700	0.0000E+00	0.0000E+00
1.900	0.0000E+00	0.0000E+00
2.000	0.0000E+00	0.0000E+00
2.200	1.4458E-01	8.2224E-03
2.400	5.1869E-01	2.9475E-02
2.600	1.0482E+00	5.9510E-02
2.800	1.6772E+00	9.5124E-02
3.000	2.3638E+00	1.3392E-01
3.200	3.0775E+00	1.7415E-01
3.400	3.7959E+00	2.1452E-01
3.600	4.5033E+00	2.5414E-01
3.800	5.1889E+00	2.9239E-01
4.000	5.8457E+00	3.2888E-01
4.200	6.4696E+00	3.6336E-01
4.400	7.0583E+00	3.9572E-01
4.600	7.6112E+00	4.2591E-01
4.800	8.1289E+00	4.5398E-01
5.000	8.6124E+00	4.8000E-01
5.200	9.0636E+00	5.0407E-01
5.400	9.4852E+00	5.2634E-01

5.600	9.8796E+00	5.4698E-01
5.800	1.0249E+01	5.6612E-01
6.000	1.0597E+01	5.8390E-01
6.200	1.0923E+01	6.0045E-01
6.400	1.1232E+01	6.1586E-01
6.600	1.1523E+01	6.3025E-01
6.800	1.1800E+01	6.4371E-01
7.000	1.2062E+01	6.5632E-01
7.200	1.2312E+01	6.6817E-01
7.400	1.2551E+01	6.7933E-01
7.600	1.2779E+01	6.8986E-01
7.800	1.2998E+01	6.9982E-01
8.000	1.3209E+01	7.0927E-01
8.200	1.3406E+01	7.1801E-01
8.333	1.3528E+01	7.2334E-01
8.533	1.3695E+01	7.3069E-01
8.733	1.3848E+01	7.3734E-01
8.933	1.3989E+01	7.4339E-01
9.133	1.4118E+01	7.4890E-01
9.333	1.4237E+01	7.5395E-01
9.533	1.4347E+01	7.5859E-01
9.733	1.4450E+01	7.6287E-01
9.933	1.4546E+01	7.6683E-01
10.133	1.4637E+01	7.7052E-01
12.000	1.5302E+01	7.9646E-01
19.444	1.7155E+01	8.6100E-01
24.000	1.8181E+01	8.9510E-01
96.000	2.0650E+01	9.7435E-01
720.000	2.4341E+01	1.0898E+00

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:04:48

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

            LOCA PPL-SSES   Primary Containment Leakage directly to Env.

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

EAB LOCA
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
    2.0   5.3387E-01   8.9443E+01   5.3327E+00

#####################################################################
                          Final Doses
#####################################################################

LOCA @ LPZ
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   9.0384E-02   1.3346E+01   6.4063E-01

LOCA @ Unprotected CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   7.3447E+00   1.5945E+03   6.8406E+01

LOCA @ CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   5.8931E-02   2.4341E+01   1.0898E+00
```

Attachment 15 RADTRAD Output:
Attch 15 MSIV_Atrium11_600cfm_Drywell Only 0-2hr.o0

7

All Attachment 15 Pages Revised for Rev 7

```
 ######################################################################
     ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:08:49

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

             LOCA AST- MSIV Leakage

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

 Input File Name      = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 15
MSIV_Atrium11_600cfm_Drywell Only 0-2hr.psf
 Output File Name     = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 15
MSIV_Atrium11_600cfm_Drywell Only 0-2hr.o0

 Inventory file       =  c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Release file         =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\msiv-imrel.rft
 Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp




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


   Radtrad 3.10  Rev. 4
   LOCA AST- MSIV Leakage
 Dose Conversion Factor File:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
 Release Fraction & Timing Files:
   1
   c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\msiv-imrel.rft
 Nuclide Inventory Files:
   1
   1 c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Plant Power Level:
   4.032E+03
 Number of Compartments:
   8
 Compartment 1:
   Primary Containment
   3
   2.396E+05
   0
   0
   0
   1
   0
 Compartment 2:
   Intact MSL No. A
   3
   6.78E+01
   0
   0
   0
   0
   0
 Compartment 3:
   Intact MSL No. B
   3
```

```
  7.39E+01
  0
  0
  0
  0
  0
Compartment 4:
  Intact MSL No. D
  3
  6.78E+01
  0
  0
  0
  0
  0
Compartment 5:
  Drain Pathway Mixing Volume
  3
  1.00E+00
  0
  0
  0
  0
  0
Compartment 6:
  Effective Condenser
  3
  9.86E+04
  0
  0
  0
  0
  0
Compartment 7:
  Environment
  2
  0.00E+00
  0
  0
  0
  0
  0
Compartment 8:
  Control Room
  1
  5.18E+05
  0
  0
  0
  0
  0
Number of Pathways:
 13
Pathway 1:
  Primary Containment to Drain Pathway Mixing Volume - Faulted MSL No. C
  1
  5
  2
Pathway 2:
  Primary Containment to Intact MSL No. A
  1
  2
  2
Pathway 3:
  Primary Containment to Intact MSL No. B
  1
  3
  2
Pathway 4:
  Primary Containment to Intact MSL No. D
```

```
  1
  4
  2
Pathway 5:
  Intact MSL No. A to Drain Pathway Mixing Volume
  2
  5
  2
Pathway 6:
  Intact MSL No. B to Drain Pathway Mixing Volume
  3
  5
  2
Pathway 7:
  Intact MSL No. D to Drain Pathway Mixing Volume
  4
  5
  2
Pathway 8:
  Drain Pathway Mixing Volume to Effective Condenser
  5
  6
  2
Pathway 9:
  Effective Condenser to Environment
  6
  7
  2
Pathway 10:
  Environment to Control Room - Emergency Filtered Air Intake
  7
  8
  2
Pathway 11:
  Environment to Control Room - Unfiltered Air Intake
  7
  8
  2
Pathway 12:
  Control Room to Environment - CR Exhaust
  8
  7
  2
Pathway 13:
  Environment to  Control Room ingress/egress
  7
  8
  2
  End of Plant Model
Source Term Input:
  1
  1  1  1  1
  0.00E+00
  0.00E+00   7.2E+02
  1
  2   9.5E-01   4.85E-02   1.5E-03
Overlying Pool:
  0
  0.00E+00
  0
  0
  0
  0
Compartments:
  8
Compartment 1:
  0
  1
  0
  0
```

```
  0
  0
  0
  3
  3
  1.00E+01
  1
  1
  0.00E+00   0.00E+00
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
  0
  0
  0
Compartment 7:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 8:
```

```
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
 13
Pathway 1:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.97E+00   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   0.00E+00   0.00E+00   0.00E+00
  2.4E+01   6.55E-01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   0.00E+00   0.00E+00   0.00E+00
  2.4E+01   6.55E-01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
```

```
  0
Pathway 4:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   0.00E+00   0.00E+00   0.00E+00
  2.4E+01   6.55E-01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   1.48E+01   6.52E+00   0.00E+00
  2.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   1.59E+01   7.06E+00   0.00E+00
  2.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 7:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   1.48E+01   6.52E+00   0.00E+00
```

```
  2.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 8:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   5.9E+00   6.7E+00   4.27E+00   0.00E+00
  2.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 9:
  1
  0
  0
  0
  0
  1
  4
  0.00E+00   5.9E+00   9.96E+01   9.96E+01   0.00E+00
  5.00E-01   5.9E+00   9.96E+01   9.96E+01   0.00E+00
  2.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 10:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   5.229E+03   9.9E+01   9.9E+01   9.9E+01
  2.00E+00   5.229E+03   1.00E+02   1.00E+02   1.00E+02
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
```

```
  0
  0
Pathway 11:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   6.00E+02   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   6.00E+02   1.00E+02   1.00E+02   1.00E+02
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 12:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.839E+03   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 13:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   1.00E+01   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   1.00E+01   1.00E+02   1.00E+02   1.00E+02
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  4
Location 1:
  EAB LOCA
  7
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
```

```
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 2:
  LOCA @ LPZ
  7
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 3:
  LOCA @ Unprotected CR
  7
  1
  2
  0.00E+00   3.5E-04
  7.2E+02   0.00E+00
  0
Location 4:
  LOCA @ CR
  8
  1
  2
  0.00E+00   3.5E-04
  7.2E+02   0.00E+00
  1
  4
  0.00E+00   1.00E+00
  2.4E+01   6.00E-01
  9.6E+01   4.00E-01
  7.2E+02   0.00E+00
X/Q Tables:
  4
  EAB LOCA
  2
  0.00E+00   8.3E-04
  7.2E+02   0.00E+00
  LOCA @ LPZ
  5
  0.00E+00   4.9E-05
  8.00E+00   3.5E-05
  2.4E+01   1.7E-05
  9.6E+01   6.1E-06
  7.2E+02   0.00E+00
  LOCA @ Unprotected CR
  6
  0.00E+00   4.72E-03
  2.00E+00   4.25E-03
  8.00E+00   1.84E-03
  2.4E+01   1.32E-03
  9.6E+01   1.03E-03
  7.2E+02   0.00E+00
  LOCA @ CR
  6
  0.00E+00   1.21E-03
  2.00E+00   8.76E-04
  8.00E+00   3.16E-04
  2.4E+01   1.92E-04
  9.6E+01   1.61E-04
  7.2E+02   0.00E+00
Inflow Pathways:
  3  10 11 13
Exhaust Pathways:
  2  9 12
X/Q table ID for Exhaust-Inflow paths:
  4 4 4
  -1 -1 -1
```

```
 Simulation Parameters:
   5
   0.00E+00   0.00E+00
   9.6E+01   1.2E+02
   2.4E+02   2.4E+02
   4.8E+02   2.4E+02
   7.2E+02   0.00E+00
 Output Filename:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 15 MSIV_Atrium11_600cfm_Drywell Only 0-
2hr.o0
   1
   1
   1
   1
   0
   End of Scenario File
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:08:50

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

            LOCA AST- MSIV Leakage

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

Number of Nuclides =  60

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

Number of compartments    =   8

Compartment information

Compartment number  1
Name: Primary Containment
Compartment volume =   2.3960E+05 (Cubic feet)
Compartment type is Normal
Removal devices within compartment:
     Deposition
Pathways into and out of compartment  1
   Exit Pathway Number    1: Primary Containment to Drain Pathway Mixing Vol
   Exit Pathway Number    2: Primary Containment to Intact MSL No. A
   Exit Pathway Number    3: Primary Containment to Intact MSL No. B
   Exit Pathway Number    4: Primary Containment to Intact MSL No. D

Compartment number  2
Name: Intact MSL No. A
Compartment volume =   6.7800E+01 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  2
   Inlet Pathway Number   2: Primary Containment to Intact MSL No. A
   Exit Pathway Number    5: Intact MSL No. A to Drain Pathway Mixing Volume

Compartment number  3
Name: Intact MSL No. B
Compartment volume =   7.3900E+01 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  3
   Inlet Pathway Number   3: Primary Containment to Intact MSL No. B
   Exit Pathway Number    6: Intact MSL No. B to Drain Pathway Mixing Volume

Compartment number  4
Name: Intact MSL No. D
Compartment volume =   6.7800E+01 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  4
   Inlet Pathway Number   4: Primary Containment to Intact MSL No. D
   Exit Pathway Number    7: Intact MSL No. D to Drain Pathway Mixing Volume

Compartment number  5
Name: Drain Pathway Mixing Volume
Compartment volume =   1.0000E+00 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  5
   Inlet Pathway Number   1: Primary Containment to Drain Pathway Mixing Vol
   Inlet Pathway Number   5: Intact MSL No. A to Drain Pathway Mixing Volume
   Inlet Pathway Number   6: Intact MSL No. B to Drain Pathway Mixing Volume
   Inlet Pathway Number   7: Intact MSL No. D to Drain Pathway Mixing Volume
   Exit Pathway Number    8: Drain Pathway Mixing Volume to Effective Conden

Compartment number  6
```

```
Name: Effective Condenser
Compartment volume =   9.8600E+04 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  6
   Inlet Pathway Number   8: Drain Pathway Mixing Volume to Effective Conden
   Exit Pathway Number    9: Effective Condenser to Environment

Compartment number  7
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  7
   Inlet Pathway Number   9: Effective Condenser to Environment
   Inlet Pathway Number  12: Control Room to Environment - CR Exhaust
   Exit Pathway Number   10: Environment to Control Room - Emergency Filtere
   Exit Pathway Number   11: Environment to Control Room - Unfiltered Air In
   Exit Pathway Number   13: Environment to  Control Room ingress/egress

Compartment number  8
Name: Control Room
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  8
   Inlet Pathway Number  10: Environment to Control Room - Emergency Filtere
   Inlet Pathway Number  11: Environment to Control Room - Unfiltered Air In
   Inlet Pathway Number  13: Environment to  Control Room ingress/egress
   Exit Pathway Number   12: Control Room to Environment - CR Exhaust

Total number of pathways =  13
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:08:50

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

            LOCA AST- MSIV Leakage

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

Power Ratio                              =   4.0320E+03

End Time                                 =   7.2000E+02 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Source Number  1 is used in Compartment  1  Primary Containment
   Nuclide Distribution given in Ci/MWt
Fraction of Nuclide Distribution in this Compartment   1.00000

Iodine fractions for source number 1
     Aerosol     =   9.5000E-01
     Elemental   =   4.8500E-02
     Organic     =   1.5000E-03

Inventory file =     c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
Release from file =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\msiv-imrel.rft
Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
```

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)
Kr-85	1	4.150E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	6.940E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.320E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	1.780E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
Rb-86	3	6.120E+01	1.612E+06	4.810E-15	1.330E-09	1.790E-09
Te-131m	4	5.230E+03	1.080E+05	7.463E-14	3.669E-08	1.758E-09
Te-132	4	3.820E+04	2.815E+05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.690E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.920E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.490E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.150E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.240E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.380E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	1.450E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Cs-134	3	5.840E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.480E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.480E+03	9.467E+08	2.725E-14	7.930E-09	8.630E-09

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
Te-131m	Te-131	0.22	I-131	0.78	none	0.00
Te-132	I-132	1.00	none	0.00	none	0.00
I-131	Xe-131m	0.01	none	0.00	none	0.00
I-133	Xe-133m	0.03	Xe-133	0.97	none	0.00
I-135	Xe-135m	0.15	Xe-135	0.85	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00

Release Fractions and Timings
 FOR SSES MSIV and immediate release assumption
 Duration (h):

	GAP	EARLY IN-VESSEL	LATE RELEASE	RELEASE MASS
	0.000001 hr	0.0000 hrs	0.0000 hrs	(gm)
NOBLES	1.0000E+00	0.0000E+00	0.0000E+00	5.458E+03
IODINE	3.0000E-01	0.0000E+00	0.0000E+00	3.465E+02
CESIUM	2.5000E-01	0.0000E+00	0.0000E+00	5.649E+04
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
AEROSOL	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00

COMPARTMENT DATA

Compartment number 1: Primary Containment

Natural Deposition (Powers' model): Aerosol data
Reactor type: BWRDBA
Percentile = 10 (%)

Natural Deposition: Elemental Removal Data

Time (hr)	Removal Coef. (hr^-1)
0.0000E+00	0.0000E+00

Compartment number 2: Intact MSL No. A

Compartment number 3: Intact MSL No. B

Compartment number 4: Intact MSL No. D

Compartment number 5: Drain Pathway Mixing Volume

Compartment number 6: Effective Condenser

Compartment number 7: Environment

Compartment number 8: Control Room

PATHWAY DATA

Pathway number 1: Primary Containment to Drain Pathway Mixing Vol

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.9700E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.0000E+00	0.0000E+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 2: Primary Containment to Intact MSL No. A

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.5500E-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 3: Primary Containment to Intact MSL No. B

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.5500E-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 4: Primary Containment to Intact MSL No. D

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.5500E-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: Intact MSL No. A to Drain Pathway Mixing Volume

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	1.4800E+01	6.5200E+00	0.0000E+00
2.0000E+00	0.0000E+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 6: Intact MSL No. B to Drain Pathway Mixing Volume

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	1.5900E+01	7.0600E+00	0.0000E+00
2.0000E+00	0.0000E+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 7: Intact MSL No. D to Drain Pathway Mixing Volume

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	1.4800E+01	6.5200E+00	0.0000E+00
2.0000E+00	0.0000E+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 8: Drain Pathway Mixing Volume to Effective Conden

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.9000E+00	6.7000E+00	4.2700E+00	0.0000E+00
2.0000E+00	0.0000E+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 9: Effective Condenser to Environment

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.9000E+00	9.9600E+01	9.9600E+01	0.0000E+00
5.0000E-01	5.9000E+00	9.9600E+01	9.9600E+01	0.0000E+00
2.0000E+00	0.0000E+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 10: Environment to Control Room - Emergency Filtere

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.2290E+03	9.9000E+01	9.9000E+01	9.9000E+01
2.0000E+00	5.2290E+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 11: Environment to Control Room - Unfiltered Air In

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    6.0000E+02   0.0000E+00   0.0000E+00   0.0000E+00
       2.0000E+00    6.0000E+02   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 12: Control Room to Environment - CR Exhaust

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    5.8390E+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 13: Environment to  Control Room ingress/egress

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    1.0000E+01   0.0000E+00   0.0000E+00   0.0000E+00
       2.0000E+00    1.0000E+01   1.0000E+02   1.0000E+02   1.0000E+02
       7.2000E+02    0.0000E+00   0.0000E+00   0.0000E+00   0.0000E+00

DOSE INFORMATION
Number_Dose_Locations =  4

Dose Location Name = EAB LOCA
         Located in compartment  7 the Environment

EAB LOCA 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

Dose Location Name = LOCA @ LPZ
         Located in compartment  7 the Environment

LOCA @ LPZ 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

Dose Location Name = LOCA @ Unprotected CR
         Located in compartment  7 the Environment

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

Dose Location Name = LOCA @ CR
         Located in compartment  8 the Control Room

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

```
 LOCA @ CR 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

 X/Q, ATMOSPHERIC DISPERSION INFORMATION

 X/Q Table Name =    EAB LOCA

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

 X/Q Table Name =    LOCA @ LPZ

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.9000E-05
        8.0000E+00          3.5000E-05
        2.4000E+01          1.7000E-05
        9.6000E+01          6.1000E-06
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ Unprotected CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.7200E-03
        2.0000E+00          4.2500E-03
        8.0000E+00          1.8400E-03
        2.4000E+01          1.3200E-03
        9.6000E+01          1.0300E-03
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          1.2100E-03
        2.0000E+00          8.7600E-04
        8.0000E+00          3.1600E-04
        2.4000E+01          1.9200E-04
        9.6000E+01          1.6100E-04
        7.2000E+02          0.0000E+00

 This X/Q Table is used for these connected pathways
  Path  9  Effective Condenser to Environment and Path 10  Environment to Control Room - Emergency
Filtere
  Path  9  Effective Condenser to Environment and Path 11  Environment to Control Room - Unfiltered Air
In
  Path  9  Effective Condenser to Environment and Path 13  Environment to  Control Room ingress/egress

 USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
         Time (hr)      Time step (hr)
        0.0000E+00        0.0000E+00
        9.6000E+01        1.2000E+02
        2.4000E+02        2.4000E+02
        4.8000E+02        2.4000E+02
        7.2000E+02        0.0000E+00

  EDIT EACH MAJOR TIME STEP

  EDIT SUPPLEMENTAL TIME STEPS

  EDIT MODEL DECONTAMINATION RESULTS

       Masses in Atoms and kg in detailed output
```

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


            LOCA AST- MSIV Leakage

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

Detailed model information at time (hr) =    0.0000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00

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EAB LOCA Doses:

Time (h) =   0.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.7273E-19  1.9745E-18  9.4694E-19
Accumulated dose (rem)  8.7273E-19  1.9745E-18  9.4694E-19

LOCA @ LPZ Doses:

Time (h) =   0.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.1522E-20  1.1656E-19  5.5903E-20
Accumulated dose (rem)  5.1522E-20  1.1656E-19  5.5903E-20

LOCA @ Unprotected CR Doses:

Time (h) =   0.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.9630E-18  1.1228E-17  5.3850E-18
Accumulated dose (rem)  4.9630E-18  1.1228E-17  5.3850E-18

LOCA @ CR Doses:

Time (h) =   0.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.1010E-26  1.1041E-25  3.5160E-26  8.1280E-25
Accumulated dose (rem)  3.1010E-26  1.1041E-25  3.5160E-26  8.1280E-25

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

Effective Condenser to Environment Transport Group Inventory:
```

```
                          Pathway
Time (h) =   0.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.8621E+03
Elemental I (atoms)      2.5544E+00   1.5388E-02
Organic I (atoms)        0.0000E+00   1.2429E-01
Aerosol I (atoms)        4.8765E+01   2.9377E-01
All Aerosols (kg)        1.8390E-21   1.1078E-23

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =   0.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.1121E+01
Elemental I (atoms)      4.5490E-05   9.1899E-07
Organic I (atoms)        3.6742E-04   7.4226E-06
Aerosol I (atoms)        8.6843E-04   1.7544E-05
All Aerosols (kg)        3.2749E-26   6.6159E-28

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                          Pathway
Time (h) =   0.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.2760E+00
Elemental I (atoms)      0.0000E+00   1.0545E-05
Organic I (atoms)        0.0000E+00   8.5170E-05
Aerosol I (atoms)        0.0000E+00   2.0131E-04
All Aerosols (kg)        0.0000E+00   7.5914E-27

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =   0.0000       Filtered    Transported
Noble gases (atoms)      6.9990E-07   0.0000E+00
Elemental I (atoms)      6.5604E-13   0.0000E+00
Organic I (atoms)        5.2987E-12   0.0000E+00
Aerosol I (atoms)        1.2524E-11   0.0000E+00
All Aerosols (kg)        4.7229E-34   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =   0.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.1267E-02
Elemental I (atoms)      0.0000E+00   1.7575E-07
Organic I (atoms)        0.0000E+00   1.4195E-06
Aerosol I (atoms)        0.0000E+00   3.3551E-06
All Aerosols (kg)        0.0000E+00   1.2652E-28

Detailed model information at time (hr) =    0.4500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.4623E+00

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EAB LOCA Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.8635E-03  1.9674E-02  9.5965E-03
Accumulated dose (rem)  8.8635E-03  1.9674E-02  9.5965E-03
```

LOCA @ LPZ Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.2326E-04	1.1614E-03	5.6654E-04
Accumulated dose (rem)	5.2326E-04	1.1614E-03	5.6654E-04

LOCA @ Unprotected CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.0404E-02	1.1188E-01	5.4573E-02
Accumulated dose (rem)	5.0404E-02	1.1188E-01	5.4573E-02

LOCA @ CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	9.0733E-05	3.2620E-04	1.0291E-04	2.3521E-03
Accumulated dose (rem)	9.0733E-05	3.2620E-04	1.0291E-04	2.3521E-03

****

Environment Integral Nuclide Release (Ci): at Time (h) = 0.5000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 9
Kr-85	4.8525E-01	0.00002
Kr-85m	7.7267E+00	0.01848
Kr-87	1.3006E+01	0.17134
Kr-88	1.9268E+01	0.62841
Rb-86	5.7214E-05	0.00001
I-131	4.4510E-02	0.04464
I-132	5.9104E-02	0.00280
I-133	8.9996E-02	0.01680
I-134	7.9799E-02	0.00364
I-135	8.3994E-02	0.00536
Xe-133	6.2843E+01	0.03135
Xe-135	1.7071E+01	0.06495
Cs-134	5.4622E-03	0.00777
Cs-136	1.3833E-03	0.00035
Cs-137	4.1903E-03	0.00408

Environment Compartment Group Inventory Distribution:

Time (h) = 0.5000	Total Release	Release Rate/s
Noble gases (atoms)	1.0333E+19	5.7406E+15
Elemental I (atoms)	8.3406E+13	4.6336E+10
Organic I (atoms)	6.8491E+14	3.8051E+11
Aerosol I (atoms)	1.3881E+15	7.7118E+11
All Aerosols (kg)	5.2719E-08	2.9288E-11

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0344E+19
Elemental I (atoms)	2.0693E+16	8.3676E+13
Organic I (atoms)	0.0000E+00	6.8712E+14
Aerosol I (atoms)	3.4437E+17	1.3928E+15
All Aerosols (kg)	1.3132E-05	5.2740E-08

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 0.5000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.4245E+16
Elemental I (atoms)	2.7056E+11	2.7442E+09
Organic I (atoms)	2.2207E+12	2.2524E+10
Aerosol I (atoms)	4.5236E+12	4.5887E+10
All Aerosols (kg)	1.7176E-10	1.7350E-12

```
Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.9294E+15
Elemental I (atoms)      0.0000E+00   3.1488E+10
Organic I (atoms)        0.0000E+00   2.5845E+11
Aerosol I (atoms)        0.0000E+00   5.2653E+11
All Aerosols (kg)        0.0000E+00   1.9908E-11

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      3.3854E+15   1.0658E+10
Elemental I (atoms)      3.1050E+09   0.0000E+00
Organic I (atoms)        2.5423E+10   0.0000E+00
Aerosol I (atoms)        5.3234E+10   0.0000E+00
All Aerosols (kg)        2.0228E-12   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   0.5000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   6.5490E+13
Elemental I (atoms)      0.0000E+00   5.2480E+08
Organic I (atoms)        0.0000E+00   4.3074E+09
Aerosol I (atoms)        0.0000E+00   8.7755E+09
All Aerosols (kg)        0.0000E+00   3.3180E-13

Detailed model information at time (hr) =    1.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 6.6053E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.9437E+00

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EAB LOCA Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.4931E-01  3.5292E-01  1.6219E-01
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.8145E-03  2.0835E-02  9.5750E-03
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.4907E-01  2.0069E+00  9.2232E-01
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        4.8896E-03  1.9518E-02  5.6057E-03  1.2374E-01
Accumulated dose (rem)  4.9803E-03  1.9844E-02  5.7086E-03  1.2609E-01
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Environment Integral Nuclide Release (Ci): at Time (h) =   2.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.1353E+01     0.00002
  Kr-85m    1.5405E+02     0.02055
  Kr-87     1.7686E+02     0.12997
  Kr-88     3.5097E+02     0.63853
  Rb-86     9.7156E-04     0.00001
  I-131     8.5454E-01     0.04781
  I-132     8.4563E-01     0.00224
  I-133     1.6765E+00     0.01746
  I-134     7.3396E-01     0.00187
  I-135     1.4562E+00     0.00518
  Xe-133    1.4644E+03     0.04075
  Xe-135    3.9591E+02     0.08403
  Cs-134    9.2894E-02     0.00737
  Cs-136    2.3475E-02     0.00033
  Cs-137    7.1264E-02     0.00387

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =   2.0000     Release     Rate/s
Noble gases (atoms)    2.4150E+20  3.3542E+16
Elemental I (atoms)    1.8813E+15  2.6129E+11
Organic I (atoms)      1.5700E+16  2.1806E+12
Aerosol I (atoms)      2.3153E+16  3.2158E+12
All Aerosols (kg)      8.9649E-07  1.2451E-10

Effective Condenser to Environment Transport Group Inventory:

                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.4152E+20
Elemental I (atoms)      4.6322E+17   1.8856E+15
Organic I (atoms)        0.0000E+00   1.5736E+16
Aerosol I (atoms)        5.6948E+18   2.3213E+16
All Aerosols (kg)        2.2321E-04   8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.4162E+17
Elemental I (atoms)      5.6278E+12   5.7495E+10
Organic I (atoms)        4.6959E+13   4.7972E+11
Aerosol I (atoms)        6.9503E+13   7.1085E+11
All Aerosols (kg)        2.7134E-09   2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.5096E+16
Elemental I (atoms)      0.0000E+00   6.5972E+11
Organic I (atoms)        0.0000E+00   5.5045E+12
Aerosol I (atoms)        0.0000E+00   8.1566E+12
All Aerosols (kg)        0.0000E+00   3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   2.0000       Filtered    Transported
Noble gases (atoms)      2.4861E+17   2.3750E+12
Elemental I (atoms)      2.1985E+11   0.0000E+00
Organic I (atoms)        1.8298E+12   0.0000E+00
Aerosol I (atoms)        2.9102E+12   0.0000E+00
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All Aerosols (kg)        1.1297E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   2.0000        Filtered    Transported
Noble gases (atoms)       0.0000E+00   1.4183E+15
Elemental I (atoms)       0.0000E+00   1.0995E+10
Organic I (atoms)         0.0000E+00   9.1741E+10
Aerosol I (atoms)         0.0000E+00   1.3594E+11
All Aerosols (kg)         0.0000E+00   5.2419E-12

Detailed model information at time (hr) =    4.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 1.0673E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 9.7204E+01

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EAB LOCA Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        6.7987E-03  3.5353E-02  8.0872E-03  1.7061E-01
Accumulated dose (rem)  1.1779E-02  5.5197E-02  1.3796E-02  2.9670E-01

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Environment Integral Nuclide Release (Ci): at Time (h) =   5.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.1353E+01     0.00002
  Kr-85m    1.5405E+02     0.02040
  Kr-87     1.7686E+02     0.12901
  Kr-88     3.5097E+02     0.63380
  Rb-86     9.7156E-04     0.00001
  I-131     8.5454E-01     0.04746
  I-132     8.4563E-01     0.00222
  I-133     1.6765E+00     0.01733
  I-134     7.3396E-01     0.00186
  I-135     1.4562E+00     0.00515
  Xe-133    1.4682E+03     0.04055
  Xe-135    4.3052E+02     0.09070
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  Cs-134    9.2894E-02     0.00732
  Cs-136    2.3475E-02     0.00033
  Cs-137    7.1264E-02     0.00384

Environment Compartment Group Inventory Distribution:

                         Total      Release
Time (h) =   5.0000     Release     Rate/s
Noble gases (atoms)    2.4165E+20  1.3425E+16
Elemental I (atoms)    1.8813E+15  1.0452E+11
Organic I (atoms)      1.5700E+16  8.7223E+11
Aerosol I (atoms)      2.3153E+16  1.2863E+12
All Aerosols (kg)      8.9649E-07  4.9805E-11

Effective Condenser to Environment Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.4168E+20
Elemental I (atoms)      4.4401E+17   1.8856E+15
Organic I (atoms)        0.0000E+00   1.5736E+16
Aerosol I (atoms)        5.4587E+18   2.3213E+16
All Aerosols (kg)        2.2315E-04   8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.4162E+17
Elemental I (atoms)      5.3945E+12   5.7495E+10
Organic I (atoms)        4.5012E+13   4.7972E+11
Aerosol I (atoms)        6.6622E+13   7.1085E+11
All Aerosols (kg)        2.7127E-09   2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.5096E+16
Elemental I (atoms)      0.0000E+00   6.5972E+11
Organic I (atoms)        0.0000E+00   5.5045E+12
Aerosol I (atoms)        0.0000E+00   8.1566E+12
All Aerosols (kg)        0.0000E+00   3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      7.3103E+17   2.9784E+13
Elemental I (atoms)      6.3554E+11   0.0000E+00
Organic I (atoms)        5.3032E+12   0.0000E+00
Aerosol I (atoms)        7.8465E+12   0.0000E+00
All Aerosols (kg)        3.0934E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =    7.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 6.3781E-01
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     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 6.6063E+02

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EAB LOCA Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        4.7312E-04  4.4637E-03  6.3608E-04  1.2392E-02
Accumulated dose (rem)  1.2252E-02  5.9661E-02  1.4432E-02  3.0910E-01

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Environment Integral Nuclide Release (Ci): at Time (h) =   8.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.1353E+01     0.00002
  Kr-85m    1.5405E+02     0.02029
  Kr-87     1.7686E+02     0.12831
  Kr-88     3.5097E+02     0.63039
  Rb-86     9.7156E-04     0.00001
  I-131     8.5454E-01     0.04720
  I-132     8.4563E-01     0.00221
  I-133     1.6765E+00     0.01723
  I-134     7.3396E-01     0.00185
  I-135     1.4562E+00     0.00512
  Xe-133    1.4717E+03     0.04043
  Xe-135    4.5578E+02     0.09550
  Cs-134    9.2894E-02     0.00728
  Cs-136    2.3475E-02     0.00033
  Cs-137    7.1264E-02     0.00382

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =   8.0000     Release     Rate/s
Noble gases (atoms)    2.4178E+20  8.3952E+15
Elemental I (atoms)    1.8813E+15  6.5324E+10
Organic I (atoms)      1.5700E+16  5.4515E+11
Aerosol I (atoms)      2.3153E+16  8.0394E+11
All Aerosols (kg)      8.9649E-07  3.1128E-11

Effective Condenser to Environment Transport Group Inventory:

                            Pathway
Time (h) =   8.0000       Filtered    Transported
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Noble gases (atoms)      0.0000E+00   2.4180E+20
Elemental I (atoms)      4.2885E+17   1.8856E+15
Organic I (atoms)        0.0000E+00   1.5736E+16
Aerosol I (atoms)        5.2723E+18   2.3213E+16
All Aerosols (kg)        2.2310E-04   8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.4162E+17
Elemental I (atoms)      5.2103E+12   5.7495E+10
Organic I (atoms)        4.3475E+13   4.7972E+11
Aerosol I (atoms)        6.4347E+13   7.1085E+11
All Aerosols (kg)        2.7121E-09   2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.5096E+16
Elemental I (atoms)      0.0000E+00   6.5972E+11
Organic I (atoms)        0.0000E+00   5.5045E+12
Aerosol I (atoms)        0.0000E+00   8.1566E+12
All Aerosols (kg)        0.0000E+00   3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      7.9424E+17   6.4553E+13
Elemental I (atoms)      6.8809E+11   0.0000E+00
Organic I (atoms)        5.7422E+12   0.0000E+00
Aerosol I (atoms)        8.4704E+12   0.0000E+00
All Aerosols (kg)        3.3515E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =    8.3000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 8.1535E+02

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EAB LOCA Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:
```

Time (h) = 8.3333	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	9.3377E-03	2.1996E-02	1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) = 8.3333	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	8.9947E-01	2.1188E+00	9.7690E-01

LOCA @ CR Doses:

Time (h) = 8.3333	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	9.7845E-06	1.3284E-04	1.4643E-05	2.7456E-04
Accumulated dose (rem)	1.2262E-02	5.9793E-02	1.4447E-02	3.0937E-01

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Environment Integral Nuclide Release (Ci): at Time (h) = 8.3333

Nuclide	Compartment Atmosphere	Dose Fract Pathway 9
Kr-85	1.1353E+01	0.00002
Kr-85m	1.5405E+02	0.02028
Kr-87	1.7686E+02	0.12827
Kr-88	3.5097E+02	0.63016
Rb-86	9.7156E-04	0.00001
I-131	8.5454E-01	0.04719
I-132	8.4563E-01	0.00221
I-133	1.6765E+00	0.01723
I-134	7.3396E-01	0.00184
I-135	1.4562E+00	0.00512
Xe-133	1.4721E+03	0.04042
Xe-135	4.5813E+02	0.09582
Cs-134	9.2894E-02	0.00728
Cs-136	2.3475E-02	0.00033
Cs-137	7.1264E-02	0.00382

Environment Compartment Group Inventory Distribution:

Time (h) = 8.3333	Total Release	Release Rate/s
Noble gases (atoms)	2.4180E+20	8.0598E+15
Elemental I (atoms)	1.8813E+15	6.2711E+10
Organic I (atoms)	1.5700E+16	5.2334E+11
Aerosol I (atoms)	2.3153E+16	7.7178E+11
All Aerosols (kg)	8.9649E-07	2.9883E-11

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 8.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4182E+20
Elemental I (atoms)	4.2733E+17	1.8856E+15
Organic I (atoms)	0.0000E+00	1.5736E+16
Aerosol I (atoms)	5.2535E+18	2.3213E+16
All Aerosols (kg)	2.2310E-04	8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 8.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4162E+17
Elemental I (atoms)	5.1918E+12	5.7495E+10
Organic I (atoms)	4.3320E+13	4.7972E+11
Aerosol I (atoms)	6.4118E+13	7.1085E+11
All Aerosols (kg)	2.7121E-09	2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

```
                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.5096E+16
Elemental I (atoms)      0.0000E+00   6.5972E+11
Organic I (atoms)        0.0000E+00   5.5045E+12
Aerosol I (atoms)        0.0000E+00   8.1566E+12
All Aerosols (kg)        0.0000E+00   3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      7.9617E+17   6.8475E+13
Elemental I (atoms)      6.8965E+11   0.0000E+00
Organic I (atoms)        5.7553E+12   0.0000E+00
Aerosol I (atoms)        8.4890E+12   0.0000E+00
All Aerosols (kg)        3.3594E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =   11.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 6.4433E+03

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EAB LOCA Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.9551E-05  4.7415E-04  4.6915E-05  8.6796E-04
Accumulated dose (rem)  1.2292E-02  6.0268E-02  1.4493E-02  3.1024E-01

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Environment Integral Nuclide Release (Ci): at Time (h) = 12.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 9
Kr-85	1.1353E+01	0.00002
Kr-85m	1.5405E+02	0.02022
Kr-87	1.7686E+02	0.12786
Kr-88	3.5097E+02	0.62814
Rb-86	9.7156E-04	0.00001
I-131	8.5454E-01	0.04704
I-132	8.4563E-01	0.00220
I-133	1.6765E+00	0.01717
I-134	7.3396E-01	0.00184
I-135	1.4562E+00	0.00510
Xe-133	1.4758E+03	0.04036
Xe-135	4.7920E+02	0.09865
Cs-134	9.2894E-02	0.00725
Cs-136	2.3475E-02	0.00033
Cs-137	7.1264E-02	0.00381

Environment Compartment Group Inventory Distribution:

Time (h) = 12.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.4192E+20	5.6001E+15
Elemental I (atoms)	1.8813E+15	4.3549E+10
Organic I (atoms)	1.5700E+16	3.6343E+11
Aerosol I (atoms)	2.3153E+16	5.3596E+11
All Aerosols (kg)	8.9649E-07	2.0752E-11

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4194E+20
Elemental I (atoms)	4.1205E+17	1.8856E+15
Organic I (atoms)	0.0000E+00	1.5736E+16
Aerosol I (atoms)	5.0656E+18	2.3213E+16
All Aerosols (kg)	2.2305E-04	8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4162E+17
Elemental I (atoms)	5.0061E+12	5.7495E+10
Organic I (atoms)	4.1771E+13	4.7972E+11
Aerosol I (atoms)	6.1825E+13	7.1085E+11
All Aerosols (kg)	2.7115E-09	2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.5096E+16
Elemental I (atoms)	0.0000E+00	6.5972E+11
Organic I (atoms)	0.0000E+00	5.5045E+12
Aerosol I (atoms)	0.0000E+00	8.1566E+12
All Aerosols (kg)	0.0000E+00	3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	8.0314E+17	1.1174E+14
Elemental I (atoms)	6.9525E+11	0.0000E+00
Organic I (atoms)	5.8021E+12	0.0000E+00
Aerosol I (atoms)	8.5555E+12	0.0000E+00
All Aerosols (kg)	3.3879E-10	0.0000E+00

```
Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =   19.2000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.2996E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.3549E+05

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EAB LOCA Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.2326E-06  4.1601E-05  3.7622E-06  7.6195E-05
Accumulated dose (rem)  1.2294E-02  6.0309E-02  1.4497E-02  3.1032E-01

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Environment Integral Nuclide Release (Ci): at Time (h) =  19.4444

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.1353E+01     0.00002
  Kr-85m    1.5405E+02     0.02014
  Kr-87     1.7686E+02     0.12738
  Kr-88     3.5097E+02     0.62579
  Rb-86     9.7156E-04     0.00001
  I-131     8.5454E-01     0.04686
  I-132     8.4563E-01     0.00219
  I-133     1.6765E+00     0.01711
  I-134     7.3396E-01     0.00183
  I-135     1.4562E+00     0.00508
  Xe-133    1.4821E+03     0.04034
  Xe-135    5.0355E+02     0.10190
  Cs-134    9.2894E-02     0.00723
  Cs-136    2.3475E-02     0.00033
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  Cs-137    7.1264E-02     0.00380

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =  19.4444     Release     Rate/s
Noble gases (atoms)    2.4212E+20  3.4588E+15
Elemental I (atoms)    1.8813E+15  2.6876E+10
Organic I (atoms)      1.5700E+16  2.2429E+11
Aerosol I (atoms)      2.3153E+16  3.3076E+11
All Aerosols (kg)      8.9649E-07  1.2807E-11

Effective Condenser to Environment Transport Group Inventory:

                            Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.4214E+20
Elemental I (atoms)      3.8700E+17   1.8856E+15
Organic I (atoms)        0.0000E+00   1.5736E+16
Aerosol I (atoms)        4.7577E+18   2.3213E+16
All Aerosols (kg)        2.2298E-04   8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                            Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.4163E+17
Elemental I (atoms)      4.7018E+12   5.7495E+10
Organic I (atoms)        3.9232E+13   4.7972E+11
Aerosol I (atoms)        5.8067E+13   7.1085E+11
All Aerosols (kg)        2.7105E-09   2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                            Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.5096E+16
Elemental I (atoms)      0.0000E+00   6.5972E+11
Organic I (atoms)        0.0000E+00   5.5045E+12
Aerosol I (atoms)        0.0000E+00   8.1566E+12
All Aerosols (kg)        0.0000E+00   3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      8.0378E+17   1.9967E+14
Elemental I (atoms)      6.9575E+11   0.0000E+00
Organic I (atoms)        5.8062E+12   0.0000E+00
Aerosol I (atoms)        8.5614E+12   0.0000E+00
All Aerosols (kg)        3.3906E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =  19.4444       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =   23.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.1344E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
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     1.0000E+00 1.0000E+00 1.0000E+00 3.4951E+06

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EAB LOCA Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.1142E-07  2.4385E-07  2.2046E-07  7.7127E-06
Accumulated dose (rem)  1.2294E-02  6.0309E-02  1.4497E-02  3.1032E-01

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Environment Integral Nuclide Release (Ci): at Time (h) =  24.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.1353E+01     0.00002
  Kr-85m    1.5405E+02     0.02012
  Kr-87     1.7686E+02     0.12722
  Kr-88     3.5097E+02     0.62502
  Rb-86     9.7156E-04     0.00001
  I-131     8.5454E-01     0.04680
  I-132     8.4563E-01     0.00219
  I-133     1.6765E+00     0.01709
  I-134     7.3396E-01     0.00183
  I-135     1.4562E+00     0.00507
  Xe-133    1.4853E+03     0.04035
  Xe-135    5.1136E+02     0.10293
  Cs-134    9.2894E-02     0.00722
  Cs-136    2.3475E-02     0.00033
  Cs-137    7.1264E-02     0.00379

Environment Compartment Group Inventory Distribution:

                         Total      Release
Time (h) =  24.0000     Release     Rate/s
Noble gases (atoms)    2.4221E+20  2.8033E+15
Elemental I (atoms)    1.8813E+15  2.1775E+10
Organic I (atoms)      1.5700E+16  1.8172E+11
Aerosol I (atoms)      2.3153E+16  2.6798E+11
All Aerosols (kg)      8.9649E-07  1.0376E-11

Effective Condenser to Environment Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.4223E+20
Elemental I (atoms)      3.7429E+17   1.8856E+15
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Organic I (atoms)        0.0000E+00   1.5736E+16
Aerosol I (atoms)        4.6015E+18   2.3213E+16
All Aerosols (kg)        2.2293E-04   8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.4163E+17
Elemental I (atoms)      4.5475E+12   5.7495E+10
Organic I (atoms)        3.7944E+13   4.7972E+11
Aerosol I (atoms)        5.6161E+13   7.1085E+11
All Aerosols (kg)        2.7100E-09   2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.5096E+16
Elemental I (atoms)      0.0000E+00   6.5972E+11
Organic I (atoms)        0.0000E+00   5.5045E+12
Aerosol I (atoms)        0.0000E+00   8.1566E+12
All Aerosols (kg)        0.0000E+00   3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      8.0379E+17   2.5348E+14
Elemental I (atoms)      6.9575E+11   0.0000E+00
Organic I (atoms)        5.8063E+12   0.0000E+00
Aerosol I (atoms)        8.5614E+12   0.0000E+00
All Aerosols (kg)        3.3906E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =   95.5000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.6211E+06

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EAB LOCA Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
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Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.2568E-07  6.7692E-09  2.2593E-07  8.3912E-06
Accumulated dose (rem)  1.2294E-02  6.0309E-02  1.4498E-02  3.1033E-01

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Environment Integral Nuclide Release (Ci): at Time (h) =  96.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.1353E+01     0.00002
  Kr-85m    1.5405E+02     0.02010
  Kr-87     1.7686E+02     0.12708
  Kr-88     3.5097E+02     0.62434
  Rb-86     9.7156E-04     0.00001
  I-131     8.5454E-01     0.04675
  I-132     8.4563E-01     0.00219
  I-133     1.6765E+00     0.01707
  I-134     7.3396E-01     0.00183
  I-135     1.4562E+00     0.00507
  Xe-133    1.5029E+03     0.04047
  Xe-135    5.2412E+02     0.10374
  Cs-134    9.2894E-02     0.00721
  Cs-136    2.3475E-02     0.00033
  Cs-137    7.1264E-02     0.00379

Environment Compartment Group Inventory Distribution:

                         Total      Release
Time (h) =  96.0000     Release     Rate/s
Noble gases (atoms)    2.4266E+20  7.0213E+14
Elemental I (atoms)    1.8813E+15  5.4436E+09
Organic I (atoms)      1.5700E+16  4.5429E+10
Aerosol I (atoms)      2.3153E+16  6.6995E+10
All Aerosols (kg)      8.9649E-07  2.5940E-12

Effective Condenser to Environment Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.4268E+20
Elemental I (atoms)      2.6279E+17   1.8856E+15
Organic I (atoms)        0.0000E+00   1.5736E+16
Aerosol I (atoms)        3.2307E+18   2.3213E+16
All Aerosols (kg)        2.2254E-04   8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.4164E+17
Elemental I (atoms)      3.1927E+12   5.7495E+10
Organic I (atoms)        2.6640E+13   4.7972E+11
Aerosol I (atoms)        3.9430E+13   7.1085E+11
All Aerosols (kg)        2.7052E-09   2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
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Noble gases (atoms)      0.0000E+00   8.5096E+16
Elemental I (atoms)      0.0000E+00   6.5972E+11
Organic I (atoms)        0.0000E+00   5.5045E+12
Aerosol I (atoms)        0.0000E+00   8.1566E+12
All Aerosols (kg)        0.0000E+00   3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      8.0380E+17   1.1039E+15
Elemental I (atoms)      6.9575E+11   0.0000E+00
Organic I (atoms)        5.8063E+12   0.0000E+00
Aerosol I (atoms)        8.5614E+12   0.0000E+00
All Aerosols (kg)        3.3906E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =  119.6500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.6641E+06

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EAB LOCA Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.3050E-09  2.1714E-30  1.3050E-09  5.6632E-08
Accumulated dose (rem)  1.2294E-02  6.0309E-02  1.4498E-02  3.1033E-01

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Environment Integral Nuclide Release (Ci): at Time (h) = 120.0000
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Nuclide	Compartment Atmosphere	Dose Fract Pathway 9
Kr-85	1.1353E+01	0.00002
Kr-85m	1.5405E+02	0.02010
Kr-87	1.7686E+02	0.12708
Kr-88	3.5097E+02	0.62434
Rb-86	9.7156E-04	0.00001
I-131	8.5454E-01	0.04675
I-132	8.4563E-01	0.00219
I-133	1.6765E+00	0.01707
I-134	7.3396E-01	0.00183
I-135	1.4562E+00	0.00507
Xe-133	1.5038E+03	0.04047
Xe-135	5.2413E+02	0.10374
Cs-134	9.2894E-02	0.00721
Cs-136	2.3475E-02	0.00033
Cs-137	7.1264E-02	0.00379

Environment Compartment Group Inventory Distribution:

Time (h) = 120.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.4268E+20	5.6176E+14
Elemental I (atoms)	1.8813E+15	4.3549E+09
Organic I (atoms)	1.5700E+16	3.6343E+10
Aerosol I (atoms)	2.3153E+16	5.3596E+10
All Aerosols (kg)	8.9649E-07	2.0752E-12

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4270E+20
Elemental I (atoms)	2.3954E+17	1.8856E+15
Organic I (atoms)	0.0000E+00	1.5736E+16
Aerosol I (atoms)	2.9449E+18	2.3213E+16
All Aerosols (kg)	2.2244E-04	8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4164E+17
Elemental I (atoms)	2.9103E+12	5.7495E+10
Organic I (atoms)	2.4283E+13	4.7972E+11
Aerosol I (atoms)	3.5942E+13	7.1085E+11
All Aerosols (kg)	2.7040E-09	2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.5096E+16
Elemental I (atoms)	0.0000E+00	6.5972E+11
Organic I (atoms)	0.0000E+00	5.5045E+12
Aerosol I (atoms)	0.0000E+00	8.1566E+12
All Aerosols (kg)	0.0000E+00	3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	8.0380E+17	1.3874E+15
Elemental I (atoms)	6.9575E+11	0.0000E+00
Organic I (atoms)	5.8063E+12	0.0000E+00
Aerosol I (atoms)	8.5614E+12	0.0000E+00
All Aerosols (kg)	3.3906E-10	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

```
                          Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =  239.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.8870E+06

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EAB LOCA Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.0008E-09  1.7624E-37  1.0008E-09  4.3754E-08
Accumulated dose (rem)  1.2294E-02  6.0309E-02  1.4498E-02  3.1033E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) = 240.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.1353E+01     0.00002
  Kr-85m    1.5405E+02     0.02010
  Kr-87     1.7686E+02     0.12708
  Kr-88     3.5097E+02     0.62434
  Rb-86     9.7156E-04     0.00001
  I-131     8.5454E-01     0.04675
  I-132     8.4563E-01     0.00219
  I-133     1.6765E+00     0.01707
  I-134     7.3396E-01     0.00183
  I-135     1.4562E+00     0.00507
  Xe-133    1.5046E+03     0.04048
  Xe-135    5.2414E+02     0.10374
  Cs-134    9.2894E-02     0.00721
  Cs-136    2.3475E-02     0.00033
  Cs-137    7.1264E-02     0.00379
```

Environment Compartment Group Inventory Distribution:

Time (h) = 240.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.4270E+20	2.8090E+14
Elemental I (atoms)	1.8813E+15	2.1775E+09
Organic I (atoms)	1.5700E+16	1.8172E+10
Aerosol I (atoms)	2.3153E+16	2.6798E+10
All Aerosols (kg)	8.9649E-07	1.0376E-12

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4272E+20
Elemental I (atoms)	1.5473E+17	1.8856E+15
Organic I (atoms)	0.0000E+00	1.5736E+16
Aerosol I (atoms)	1.9022E+18	2.3213E+16
All Aerosols (kg)	2.2205E-04	8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4164E+17
Elemental I (atoms)	1.8798E+12	5.7495E+10
Organic I (atoms)	1.5685E+13	4.7972E+11
Aerosol I (atoms)	2.3216E+13	7.1085E+11
All Aerosols (kg)	2.6993E-09	2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.5096E+16
Elemental I (atoms)	0.0000E+00	6.5972E+11
Organic I (atoms)	0.0000E+00	5.5045E+12
Aerosol I (atoms)	0.0000E+00	8.1566E+12
All Aerosols (kg)	0.0000E+00	3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	8.0380E+17	2.8048E+15
Elemental I (atoms)	6.9575E+11	0.0000E+00
Organic I (atoms)	5.8063E+12	0.0000E+00
Aerosol I (atoms)	8.5614E+12	0.0000E+00
All Aerosols (kg)	3.3906E-10	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4183E+15
Elemental I (atoms)	0.0000E+00	1.0995E+10
Organic I (atoms)	0.0000E+00	9.1741E+10
Aerosol I (atoms)	0.0000E+00	1.3594E+11
All Aerosols (kg)	0.0000E+00	5.2419E-12

Detailed model information at time (hr) = 479.7000

Natural deposition - Powers' Model, Compartment 1

Deposition Lambda (1 / Hours)

Noble	Elemental	Organic	Aerosol
0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Deposition Net DF

Noble	Elemental	Organic	Aerosol
1.0000E+00	1.0000E+00	1.0000E+00	4.3743E+06

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EAB LOCA Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02

LOCA @ Unprotected CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  8.9947E-01  2.1188E+00  9.7690E-01

LOCA @ CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.8588E-11  6.4499E-73  1.8588E-11  8.1345E-10
Accumulated dose (rem)  1.2294E-02  6.0309E-02  1.4498E-02  3.1033E-01

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Environment Integral Nuclide Release (Ci): at Time (h) = 480.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.1353E+01     0.00002
  Kr-85m    1.5405E+02     0.02010
  Kr-87     1.7686E+02     0.12708
  Kr-88     3.5097E+02     0.62434
  Rb-86     9.7156E-04     0.00001
  I-131     8.5454E-01     0.04675
  I-132     8.4563E-01     0.00219
  I-133     1.6765E+00     0.01707
  I-134     7.3396E-01     0.00183
  I-135     1.4562E+00     0.00507
  Xe-133    1.5046E+03     0.04048
  Xe-135    5.2414E+02     0.10374
  Cs-134    9.2894E-02     0.00721
  Cs-136    2.3475E-02     0.00033
  Cs-137    7.1264E-02     0.00379

Environment Compartment Group Inventory Distribution:

                         Total      Release
Time (h) = 480.0000     Release     Rate/s
Noble gases (atoms)    2.4270E+20  1.4045E+14
Elemental I (atoms)    1.8813E+15  1.0887E+09
Organic I (atoms)      1.5700E+16  9.0858E+09
Aerosol I (atoms)      2.3153E+16  1.3399E+10
All Aerosols (kg)      8.9649E-07  5.1880E-13

Effective Condenser to Environment Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.4272E+20
Elemental I (atoms)      6.5324E+16   1.8856E+15
Organic I (atoms)        0.0000E+00   1.5736E+16
Aerosol I (atoms)        8.0308E+17   2.3213E+16
```

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All Aerosols (kg)        2.2150E-04   8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.4164E+17
Elemental I (atoms)      7.9365E+11   5.7495E+10
Organic I (atoms)        6.6221E+12   4.7972E+11
Aerosol I (atoms)        9.8015E+12   7.1085E+11
All Aerosols (kg)        2.6926E-09   2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.5096E+16
Elemental I (atoms)      0.0000E+00   6.5972E+11
Organic I (atoms)        0.0000E+00   5.5045E+12
Aerosol I (atoms)        0.0000E+00   8.1566E+12
All Aerosols (kg)        0.0000E+00   3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      8.0380E+17   5.6396E+15
Elemental I (atoms)      6.9575E+11   0.0000E+00
Organic I (atoms)        5.8063E+12   0.0000E+00
Aerosol I (atoms)        8.5614E+12   0.0000E+00
All Aerosols (kg)        3.3906E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4183E+15
Elemental I (atoms)      0.0000E+00   1.0995E+10
Organic I (atoms)        0.0000E+00   9.1741E+10
Aerosol I (atoms)        0.0000E+00   1.3594E+11
All Aerosols (kg)        0.0000E+00   5.2419E-12

Detailed model information at time (hr) =  719.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 4.9227E+06

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EAB LOCA Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  1.5817E-01  3.7259E-01  1.7178E-01

LOCA @ LPZ Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  9.3377E-03  2.1996E-02  1.0142E-02
```

LOCA @ Unprotected CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	8.9947E-01	2.1188E+00	9.7690E-01

LOCA @ CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	6.2474E-15	8.9015-144	6.2474E-15	2.7340E-13
Accumulated dose (rem)	1.2294E-02	6.0309E-02	1.4498E-02	3.1033E-01

****

Environment Integral Nuclide Release (Ci): at Time (h) = 720.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 9
Kr-85	1.1354E+01	0.00002
Kr-85m	1.5405E+02	0.02010
Kr-87	1.7686E+02	0.12708
Kr-88	3.5097E+02	0.62434
Rb-86	9.7156E-04	0.00001
I-131	8.5454E-01	0.04675
I-132	8.4563E-01	0.00219
I-133	1.6765E+00	0.01707
I-134	7.3396E-01	0.00183
I-135	1.4562E+00	0.00507
Xe-133	1.5046E+03	0.04048
Xe-135	5.2415E+02	0.10374
Cs-134	9.2894E-02	0.00721
Cs-136	2.3475E-02	0.00033
Cs-137	7.1264E-02	0.00379

Environment Compartment Group Inventory Distribution:

Time (h) = 720.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.4271E+20	9.3637E+13
Elemental I (atoms)	1.8813E+15	7.2582E+08
Organic I (atoms)	1.5700E+16	6.0572E+09
Aerosol I (atoms)	2.3153E+16	8.9327E+09
All Aerosols (kg)	8.9649E-07	3.4587E-13

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.4272E+20
Elemental I (atoms)	2.7584E+16	1.8856E+15
Organic I (atoms)	0.0000E+00	1.5736E+16
Aerosol I (atoms)	3.3911E+17	2.3213E+16
All Aerosols (kg)	2.2110E-04	8.9649E-07

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4164E+17
Elemental I (atoms)	3.3513E+11	5.7495E+10
Organic I (atoms)	2.7963E+12	4.7972E+11
Aerosol I (atoms)	4.1388E+12	7.1085E+11
All Aerosols (kg)	2.6877E-09	2.7410E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.5096E+16
Elemental I (atoms)	0.0000E+00	6.5972E+11

Organic I (atoms)	0.0000E+00	5.5045E+12
Aerosol I (atoms)	0.0000E+00	8.1566E+12
All Aerosols (kg)	0.0000E+00	3.1451E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	8.0380E+17	8.4744E+15
Elemental I (atoms)	6.9575E+11	0.0000E+00
Organic I (atoms)	5.8063E+12	0.0000E+00
Aerosol I (atoms)	8.5614E+12	0.0000E+00
All Aerosols (kg)	3.3906E-10	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4183E+15
Elemental I (atoms)	0.0000E+00	1.0995E+10
Organic I (atoms)	0.0000E+00	9.1741E+10
Aerosol I (atoms)	0.0000E+00	1.3594E+11
All Aerosols (kg)	0.0000E+00	5.2419E-12

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#################################################################
                            I-131 Summary
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Time (hr)	Primary Containment I-131 (Curies)	Intact MSL No. A I-131 (Curies)	Intact MSL No. B I-131 (Curies)
0.000	3.2538E+07	5.3370E-03	5.3370E-03
0.200	2.8152E+07	1.7681E+03	1.7849E+03
0.400	2.4388E+07	2.9320E+03	2.9871E+03
0.500	2.2711E+07	3.3386E+03	3.4167E+03
0.700	2.0081E+07	3.8936E+03	4.0196E+03
0.900	1.7779E+07	4.1896E+03	4.3615E+03
1.100	1.5763E+07	4.2984E+03	4.5106E+03
1.300	1.3998E+07	4.2744E+03	4.5198E+03
1.500	1.2453E+07	4.1588E+03	4.4299E+03
1.700	1.1101E+07	3.9828E+03	4.2719E+03
1.900	9.9165E+06	3.7694E+03	4.0697E+03
2.000	9.3809E+06	3.6541E+03	3.9577E+03
2.200	7.8800E+06	4.2158E+03	4.5192E+03
2.400	6.6685E+06	4.6884E+03	4.9916E+03
2.600	5.6905E+06	5.0892E+03	5.3922E+03
2.800	4.9009E+06	5.4319E+03	5.7347E+03
3.000	4.2634E+06	5.7278E+03	6.0303E+03
3.200	3.7486E+06	5.9858E+03	6.2881E+03
3.400	3.3329E+06	6.2133E+03	6.5154E+03
3.600	2.9971E+06	6.4160E+03	6.7179E+03
3.800	2.7258E+06	6.5988E+03	6.9004E+03
4.000	2.5066E+06	6.7653E+03	7.0668E+03
4.200	2.3294E+06	6.9189E+03	7.2201E+03
4.400	2.1861E+06	7.0618E+03	7.3628E+03
4.600	2.0702E+06	7.1962E+03	7.4970E+03
4.800	1.9764E+06	7.3236E+03	7.6242E+03
5.000	1.9004E+06	7.4454E+03	7.7457E+03
5.200	1.8613E+06	7.5634E+03	7.8635E+03
5.400	1.8268E+06	7.6789E+03	7.9788E+03
5.600	1.7963E+06	7.7921E+03	8.0918E+03
5.800	1.7692E+06	7.9034E+03	8.2029E+03
6.000	1.7453E+06	8.0130E+03	8.3123E+03

6.200	1.7241E+06	8.1210E+03	8.4201E+03
6.400	1.7053E+06	8.2276E+03	8.5265E+03
6.600	1.6885E+06	8.3330E+03	8.6316E+03
6.800	1.6736E+06	8.4373E+03	8.7357E+03
7.000	1.6604E+06	8.5405E+03	8.8387E+03
7.200	1.6485E+06	8.6429E+03	8.9409E+03
7.400	1.6379E+06	8.7444E+03	9.0422E+03
7.600	1.6284E+06	8.8453E+03	9.1428E+03
7.800	1.6199E+06	8.9454E+03	9.2428E+03
8.000	1.6123E+06	9.0450E+03	9.3421E+03
8.200	1.6054E+06	9.1440E+03	9.4409E+03
8.333	1.6012E+06	9.2097E+03	9.5065E+03
8.533	1.5959E+06	9.3080E+03	9.6045E+03
8.733	1.5909E+06	9.4058E+03	9.7021E+03
8.933	1.5863E+06	9.5032E+03	9.7994E+03
9.133	1.5821E+06	9.6003E+03	9.8962E+03
9.333	1.5782E+06	9.6970E+03	9.9927E+03
9.533	1.5745E+06	9.7935E+03	1.0089E+04
9.733	1.5711E+06	9.8896E+03	1.0185E+04
9.933	1.5679E+06	9.9854E+03	1.0280E+04
10.133	1.5649E+06	1.0081E+04	1.0376E+04
12.000	1.5430E+06	1.0962E+04	1.1254E+04
19.444	1.4870E+06	1.4320E+04	1.4605E+04
24.000	1.4563E+06	1.6268E+04	1.6549E+04
96.000	1.0852E+06	2.5607E+04	2.5824E+04
720.000	8.4859E+04	1.2888E+04	1.2911E+04

Time (hr)	Intact MSL No. D I-131 (Curies)	Drain Pathway Mixing I-131 (Curies)	Effective Condenser I-131 (Curies)
0.000	5.3370E-03	8.0250E-03	8.8474E-07
0.200	1.7681E+03	5.3600E+01	3.2491E+03
0.400	2.9320E+03	5.7997E+01	6.9525E+03
0.500	3.3386E+03	5.9060E+01	8.8853E+03
0.700	3.8936E+03	6.0080E+01	1.2823E+04
0.900	4.1896E+03	5.9442E+01	1.6766E+04
1.100	4.2984E+03	5.7658E+01	2.0621E+04
1.300	4.2744E+03	5.5119E+01	2.4326E+04
1.500	4.1588E+03	5.2117E+01	2.7843E+04
1.700	3.9828E+03	4.8867E+01	3.1147E+04
1.900	3.7694E+03	4.5526E+01	3.4228E+04
2.000	3.6541E+03	4.3858E+01	3.5685E+04
2.200	4.2158E+03	4.3827E+01	3.5659E+04
2.400	4.6884E+03	4.3795E+01	3.5633E+04
2.600	5.0892E+03	4.3764E+01	3.5608E+04
2.800	5.4319E+03	4.3733E+01	3.5582E+04
3.000	5.7278E+03	4.3701E+01	3.5557E+04
3.200	5.9858E+03	4.3670E+01	3.5531E+04
3.400	6.2133E+03	4.3638E+01	3.5506E+04
3.600	6.4160E+03	4.3607E+01	3.5480E+04
3.800	6.5988E+03	4.3576E+01	3.5455E+04
4.000	6.7653E+03	4.3544E+01	3.5429E+04
4.200	6.9189E+03	4.3513E+01	3.5404E+04
4.400	7.0618E+03	4.3482E+01	3.5378E+04
4.600	7.1962E+03	4.3451E+01	3.5353E+04
4.800	7.3236E+03	4.3420E+01	3.5328E+04
5.000	7.4454E+03	4.3388E+01	3.5302E+04
5.200	7.5634E+03	4.3357E+01	3.5277E+04
5.400	7.6789E+03	4.3326E+01	3.5252E+04
5.600	7.7921E+03	4.3295E+01	3.5226E+04
5.800	7.9034E+03	4.3264E+01	3.5201E+04
6.000	8.0130E+03	4.3233E+01	3.5176E+04
6.200	8.1210E+03	4.3202E+01	3.5150E+04
6.400	8.2276E+03	4.3171E+01	3.5125E+04
6.600	8.3330E+03	4.3140E+01	3.5100E+04
6.800	8.4373E+03	4.3109E+01	3.5075E+04
7.000	8.5405E+03	4.3078E+01	3.5049E+04
7.200	8.6429E+03	4.3047E+01	3.5024E+04
7.400	8.7444E+03	4.3016E+01	3.4999E+04
7.600	8.8453E+03	4.2985E+01	3.4974E+04
7.800	8.9454E+03	4.2954E+01	3.4949E+04

8.000	9.0450E+03	4.2923E+01	3.4924E+04
8.200	9.1440E+03	4.2892E+01	3.4899E+04
8.333	9.2097E+03	4.2872E+01	3.4882E+04
8.533	9.3080E+03	4.2841E+01	3.4857E+04
8.733	9.4058E+03	4.2810E+01	3.4832E+04
8.933	9.5032E+03	4.2780E+01	3.4807E+04
9.133	9.6003E+03	4.2749E+01	3.4782E+04
9.333	9.6970E+03	4.2718E+01	3.4757E+04
9.533	9.7935E+03	4.2687E+01	3.4732E+04
9.733	9.8896E+03	4.2657E+01	3.4707E+04
9.933	9.9854E+03	4.2626E+01	3.4682E+04
10.133	1.0081E+04	4.2596E+01	3.4657E+04
12.000	1.0962E+04	4.2311E+01	3.4426E+04
19.444	1.4320E+04	4.1194E+01	3.3517E+04
24.000	1.6268E+04	4.0526E+01	3.2973E+04
96.000	2.5607E+04	3.1290E+01	2.5459E+04
720.000	1.2888E+04	3.3260E+00	2.7062E+03

Time (hr)	Environment I-131 (Curies)	Control Room I-131 (Curies)
0.000	4.4464E-18	1.6816E-21
0.200	6.3827E-03	2.3113E-06
0.400	2.7652E-02	9.6022E-06
0.500	4.4510E-02	1.5143E-05
0.700	9.1519E-02	2.9912E-05
0.900	1.5699E-01	4.9333E-05
1.100	2.4141E-01	7.2987E-05
1.300	3.4492E-01	1.0038E-04
1.500	4.6740E-01	1.3100E-04
1.700	6.0859E-01	1.6434E-04
1.900	7.6808E-01	1.9991E-04
2.000	8.5454E-01	2.1839E-04
2.200	8.5454E-01	1.9063E-04
2.400	8.5454E-01	1.6639E-04
2.600	8.5454E-01	1.4523E-04
2.800	8.5454E-01	1.2677E-04
3.000	8.5454E-01	1.1065E-04
3.200	8.5454E-01	9.6581E-05
3.400	8.5454E-01	8.4302E-05
3.600	8.5454E-01	7.3583E-05
3.800	8.5454E-01	6.4228E-05
4.000	8.5454E-01	5.6061E-05
4.200	8.5454E-01	4.8934E-05
4.400	8.5454E-01	4.2712E-05
4.600	8.5454E-01	3.7281E-05
4.800	8.5454E-01	3.2541E-05
5.000	8.5454E-01	2.8404E-05
5.200	8.5454E-01	2.4792E-05
5.400	8.5454E-01	2.1640E-05
5.600	8.5454E-01	1.8889E-05
5.800	8.5454E-01	1.6487E-05
6.000	8.5454E-01	1.4391E-05
6.200	8.5454E-01	1.2561E-05
6.400	8.5454E-01	1.0964E-05
6.600	8.5454E-01	9.5701E-06
6.800	8.5454E-01	8.3533E-06
7.000	8.5454E-01	7.2912E-06
7.200	8.5454E-01	6.3642E-06
7.400	8.5454E-01	5.5550E-06
7.600	8.5454E-01	4.8487E-06
7.800	8.5454E-01	4.2323E-06
8.000	8.5454E-01	3.6942E-06
8.200	8.5454E-01	3.2245E-06
8.333	8.5454E-01	2.9450E-06
8.533	8.5454E-01	2.5706E-06
8.733	8.5454E-01	2.2437E-06
8.933	8.5454E-01	1.9585E-06
9.133	8.5454E-01	1.7094E-06
9.333	8.5454E-01	1.4921E-06
9.533	8.5454E-01	1.3024E-06

9.733	8.5454E-01	1.1368E-06
9.933	8.5454E-01	9.9226E-07
10.133	8.5454E-01	8.6610E-07
12.000	8.5454E-01	2.4343E-07
19.444	8.5454E-01	1.5421E-09
24.000	8.5454E-01	6.9649E-11
96.000	8.5454E-01	3.8215E-32
720.000	8.5454E-01	2.1034-216

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

	EAB LOCA		LOCA @ LPZ		LOCA @ Unprotected 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
0.200	2.8297E-03	1.3770E-03	1.6705E-04	8.1293E-05	1.6092E-02	7.8307E-03
0.400	1.2234E-02	5.9687E-03	7.2227E-04	3.5237E-04	6.9574E-02	3.3943E-02
0.500	1.9674E-02	9.5965E-03	1.1614E-03	5.6654E-04	1.1188E-01	5.4573E-02
0.700	4.0373E-02	1.9643E-02	2.3835E-03	1.1597E-03	2.2959E-01	1.1171E-01
0.900	6.9123E-02	3.3462E-02	4.0808E-03	1.9755E-03	3.9309E-01	1.9029E-01
1.100	1.0610E-01	5.1011E-02	6.2635E-03	3.0115E-03	6.0334E-01	2.9009E-01
1.300	1.5131E-01	7.2165E-02	8.9327E-03	4.2604E-03	8.6046E-01	4.1039E-01
1.500	2.0468E-01	9.6747E-02	1.2083E-02	5.7115E-03	1.1639E+00	5.5017E-01
1.700	2.6603E-01	1.2455E-01	1.5706E-02	7.3527E-03	1.5129E+00	7.0826E-01
1.900	3.3517E-01	1.5534E-01	1.9787E-02	9.1706E-03	1.9060E+00	8.8337E-01
2.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
2.200	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
2.400	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
2.600	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
2.800	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
3.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
3.200	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
3.400	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
3.600	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
3.800	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
4.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
4.200	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
4.400	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
4.600	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
4.800	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
5.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
5.200	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
5.400	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
5.600	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
5.800	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
6.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
6.200	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
6.400	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
6.600	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
6.800	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
7.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
7.200	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
7.400	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
7.600	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
7.800	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
8.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
8.200	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
8.333	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
8.533	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
8.733	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
8.933	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
9.133	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
9.333	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
9.533	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
9.733	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
9.933	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
10.133	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
12.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01

19.444	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
24.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
96.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01
720.000	3.7259E-01	1.7178E-01	2.1996E-02	1.0142E-02	2.1188E+00	9.7690E-01

LOCA @ CR

Time (hr)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00
0.200	2.0329E-05	6.4947E-06
0.400	1.6575E-04	5.2523E-05
0.500	3.2620E-04	1.0291E-04
0.700	9.0311E-04	2.8210E-04
0.900	1.9233E-03	5.9416E-04
1.100	3.4997E-03	1.0683E-03
1.300	5.7326E-03	1.7280E-03
1.500	8.7085E-03	2.5909E-03
1.700	1.2500E-02	3.6697E-03
1.900	1.7167E-02	4.9722E-03
2.000	1.9844E-02	5.7086E-03
2.200	2.5063E-02	7.1098E-03
2.400	2.9608E-02	8.2828E-03
2.600	3.3566E-02	9.2655E-03
2.800	3.7014E-02	1.0090E-02
3.000	4.0016E-02	1.0781E-02
3.200	4.2631E-02	1.1362E-02
3.400	4.4909E-02	1.1850E-02
3.600	4.6893E-02	1.2260E-02
3.800	4.8621E-02	1.2606E-02
4.000	5.0126E-02	1.2897E-02
4.200	5.1438E-02	1.3142E-02
4.400	5.2580E-02	1.3349E-02
4.600	5.3575E-02	1.3524E-02
4.800	5.4442E-02	1.3671E-02
5.000	5.5197E-02	1.3796E-02
5.200	5.5855E-02	1.3901E-02
5.400	5.6428E-02	1.3991E-02
5.600	5.6927E-02	1.4066E-02
5.800	5.7362E-02	1.4130E-02
6.000	5.7741E-02	1.4185E-02
6.200	5.8072E-02	1.4231E-02
6.400	5.8359E-02	1.4270E-02
6.600	5.8610E-02	1.4303E-02
6.800	5.8829E-02	1.4332E-02
7.000	5.9019E-02	1.4356E-02
7.200	5.9185E-02	1.4376E-02
7.400	5.9329E-02	1.4394E-02
7.600	5.9455E-02	1.4408E-02
7.800	5.9565E-02	1.4421E-02
8.000	5.9661E-02	1.4432E-02
8.200	5.9744E-02	1.4441E-02
8.333	5.9793E-02	1.4447E-02
8.533	5.9860E-02	1.4454E-02
8.733	5.9917E-02	1.4460E-02
8.933	5.9968E-02	1.4465E-02
9.133	6.0012E-02	1.4469E-02
9.333	6.0050E-02	1.4473E-02
9.533	6.0083E-02	1.4477E-02
9.733	6.0112E-02	1.4479E-02
9.933	6.0137E-02	1.4482E-02
10.133	6.0159E-02	1.4484E-02
12.000	6.0268E-02	1.4493E-02
19.444	6.0309E-02	1.4497E-02
24.000	6.0309E-02	1.4497E-02
96.000	6.0309E-02	1.4498E-02
720.000	6.0309E-02	1.4498E-02

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:08:56

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

            LOCA AST- MSIV Leakage

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

EAB LOCA
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
    0.0   1.5817E-01   3.7259E-01   1.7178E-01

#################################################################
                          Final Doses
#################################################################

LOCA @ LPZ
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   9.3377E-03   2.1996E-02   1.0142E-02

LOCA @ Unprotected CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   8.9947E-01   2.1188E+00   9.7690E-01

LOCA @ CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   1.2294E-02   6.0309E-02   1.4498E-02
```

Attachment 16 RADTRAD Output:
Attch 16 MSIV_Atrium11_600cfm_Drywell+Wetwell 2-720hr.o0

7

All Attachment 16 Pages Revised for Rev 7

```
 ######################################################################
     ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:10:37

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

             LOCA AST- MSIV Leakage

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

 Input File Name      = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 16
MSIV_Atrium11_600cfm_Drywell+Wetwell 2-720hr.psf
 Output File Name     = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 16
MSIV_Atrium11_600cfm_Drywell+Wetwell 2-720hr.o0

 Inventory file       =  c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Release file         =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\msiv-imrel.rft
 Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp




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


   Radtrad 3.10  Rev. 4
   LOCA AST- MSIV Leakage
 Dose Conversion Factor File:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
 Release Fraction & Timing Files:
   1
   c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\msiv-imrel.rft
 Nuclide Inventory Files:
   1
   1 c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Plant Power Level:
   4.032E+03
 Number of Compartments:
   8
 Compartment 1:
   Primary Containment
   3
   3.8819E+05
   0
   0
   0
   1
   0
 Compartment 2:
   Intact MSL No. A
   3
   6.78E+01
   0
   0
   0
   0
   0
 Compartment 3:
   Intact MSL No. B
   3
```

```
  7.39E+01
  0
  0
  0
  0
  0
Compartment 4:
  Intact MSL No. D
  3
  6.78E+01
  0
  0
  0
  0
  0
Compartment 5:
  Drain Pathway Mixing Volume
  3
  1.00E+00
  0
  0
  0
  0
  0
Compartment 6:
  Effective Condenser
  3
  9.86E+04
  0
  0
  0
  0
  0
Compartment 7:
  Environment
  2
  0.00E+00
  0
  0
  0
  0
  0
Compartment 8:
  Control Room
  1
  5.18E+05
  0
  0
  0
  0
  0
Number of Pathways:
 13
Pathway 1:
  Primary Containment to Drain Pathway Mixing Volume - Faulted MSL No. C
  1
  5
  2
Pathway 2:
  Primary Containment to Intact MSL No. A
  1
  2
  2
Pathway 3:
  Primary Containment to Intact MSL No. B
  1
  3
  2
Pathway 4:
  Primary Containment to Intact MSL No. D
```

```
  1
  4
  2
Pathway 5:
  Intact MSL No. A to Drain Pathway Mixing Volume
  2
  5
  2
Pathway 6:
  Intact MSL No. B to Drain Pathway Mixing Volume
  3
  5
  2
Pathway 7:
  Intact MSL No. D to Drain Pathway Mixing Volume
  4
  5
  2
Pathway 8:
  Drain Pathway Mixing Volume to Effective Condenser
  5
  6
  2
Pathway 9:
  Effective Condenser to Environment
  6
  7
  2
Pathway 10:
  Environment to Control Room - Emergency Filtered Air Intake
  7
  8
  2
Pathway 11:
  Environment to Control Room - Unfiltered Air Intake
  7
  8
  2
Pathway 12:
  Control Room to Environment - CR Exhaust
  8
  7
  2
Pathway 13:
  Environment to  Control Room ingress/egress
  7
  8
  2
  End of Plant Model
Source Term Input:
  1
  1  1  1  1
  0.00E+00
  0.00E+00   7.2E+02
  1
  2   9.5E-01   4.85E-02   1.5E-03
Overlying Pool:
  0
  0.00E+00
  0
  0
  0
  0
Compartments:
  8
Compartment 1:
  0
  1
  0
  0
```

```
  0
  0
  0
  3
  3
  1.00E+01
  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
  0
  0
  0
Compartment 7:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 8:
  0
  1
```

```
  0
  0
  0
  0
  0
  0
  0
Pathways:
 13
Pathway 1:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.97E+00   0.00E+00   0.00E+00   0.00E+00
  2.4E+01   9.85E-01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 2:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   0.00E+00   0.00E+00   0.00E+00
  2.4E+01   6.55E-01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   0.00E+00   0.00E+00   0.00E+00
  2.4E+01   6.55E-01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 4:
```

```
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   0.00E+00   0.00E+00   0.00E+00
  2.4E+01   6.55E-01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   1.48E+01   6.52E+00   0.00E+00
  2.4E+01   6.55E-01   2.58E+01   1.225E+01   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   1.59E+01   7.06E+00   0.00E+00
  2.4E+01   6.55E-01   2.75E+01   1.319E+01   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 7:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   1.31E+00   1.48E+01   6.52E+00   0.00E+00
  2.4E+01   6.55E-01   2.58E+01   1.225E+01   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
```

```
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 8:
  0
  0
  0
  0
  0
  1
  3
  0.00E+00   5.9E+00   6.7E+00   4.27E+00   0.00E+00
  2.4E+01   2.95E+00   1.25E+01   8.19E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 9:
  1
  0
  0
  0
  0
  1
  4
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  2.00E+00   5.9E+00   9.96E+01   9.96E+01   0.00E+00
  2.4E+01   2.95E+00   9.96E+01   9.96E+01   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 10:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   5.229E+03   1.00E+02   1.00E+02   1.00E+02
  2.00E+00   5.229E+03   9.9E+01   9.9E+01   9.9E+01
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
```

```
Pathway 11:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   6.00E+02   1.00E+02   1.00E+02   1.00E+02
  2.00E+00   6.00E+02   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 12:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.839E+03   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 13:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   1.00E+01   1.00E+02   1.00E+02   1.00E+02
  2.00E+00   1.00E+01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  4
Location 1:
  EAB LOCA
  7
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
```

```
  0
Location 2:
  LOCA @ LPZ
  7
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 3:
  LOCA @ Unprotected CR
  7
  1
  2
  0.00E+00   3.5E-04
  7.2E+02   0.00E+00
  0
Location 4:
  LOCA @ CR
  8
  1
  2
  0.00E+00   3.5E-04
  7.2E+02   0.00E+00
  1
  4
  0.00E+00   1.00E+00
  2.4E+01   6.00E-01
  9.6E+01   4.00E-01
  7.2E+02   0.00E+00
X/Q Tables:
  4
  EAB LOCA
  2
  0.00E+00   8.3E-04
  7.2E+02   0.00E+00
  LOCA @ LPZ
  5
  0.00E+00   4.9E-05
  8.00E+00   3.5E-05
  2.4E+01   1.7E-05
  9.6E+01   6.1E-06
  7.2E+02   0.00E+00
  LOCA @ Unprotected CR
  6
  0.00E+00   4.72E-03
  2.00E+00   4.25E-03
  8.00E+00   1.84E-03
  2.4E+01   1.32E-03
  9.6E+01   1.03E-03
  7.2E+02   0.00E+00
  LOCA @ CR
  6
  0.00E+00   1.21E-03
  2.00E+00   8.76E-04
  8.00E+00   3.16E-04
  2.4E+01   1.92E-04
  9.6E+01   1.61E-04
  7.2E+02   0.00E+00
Inflow Pathways:
  3  10 11 13
Exhaust Pathways:
  2  9 12
X/Q table ID for Exhaust-Inflow paths:
  4 4 4
  -1 -1 -1
Simulation Parameters:
  5
```

```
   0.00E+00   0.00E+00
   9.6E+01   1.2E+02
   2.4E+02   2.4E+02
   4.8E+02   2.4E+02
   7.2E+02   0.00E+00
 Output Filename:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 16 MSIV_Atrium11_600cfm_Drywell+Wetwell 2-
720hr.o0
   1
   1
   1
   1
   0
   End of Scenario File
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:10:37

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

            LOCA AST- MSIV Leakage

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

Number of Nuclides =  60

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

Number of compartments    =   8

Compartment information

Compartment number  1
Name: Primary Containment
Compartment volume =   3.8819E+05 (Cubic feet)
Compartment type is Normal
Removal devices within compartment:
     Deposition
Pathways into and out of compartment  1
   Exit Pathway Number    1: Primary Containment to Drain Pathway Mixing Vol
   Exit Pathway Number    2: Primary Containment to Intact MSL No. A
   Exit Pathway Number    3: Primary Containment to Intact MSL No. B
   Exit Pathway Number    4: Primary Containment to Intact MSL No. D

Compartment number  2
Name: Intact MSL No. A
Compartment volume =   6.7800E+01 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  2
   Inlet Pathway Number   2: Primary Containment to Intact MSL No. A
   Exit Pathway Number    5: Intact MSL No. A to Drain Pathway Mixing Volume

Compartment number  3
Name: Intact MSL No. B
Compartment volume =   7.3900E+01 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  3
   Inlet Pathway Number   3: Primary Containment to Intact MSL No. B
   Exit Pathway Number    6: Intact MSL No. B to Drain Pathway Mixing Volume

Compartment number  4
Name: Intact MSL No. D
Compartment volume =   6.7800E+01 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  4
   Inlet Pathway Number   4: Primary Containment to Intact MSL No. D
   Exit Pathway Number    7: Intact MSL No. D to Drain Pathway Mixing Volume

Compartment number  5
Name: Drain Pathway Mixing Volume
Compartment volume =   1.0000E+00 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  5
   Inlet Pathway Number   1: Primary Containment to Drain Pathway Mixing Vol
   Inlet Pathway Number   5: Intact MSL No. A to Drain Pathway Mixing Volume
   Inlet Pathway Number   6: Intact MSL No. B to Drain Pathway Mixing Volume
   Inlet Pathway Number   7: Intact MSL No. D to Drain Pathway Mixing Volume
   Exit Pathway Number    8: Drain Pathway Mixing Volume to Effective Conden

Compartment number  6
```

```
Name: Effective Condenser
Compartment volume =   9.8600E+04 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  6
   Inlet Pathway Number   8: Drain Pathway Mixing Volume to Effective Conden
   Exit Pathway Number    9: Effective Condenser to Environment

Compartment number  7
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  7
   Inlet Pathway Number   9: Effective Condenser to Environment
   Inlet Pathway Number  12: Control Room to Environment - CR Exhaust
   Exit Pathway Number   10: Environment to Control Room - Emergency Filtere
   Exit Pathway Number   11: Environment to Control Room - Unfiltered Air In
   Exit Pathway Number   13: Environment to  Control Room ingress/egress

Compartment number  8
Name: Control Room
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  8
   Inlet Pathway Number  10: Environment to Control Room - Emergency Filtere
   Inlet Pathway Number  11: Environment to Control Room - Unfiltered Air In
   Inlet Pathway Number  13: Environment to  Control Room ingress/egress
   Exit Pathway Number   12: Control Room to Environment - CR Exhaust

Total number of pathways =  13
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:10:37

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

            LOCA AST- MSIV Leakage

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

Power Ratio                              =   4.0320E+03

End Time                                 =   7.2000E+02 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Source Number  1 is used in Compartment  1  Primary Containment
   Nuclide Distribution given in Ci/MWt
Fraction of Nuclide Distribution in this Compartment   1.00000

Iodine fractions for source number 1
     Aerosol     =   9.5000E-01
     Elemental   =   4.8500E-02
     Organic     =   1.5000E-03

Inventory file =     c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
Release from file =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\msiv-imrel.rft
Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
```

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)
Kr-85	1	4.150E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	6.940E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.320E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	1.780E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
Rb-86	3	6.120E+01	1.612E+06	4.810E-15	1.330E-09	1.790E-09
Te-131m	4	5.230E+03	1.080E+05	7.463E-14	3.669E-08	1.758E-09
Te-132	4	3.820E+04	2.815E+05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.690E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09
I-132	2	3.920E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.490E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.150E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.240E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.380E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	1.450E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Cs-134	3	5.840E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.480E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.480E+03	9.467E+08	2.725E-14	7.930E-09	8.630E-09

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
Te-131m	Te-131	0.22	I-131	0.78	none	0.00
Te-132	I-132	1.00	none	0.00	none	0.00
I-131	Xe-131m	0.01	none	0.00	none	0.00
I-133	Xe-133m	0.03	Xe-133	0.97	none	0.00
I-135	Xe-135m	0.15	Xe-135	0.85	none	0.00
Xe-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00

Release Fractions and Timings
 FOR SSES MSIV and immediate release assumption
 Duration (h):

	GAP	EARLY IN-VESSEL	LATE RELEASE	RELEASE MASS
	0.000001 hr	0.0000 hrs	0.0000 hrs	(gm)
NOBLES	1.0000E+00	0.0000E+00	0.0000E+00	5.458E+03
IODINE	3.0000E-01	0.0000E+00	0.0000E+00	3.465E+02
CESIUM	2.5000E-01	0.0000E+00	0.0000E+00	5.649E+04
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
AEROSOL	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00

COMPARTMENT DATA

Compartment number 1: Primary Containment

Natural Deposition (Powers' model): Aerosol data
Reactor type: BWRDBA
Percentile = 10 (%)

Compartment number 2: Intact MSL No. A

Compartment number 3: Intact MSL No. B

Compartment number 4: Intact MSL No. D

Compartment number 5: Drain Pathway Mixing Volume

Compartment number 6: Effective Condenser

Compartment number 7: Environment

Compartment number 8: Control Room

PATHWAY DATA

Pathway number 1: Primary Containment to Drain Pathway Mixing Vol

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.9700E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	9.8500E-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 2: Primary Containment to Intact MSL No. A

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.5500E-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 3: Primary Containment to Intact MSL No. B

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.5500E-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 4: Primary Containment to Intact MSL No. D

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	0.0000E+00	0.0000E+00	0.0000E+00
2.4000E+01	6.5500E-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: Intact MSL No. A to Drain Pathway Mixing Volume

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	1.4800E+01	6.5200E+00	0.0000E+00
2.4000E+01	6.5500E-01	2.5800E+01	1.2250E+01	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 6: Intact MSL No. B to Drain Pathway Mixing Volume

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	1.5900E+01	7.0600E+00	0.0000E+00
2.4000E+01	6.5500E-01	2.7500E+01	1.3190E+01	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 7: Intact MSL No. D to Drain Pathway Mixing Volume

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.3100E+00	1.4800E+01	6.5200E+00	0.0000E+00
2.4000E+01	6.5500E-01	2.5800E+01	1.2250E+01	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 8: Drain Pathway Mixing Volume to Effective Conden

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.9000E+00	6.7000E+00	4.2700E+00	0.0000E+00
2.4000E+01	2.9500E+00	1.2500E+01	8.1900E+00	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 9: Effective Condenser 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
2.0000E+00	5.9000E+00	9.9600E+01	9.9600E+01	0.0000E+00
2.4000E+01	2.9500E+00	9.9600E+01	9.9600E+01	0.0000E+00
7.2000E+02	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

Pathway number 10: Environment to Control Room - Emergency Filtere

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.2290E+03	1.0000E+02	1.0000E+02	1.0000E+02
2.0000E+00	5.2290E+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 11: Environment to Control Room - Unfiltered Air In

```
     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    6.0000E+02   1.0000E+02   1.0000E+02   1.0000E+02
       2.0000E+00    6.0000E+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 12: Control Room to Environment - CR Exhaust

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    5.8390E+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 13: Environment to  Control Room ingress/egress

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    1.0000E+01   1.0000E+02   1.0000E+02   1.0000E+02
       2.0000E+00    1.0000E+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

DOSE INFORMATION
Number_Dose_Locations =  4

Dose Location Name = EAB LOCA
         Located in compartment  7 the Environment

EAB LOCA 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

Dose Location Name = LOCA @ LPZ
         Located in compartment  7 the Environment

LOCA @ LPZ 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

Dose Location Name = LOCA @ Unprotected CR
         Located in compartment  7 the Environment

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

Dose Location Name = LOCA @ CR
         Located in compartment  8 the Control Room

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

LOCA @ CR 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

 X/Q, ATMOSPHERIC DISPERSION INFORMATION

 X/Q Table Name =    EAB LOCA

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

 X/Q Table Name =    LOCA @ LPZ

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.9000E-05
        8.0000E+00          3.5000E-05
        2.4000E+01          1.7000E-05
        9.6000E+01          6.1000E-06
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ Unprotected CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.7200E-03
        2.0000E+00          4.2500E-03
        8.0000E+00          1.8400E-03
        2.4000E+01          1.3200E-03
        9.6000E+01          1.0300E-03
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          1.2100E-03
        2.0000E+00          8.7600E-04
        8.0000E+00          3.1600E-04
        2.4000E+01          1.9200E-04
        9.6000E+01          1.6100E-04
        7.2000E+02          0.0000E+00

 This X/Q Table is used for these connected pathways
  Path  9  Effective Condenser to Environment and Path 10  Environment to Control Room - Emergency
Filtere
  Path  9  Effective Condenser to Environment and Path 11  Environment to Control Room - Unfiltered Air
In
  Path  9  Effective Condenser to Environment and Path 13  Environment to  Control Room ingress/egress

 USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
        Time (hr)      Time step (hr)
       0.0000E+00        0.0000E+00
       9.6000E+01        1.2000E+02
       2.4000E+02        2.4000E+02
       4.8000E+02        2.4000E+02
       7.2000E+02        0.0000E+00

  EDIT EACH MAJOR TIME STEP

  EDIT SUPPLEMENTAL TIME STEPS

  EDIT MODEL DECONTAMINATION RESULTS

       Masses in Atoms and kg in detailed output
```

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


            LOCA AST- MSIV Leakage

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

Detailed model information at time (hr) =    0.0000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00

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EAB LOCA Doses:

Time (h) =   0.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ LPZ Doses:

Time (h) =   0.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) =   0.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ CR Doses:

Time (h) =   0.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

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

Effective Condenser to Environment Transport Group Inventory:
```

```
                          Pathway
Time (h) =   0.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =   0.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                          Pathway
Time (h) =   0.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =   0.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =   0.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    0.4500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.4623E+00

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EAB LOCA Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00
```

LOCA @ LPZ Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00

LOCA @ CR Doses:

Time (h) = 0.5000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

****

Effective Condenser 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Emergency Filtere 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Unfiltered Air In 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Control Room to Environment - CR Exhaust 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room ingress/egress 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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

```
Detailed model information at time (hr) =    1.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 6.6053E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.9416E+00

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EAB LOCA Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ LPZ Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

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

Effective Condenser to Environment 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Emergency Filtere 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Air In 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
```

```
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    4.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 1.0673E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 9.7133E+01

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EAB LOCA Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.8814E-01  1.1347E+00  4.2808E-01
Accumulated dose (rem)  3.8814E-01  1.1347E+00  4.2808E-01

LOCA @ LPZ Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2914E-02  6.6990E-02  2.5272E-02
Accumulated dose (rem)  2.2914E-02  6.6990E-02  2.5272E-02

LOCA @ Unprotected CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.9874E+00  5.8104E+00  2.1920E+00
Accumulated dose (rem)  1.9874E+00  5.8104E+00  2.1920E+00

LOCA @ CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.4053E-02  7.0916E-02  1.6564E-02  3.5600E-01
Accumulated dose (rem)  1.4053E-02  7.0916E-02  1.6564E-02  3.5600E-01

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

Environment Integral Nuclide Release (Ci): at Time (h) =   5.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     4.7761E+01     0.00004
  Kr-85m    4.5255E+02     0.02420
```

Kr-87	2.2158E+02	0.06526
Kr-88	8.4261E+02	0.61437
Rb-86	2.2838E-03	0.00001
I-131	2.6740E+00	0.05997
I-132	1.3563E+00	0.00144
I-133	4.8974E+00	0.02044
I-134	4.3114E-01	0.00044
I-135	3.6118E+00	0.00515
Xe-133	6.0960E+03	0.06798
Xe-135	1.5253E+03	0.12974
Cs-134	2.1910E-01	0.00697
Cs-136	5.5100E-02	0.00031
Cs-137	1.6810E-01	0.00366

Environment Compartment Group Inventory Distribution:

Time (h) = 5.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.0135E+21	5.6306E+16
Elemental I (atoms)	7.5681E+15	4.2045E+11
Organic I (atoms)	6.3688E+16	3.5382E+12
Aerosol I (atoms)	5.2731E+16	2.9295E+12
All Aerosols (kg)	2.1142E-06	1.1746E-10

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 5.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0135E+21
Elemental I (atoms)	1.8524E+18	7.5860E+15
Organic I (atoms)	0.0000E+00	6.3838E+16
Aerosol I (atoms)	1.2876E+19	5.2879E+16
All Aerosols (kg)	5.2638E-04	2.1142E-06

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 5.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2087E+18
Elemental I (atoms)	1.6008E+13	1.6450E+11
Organic I (atoms)	1.3472E+14	1.3843E+12
Aerosol I (atoms)	1.1142E+14	1.1476E+12
All Aerosols (kg)	4.5375E-09	4.5839E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 5.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.5344E+17
Elemental I (atoms)	0.0000E+00	1.8876E+12
Organic I (atoms)	0.0000E+00	1.5884E+13
Aerosol I (atoms)	0.0000E+00	1.3168E+13
All Aerosols (kg)	0.0000E+00	5.2597E-10

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 5.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.2322E+18	1.6499E+13
Elemental I (atoms)	1.0411E+12	0.0000E+00
Organic I (atoms)	8.7565E+12	0.0000E+00
Aerosol I (atoms)	7.9217E+12	0.0000E+00
All Aerosols (kg)	3.1907E-10	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 5.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.2240E+15
Elemental I (atoms)	0.0000E+00	3.1460E+10

```
Organic I (atoms)        0.0000E+00   2.6474E+11
Aerosol I (atoms)        0.0000E+00   2.1947E+11
All Aerosols (kg)        0.0000E+00   8.7662E-12

Detailed model information at time (hr) =    7.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 6.3781E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 6.6000E+02

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EAB LOCA Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.4320E-01  1.7813E+00  5.0369E-01
Accumulated dose (rem)  8.3133E-01  2.9160E+00  9.3177E-01

LOCA @ LPZ Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.6165E-02  1.0516E-01  2.9736E-02
Accumulated dose (rem)  4.9079E-02  1.7215E-01  5.5008E-02

LOCA @ Unprotected CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2694E+00  9.1211E+00  2.5791E+00
Accumulated dose (rem)  4.2568E+00  1.4931E+01  4.7711E+00

LOCA @ CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.5171E-02  1.7076E-01  3.1039E-02  6.7724E-01
Accumulated dose (rem)  3.9223E-02  2.4168E-01  4.7603E-02  1.0332E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =   8.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.4357E+02     0.00006
  Kr-85m    1.0347E+03     0.02536
  Kr-87     3.1472E+02     0.04249
  Kr-88     1.6816E+03     0.56208
  Rb-86     4.8489E-03     0.00001
  I-131     6.9950E+00     0.07190
  I-132     2.2785E+00     0.00111
  I-133     1.2155E+01     0.02325
  I-134     5.0189E-01     0.00023
  I-135     7.9592E+00     0.00521
  Xe-133    1.8166E+04     0.09287
  Xe-135    4.2249E+03     0.16475
  Cs-134    4.6628E-01     0.00680
  Cs-136    1.1687E-01     0.00031
  Cs-137    3.5776E-01     0.00357

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =   8.0000     Release     Rate/s
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Noble gases (atoms)    3.0414E+21  1.0560E+17
Elemental I (atoms)    2.2179E+16  7.7012E+11
Organic I (atoms)      1.8693E+17  6.4905E+12
Aerosol I (atoms)      1.1006E+17  3.8216E+12
All Aerosols (kg)      4.4991E-06  1.5622E-10

Effective Condenser to Environment Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.0414E+21
Elemental I (atoms)      5.3701E+18   2.2223E+16
Organic I (atoms)        0.0000E+00   1.8729E+17
Aerosol I (atoms)        2.6468E+19   1.1036E+17
All Aerosols (kg)        1.1200E-03   4.4991E-06

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   6.6098E+18
Elemental I (atoms)      4.6322E+13   4.8120E+11
Organic I (atoms)        3.9041E+14   4.0554E+12
Aerosol I (atoms)        2.2869E+14   2.3919E+12
All Aerosols (kg)        9.6410E-09   9.7403E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.5844E+17
Elemental I (atoms)      0.0000E+00   5.5215E+12
Organic I (atoms)        0.0000E+00   4.6534E+13
Aerosol I (atoms)        0.0000E+00   2.7445E+13
All Aerosols (kg)        0.0000E+00   1.1177E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      4.9155E+18   1.0489E+14
Elemental I (atoms)      4.0530E+12   0.0000E+00
Organic I (atoms)        3.4145E+13   0.0000E+00
Aerosol I (atoms)        2.2302E+13   0.0000E+00
All Aerosols (kg)        9.1754E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.2641E+16
Elemental I (atoms)      0.0000E+00   9.2025E+10
Organic I (atoms)        0.0000E+00   7.7557E+11
Aerosol I (atoms)        0.0000E+00   4.5742E+11
All Aerosols (kg)        0.0000E+00   1.8628E-11

Detailed model information at time (hr) =    8.3000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 8.1456E+02

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EAB LOCA Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.8035E-02  1.1946E-01  5.2036E-02
Accumulated dose (rem)  8.7937E-01  3.0355E+00  9.8381E-01

LOCA @ LPZ Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.0256E-03  5.0376E-03  2.1943E-03
Accumulated dose (rem)  5.1104E-02  1.7719E-01  5.7202E-02

LOCA @ Unprotected CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0649E-01  5.1496E-01  1.2373E-01
Accumulated dose (rem)  4.3633E+00  1.5446E+01  4.8948E+00

LOCA @ CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.7008E-03  2.1759E-02  3.4381E-03  7.6590E-02
Accumulated dose (rem)  4.1924E-02  2.6343E-01  5.1041E-02  1.1098E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =   8.3333

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.5717E+02     0.00006
  Kr-85m    1.0992E+03     0.02540
  Kr-87     3.1983E+02     0.04121
  Kr-88     1.7615E+03     0.55724
  Rb-86     5.1342E-03     0.00001
  I-131     7.5665E+00     0.07296
  I-132     2.3523E+00     0.00109
  I-133     1.3071E+01     0.02349
  I-134     5.0405E-01     0.00023
  I-135     8.4472E+00     0.00521
  Xe-133    1.9867E+04     0.09500
  Xe-135    4.5790E+03     0.16743
  Cs-134    4.9384E-01     0.00680
  Cs-136    1.2373E-01     0.00031
  Cs-137    3.7891E-01     0.00357

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =   8.3333     Release     Rate/s
Noble gases (atoms)    3.3289E+21  1.1096E+17
Elemental I (atoms)    2.4217E+16  8.0722E+11
Organic I (atoms)      2.0412E+17  6.8039E+12
Aerosol I (atoms)      1.1634E+17  3.8779E+12
All Aerosols (kg)      4.7650E-06  1.5883E-10

Effective Condenser to Environment Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.3289E+21
Elemental I (atoms)      5.8573E+18   2.4263E+16
Organic I (atoms)        0.0000E+00   2.0451E+17
Aerosol I (atoms)        2.7933E+19   1.1665E+17
All Aerosols (kg)        1.1862E-03   4.7650E-06

Environment to Control Room - Emergency Filtere Transport Group Inventory:
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                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   6.8347E+18
Elemental I (atoms)      4.7730E+13   4.9712E+11
Organic I (atoms)        4.0229E+14   4.1898E+12
Aerosol I (atoms)        2.3272E+14   2.4410E+12
All Aerosols (kg)        9.8461E-09   9.9477E-11

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.8424E+17
Elemental I (atoms)      0.0000E+00   5.7041E+12
Organic I (atoms)        0.0000E+00   4.8075E+13
Aerosol I (atoms)        0.0000E+00   2.8009E+13
All Aerosols (kg)        0.0000E+00   1.1414E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      5.4293E+18   1.2039E+14
Elemental I (atoms)      4.4664E+12   0.0000E+00
Organic I (atoms)        3.7632E+13   0.0000E+00
Aerosol I (atoms)        2.3864E+13   0.0000E+00
All Aerosols (kg)        9.8371E-10   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.3071E+16
Elemental I (atoms)      0.0000E+00   9.5069E+10
Organic I (atoms)        0.0000E+00   8.0126E+11
Aerosol I (atoms)        0.0000E+00   4.6681E+11
All Aerosols (kg)        0.0000E+00   1.9024E-11

Detailed model information at time (hr) =   11.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 6.4353E+03

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EAB LOCA Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.0098E-01  1.5309E+00  5.5162E-01
Accumulated dose (rem)  1.3803E+00  4.5664E+00  1.5354E+00

LOCA @ LPZ Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.1126E-02  6.4557E-02  2.3261E-02
Accumulated dose (rem)  7.2230E-02  2.4175E-01  8.0464E-02

LOCA @ Unprotected CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.1106E+00  6.5992E+00  1.3289E+00
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Accumulated dose (rem)  5.4739E+00  2.2046E+01  6.2238E+00

LOCA @ CR Doses:

Time (h) =  12.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.6495E-02  1.6015E-01  2.1863E-02  4.9823E-01
Accumulated dose (rem)  5.8419E-02  4.2358E-01  7.2904E-02  1.6081E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  12.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     3.4538E+02     0.00007
  Kr-85m    1.7522E+03     0.02520
  Kr-87     3.4618E+02     0.03026
  Kr-88     2.4450E+03     0.49468
  Rb-86     8.2474E-03     0.00001
  I-131     1.5012E+01     0.08688
  I-132     2.8951E+00     0.00088
  I-133     2.4290E+01     0.02646
  I-134     5.1162E-01     0.00016
  I-135     1.3628E+01     0.00522
  Xe-133    4.3170E+04     0.12239
  Xe-135    8.9580E+03     0.19711
  Cs-134    7.9550E-01     0.00680
  Cs-136    1.9852E-01     0.00030
  Cs-137    6.1040E-01     0.00357

Environment Compartment Group Inventory Distribution:

                          Total      Release
Time (h) =  12.0000     Release     Rate/s
Noble gases (atoms)    7.2998E+21  1.6898E+17
Elemental I (atoms)    5.1801E+16  1.1991E+12
Organic I (atoms)      4.3699E+17  1.0115E+13
Aerosol I (atoms)      1.8364E+17  4.2509E+12
All Aerosols (kg)      7.6753E-06  1.7767E-10

Effective Condenser to Environment Transport Group Inventory:

                            Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.2998E+21
Elemental I (atoms)      1.2400E+19   5.1887E+16
Organic I (atoms)        0.0000E+00   4.3771E+17
Aerosol I (atoms)        4.3389E+19   1.8411E+17
All Aerosols (kg)        1.9106E-03   7.6754E-06

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                            Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.9403E+18
Elemental I (atoms)      6.7004E+13   7.1269E+11
Organic I (atoms)        5.6502E+14   6.0096E+12
Aerosol I (atoms)        2.7562E+14   2.9678E+12
All Aerosols (kg)        1.2090E-08   1.2217E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                            Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.1406E+18
Elemental I (atoms)      0.0000E+00   8.1777E+12
Organic I (atoms)        0.0000E+00   6.8957E+13
Aerosol I (atoms)        0.0000E+00   3.4054E+13
All Aerosols (kg)        0.0000E+00   1.4018E-09
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Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      9.4884E+18   3.3746E+14
Elemental I (atoms)      7.6737E+12   0.0000E+00
Organic I (atoms)        6.4696E+13   0.0000E+00
Aerosol I (atoms)        3.3895E+13   0.0000E+00
All Aerosols (kg)        1.4165E-09   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.9010E+16
Elemental I (atoms)      0.0000E+00   1.3629E+11
Organic I (atoms)        0.0000E+00   1.1493E+12
Aerosol I (atoms)        0.0000E+00   5.6757E+11
All Aerosols (kg)        0.0000E+00   2.3364E-11

Detailed model information at time (hr) =   19.2000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.2996E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.3490E+05

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EAB LOCA Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.2519E-01  4.2304E+00  1.0622E+00
Accumulated dose (rem)  2.3055E+00  8.7969E+00  2.5976E+00

LOCA @ LPZ Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.9014E-02  1.7839E-01  4.4792E-02
Accumulated dose (rem)  1.1124E-01  4.2014E-01  1.2526E-01

LOCA @ Unprotected CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.0510E+00  1.8236E+01  2.6417E+00
Accumulated dose (rem)  7.5249E+00  4.0281E+01  8.8654E+00

LOCA @ CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.3075E-02  3.3050E-01  3.3832E-02  8.2154E-01
Accumulated dose (rem)  8.1493E-02  7.5408E-01  1.0674E-01  2.4296E+00

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Environment Integral Nuclide Release (Ci): at Time (h) =  19.4444

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     9.4146E+02     0.00011
  Kr-85m    2.6688E+03     0.02226
  Kr-87     3.5262E+02     0.01903
  Kr-88     3.0661E+03     0.36814
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Rb-86	1.4400E-02	0.00001
I-131	3.6374E+01	0.11894
I-132	3.2461E+00	0.00060
I-133	5.1673E+01	0.03193
I-134	5.1228E-01	0.00010
I-135	2.2303E+01	0.00492
Xe-133	1.1504E+05	0.18418
Xe-135	1.9125E+04	0.23910
Cs-134	1.3965E+00	0.00680
Cs-136	3.4581E-01	0.00030
Cs-137	1.0717E+00	0.00357

Environment Compartment Group Inventory Distribution:

Time (h) = 19.4444	Total Release	Release Rate/s
Noble gases (atoms)	1.9821E+22	2.8316E+17
Elemental I (atoms)	1.3489E+17	1.9270E+12
Organic I (atoms)	1.1388E+18	1.6269E+13
Aerosol I (atoms)	3.1144E+17	4.4491E+12
All Aerosols (kg)	1.3473E-05	1.9247E-10

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9821E+22
Elemental I (atoms)	3.1721E+19	1.3554E+17
Organic I (atoms)	0.0000E+00	1.1443E+18
Aerosol I (atoms)	7.1545E+19	3.1346E+17
All Aerosols (kg)	3.3533E-03	1.3473E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9856E+19
Elemental I (atoms)	1.2589E+14	1.3681E+12
Organic I (atoms)	1.0625E+15	1.1545E+13
Aerosol I (atoms)	3.5674E+14	3.9897E+12
All Aerosols (kg)	1.6558E-08	1.6735E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.2784E+18
Elemental I (atoms)	0.0000E+00	1.5698E+13
Organic I (atoms)	0.0000E+00	1.3248E+14
Aerosol I (atoms)	0.0000E+00	4.5779E+13
All Aerosols (kg)	0.0000E+00	1.9202E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	1.9454E+19	9.2939E+14
Elemental I (atoms)	1.5178E+13	0.0000E+00
Organic I (atoms)	1.2807E+14	0.0000E+00
Aerosol I (atoms)	4.6878E+13	0.0000E+00
All Aerosols (kg)	2.0053E-09	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 19.4444	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.7973E+16
Elemental I (atoms)	0.0000E+00	2.6163E+11
Organic I (atoms)	0.0000E+00	2.2079E+12
Aerosol I (atoms)	0.0000E+00	7.6299E+11

```
All Aerosols (kg)        0.0000E+00   3.2004E-11

Detailed model information at time (hr) =   23.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.1344E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.4877E+06

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EAB LOCA Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.4226E-01  3.2444E+00  6.4600E-01
Accumulated dose (rem)  2.8478E+00  1.2041E+01  3.2436E+00

LOCA @ LPZ Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2866E-02  1.3681E-01  2.7241E-02
Accumulated dose (rem)  1.3411E-01  5.5695E-01  1.5250E-01

LOCA @ Unprotected CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.2021E+00  1.3985E+01  1.6493E+00
Accumulated dose (rem)  8.7271E+00  5.4267E+01  1.0515E+01

LOCA @ CR Doses:

Time (h) =  24.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.3821E-02  2.5621E-01  2.2035E-02  5.4501E-01
Accumulated dose (rem)  9.5315E-02  1.0103E+00  1.2877E-01  2.9746E+00

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

Environment Integral Nuclide Release (Ci): at Time (h) =  24.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.4443E+03     0.00014
  Kr-85m    2.9755E+03     0.01979
  Kr-87     3.5279E+02     0.01540
  Kr-88     3.1846E+03     0.30718
  Rb-86     1.8051E-02     0.00001
  I-131     5.3307E+01     0.13779
  I-132     3.2900E+00     0.00049
  I-133     6.9913E+01     0.03417
  I-134     5.1228E-01     0.00008
  I-135     2.6067E+01     0.00457
  Xe-133    1.7396E+05     0.22073
  Xe-135    2.5118E+04     0.24906
  Cs-134    1.7564E+00     0.00675
  Cs-136    4.3287E-01     0.00030
  Cs-137    1.3480E+00     0.00355

Environment Compartment Group Inventory Distribution:

                         Total      Release
Time (h) =  24.0000     Release     Rate/s
Noble gases (atoms)    3.0338E+22  3.5113E+17
Elemental I (atoms)    2.0185E+17  2.3362E+12
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Organic I (atoms)      1.7045E+18  1.9728E+13
Aerosol I (atoms)      3.8442E+17  4.4493E+12
All Aerosols (kg)      1.6945E-05  1.9612E-10

Effective Condenser to Environment Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.0338E+22
Elemental I (atoms)      4.7054E+19   2.0282E+17
Organic I (atoms)        0.0000E+00   1.7127E+18
Aerosol I (atoms)        8.7034E+19   3.8711E+17
All Aerosols (kg)        4.2170E-03   1.6945E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.8154E+19
Elemental I (atoms)      1.7301E+14   1.8950E+12
Organic I (atoms)        1.4606E+15   1.5997E+13
Aerosol I (atoms)        4.0154E+14   4.5715E+12
All Aerosols (kg)        1.9233E-08   1.9440E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered    Transported
Noble gases (atoms)      0.0000E+00   3.2305E+18
Elemental I (atoms)      0.0000E+00   2.1744E+13
Organic I (atoms)        0.0000E+00   1.8356E+14
Aerosol I (atoms)        0.0000E+00   5.2456E+13
All Aerosols (kg)        0.0000E+00   2.2306E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered    Transported
Noble gases (atoms)      2.7995E+19   1.3506E+15
Elemental I (atoms)      2.1347E+13   0.0000E+00
Organic I (atoms)        1.8020E+14   0.0000E+00
Aerosol I (atoms)        5.4127E+13   0.0000E+00
All Aerosols (kg)        2.3501E-09   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =  24.0000      Filtered    Transported
Noble gases (atoms)      0.0000E+00   5.3841E+16
Elemental I (atoms)      0.0000E+00   3.6241E+11
Organic I (atoms)        0.0000E+00   3.0594E+12
Aerosol I (atoms)        0.0000E+00   8.7427E+11
All Aerosols (kg)        0.0000E+00   3.7177E-11

Detailed model information at time (hr) =   95.5000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.6041E+06

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EAB LOCA Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.7816E+00	4.4494E+01	5.1775E+00
Accumulated dose (rem)	6.6294E+00	5.6536E+01	8.4212E+00

LOCA @ LPZ Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	7.7455E-02	9.1133E-01	1.0605E-01
Accumulated dose (rem)	2.1157E-01	1.4683E+00	2.5854E-01

LOCA @ Unprotected CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.0142E+00	1.0768E+02	9.3924E+00
Accumulated dose (rem)	1.4741E+01	1.6195E+02	1.9907E+01

LOCA @ CR Doses:

Time (h) = 96.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	3.9093E-02	1.0861E+00	7.3204E-02	1.7111E+00
Accumulated dose (rem)	1.3441E-01	2.0964E+00	2.0197E-01	4.6857E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 96.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 9
Kr-85	8.8447E+03	0.00027
Kr-85m	3.1645E+03	0.01174
Kr-87	3.5280E+02	0.00889
Kr-88	3.2199E+03	0.17813
Rb-86	4.3396E-02	0.00001
I-131	2.5593E+02	0.21856
I-132	3.2988E+00	0.00028
I-133	1.4701E+02	0.02957
I-134	5.1228E-01	0.00005
I-135	3.0011E+01	0.00281
Xe-133	8.7134E+05	0.36562
Xe-135	3.6685E+04	0.17393
Cs-134	4.3986E+00	0.00647
Cs-136	1.0228E+00	0.00028
Cs-137	3.3791E+00	0.00340

Environment Compartment Group Inventory Distribution:

Time (h) = 96.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.8087E+23	5.2334E+17
Elemental I (atoms)	9.5937E+17	2.7759E+12
Organic I (atoms)	8.3349E+18	2.4117E+13
Aerosol I (atoms)	8.2317E+17	2.3818E+12
All Aerosols (kg)	4.2442E-05	1.2281E-10

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.8087E+23
Elemental I (atoms)	1.9621E+20	9.6121E+17
Organic I (atoms)	0.0000E+00	8.3505E+18
Aerosol I (atoms)	1.5320E+20	8.2700E+17
All Aerosols (kg)	1.0553E-02	4.2443E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 96.0000	Pathway Filtered	Transported

```
Noble gases (atoms)      0.0000E+00   9.9684E+19
Elemental I (atoms)      4.2967E+14   5.4939E+12
Organic I (atoms)        3.7264E+15   4.7495E+13
Aerosol I (atoms)        4.5669E+14   6.6670E+12
All Aerosols (kg)        3.1143E-08   3.1515E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.1438E+19
Elemental I (atoms)      0.0000E+00   6.3039E+13
Organic I (atoms)        0.0000E+00   5.4498E+14
Aerosol I (atoms)        0.0000E+00   7.6500E+13
All Aerosols (kg)        0.0000E+00   3.6162E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      1.0845E+20   8.4965E+15
Elemental I (atoms)      6.7585E+13   0.0000E+00
Organic I (atoms)        5.8409E+14   0.0000E+00
Aerosol I (atoms)        8.2149E+13   0.0000E+00
All Aerosols (kg)        3.9625E-09   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.9064E+17
Elemental I (atoms)      0.0000E+00   1.0507E+12
Organic I (atoms)        0.0000E+00   9.0830E+12
Aerosol I (atoms)        0.0000E+00   1.2750E+12
All Aerosols (kg)        0.0000E+00   6.0271E-11

Detailed model information at time (hr) =  119.6500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.6438E+06

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EAB LOCA Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.3335E+00  1.7714E+01  1.8841E+00
Accumulated dose (rem)  7.9629E+00  7.4249E+01  1.0305E+01

LOCA @ LPZ Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.8004E-03  1.3018E-01  1.3847E-02
Accumulated dose (rem)  2.2137E-01  1.5985E+00  2.7239E-01

LOCA @ Unprotected CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.6548E+00  3.3451E+01  2.6947E+00
Accumulated dose (rem)  1.6396E+01  1.9540E+02  2.2602E+01
```

LOCA @ CR Doses:

Time (h) = 120.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	7.5162E-03	2.3775E-01	1.4909E-02	3.4004E-01
Accumulated dose (rem)	1.4192E-01	2.3342E+00	2.1688E-01	5.0257E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 120.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 9
Kr-85	1.2557E+04	0.00029
Kr-85m	3.1645E+03	0.01112
Kr-87	3.5280E+02	0.00842
Kr-88	3.2199E+03	0.16875
Rb-86	5.0576E-02	0.00001
I-131	3.4058E+02	0.22678
I-132	3.2988E+00	0.00027
I-133	1.5416E+02	0.02832
I-134	5.1228E-01	0.00004
I-135	3.0015E+01	0.00266
Xe-133	1.1476E+06	0.37844
Xe-135	3.6789E+04	0.16486
Cs-134	5.2046E+00	0.00640
Cs-136	1.1846E+00	0.00027
Cs-137	3.9998E+00	0.00337

Environment Compartment Group Inventory Distribution:

Time (h) = 120.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.5458E+23	5.8932E+17
Elemental I (atoms)	1.2676E+18	2.9342E+12
Organic I (atoms)	1.1086E+19	2.5662E+13
Aerosol I (atoms)	9.3124E+17	2.1556E+12
All Aerosols (kg)	5.0227E-05	1.1627E-10

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.5458E+23
Elemental I (atoms)	2.5213E+20	1.2696E+18
Organic I (atoms)	0.0000E+00	1.1103E+19
Aerosol I (atoms)	1.6530E+20	9.3520E+17
All Aerosols (kg)	1.2487E-02	5.0228E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2903E+20
Elemental I (atoms)	5.0762E+14	6.7204E+12
Organic I (atoms)	4.4317E+15	5.8443E+13
Aerosol I (atoms)	4.5700E+14	7.0986E+12
All Aerosols (kg)	3.4190E-08	3.4607E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.4805E+19
Elemental I (atoms)	0.0000E+00	7.7113E+13
Organic I (atoms)	0.0000E+00	6.7060E+14
Aerosol I (atoms)	0.0000E+00	8.1453E+13
All Aerosols (kg)	0.0000E+00	3.9710E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

```
                          Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      1.4119E+20   1.0891E+16
Elemental I (atoms)      8.3127E+13   0.0000E+00
Organic I (atoms)        7.2276E+14   0.0000E+00
Aerosol I (atoms)        8.7673E+13   0.0000E+00
All Aerosols (kg)        4.3601E-09   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.4675E+17
Elemental I (atoms)      0.0000E+00   1.2852E+12
Organic I (atoms)        0.0000E+00   1.1177E+13
Aerosol I (atoms)        0.0000E+00   1.3575E+12
All Aerosols (kg)        0.0000E+00   6.6183E-11

Detailed model information at time (hr) =  239.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.8487E+06

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EAB LOCA Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        6.3784E+00  9.4229E+01  9.2952E+00
Accumulated dose (rem)  1.4341E+01  1.6848E+02  1.9601E+01

LOCA @ LPZ Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        4.6878E-02  6.9253E-01  6.8314E-02
Accumulated dose (rem)  2.6824E-01  2.2910E+00  3.4070E-01

LOCA @ Unprotected CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.9154E+00  1.7795E+02  1.3424E+01
Accumulated dose (rem)  2.4311E+01  3.7334E+02  3.6025E+01

LOCA @ CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.5673E-02  1.2548E+00  7.4519E-02  1.6410E+00
Accumulated dose (rem)  1.7760E-01  3.5889E+00  2.9140E-01  6.6667E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 240.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     3.8986E+04     0.00042
  Kr-85m    3.1645E+03     0.00881
  Kr-87     3.5280E+02     0.00667
  Kr-88     3.2199E+03     0.13370
  Rb-86     7.8981E-02     0.00001
  I-131     7.9606E+02     0.26375
```

I-132	3.2988E+00	0.00021
I-133	1.6128E+02	0.02268
I-134	5.1228E-01	0.00003
I-135	3.0015E+01	0.00211
Xe-133	2.4712E+06	0.42158
Xe-135	3.6813E+04	0.13063
Cs-134	8.7432E+00	0.00600
Cs-136	1.7968E+00	0.00024
Cs-137	6.7316E+00	0.00316

Environment Compartment Group Inventory Distribution:

Time (h) = 240.0000	Total Release	Release Rate/s
Noble gases (atoms)	7.6387E+23	8.8411E+17
Elemental I (atoms)	2.9188E+18	3.3782E+12
Organic I (atoms)	2.5982E+19	3.0072E+13
Aerosol I (atoms)	1.3014E+18	1.5062E+12
All Aerosols (kg)	8.4458E-05	9.7752E-11

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.6387E+23
Elemental I (atoms)	4.9632E+20	2.9212E+18
Organic I (atoms)	0.0000E+00	2.6003E+19
Aerosol I (atoms)	1.7972E+20	1.3056E+18
All Aerosols (kg)	2.0981E-02	8.4458E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.3159E+20
Elemental I (atoms)	8.5519E+14	1.3288E+13
Organic I (atoms)	7.6216E+15	1.1769E+14
Aerosol I (atoms)	4.1078E+14	8.5748E+12
All Aerosols (kg)	4.7576E-08	4.8201E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.8048E+19
Elemental I (atoms)	0.0000E+00	1.5247E+14
Organic I (atoms)	0.0000E+00	1.3504E+15
Aerosol I (atoms)	0.0000E+00	9.8391E+13
All Aerosols (kg)	0.0000E+00	5.5308E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	3.6584E+20	2.2870E+16
Elemental I (atoms)	1.6574E+14	0.0000E+00
Organic I (atoms)	1.4680E+15	0.0000E+00
Aerosol I (atoms)	1.0635E+14	0.0000E+00
All Aerosols (kg)	6.0873E-09	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 240.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.3413E+17
Elemental I (atoms)	0.0000E+00	2.5412E+12
Organic I (atoms)	0.0000E+00	2.2507E+13
Aerosol I (atoms)	0.0000E+00	1.6399E+12
All Aerosols (kg)	0.0000E+00	9.2180E-11

```
Detailed model information at time (hr) =  479.7000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 4.2938E+06

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EAB LOCA Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.6792E+00  1.5228E+02  1.2384E+01
Accumulated dose (rem)  2.2021E+01  3.2076E+02  3.1984E+01

LOCA @ LPZ Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.6438E-02  1.1191E+00  9.1013E-02
Accumulated dose (rem)  3.2468E-01  3.4101E+00  4.3172E-01

LOCA @ Unprotected CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.5297E+00  2.8756E+02  1.8414E+01
Accumulated dose (rem)  3.3841E+01  6.6091E+02  5.4439E+01

LOCA @ CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        4.3046E-02  2.0343E+00  1.0590E-01  2.1320E+00
Accumulated dose (rem)  2.2064E-01  5.6233E+00  3.9730E-01  8.7987E+00

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

Environment Integral Nuclide Release (Ci): at Time (h) = 480.0000

 Nuclide    Compartment  Dose Fract
            Atmosphere   Pathway  9
  Kr-85     1.2061E+05     0.00077
  Kr-85m    3.1645E+03     0.00686
  Kr-87     3.5280E+02     0.00519
  Kr-88     3.2199E+03     0.10405
  Rb-86     1.1073E-01     0.00001
  I-131     1.5340E+03     0.31126
  I-132     3.2988E+00     0.00016
  I-133     1.6148E+02     0.01766
  I-134     5.1228E-01     0.00003
  I-135     3.0015E+01     0.00164
  Xe-133    4.0589E+06     0.44176
  Xe-135    3.6813E+04     0.10167
  Cs-134    1.3862E+01     0.00571
  Cs-136    2.4100E+00     0.00021
  Cs-137    1.0708E+01     0.00301

Environment Compartment Group Inventory Distribution:

                         Total      Release
Time (h) = 480.0000     Release     Rate/s
Noble gases (atoms)    2.2762E+24  1.3172E+18
Elemental I (atoms)    5.5970E+18  3.2390E+12
Organic I (atoms)      5.0375E+19  2.9152E+13
Aerosol I (atoms)      1.5963E+18  9.2378E+11
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All Aerosols (kg)      1.3420E-04  7.7662E-11

Effective Condenser to Environment Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.2762E+24
Elemental I (atoms)      6.4077E+20   5.5997E+18
Organic I (atoms)        0.0000E+00   5.0398E+19
Aerosol I (atoms)        1.2073E+20   1.6006E+18
All Aerosols (kg)        3.3299E-02   1.3420E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.3273E+20
Elemental I (atoms)      1.0425E+15   2.3933E+13
Organic I (atoms)        9.4278E+15   2.1464E+14
Aerosol I (atoms)        2.4438E+14   9.7491E+12
All Aerosols (kg)        6.6990E-08   6.7955E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.0703E+20
Elemental I (atoms)      0.0000E+00   2.7462E+14
Organic I (atoms)        0.0000E+00   2.4629E+15
Aerosol I (atoms)        0.0000E+00   1.1187E+14
All Aerosols (kg)        0.0000E+00   7.7975E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      1.0352E+21   4.6832E+16
Elemental I (atoms)      3.0019E+14   0.0000E+00
Organic I (atoms)        2.6924E+15   0.0000E+00
Aerosol I (atoms)        1.2123E+14   0.0000E+00
All Aerosols (kg)        8.5972E-09   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.7838E+18
Elemental I (atoms)      0.0000E+00   4.5771E+12
Organic I (atoms)        0.0000E+00   4.1049E+13
Aerosol I (atoms)        0.0000E+00   1.8644E+12
All Aerosols (kg)        0.0000E+00   1.2996E-10

Detailed model information at time (hr) =  719.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 4.7904E+06

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EAB LOCA Doses:
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Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.7179E+00	8.2672E+01	5.2788E+00
Accumulated dose (rem)	2.4739E+01	4.0343E+02	3.7263E+01

LOCA @ LPZ Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.9975E-02	6.0759E-01	3.8796E-02
Accumulated dose (rem)	3.4466E-01	4.0177E+00	4.7051E-01

LOCA @ Unprotected CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.3728E+00	1.5612E+02	8.2089E+00
Accumulated dose (rem)	3.7214E+01	8.1703E+02	6.2648E+01

LOCA @ CR Doses:

Time (h) = 720.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	1.5220E-02	1.1062E+00	4.9487E-02	9.8182E-01
Accumulated dose (rem)	2.3586E-01	6.7294E+00	4.4679E-01	9.7806E+00

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Environment Integral Nuclide Release (Ci): at Time (h) = 720.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 9
Kr-85	2.2416E+05	0.00122
Kr-85m	3.1645E+03	0.00624
Kr-87	3.5280E+02	0.00473
Kr-88	3.2199E+03	0.09469
Rb-86	1.2497E-01	0.00001
I-131	1.9347E+03	0.33563
I-132	3.2988E+00	0.00015
I-133	1.6148E+02	0.01607
I-134	5.1228E-01	0.00002
I-135	3.0015E+01	0.00149
Xe-133	4.6134E+06	0.43815
Xe-135	3.6813E+04	0.09252
Cs-134	1.7159E+01	0.00581
Cs-136	2.6448E+00	0.00020
Cs-137	1.3291E+01	0.00307

Environment Compartment Group Inventory Distribution:

Time (h) = 720.0000	Total Release	Release Rate/s
Noble gases (atoms)	4.1596E+24	1.6048E+18
Elemental I (atoms)	7.0528E+18	2.7210E+12
Organic I (atoms)	6.3694E+19	2.4573E+13
Aerosol I (atoms)	1.6772E+18	6.4708E+11
All Aerosols (kg)	1.6646E-04	6.4222E-11

Effective Condenser to Environment Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.1596E+24
Elemental I (atoms)	5.0103E+20	7.0555E+18
Organic I (atoms)	0.0000E+00	6.3717E+19
Aerosol I (atoms)	6.3289E+19	1.6816E+18
All Aerosols (kg)	4.1265E-02	1.6647E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.6812E+21
Elemental I (atoms)	8.0434E+14	2.9719E+13

Organic I (atoms)	7.3129E+15	2.6757E+14
Aerosol I (atoms)	1.2265E+14	1.0071E+13
All Aerosols (kg)	7.9540E-08	8.0768E-10

Environment to Control Room - Unfiltered Air In Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9291E+20
Elemental I (atoms)	0.0000E+00	3.4100E+14
Organic I (atoms)	0.0000E+00	3.0703E+15
Aerosol I (atoms)	0.0000E+00	1.1556E+14
All Aerosols (kg)	0.0000E+00	9.2676E-09

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.8701E+21	7.0793E+16
Elemental I (atoms)	3.7338E+14	0.0000E+00
Organic I (atoms)	3.3620E+15	0.0000E+00
Aerosol I (atoms)	1.2531E+14	0.0000E+00
All Aerosols (kg)	1.0225E-08	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.2151E+18
Elemental I (atoms)	0.0000E+00	5.6834E+12
Organic I (atoms)	0.0000E+00	5.1171E+13
Aerosol I (atoms)	0.0000E+00	1.9260E+12
All Aerosols (kg)	0.0000E+00	1.5446E-10

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#################################################################
                            I-131 Summary
#################################################################
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Time (hr)	Primary Containment I-131 (Curies)	Intact MSL No. A I-131 (Curies)	Intact MSL No. B I-131 (Curies)
0.000	3.2538E+07	3.2941E-03	3.2941E-03
0.200	2.8155E+07	1.0914E+03	1.1017E+03
0.400	2.4394E+07	1.8099E+03	1.8439E+03
0.500	2.2718E+07	2.0609E+03	2.1092E+03
0.700	2.0089E+07	2.4037E+03	2.4815E+03
0.900	1.7788E+07	2.5866E+03	2.6928E+03
1.100	1.5773E+07	2.6540E+03	2.7850E+03
1.300	1.4008E+07	2.6393E+03	2.7909E+03
1.500	1.2464E+07	2.5682E+03	2.7355E+03
1.700	1.1111E+07	2.4597E+03	2.6382E+03
1.900	9.9271E+06	2.3280E+03	2.5135E+03
2.000	9.3915E+06	2.2569E+03	2.4444E+03
2.200	7.8891E+06	2.0988E+03	2.2877E+03
2.400	6.6763E+06	1.9247E+03	2.1120E+03
2.600	5.6972E+06	1.7476E+03	1.9304E+03
2.800	4.9068E+06	1.5754E+03	1.7517E+03
3.000	4.2686E+06	1.4134E+03	1.5815E+03
3.200	3.7532E+06	1.2643E+03	1.4231E+03
3.400	3.3370E+06	1.1295E+03	1.2783E+03
3.600	3.0008E+06	1.0092E+03	1.1478E+03
3.800	2.7293E+06	9.0291E+02	1.0313E+03
4.000	2.5098E+06	8.0990E+02	9.2832E+02

4.200	2.3324E+06	7.2908E+02	8.3796E+02
4.400	2.1890E+06	6.5927E+02	7.5916E+02
4.600	2.0729E+06	5.9931E+02	6.9081E+02
4.800	1.9790E+06	5.4802E+02	6.3179E+02
5.000	1.9029E+06	5.0433E+02	5.8104E+02
5.200	1.8638E+06	4.6768E+02	5.3801E+02
5.400	1.8293E+06	4.3731E+02	5.0190E+02
5.600	1.7988E+06	4.1208E+02	4.7156E+02
5.800	1.7717E+06	3.9104E+02	4.4600E+02
6.000	1.7478E+06	3.7345E+02	4.2443E+02
6.200	1.7266E+06	3.5870E+02	4.0618E+02
6.400	1.7077E+06	3.4629E+02	3.9071E+02
6.600	1.6910E+06	3.3581E+02	3.7757E+02
6.800	1.6761E+06	3.2694E+02	3.6638E+02
7.000	1.6628E+06	3.1940E+02	3.5682E+02
7.200	1.6510E+06	3.1298E+02	3.4865E+02
7.400	1.6404E+06	3.0748E+02	3.4164E+02
7.600	1.6309E+06	3.0276E+02	3.3562E+02
7.800	1.6224E+06	2.9870E+02	3.3042E+02
8.000	1.6148E+06	2.9519E+02	3.2593E+02
8.200	1.6079E+06	2.9215E+02	3.2204E+02
8.333	1.6038E+06	2.9035E+02	3.1973E+02
8.533	1.5984E+06	2.8794E+02	3.1666E+02
8.733	1.5935E+06	2.8585E+02	3.1399E+02
8.933	1.5889E+06	2.8402E+02	3.1166E+02
9.133	1.5847E+06	2.8241E+02	3.0962E+02
9.333	1.5808E+06	2.8099E+02	3.0783E+02
9.533	1.5772E+06	2.7973E+02	3.0624E+02
9.733	1.5738E+06	2.7860E+02	3.0483E+02
9.933	1.5706E+06	2.7759E+02	3.0357E+02
10.133	1.5676E+06	2.7668E+02	3.0244E+02
12.000	1.5459E+06	2.7103E+02	2.9566E+02
19.444	1.4906E+06	2.6056E+02	2.8402E+02
24.000	1.4602E+06	2.5524E+02	2.7822E+02
96.000	1.0910E+06	1.9071E+02	2.0788E+02
720.000	8.7255E+04	1.5252E+01	1.6625E+01

Time (hr)	Intact MSL No. D I-131 (Curies)	Drain Pathway Mixing I-131 (Curies)	Effective Condenser I-131 (Curies)
0.000	3.2941E-03	4.9532E-03	5.4608E-07
0.200	1.0914E+03	3.3086E+01	2.0062E+03
0.400	1.8099E+03	3.5804E+01	4.2946E+03
0.500	2.0609E+03	3.6461E+01	5.4896E+03
0.700	2.4037E+03	3.7093E+01	7.9255E+03
0.900	2.5866E+03	3.6703E+01	1.0366E+04
1.100	2.6540E+03	3.5604E+01	1.2755E+04
1.300	2.6393E+03	3.4038E+01	1.5053E+04
1.500	2.5682E+03	3.2187E+01	1.7236E+04
1.700	2.4597E+03	3.0182E+01	1.9290E+04
1.900	2.3280E+03	2.8121E+01	2.1208E+04
2.000	2.2569E+03	2.7092E+01	2.2115E+04
2.200	2.0988E+03	2.4533E+01	2.3794E+04
2.400	1.9247E+03	2.2077E+01	2.5304E+04
2.600	1.7476E+03	1.9787E+01	2.6655E+04
2.800	1.5754E+03	1.7695E+01	2.7860E+04
3.000	1.4134E+03	1.5811E+01	2.8932E+04
3.200	1.2643E+03	1.4134E+01	2.9884E+04
3.400	1.1295E+03	1.2656E+01	3.0732E+04
3.600	1.0092E+03	1.1364E+01	3.1486E+04
3.800	9.0291E+02	1.0241E+01	3.2160E+04
4.000	8.0990E+02	9.2717E+00	3.2765E+04
4.200	7.2908E+02	8.4383E+00	3.3308E+04
4.400	6.5927E+02	7.7249E+00	3.3801E+04
4.600	5.9931E+02	7.1165E+00	3.4248E+04
4.800	5.4802E+02	6.5993E+00	3.4659E+04
5.000	5.0433E+02	6.1608E+00	3.5037E+04
5.200	4.6768E+02	5.8127E+00	3.5388E+04
5.400	4.3731E+02	5.5215E+00	3.5718E+04
5.600	4.1208E+02	5.2771E+00	3.6030E+04
5.800	3.9104E+02	5.0712E+00	3.6327E+04

6.000	3.7345E+02	4.8974E+00	3.6611E+04
6.200	3.5870E+02	4.7502E+00	3.6884E+04
6.400	3.4629E+02	4.6252E+00	3.7147E+04
6.600	3.3581E+02	4.5187E+00	3.7403E+04
6.800	3.2694E+02	4.4278E+00	3.7651E+04
7.000	3.1940E+02	4.3498E+00	3.7894E+04
7.200	3.1298E+02	4.2828E+00	3.8131E+04
7.400	3.0748E+02	4.2250E+00	3.8364E+04
7.600	3.0276E+02	4.1750E+00	3.8594E+04
7.800	2.9870E+02	4.1316E+00	3.8819E+04
8.000	2.9519E+02	4.0938E+00	3.9042E+04
8.200	2.9215E+02	4.0608E+00	3.9262E+04
8.333	2.9035E+02	4.0412E+00	3.9407E+04
8.533	2.8794E+02	4.0151E+00	3.9624E+04
8.733	2.8585E+02	3.9922E+00	3.9838E+04
8.933	2.8402E+02	3.9720E+00	4.0051E+04
9.133	2.8241E+02	3.9540E+00	4.0262E+04
9.333	2.8099E+02	3.9379E+00	4.0472E+04
9.533	2.7973E+02	3.9235E+00	4.0680E+04
9.733	2.7860E+02	3.9105E+00	4.0887E+04
9.933	2.7759E+02	3.8987E+00	4.1093E+04
10.133	2.7668E+02	3.8880E+00	4.1298E+04
12.000	2.7103E+02	3.8187E+00	4.3170E+04
19.444	2.6056E+02	3.6756E+00	5.0125E+04
24.000	2.5524E+02	3.6007E+00	5.4045E+04
96.000	1.9071E+02	2.5838E+00	6.5572E+04
720.000	1.5252E+01	2.0664E-01	1.6518E+04

Time (hr)	Environment I-131 (Curies)	Control Room I-131 (Curies)
0.000	0.0000E+00	0.0000E+00
0.200	0.0000E+00	0.0000E+00
0.400	0.0000E+00	0.0000E+00
0.500	0.0000E+00	0.0000E+00
0.700	0.0000E+00	0.0000E+00
0.900	0.0000E+00	0.0000E+00
1.100	0.0000E+00	0.0000E+00
1.300	0.0000E+00	0.0000E+00
1.500	0.0000E+00	0.0000E+00
1.700	0.0000E+00	0.0000E+00
1.900	0.0000E+00	0.0000E+00
2.000	0.0000E+00	0.0000E+00
2.200	1.1526E-01	2.9535E-05
2.400	2.4097E-01	5.7990E-05
2.600	3.7672E-01	8.5396E-05
2.800	5.2212E-01	1.1178E-04
3.000	6.7679E-01	1.3719E-04
3.200	8.4039E-01	1.6165E-04
3.400	1.0126E+00	1.8521E-04
3.600	1.1932E+00	2.0792E-04
3.800	1.3819E+00	2.2981E-04
4.000	1.5785E+00	2.5093E-04
4.200	1.7828E+00	2.7134E-04
4.400	1.9946E+00	2.9109E-04
4.600	2.2138E+00	3.1022E-04
4.800	2.4403E+00	3.2877E-04
5.000	2.6740E+00	3.4680E-04
5.200	2.9147E+00	3.6435E-04
5.400	3.1624E+00	3.8145E-04
5.600	3.4170E+00	3.9814E-04
5.800	3.6784E+00	4.1447E-04
6.000	3.9467E+00	4.3047E-04
6.200	4.2217E+00	4.4616E-04
6.400	4.5035E+00	4.6157E-04
6.600	4.7919E+00	4.7673E-04
6.800	5.0869E+00	4.9167E-04
7.000	5.3886E+00	5.0639E-04
7.200	5.6968E+00	5.2093E-04
7.400	6.0116E+00	5.3530E-04
7.600	6.3329E+00	5.4951E-04

7.800	6.6607E+00	5.6357E-04
8.000	6.9950E+00	5.7751E-04
8.200	7.3358E+00	5.3556E-04
8.333	7.5665E+00	5.1093E-04
8.533	7.9180E+00	4.7843E-04
8.733	8.2759E+00	4.5065E-04
8.933	8.6401E+00	4.2700E-04
9.133	9.0107E+00	4.0694E-04
9.333	9.3877E+00	3.9001E-04
9.533	9.7710E+00	3.7582E-04
9.733	1.0161E+01	3.6402E-04
9.933	1.0556E+01	3.5430E-04
10.133	1.0959E+01	3.4640E-04
12.000	1.5012E+01	3.2723E-04
19.444	3.6374E+01	4.6403E-04
24.000	5.3307E+01	5.5521E-04
96.000	2.5593E+02	2.9889E-04
720.000	1.9347E+03	8.3546E-05

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

	EAB LOCA		LOCA @ LPZ		LOCA @ Unprotected 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
0.200	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.400	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
0.700	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.900	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.100	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.300	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.500	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
1.900	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
2.200	4.9782E-02	2.1572E-02	2.9389E-03	1.2735E-03	2.5491E-01	1.1046E-01
2.400	1.0395E-01	4.4644E-02	6.1369E-03	2.6356E-03	5.3228E-01	2.2860E-01
2.600	1.6231E-01	6.9068E-02	9.5822E-03	4.0775E-03	8.3111E-01	3.5366E-01
2.800	2.2467E-01	9.4714E-02	1.3264E-02	5.5915E-03	1.1504E+00	4.8498E-01
3.000	2.9086E-01	1.2146E-01	1.7171E-02	7.1704E-03	1.4893E+00	6.2192E-01
3.200	3.6071E-01	1.4919E-01	2.1295E-02	8.8074E-03	1.8470E+00	7.6391E-01
3.400	4.3408E-01	1.7779E-01	2.5626E-02	1.0496E-02	2.2227E+00	9.1039E-01
3.600	5.1083E-01	2.0718E-01	3.0158E-02	1.2231E-02	2.6157E+00	1.0609E+00
3.800	5.9086E-01	2.3726E-01	3.4882E-02	1.4007E-02	3.0255E+00	1.2149E+00
4.000	6.7406E-01	2.6794E-01	3.9794E-02	1.5818E-02	3.4515E+00	1.3720E+00
4.200	7.6034E-01	2.9916E-01	4.4887E-02	1.7661E-02	3.8933E+00	1.5319E+00
4.400	8.4961E-01	3.3084E-01	5.0158E-02	1.9532E-02	4.3504E+00	1.6941E+00
4.600	9.4181E-01	3.6293E-01	5.5601E-02	2.1426E-02	4.8225E+00	1.8584E+00
4.800	1.0369E+00	3.9536E-01	6.1213E-02	2.3340E-02	5.3093E+00	2.0244E+00
5.000	1.1347E+00	4.2808E-01	6.6990E-02	2.5272E-02	5.8104E+00	2.1920E+00
5.200	1.2354E+00	4.6106E-01	7.2931E-02	2.7219E-02	6.3256E+00	2.3608E+00
5.400	1.3387E+00	4.9424E-01	7.9031E-02	2.9178E-02	6.8547E+00	2.5307E+00
5.600	1.4447E+00	5.2759E-01	8.5290E-02	3.1147E-02	7.3976E+00	2.7015E+00
5.800	1.5534E+00	5.6107E-01	9.1705E-02	3.3124E-02	7.9540E+00	2.8730E+00
6.000	1.6646E+00	5.9467E-01	9.8274E-02	3.5107E-02	8.5238E+00	3.0450E+00
6.200	1.7785E+00	6.2834E-01	1.0500E-01	3.7095E-02	9.1068E+00	3.2174E+00
6.400	1.8949E+00	6.6206E-01	1.1187E-01	3.9086E-02	9.7030E+00	3.3901E+00
6.600	2.0139E+00	6.9583E-01	1.1889E-01	4.1079E-02	1.0312E+01	3.5630E+00
6.800	2.1354E+00	7.2960E-01	1.2606E-01	4.3073E-02	1.0934E+01	3.7359E+00
7.000	2.2593E+00	7.6338E-01	1.3338E-01	4.5067E-02	1.1569E+01	3.9089E+00
7.200	2.3858E+00	7.9713E-01	1.4085E-01	4.7060E-02	1.2216E+01	4.0817E+00
7.400	2.5147E+00	8.3086E-01	1.4846E-01	4.9051E-02	1.2877E+01	4.2544E+00
7.600	2.6461E+00	8.6455E-01	1.5621E-01	5.1040E-02	1.3549E+01	4.4269E+00
7.800	2.7798E+00	8.9819E-01	1.6411E-01	5.3026E-02	1.4234E+01	4.5992E+00
8.000	2.9160E+00	9.3177E-01	1.7215E-01	5.5008E-02	1.4931E+01	4.7711E+00
8.200	2.9873E+00	9.6303E-01	1.7516E-01	5.6326E-02	1.5239E+01	4.8454E+00
8.333	3.0355E+00	9.8381E-01	1.7719E-01	5.7202E-02	1.5446E+01	4.8948E+00

8.533	3.1088E+00	1.0149E+00	1.8028E-01	5.8513E-02	1.5762E+01	4.9689E+00
8.733	3.1833E+00	1.0459E+00	1.8342E-01	5.9819E-02	1.6084E+01	5.0427E+00
8.933	3.2590E+00	1.0767E+00	1.8662E-01	6.1120E-02	1.6410E+01	5.1164E+00
9.133	3.3360E+00	1.1074E+00	1.8986E-01	6.2416E-02	1.6742E+01	5.1899E+00
9.333	3.4141E+00	1.1381E+00	1.9315E-01	6.3707E-02	1.7078E+01	5.2632E+00
9.533	3.4934E+00	1.1685E+00	1.9650E-01	6.4993E-02	1.7420E+01	5.3363E+00
9.733	3.5738E+00	1.1989E+00	1.9989E-01	6.6273E-02	1.7767E+01	5.4092E+00
9.933	3.6555E+00	1.2292E+00	2.0333E-01	6.7549E-02	1.8119E+01	5.4820E+00
10.133	3.7383E+00	1.2593E+00	2.0683E-01	6.8820E-02	1.8476E+01	5.5545E+00
12.000	4.5664E+00	1.5354E+00	2.4175E-01	8.0464E-02	2.2046E+01	6.2238E+00
19.444	8.7969E+00	2.5976E+00	4.2014E-01	1.2526E-01	4.0281E+01	8.8654E+00
24.000	1.2041E+01	3.2436E+00	5.5695E-01	1.5250E-01	5.4267E+01	1.0515E+01
96.000	5.6536E+01	8.4212E+00	1.4683E+00	2.5854E-01	1.6195E+02	1.9907E+01
720.000	4.0343E+02	3.7263E+01	4.0177E+00	4.7051E-01	8.1703E+02	6.2648E+01

LOCA @ CR

Time (hr)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00
0.200	0.0000E+00	0.0000E+00
0.400	0.0000E+00	0.0000E+00
0.500	0.0000E+00	0.0000E+00
0.700	0.0000E+00	0.0000E+00
0.900	0.0000E+00	0.0000E+00
1.100	0.0000E+00	0.0000E+00
1.300	0.0000E+00	0.0000E+00
1.500	0.0000E+00	0.0000E+00
1.700	0.0000E+00	0.0000E+00
1.900	0.0000E+00	0.0000E+00
2.000	0.0000E+00	0.0000E+00
2.200	3.7935E-04	1.0881E-04
2.400	1.4968E-03	4.2165E-04
2.600	3.3218E-03	9.1969E-04
2.800	5.8250E-03	1.5861E-03
3.000	8.9782E-03	2.4059E-03
3.200	1.2754E-02	3.3652E-03
3.400	1.7127E-02	4.4519E-03
3.600	2.2071E-02	5.6545E-03
3.800	2.7565E-02	6.9630E-03
4.000	3.3585E-02	8.3678E-03
4.200	4.0112E-02	9.8605E-03
4.400	4.7125E-02	1.1433E-02
4.600	5.4608E-02	1.3079E-02
4.800	6.2543E-02	1.4791E-02
5.000	7.0916E-02	1.6564E-02
5.200	7.9711E-02	1.8391E-02
5.400	8.8918E-02	2.0268E-02
5.600	9.8522E-02	2.2191E-02
5.800	1.0851E-01	2.4155E-02
6.000	1.1888E-01	2.6157E-02
6.200	1.2962E-01	2.8192E-02
6.400	1.4072E-01	3.0259E-02
6.600	1.5217E-01	3.2353E-02
6.800	1.6397E-01	3.4472E-02
7.000	1.7610E-01	3.6615E-02
7.200	1.8857E-01	3.8778E-02
7.400	2.0137E-01	4.0960E-02
7.600	2.1449E-01	4.3159E-02
7.800	2.2792E-01	4.5374E-02
8.000	2.4168E-01	4.7603E-02
8.200	2.5506E-01	4.9731E-02
8.333	2.6343E-01	5.1041E-02
8.533	2.7530E-01	5.2865E-02
8.733	2.8642E-01	5.4544E-02
8.933	2.9690E-01	5.6099E-02
9.133	3.0686E-01	5.7550E-02
9.333	3.1635E-01	5.8911E-02
9.533	3.2546E-01	6.0197E-02
9.733	3.3425E-01	6.1418E-02
9.933	3.4276E-01	6.2586E-02

10.133	3.5106E-01	6.3707E-02
12.000	4.2358E-01	7.2904E-02
19.444	7.5408E-01	1.0674E-01
24.000	1.0103E+00	1.2877E-01
96.000	2.0964E+00	2.0197E-01
720.000	6.7294E+00	4.4679E-01

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:10:44

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

            LOCA AST- MSIV Leakage

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

EAB LOCA
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
    5.8   2.9558E-01   1.2265E+00   3.3712E-01

#################################################################
                         Final Doses
#################################################################

LOCA @ LPZ
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   3.4466E-01   4.0177E+00   4.7051E-01

LOCA @ Unprotected CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   3.7214E+01   8.1703E+02   6.2648E+01

LOCA @ CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   2.3586E-01   6.7294E+00   4.4679E-01
```

Attachment 19 RADTRAD Output:
Attch 19 SGTS_Atrium11_600cfm_11110cfm_6495cfm_2-720hr Tot vol.o0

7

All Attachment 19 Pages Revised for Rev 7

```
 ######################################################################
     ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:14:04

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

             LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

 Input File Name      = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 19
SGTS_Atrium11_600cfm_11110cfm_6495cfm_2-720hr Tot vol.psf
 Output File Name     = C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 19
SGTS_Atrium11_600cfm_11110cfm_6495cfm_2-720hr Tot vol.o0

 Inventory file       =  c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Release file         =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
 Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp




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


   Radtrad 3.10  Rev. 4
   LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS
 Dose Conversion Factor File:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
 Release Fraction & Timing Files:
   1
   c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
 Nuclide Inventory Files:
   1
   1 c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
 Plant Power Level:
   4.032E+03
 Number of Compartments:
   4
 Compartment 1:
   Primary Containment
   3
   3.8819E+05
   0
   0
   0
   1
   0
 Compartment 2:
   Secondary Containment
   3
   2.078E+06
   0
   0
   0
   0
   0
 Compartment 3:
   Environment
   2
```

```
  0.00E+00
  0
  0
  0
  0
  0
Compartment 4:
  Control Room
  1
  5.18E+05
  0
  0
  0
  0
  0
Number of Pathways:
  7
Pathway 1:
  Primary Containment to Secondary Containment - Primary Leakage
  1
  2
  4
Pathway 2:
  Secondary Containment to Environment - SGTS Leakage
  2
  3
  2
Pathway 3:
  Environment to Control Room - Emergency Filtered Air Intake
  3
  4
  2
Pathway 4:
  Environment to Control Room - Unfiltered Inleakage
  3
  4
  2
Pathway 5:
  Control Room to Environment - CR Exhaust
  4
  3
  2
Pathway 6:
  Environment to  Control Room ingress/egress
  3
  4
  2
Pathway 7:
  Secondary Containment to  Environment
  2
  3
  2
  End of Plant Model
Source Term Input:
  1
  1  1  1  1
  0.00E+00
  0.00E+00   7.2E+02
  1
  2   9.5E-01   4.85E-02   1.5E-03
Overlying Pool:
  0
  0.00E+00
  0
  0
  0
  0
Compartments:
  4
Compartment 1:
```

```
  0
  1
  0
  0
  0
  0
  0
  3
  3
  1.00E+01
  0
Compartment 2:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 3:
  1
  1
  0
  0
  0
  0
  0
  0
  0
Compartment 4:
  0
  1
  0
  0
  0
  0
  0
  0
  0
Pathways:
  7
Pathway 1:
  0
  0
  0
  0
  0
  0
  0
  0
  0
  0
  1
  5
  0.00E+00   0.00E+00
  1.667E-01   0.00E+00
  2.00E+00   9.7777E-01
  2.4E+01   4.889E-01
  7.2E+02   0.00E+00
  0
Pathway 2:
  1
  0
  0
  0
  0
  1
  3
```

```
  0.00E+00   1.111E+04   0.00E+00   0.00E+00   0.00E+00
  1.667E-01   6.495E+03   9.9E+01   9.9E+01   9.9E+01
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 3:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.229E+03   9.9E+01   9.9E+01   9.9E+01
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 4:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   6.00E+02   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 5:
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   5.839E+03   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 6:
```

```
  1
  0
  0
  0
  0
  1
  2
  0.00E+00   1.00E+01   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Pathway 7:
  1
  0
  0
  0
  0
  1
  3
  0.00E+00   6.495E+03   0.00E+00   0.00E+00   0.00E+00
  1.667E-01   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  7.2E+02   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0
  0.00E+00   0.00E+00   0.00E+00   0.00E+00   0.00E+00
  0.00E+00
  0
  0
  0
  0
  0
  0
Dose Locations:
  4
Location 1:
  EAB with LOCA
  3
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 2:
  LOCA @ LPZ
  3
  1
  4
  0.00E+00   3.5E-04
  8.00E+00   1.8E-04
  2.4E+01   2.3E-04
  7.2E+02   0.00E+00
  0
Location 3:
  LOCA @ Unprotected CR
  3
  1
  2
  0.00E+00   3.5E-04
  7.2E+02   0.00E+00
  0
Location 4:
  LOCA @ CR
```

```
   4
   1
   2
   0.00E+00   3.5E-04
   7.2E+02   0.00E+00
   1
   4
   0.00E+00   1.00E+00
   2.4E+01   6.00E-01
   9.6E+01   4.00E-01
   7.2E+02   0.00E+00
 X/Q Tables:
   4
   EAB with LOCA
   2
   0.00E+00   8.3E-04
   7.2E+02   0.00E+00
   LOCA @ LPZ
   5
   0.00E+00   4.9E-05
   8.00E+00   3.5E-05
   2.4E+01   1.7E-05
   9.6E+01   6.1E-06
   7.2E+02   0.00E+00
   LOCA @ Unprotected CR
   6
   0.00E+00   4.15E-03
   2.00E+00   3.61E-03
   8.00E+00   1.57E-03
   2.4E+01   1.12E-03
   9.6E+01   8.86E-04
   7.2E+02   0.00E+00
   LOCA @ CR
   6
   0.00E+00   1.16E-03
   2.00E+00   8.64E-04
   8.00E+00   3.09E-04
   2.4E+01   1.87E-04
   9.6E+01   1.6E-04
   7.2E+02   0.00E+00
 Inflow Pathways:
   3  3 4 6
 Exhaust Pathways:
   3  2 5 7
 X/Q table ID for Exhaust-Inflow paths:
   4 4 4
   -1 -1 -1
   4 4 4
 Simulation Parameters:
   5
   0.00E+00   0.00E+00
   9.6E+01   1.2E+02
   2.4E+02   2.4E+02
   4.8E+02   2.4E+02
   7.2E+02   0.00E+00
 Output Filename:
   C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Attch 19
SGTS_Atrium11_600cfm_11110cfm_6495cfm_2-720hr Tot vol.o0
   1
   1
   1
   1
   0
   End of Scenario File
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:14:04

                Copyright © 2018 Alion Science and Technology
#######################################################################

            LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

Number of Nuclides =  60

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

Number of compartments    =   4

Compartment information

Compartment number  1
Name: Primary Containment
Compartment volume =   3.8819E+05 (Cubic feet)
Compartment type is Normal
Removal devices within compartment:
     Deposition
Pathways into and out of compartment  1
   Exit Pathway Number    1: Primary Containment to Secondary Containment -

Compartment number  2
Name: Secondary Containment
Compartment volume =   2.0780E+06 (Cubic feet)
Compartment type is Normal
Pathways into and out of compartment  2
   Inlet Pathway Number   1: Primary Containment to Secondary Containment -
   Exit Pathway Number    2: Secondary Containment to Environment - SGTS Lea
   Exit Pathway Number    7: Secondary Containment to  Environment

Compartment number  3
Name: Environment
Compartment type is Environment
Pathways into and out of compartment  3
   Inlet Pathway Number   2: Secondary Containment to Environment - SGTS Lea
   Inlet Pathway Number   5: Control Room to Environment - CR Exhaust
   Inlet Pathway Number   7: Secondary Containment to  Environment
   Exit Pathway Number    3: Environment to Control Room - Emergency Filtere
   Exit Pathway Number    4: Environment to Control Room - Unfiltered Inleak
   Exit Pathway Number    6: Environment to  Control Room ingress/egress

Compartment number  4
Name: Control Room
Compartment volume =   5.1800E+05 (Cubic feet)
Compartment type is Control Room
Pathways into and out of compartment  4
   Inlet Pathway Number   3: Environment to Control Room - Emergency Filtere
   Inlet Pathway Number   4: Environment to Control Room - Unfiltered Inleak
   Inlet Pathway Number   6: Environment to  Control Room ingress/egress
   Exit Pathway Number    5: Control Room to Environment - CR Exhaust

Total number of pathways =   7
```

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:14:04

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

            LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

Power Ratio                              =   4.0320E+03

End Time                                 =   7.2000E+02 (Hours)

Radioactive Decay is enabled
Calculation of Daughters is enabled

Source Number  1 is used in Compartment  1  Primary Containment
   Nuclide Distribution given in Ci/MWt
Fraction of Nuclide Distribution in this Compartment   1.00000

Iodine fractions for source number 1
     Aerosol     =   9.5000E-01
     Elemental   =   4.8500E-02
     Organic     =   1.5000E-03

Inventory file =     c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_ast-loca_atrium11.nif
Release from file =    c:\radtrad\radtrad_310\ec-radn-1125 rev 7 radtrad310\sses_dba.rft
Dose Conversion file =    C:\RADTRAD\RADTRAD_310\EC-RADN-1125 Rev 7 RADTRAD310\Fgr11&12.inp
```

Nuclide Name	Group	Specific Inventory (Ci/MWt)	half life (s)	Whole Body DCF (Sv-m3/Bq-s)	Inhaled Thyroid (Sv/Bq)	Inhaled Effective (Sv/Bq)
Co-58	7	1.070E+02	6.117E+06	4.760E-14	8.720E-10	2.940E-09
Co-60	7	4.390E+00	1.663E+08	1.260E-13	1.620E-08	5.910E-08
Kr-85	1	4.150E+02	3.383E+08	1.190E-16	0.000E+00	0.000E+00
Kr-85m	1	6.940E+03	1.613E+04	7.480E-15	0.000E+00	0.000E+00
Kr-87	1	1.320E+04	4.578E+03	4.120E-14	0.000E+00	0.000E+00
Kr-88	1	1.780E+04	1.022E+04	1.020E-13	0.000E+00	0.000E+00
Rb-86	3	6.120E+01	1.612E+06	4.810E-15	1.330E-09	1.790E-09
Sr-89	5	2.480E+04	4.363E+06	7.730E-17	7.960E-12	1.120E-08
Sr-90	5	3.310E+03	9.190E+08	7.530E-18	2.690E-10	3.510E-07
Sr-91	5	3.120E+04	3.420E+04	4.924E-14	9.930E-12	4.547E-10
Sr-92	5	3.370E+04	9.756E+03	6.790E-14	3.920E-12	2.180E-10
Y-90	9	3.490E+03	2.304E+05	1.900E-16	5.170E-13	2.280E-09
Y-91	9	3.230E+04	5.055E+06	2.600E-16	8.500E-12	1.320E-08
Y-92	9	3.410E+04	1.274E+04	1.300E-14	1.050E-12	2.110E-10
Y-93	9	3.870E+04	3.636E+04	4.800E-15	9.260E-13	5.820E-10
Zr-95	9	4.680E+04	5.528E+06	3.600E-14	1.440E-09	6.390E-09
Zr-97	9	4.750E+04	6.084E+04	4.432E-14	2.315E-11	1.171E-09
Nb-95	9	4.690E+04	3.037E+06	3.740E-14	3.580E-10	1.570E-09
Mo-99	7	4.980E+04	2.376E+05	7.280E-15	1.520E-11	1.070E-09
Tc-99m	7	4.370E+04	2.167E+04	5.890E-15	5.010E-11	8.800E-12
Ru-103	7	4.300E+04	3.394E+06	2.251E-14	2.570E-10	2.421E-09
Ru-105	7	2.990E+04	1.598E+04	3.810E-14	4.150E-12	1.230E-10
Ru-106	7	1.670E+04	3.181E+07	1.040E-14	1.720E-09	1.290E-07
Rh-105	7	2.780E+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	7.630E+03	1.555E+04	7.140E-14	9.720E-12	1.740E-10
Te-127	4	2.300E+03	3.366E+04	2.420E-16	1.840E-12	8.600E-11
Te-127m	4	1.810E+02	9.418E+06	1.470E-16	9.660E-11	5.810E-09
Te-129	4	7.280E+03	4.176E+03	2.750E-15	5.090E-13	2.090E-11
Te-129m	4	1.250E+03	2.903E+06	3.337E-15	1.563E-10	6.484E-09
Te-131m	4	5.230E+03	1.080E+05	7.463E-14	3.669E-08	1.758E-09
Te-132	4	3.820E+04	2.815E+05	1.030E-14	6.280E-08	2.550E-09
I-131	2	2.690E+04	6.947E+05	1.820E-14	2.920E-07	8.890E-09

I-132	2	3.920E+04	8.280E+03	1.120E-13	1.740E-09	1.030E-10
I-133	2	5.490E+04	7.488E+04	2.940E-14	4.860E-08	1.580E-09
I-134	2	6.150E+04	3.156E+03	1.300E-13	2.880E-10	3.550E-11
I-135	2	5.240E+04	2.380E+04	8.294E-14	8.460E-09	3.320E-10
Xe-133	1	5.380E+04	4.532E+05	1.560E-15	0.000E+00	0.000E+00
Xe-135	1	1.450E+04	3.272E+04	1.190E-14	0.000E+00	0.000E+00
Cs-134	3	5.840E+03	6.507E+07	7.570E-14	1.110E-08	1.250E-08
Cs-136	3	1.480E+03	1.132E+06	1.060E-13	1.730E-09	1.980E-09
Cs-137	3	4.480E+03	9.467E+08	2.725E-14	7.930E-09	8.630E-09
Ba-139	6	4.850E+04	4.962E+03	2.170E-15	2.400E-12	4.640E-11
Ba-140	6	4.690E+04	1.101E+06	8.580E-15	2.560E-10	1.010E-09
La-140	9	4.910E+04	1.450E+05	1.170E-13	6.870E-11	1.310E-09
La-141	9	4.390E+04	1.415E+04	2.390E-15	9.400E-12	1.570E-10
La-142	9	4.230E+04	5.550E+03	1.440E-13	8.740E-12	6.840E-11
Ce-141	8	4.420E+04	2.808E+06	3.430E-15	2.550E-11	2.420E-09
Ce-143	8	4.100E+04	1.188E+05	1.290E-14	6.230E-12	9.160E-10
Ce-144	8	3.680E+04	2.456E+07	2.773E-15	2.920E-10	1.010E-07
Pr-143	9	4.000E+04	1.172E+06	2.100E-17	1.680E-18	2.190E-09
Nd-147	9	1.750E+04	9.487E+05	6.190E-15	1.820E-11	1.850E-09
Np-239	8	5.060E+05	2.035E+05	7.690E-15	7.620E-12	6.780E-10
Pu-238	8	1.090E+02	2.769E+09	4.880E-18	3.860E-10	7.790E-05
Pu-239	8	1.020E+01	7.594E+11	4.240E-18	3.750E-10	8.330E-05
Pu-240	8	1.820E+01	2.063E+11	4.750E-18	3.760E-10	8.330E-05
Pu-241	8	4.340E+03	4.544E+08	7.250E-20	9.150E-12	1.340E-06
Am-241	9	5.360E+00	1.364E+10	8.180E-16	1.600E-09	1.200E-04
Cm-242	9	1.900E+03	1.407E+07	5.690E-18	9.410E-10	4.670E-06
Cm-244	9	9.700E+01	5.715E+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-135	Cs-135	1.00	none	0.00	none	0.00
Cs-137	Ba-137m	0.95	none	0.00	none	0.00
Ba-140	La-140	1.00	none	0.00	none	0.00
La-141	Ce-141	1.00	none	0.00	none	0.00
Ce-143	Pr-143	1.00	none	0.00	none	0.00
Ce-144	Pr-144m	0.02	Pr-144	0.98	none	0.00
Nd-147	Pm-147	1.00	none	0.00	none	0.00
Np-239	Pu-239	1.00	none	0.00	none	0.00
Pu-238	U-234	1.00	none	0.00	none	0.00
Pu-239	U-235	1.00	none	0.00	none	0.00
Pu-240	U-236	1.00	none	0.00	none	0.00
Pu-241	U-237	0.00	Am-241	1.00	none	0.00
Am-241	Np-237	1.00	none	0.00	none	0.00
Cm-242	Pu-238	1.00	none	0.00	none	0.00
Cm-244	Pu-240	1.00	none	0.00	none	0.00

Release Fractions and Timings

BWR, RG 1.183, Table 1 Section 3.2
Duration (h): Design Basis Accident

	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	5.458E+03
IODINE	5.0000E-02	2.5000E-01	0.0000E+00	3.465E+02
CESIUM	5.0000E-02	2.0000E-01	0.0000E+00	5.649E+04
TELLURIUM	0.0000E+00	5.0000E-02	0.0000E+00	4.137E+01
STRONTIUM	0.0000E+00	2.0000E-02	0.0000E+00	2.027E+03
BARIUM	0.0000E+00	2.0000E-02	0.0000E+00	5.190E+01
RUTHENIUM	0.0000E+00	2.5000E-03	0.0000E+00	6.533E+01
CERIUM	0.0000E+00	5.0000E-04	0.0000E+00	6.205E+02
LANTHANUM	0.0000E+00	2.0000E-04	0.0000E+00	7.245E+00
AEROSOL	0.0000E+00	0.0000E+00	0.0000E+00	0.000E+00

COMPARTMENT DATA

Compartment number 1: Primary Containment

Natural Deposition (Powers' model): Aerosol data
Reactor type: BWRDBA
Percentile = 10 (%)

Compartment number 2: Secondary Containment

Compartment number 3: Environment

Compartment number 4: Control Room

PATHWAY DATA

Pathway number 1: Primary Containment to Secondary Containment -

Convection Data

Time (hr)	Flow Rate (% / day)
0.0000E+00	0.0000E+00
1.6670E-01	0.0000E+00
2.0000E+00	9.7777E-01
2.4000E+01	4.8890E-01
7.2000E+02	0.0000E+00

Pathway number 2: Secondary Containment to Environment - SGTS Lea

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	1.1110E+04	0.0000E+00	0.0000E+00	0.0000E+00
1.6670E-01	6.4950E+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 3: Environment to Control Room - Emergency Filtere

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	5.2290E+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 4: Environment to Control Room - Unfiltered Inleak

Pathway Filter: Removal Data

Time (hr)	Flow Rate (cfm)	Filter Efficiencies (%) Aerosol	Elemental	Organic
0.0000E+00	6.0000E+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 5: Control Room to Environment - CR Exhaust

```
     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    5.8390E+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  6: Environment to  Control Room ingress/egress

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    1.0000E+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  7: Secondary Containment to  Environment

     Pathway Filter: Removal Data

       Time (hr)      Flow Rate          Filter Efficiencies (%)
                       (cfm)        Aerosol     Elemental    Organic
       0.0000E+00    6.4950E+03   0.0000E+00   0.0000E+00   0.0000E+00
       1.6670E-01    0.0000E+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

DOSE INFORMATION
Number_Dose_Locations =  4

Dose Location Name = EAB with LOCA
         Located in compartment  3 the Environment

EAB with LOCA 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

Dose Location Name = LOCA @ LPZ
         Located in compartment  3 the Environment

LOCA @ LPZ 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

Dose Location Name = LOCA @ Unprotected CR
         Located in compartment  3 the Environment

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

Dose Location Name = LOCA @ CR
         Located in compartment  4 the Control Room

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

LOCA @ CR 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

 X/Q, ATMOSPHERIC DISPERSION INFORMATION

 X/Q Table Name =    EAB with LOCA

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

 X/Q Table Name =    LOCA @ LPZ

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.9000E-05
        8.0000E+00          3.5000E-05
        2.4000E+01          1.7000E-05
        9.6000E+01          6.1000E-06
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ Unprotected CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          4.1500E-03
        2.0000E+00          3.6100E-03
        8.0000E+00          1.5700E-03
        2.4000E+01          1.1200E-03
        9.6000E+01          8.8600E-04
        7.2000E+02          0.0000E+00

 X/Q Table Name =    LOCA @ CR

      Location X/Q Data
       Time (hr)         X/Q (s * m^-3)
        0.0000E+00          1.1600E-03
        2.0000E+00          8.6400E-04
        8.0000E+00          3.0900E-04
        2.4000E+01          1.8700E-04
        9.6000E+01          1.6000E-04
        7.2000E+02          0.0000E+00

 This X/Q Table is used for these connected pathways
  Path  2  Secondary Containment to Environment - SGTS Lea and Path  3  Environment to Control Room -
Emergency Filtere
  Path  7  Secondary Containment to  Environment and Path  3  Environment to Control Room - Emergency
Filtere
  Path  2  Secondary Containment to Environment - SGTS Lea and Path  4  Environment to Control Room -
Unfiltered Inleak
  Path  7  Secondary Containment to  Environment and Path  4  Environment to Control Room - Unfiltered
Inleak
  Path  2  Secondary Containment to Environment - SGTS Lea and Path  6  Environment to  Control Room
ingress/egress
  Path  7  Secondary Containment to  Environment and Path  6  Environment to  Control Room
ingress/egress

 USER SPECIFIED TIME STEP DATA - SUPPLEMENTAL TIME STEPS
         Time (hr)      Time step (hr)
        0.0000E+00        0.0000E+00
        9.6000E+01        1.2000E+02
        2.4000E+02        2.4000E+02
        4.8000E+02        2.4000E+02
        7.2000E+02        0.0000E+00

  EDIT EACH MAJOR TIME STEP

  EDIT SUPPLEMENTAL TIME STEPS
```

```
EDIT MODEL DECONTAMINATION RESULTS

     Masses in Atoms and kg in detailed output
```

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


            LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

Detailed model information at time (hr) =    0.0000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.0002E+00

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EAB with LOCA Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ LPZ Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ CR Doses:

Time (h) =   0.0006    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

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

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:
```

```
                            Pathway
Time (h) =   0.0006       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   0.0006       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    0.1478

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.0646E+00

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

##

EAB with LOCA Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00

LOCA @ LPZ Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00

LOCA @ CR Doses:

Time (h) = 0.1667	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
Accumulated dose (rem)	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

****

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

	Pathway	
Time (h) = 0.1667	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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Emergency Filtere Transport Group Inventory:

	Pathway	
Time (h) = 0.1667	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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

	Pathway	
Time (h) = 0.1667	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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

Control Room to Environment - CR Exhaust Transport Group Inventory:

	Pathway	
Time (h) = 0.1667	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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

```
Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   0.1667        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
Aerosol I (atoms)         0.0000E+00   0.0000E+00
All Aerosols (kg)         0.0000E+00   0.0000E+00

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   0.1667        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
Aerosol I (atoms)         0.0000E+00   0.0000E+00
All Aerosols (kg)         0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    0.4667

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 7.5973E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2018E+00

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EAB with LOCA Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ LPZ Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ CR Doses:

Time (h) =   0.5000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

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

Secondary Containment to Environment - SGTS Lea 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
Aerosol I (atoms)         0.0000E+00   0.0000E+00
```

```
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Emergency Filtere 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    1.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 3.2982E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.3952E+00

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EAB with LOCA Doses:
```

```
Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ LPZ Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ Unprotected CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00

LOCA @ CR Doses:

Time (h) =   2.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00
Accumulated dose (rem)  0.0000E+00  0.0000E+00  0.0000E+00  0.0000E+00

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

Secondary Containment to Environment - SGTS Lea 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Emergency Filtere 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to Control Room - Unfiltered Inleak 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Control Room to Environment - CR Exhaust 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Environment to  Control Room ingress/egress 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Secondary Containment to  Environment 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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    4.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 1.0673E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 3.4332E+01

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EAB with LOCA Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.8028E+00  1.3880E+01  4.5518E+00
Accumulated dose (rem)  3.8028E+00  1.3880E+01  4.5518E+00

LOCA @ LPZ Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.2450E-01  8.1942E-01  2.6872E-01
Accumulated dose (rem)  2.2450E-01  8.1942E-01  2.6872E-01

LOCA @ Unprotected CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.6540E+01  6.0370E+01  1.9798E+01
Accumulated dose (rem)  1.6540E+01  6.0370E+01  1.9798E+01

LOCA @ CR Doses:

Time (h) =   5.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.2278E-01  8.3841E-01  1.6847E-01  3.1589E+00
Accumulated dose (rem)  1.2278E-01  8.3841E-01  1.6847E-01  3.1589E+00

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

Environment Integral Nuclide Release (Ci): at Time (h) =   5.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     1.0126E-03     0.00000      0.00000
  Co-60     4.1607E-05     0.00000      0.00000
  Kr-85     4.8084E+02     0.00004      0.00000
  Kr-85m    4.3719E+03     0.02200      0.00000
  Kr-87     1.8958E+03     0.05256      0.00000
  Kr-88     7.9337E+03     0.54453      0.00000
  Rb-86     5.3040E-02     0.00002      0.00000
  Sr-89     1.8765E+00     0.00495      0.00000
  Sr-90     2.5098E-01     0.02075      0.00000
  Sr-91     1.8038E+00     0.00025      0.00000
```

Sr-92	1.0011E+00	0.00010	0.00000
Y-90	8.9926E-03	0.00000	0.00000
Y-91	2.5424E-02	0.00008	0.00000
Y-92	4.9261E-01	0.00003	0.00000
Y-93	2.2735E-02	0.00000	0.00000
Zr-95	3.5427E-02	0.00005	0.00000
Zr-97	3.0912E-02	0.00001	0.00000
Nb-95	3.5561E-02	0.00001	0.00000
Mo-99	4.5386E-01	0.00012	0.00000
Tc-99m	4.1172E-01	0.00000	0.00000
Ru-103	4.0645E-01	0.00024	0.00000
Ru-105	1.5923E-01	0.00001	0.00000
Ru-106	1.5824E-01	0.00481	0.00000
Rh-105	2.5987E-01	0.00002	0.00000
Sb-127	4.7188E-01	0.00019	0.00000
Sb-129	7.9989E-01	0.00007	0.00000
Te-127	4.3360E-01	0.00001	0.00000
Te-127m	3.4363E-02	0.00005	0.00000
Te-129	9.6645E-01	0.00001	0.00000
Te-129m	2.3696E-01	0.00036	0.00000
Te-131m	9.0952E-01	0.00042	0.00000
Te-132	7.0055E+00	0.00426	0.00000
I-131	3.1393E+01	0.06611	0.00000
I-132	2.5846E+01	0.00257	0.00000
I-133	5.7239E+01	0.02243	0.00000
I-134	4.4189E+00	0.00042	0.00000
I-135	4.1827E+01	0.00560	0.00000
Xe-133	6.1637E+04	0.06470	0.00000
Xe-135	1.8127E+04	0.14515	0.00000
Cs-134	5.0899E+00	0.01524	0.00000
Cs-136	1.2795E+00	0.00069	0.00000
Cs-137	3.9051E+00	0.00801	0.00000
Ba-139	6.0434E-01	0.00001	0.00000
Ba-140	3.5263E+00	0.00086	0.00000
La-140	1.7808E-01	0.00007	0.00000
La-141	1.7372E-02	0.00000	0.00000
La-142	6.3376E-03	0.00000	0.00000
Ce-141	8.3643E-02	0.00005	0.00000
Ce-143	7.1861E-02	0.00002	0.00000
Ce-144	6.9734E-02	0.00166	0.00000
Pr-143	3.0551E-02	0.00002	0.00000
Nd-147	1.3140E-02	0.00001	0.00000
Np-239	9.1626E-01	0.00015	0.00000
Pu-238	2.0663E-04	0.00379	0.00000
Pu-239	1.9347E-05	0.00038	0.00000
Pu-240	3.4501E-05	0.00068	0.00000
Pu-241	8.2270E-03	0.00260	0.00000
Am-241	4.0687E-06	0.00011	0.00000
Cm-242	1.4397E-03	0.00158	0.00000
Cm-244	7.3550E-05	0.00116	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 5.0000	Total Release	Release Rate/s
Noble gases (atoms)	1.0214E+22	5.6746E+17
Elemental I (atoms)	2.0729E+17	1.1516E+13
Organic I (atoms)	6.4110E+15	3.5617E+11
Aerosol I (atoms)	1.2445E+18	6.9137E+13
All Aerosols (kg)	5.1763E-05	2.8757E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 5.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0214E+22
Elemental I (atoms)	2.0228E+19	2.0727E+17
Organic I (atoms)	6.2560E+17	6.4105E+15
Aerosol I (atoms)	1.2102E+20	1.2443E+18
All Aerosols (kg)	5.1233E-03	5.1756E-05

```
Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.2105E+19
Elemental I (atoms)      4.3374E+14   4.4450E+12
Organic I (atoms)        1.3415E+13   1.3748E+11
Aerosol I (atoms)        2.6084E+15   2.6823E+13
All Aerosols (kg)        1.1024E-07   1.1137E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.5364E+18
Elemental I (atoms)      0.0000E+00   5.1005E+13
Organic I (atoms)        0.0000E+00   1.5775E+12
Aerosol I (atoms)        0.0000E+00   3.0778E+14
All Aerosols (kg)        0.0000E+00   1.2779E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      1.0958E+19   1.1912E+14
Elemental I (atoms)      2.5178E+13   0.0000E+00
Organic I (atoms)        7.7869E+11   0.0000E+00
Aerosol I (atoms)        1.7545E+14   0.0000E+00
All Aerosols (kg)        7.3240E-09   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   4.2273E+16
Elemental I (atoms)      0.0000E+00   8.5008E+11
Organic I (atoms)        0.0000E+00   2.6291E+10
Aerosol I (atoms)        0.0000E+00   5.1297E+12
All Aerosols (kg)        0.0000E+00   2.1299E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =   5.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    7.9500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 6.3781E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.3293E+02

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EAB with LOCA Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
```

```
Delta dose (rem)        5.5286E+00  1.5157E+01  6.2914E+00
Accumulated dose (rem)  9.3314E+00  2.9037E+01  1.0843E+01

LOCA @ LPZ Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.2639E-01  8.9481E-01  3.7142E-01
Accumulated dose (rem)  5.5089E-01  1.7142E+00  6.4014E-01

LOCA @ Unprotected CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.4046E+01  6.5924E+01  2.7364E+01
Accumulated dose (rem)  4.0586E+01  1.2629E+02  4.7162E+01

LOCA @ CR Doses:

Time (h) =   8.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.0413E-01  1.7140E+00  3.9356E-01  8.3150E+00
Accumulated dose (rem)  4.2691E-01  2.5524E+00  5.6202E-01  1.1474E+01

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Environment Integral Nuclide Release (Ci): at Time (h) =   8.0000
```

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	1.9474E-03	0.00000	0.00000
Co-60	8.0058E-05	0.00000	0.00000
Kr-85	1.6337E+03	0.00005	0.00000
Kr-85m	1.1342E+04	0.02392	0.00000
Kr-87	2.9964E+03	0.03481	0.00000
Kr-88	1.7949E+04	0.51627	0.00000
Rb-86	1.0185E-01	0.00002	0.00000
Sr-89	3.6080E+00	0.00399	0.00000
Sr-90	4.8293E-01	0.01673	0.00000
Sr-91	3.1761E+00	0.00019	0.00000
Sr-92	1.4704E+00	0.00006	0.00000
Y-90	2.3679E-02	0.00001	0.00000
Y-91	4.9726E-02	0.00006	0.00000
Y-92	1.0266E+00	0.00003	0.00000
Y-93	4.0232E-02	0.00000	0.00000
Zr-95	6.8127E-02	0.00004	0.00000
Zr-97	5.6518E-02	0.00001	0.00000
Nb-95	6.8424E-02	0.00001	0.00000
Mo-99	8.6169E-01	0.00009	0.00000
Tc-99m	7.8785E-01	0.00000	0.00000
Ru-103	7.8133E-01	0.00019	0.00000
Ru-105	2.5637E-01	0.00001	0.00000
Ru-106	3.0445E-01	0.00388	0.00000
Rh-105	4.9388E-01	0.00001	0.00000
Sb-127	8.9931E-01	0.00015	0.00000
Sb-129	1.2823E+00	0.00005	0.00000
Te-127	8.3153E-01	0.00001	0.00000
Te-127m	6.6152E-02	0.00004	0.00000
Te-129	1.6132E+00	0.00000	0.00000
Te-129m	4.5574E-01	0.00029	0.00000
Te-131m	1.6998E+00	0.00033	0.00000
Te-132	1.3328E+01	0.00339	0.00000
I-131	6.6864E+01	0.05901	0.00000
I-132	4.2593E+01	0.00178	0.00000
I-133	1.1691E+02	0.01920	0.00000
I-134	5.0353E+00	0.00020	0.00000
I-135	7.7789E+01	0.00437	0.00000
Xe-133	2.0766E+05	0.09135	0.00000
Xe-135	5.6481E+04	0.18953	0.00000
Cs-134	9.7934E+00	0.01229	0.00000
Cs-136	2.4550E+00	0.00055	0.00000
Cs-137	7.5141E+00	0.00646	0.00000
Ba-139	7.5234E-01	0.00000	0.00000

Ba-140	6.7654E+00	0.00069	0.00000
La-140	4.8120E-01	0.00008	0.00000
La-141	2.7418E-02	0.00000	0.00000
La-142	8.1222E-03	0.00000	0.00000
Ce-141	1.6079E-01	0.00004	0.00000
Ce-143	1.3465E-01	0.00001	0.00000
Ce-144	1.3416E-01	0.00134	0.00000
Pr-143	5.8991E-02	0.00001	0.00000
Nd-147	2.5198E-02	0.00000	0.00000
Np-239	1.7357E+00	0.00012	0.00000
Pu-238	3.9760E-04	0.00306	0.00000
Pu-239	3.7234E-05	0.00031	0.00000
Pu-240	6.6385E-05	0.00055	0.00000
Pu-241	1.5830E-02	0.00209	0.00000
Am-241	7.8325E-06	0.00009	0.00000
Cm-242	2.7697E-03	0.00128	0.00000
Cm-244	1.4152E-04	0.00094	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 8.0000	Total Release	Release Rate/s
Noble gases (atoms)	3.4644E+22	1.2029E+18
Elemental I (atoms)	6.8787E+17	2.3884E+13
Organic I (atoms)	2.1274E+16	7.3869E+11
Aerosol I (atoms)	2.3560E+18	8.1806E+13
All Aerosols (kg)	9.9590E-05	3.4580E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.4643E+22
Elemental I (atoms)	6.6353E+19	6.8785E+17
Organic I (atoms)	2.0522E+18	2.1274E+16
Aerosol I (atoms)	2.2488E+20	2.3558E+18
All Aerosols (kg)	9.8564E-03	9.9583E-05

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.4371E+19
Elemental I (atoms)	1.4162E+15	1.4682E+13
Organic I (atoms)	4.3800E+13	4.5410E+11
Aerosol I (atoms)	4.8179E+15	5.0482E+13
All Aerosols (kg)	2.1079E-07	2.1296E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	8.5336E+18
Elemental I (atoms)	0.0000E+00	1.6847E+14
Organic I (atoms)	0.0000E+00	5.2105E+12
Aerosol I (atoms)	0.0000E+00	5.7925E+14
All Aerosols (kg)	0.0000E+00	2.4436E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 8.0000	Pathway Filtered	Transported
Noble gases (atoms)	5.4106E+19	1.0060E+15
Elemental I (atoms)	1.2158E+14	0.0000E+00
Organic I (atoms)	3.7601E+12	0.0000E+00
Aerosol I (atoms)	4.9110E+14	0.0000E+00
All Aerosols (kg)	2.0889E-08	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

```
                            Pathway
Time (h) =   8.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4223E+17
Elemental I (atoms)      0.0000E+00   2.8079E+12
Organic I (atoms)        0.0000E+00   8.6842E+10
Aerosol I (atoms)        0.0000E+00   9.6542E+12
All Aerosols (kg)        0.0000E+00   4.0727E-10

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   8.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =    8.3000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.8743E+02

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EAB with LOCA Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.7281E-01  7.5745E-01  6.0892E-01
Accumulated dose (rem)  9.9042E+00  2.9794E+01  1.1452E+01

LOCA @ LPZ Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.4154E-02  3.1941E-02  2.5677E-02
Accumulated dose (rem)  5.7505E-01  1.7462E+00  6.6582E-01

LOCA @ Unprotected CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0835E+00  2.7859E+00  1.2163E+00
Accumulated dose (rem)  4.1670E+01  1.2908E+02  4.8378E+01

LOCA @ CR Doses:

Time (h) =   8.3333    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        3.2865E-02  1.7334E-01  4.1581E-02  9.4618E-01
Accumulated dose (rem)  4.5977E-01  2.7258E+00  6.0361E-01  1.2420E+01

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Environment Integral Nuclide Release (Ci): at Time (h) =   8.3333

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     2.0260E-03     0.00000      0.00000
  Co-60     8.3291E-05     0.00000      0.00000
  Kr-85     1.7892E+03     0.00006      0.00000
  Kr-85m    1.2074E+04     0.02401      0.00000
  Kr-87     3.0534E+03     0.03385      0.00000
  Kr-88     1.8852E+04     0.51304      0.00000
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Rb-86	1.0595E-01	0.00002	0.00000
Sr-89	3.7535E+00	0.00394	0.00000
Sr-90	5.0244E-01	0.01651	0.00000
Sr-91	3.2772E+00	0.00018	0.00000
Sr-92	1.4949E+00	0.00006	0.00000
Y-90	2.5264E-02	0.00001	0.00000
Y-91	5.1809E-02	0.00006	0.00000
Y-92	1.0677E+00	0.00002	0.00000
Y-93	4.1533E-02	0.00000	0.00000
Zr-95	7.0876E-02	0.00004	0.00000
Zr-97	5.8519E-02	0.00001	0.00000
Nb-95	7.1188E-02	0.00001	0.00000
Mo-99	8.9536E-01	0.00009	0.00000
Tc-99m	8.1917E-01	0.00000	0.00000
Ru-103	8.1282E-01	0.00019	0.00000
Ru-105	2.6250E-01	0.00001	0.00000
Ru-106	3.1675E-01	0.00383	0.00000
Rh-105	5.1314E-01	0.00001	0.00000
Sb-127	9.3478E-01	0.00015	0.00000
Sb-129	1.3125E+00	0.00005	0.00000
Te-127	8.6481E-01	0.00001	0.00000
Te-127m	6.8827E-02	0.00004	0.00000
Te-129	1.6570E+00	0.00000	0.00000
Te-129m	4.7413E-01	0.00029	0.00000
Te-131m	1.7636E+00	0.00033	0.00000
Te-132	1.3852E+01	0.00335	0.00000
I-131	7.0383E+01	0.05873	0.00000
I-132	4.3766E+01	0.00174	0.00000
I-133	1.2253E+02	0.01905	0.00000
I-134	5.0481E+00	0.00019	0.00000
I-135	8.0776E+01	0.00431	0.00000
Xe-133	2.2722E+05	0.09352	0.00000
Xe-135	6.1258E+04	0.19279	0.00000
Cs-134	1.0189E+01	0.01213	0.00000
Cs-136	2.5535E+00	0.00055	0.00000
Cs-137	7.8176E+00	0.00637	0.00000
Ba-139	7.5699E-01	0.00000	0.00000
Ba-140	7.0367E+00	0.00068	0.00000
La-140	5.1416E-01	0.00008	0.00000
La-141	2.8028E-02	0.00000	0.00000
La-142	8.1850E-03	0.00000	0.00000
Ce-141	1.6727E-01	0.00004	0.00000
Ce-143	1.3974E-01	0.00001	0.00000
Ce-144	1.3958E-01	0.00132	0.00000
Pr-143	6.1394E-02	0.00001	0.00000
Nd-147	2.6207E-02	0.00000	0.00000
Np-239	1.8032E+00	0.00012	0.00000
Pu-238	4.1366E-04	0.00302	0.00000
Pu-239	3.8739E-05	0.00030	0.00000
Pu-240	6.9067E-05	0.00054	0.00000
Pu-241	1.6469E-02	0.00207	0.00000
Am-241	8.1493E-06	0.00009	0.00000
Cm-242	2.8815E-03	0.00126	0.00000
Cm-244	1.4724E-04	0.00092	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 8.3333	Total Release	Release Rate/s
Noble gases (atoms)	3.7935E+22	1.2645E+18
Elemental I (atoms)	7.5154E+17	2.5051E+13
Organic I (atoms)	2.3244E+16	7.7479E+11
Aerosol I (atoms)	2.4476E+18	8.1587E+13
All Aerosols (kg)	1.0361E-04	3.4537E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 8.3333	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.7934E+22

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Elemental I (atoms)      7.2407E+19   7.5153E+17
Organic I (atoms)        2.2394E+18   2.3243E+16
Aerosol I (atoms)        2.3313E+20   2.4474E+18
All Aerosols (kg)        1.0254E-02   1.0360E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.6885E+19
Elemental I (atoms)      1.4591E+15   1.5168E+13
Organic I (atoms)        4.5127E+13   4.6910E+11
Aerosol I (atoms)        4.8696E+15   5.1179E+13
All Aerosols (kg)        2.1380E-07   2.1602E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.8221E+18
Elemental I (atoms)      0.0000E+00   1.7404E+14
Organic I (atoms)        0.0000E+00   5.3827E+12
Aerosol I (atoms)        0.0000E+00   5.8725E+14
All Aerosols (kg)        0.0000E+00   2.4787E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      6.0105E+19   1.1706E+15
Elemental I (atoms)      1.3478E+14   0.0000E+00
Organic I (atoms)        4.1684E+12   0.0000E+00
Aerosol I (atoms)        5.1976E+14   0.0000E+00
All Aerosols (kg)        2.2142E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.4703E+17
Elemental I (atoms)      0.0000E+00   2.9007E+12
Organic I (atoms)        0.0000E+00   8.9711E+10
Aerosol I (atoms)        0.0000E+00   9.7875E+12
All Aerosols (kg)        0.0000E+00   4.1311E-10

Secondary Containment to  Environment Transport Group Inventory:

                            Pathway
Time (h) =   8.3333       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =   11.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.6279E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 2.2666E+03

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EAB with LOCA Doses:

Time (h) = 12.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	5.4961E+00	7.2089E+00	5.8182E+00
Accumulated dose (rem)	1.5400E+01	3.7003E+01	1.7270E+01

LOCA @ LPZ Doses:

Time (h) = 12.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	2.3176E-01	3.0399E-01	2.4535E-01
Accumulated dose (rem)	8.0681E-01	2.0502E+00	9.1117E-01

LOCA @ Unprotected CR Doses:

Time (h) = 12.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.0396E+01	2.6515E+01	1.1581E+01
Accumulated dose (rem)	5.2066E+01	1.5559E+02	5.9959E+01

LOCA @ CR Doses:

Time (h) = 12.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	1.9149E-01	1.0258E+00	2.4129E-01	5.8498E+00
Accumulated dose (rem)	6.5127E-01	3.7515E+00	8.4490E-01	1.8270E+01

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Environment Integral Nuclide Release (Ci): at Time (h) = 12.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	2.6417E-03	0.00000	0.00000
Co-60	1.0865E-04	0.00000	0.00000
Kr-85	3.7337E+03	0.00007	0.00000
Kr-85m	1.8827E+04	0.02432	0.00000
Kr-87	3.3262E+03	0.02594	0.00000
Kr-88	2.5925E+04	0.46987	0.00000
Rb-86	1.3797E-01	0.00002	0.00000
Sr-89	4.8932E+00	0.00346	0.00000
Sr-90	6.5542E-01	0.01451	0.00000
Sr-91	3.9751E+00	0.00015	0.00000
Sr-92	1.6202E+00	0.00004	0.00000
Y-90	4.0393E-02	0.00001	0.00000
Y-91	6.8398E-02	0.00006	0.00000
Y-92	1.3396E+00	0.00002	0.00000
Y-93	5.0569E-02	0.00000	0.00000
Zr-95	9.2409E-02	0.00004	0.00000
Zr-97	7.3109E-02	0.00001	0.00000
Nb-95	9.2863E-02	0.00001	0.00000
Mo-99	1.1545E+00	0.00008	0.00000
Tc-99m	1.0619E+00	0.00000	0.00000
Ru-103	1.0594E+00	0.00017	0.00000
Ru-105	2.9932E-01	0.00000	0.00000
Ru-106	4.1316E-01	0.00336	0.00000
Rh-105	6.6035E-01	0.00001	0.00000
Sb-127	1.2093E+00	0.00013	0.00000
Sb-129	1.4926E+00	0.00004	0.00000
Te-127	1.1241E+00	0.00001	0.00000
Te-127m	8.9822E-02	0.00003	0.00000
Te-129	1.9411E+00	0.00000	0.00000
Te-129m	6.1816E-01	0.00025	0.00000
Te-131m	2.2435E+00	0.00028	0.00000
Te-132	1.7892E+01	0.00292	0.00000
I-131	1.0459E+02	0.05719	0.00000
I-132	5.1824E+01	0.00142	0.00000
I-133	1.7417E+02	0.01790	0.00000
I-134	5.0854E+00	0.00014	0.00000
I-135	1.0480E+02	0.00377	0.00000
Xe-133	4.6950E+05	0.11995	0.00000
Xe-135	1.1503E+05	0.22788	0.00000

Cs-134	1.3291E+01	0.01066	0.00000
Cs-136	3.3228E+00	0.00048	0.00000
Cs-137	1.0198E+01	0.00560	0.00000
Ba-139	7.7380E-01	0.00000	0.00000
Ba-140	9.1559E+00	0.00060	0.00000
La-140	8.2908E-01	0.00008	0.00000
La-141	3.1572E-02	0.00000	0.00000
La-142	8.4283E-03	0.00000	0.00000
Ce-141	2.1801E-01	0.00003	0.00000
Ce-143	1.7816E-01	0.00001	0.00000
Ce-144	1.8206E-01	0.00116	0.00000
Pr-143	8.0313E-02	0.00001	0.00000
Nd-147	3.4086E-02	0.00000	0.00000
Np-239	2.3205E+00	0.00010	0.00000
Pu-238	5.3962E-04	0.00265	0.00000
Pu-239	5.0544E-05	0.00027	0.00000
Pu-240	9.0097E-05	0.00047	0.00000
Pu-241	2.1484E-02	0.00182	0.00000
Am-241	1.0635E-05	0.00008	0.00000
Cm-242	3.7581E-03	0.00111	0.00000
Cm-244	1.9207E-04	0.00081	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 12.0000	Total Release	Release Rate/s
Noble gases (atoms)	7.9013E+22	1.8290E+18
Elemental I (atoms)	1.5309E+18	3.5438E+13
Organic I (atoms)	4.7349E+16	1.0960E+12
Aerosol I (atoms)	3.1529E+18	7.2983E+13
All Aerosols (kg)	1.3515E-04	3.1285E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	7.9012E+22
Elemental I (atoms)	1.4564E+20	1.5309E+18
Organic I (atoms)	4.5042E+18	4.7348E+16
Aerosol I (atoms)	2.9323E+20	3.1527E+18
All Aerosols (kg)	1.3374E-02	1.3514E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.0825E+20
Elemental I (atoms)	1.9847E+15	2.1106E+13
Organic I (atoms)	6.1382E+13	6.5277E+11
Aerosol I (atoms)	5.2162E+15	5.6543E+13
All Aerosols (kg)	2.3744E-07	2.3994E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.2421E+19
Elemental I (atoms)	0.0000E+00	2.4218E+14
Organic I (atoms)	0.0000E+00	7.4902E+12
Aerosol I (atoms)	0.0000E+00	6.4880E+14
All Aerosols (kg)	0.0000E+00	2.7532E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 12.0000	Pathway Filtered	Transported
Noble gases (atoms)	1.0464E+20	3.5021E+15
Elemental I (atoms)	2.3130E+14	0.0000E+00
Organic I (atoms)	7.1537E+12	0.0000E+00
Aerosol I (atoms)	6.7276E+14	0.0000E+00

```
All Aerosols (kg)        2.8908E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) =  12.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.0702E+17
Elemental I (atoms)      0.0000E+00   4.0364E+12
Organic I (atoms)        0.0000E+00   1.2484E+11
Aerosol I (atoms)        0.0000E+00   1.0813E+13
All Aerosols (kg)        0.0000E+00   4.5886E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) =  12.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =   19.2000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.2996E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.1752E+05

#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:14:04

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EAB with LOCA Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.9199E+00  1.0998E+01  8.3359E+00
Accumulated dose (rem)  2.3320E+01  4.8001E+01  2.5606E+01

LOCA @ LPZ Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.3397E-01  4.6377E-01  3.5152E-01
Accumulated dose (rem)  1.1408E+00  2.5139E+00  1.2627E+00

LOCA @ Unprotected CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.4981E+01  4.0451E+01  1.6511E+01
Accumulated dose (rem)  6.7047E+01  1.9604E+02  7.6470E+01

LOCA @ CR Doses:

Time (h) =  19.4444    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        2.0715E-01  9.8983E-01  2.4698E-01  7.3590E+00
Accumulated dose (rem)  8.5842E-01  4.7414E+00  1.0919E+00  2.5629E+01

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Environment Integral Nuclide Release (Ci): at Time (h) =  19.4444

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     3.1172E-03     0.00000      0.00000
  Co-60     1.2827E-04     0.00000      0.00000
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Kr-85	8.3712E+03	0.00011	0.00000
Kr-85m	2.6145E+04	0.02281	0.00000
Kr-87	3.3801E+03	0.01875	0.00000
Kr-88	3.0952E+04	0.38666	0.00000
Rb-86	1.6256E-01	0.00001	0.00000
Sr-89	5.7728E+00	0.00281	0.00000
Sr-90	7.7380E-01	0.01181	0.00000
Sr-91	4.3606E+00	0.00012	0.00000
Sr-92	1.6517E+00	0.00003	0.00000
Y-90	5.7402E-02	0.00001	0.00000
Y-91	8.1643E-02	0.00005	0.00000
Y-92	1.4567E+00	0.00002	0.00000
Y-93	5.5659E-02	0.00000	0.00000
Zr-95	1.0904E-01	0.00003	0.00000
Zr-97	8.2432E-02	0.00000	0.00000
Nb-95	1.0963E-01	0.00001	0.00000
Mo-99	1.3453E+00	0.00006	0.00000
Tc-99m	1.2430E+00	0.00000	0.00000
Ru-103	1.2496E+00	0.00014	0.00000
Ru-105	3.1339E-01	0.00000	0.00000
Ru-106	4.8773E-01	0.00274	0.00000
Rh-105	7.6594E-01	0.00001	0.00000
Sb-127	1.4143E+00	0.00011	0.00000
Sb-129	1.5602E+00	0.00003	0.00000
Te-127	1.3206E+00	0.00000	0.00000
Te-127m	1.0609E-01	0.00003	0.00000
Te-129	2.0852E+00	0.00000	0.00000
Te-129m	7.2924E-01	0.00021	0.00000
Te-131m	2.5767E+00	0.00022	0.00000
Te-132	2.0891E+01	0.00235	0.00000
I-131	1.5940E+02	0.05792	0.00000
I-132	5.6672E+01	0.00108	0.00000
I-133	2.4503E+02	0.01689	0.00000
I-134	5.0874E+00	0.00010	0.00000
I-135	1.2776E+02	0.00315	0.00000
Xe-133	1.0335E+06	0.17316	0.00000
Xe-135	2.1194E+05	0.27744	0.00000
Cs-134	1.5691E+01	0.00868	0.00000
Cs-136	3.9119E+00	0.00039	0.00000
Cs-137	1.2040E+01	0.00456	0.00000
Ba-139	7.7538E-01	0.00000	0.00000
Ba-140	1.0778E+01	0.00049	0.00000
La-140	1.1805E+00	0.00008	0.00000
La-141	3.2815E-02	0.00000	0.00000
La-142	8.4565E-03	0.00000	0.00000
Ce-141	2.5711E-01	0.00003	0.00000
Ce-143	2.0510E-01	0.00001	0.00000
Ce-144	2.1491E-01	0.00094	0.00000
Pr-143	9.5087E-02	0.00001	0.00000
Nd-147	4.0108E-02	0.00000	0.00000
Np-239	2.6984E+00	0.00008	0.00000
Pu-238	6.3709E-04	0.00216	0.00000
Pu-239	5.9684E-05	0.00022	0.00000
Pu-240	1.0637E-04	0.00039	0.00000
Pu-241	2.5364E-02	0.00148	0.00000
Am-241	1.2562E-05	0.00007	0.00000
Cm-242	4.4359E-03	0.00090	0.00000
Cm-244	2.2676E-04	0.00066	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 19.4444	Total Release	Release Rate/s
Noble gases (atoms)	1.7658E+23	2.5226E+18
Elemental I (atoms)	3.3008E+18	4.7154E+13
Organic I (atoms)	1.0209E+17	1.4584E+12
Aerosol I (atoms)	3.6753E+18	5.2505E+13
All Aerosols (kg)	1.5955E-04	2.2792E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

```
                          Pathway
Time (h) =  19.4444      Filtered    Transported
Noble gases (atoms)     0.0000E+00   1.7657E+23
Elemental I (atoms)     3.0655E+20   3.3009E+18
Organic I (atoms)       9.4811E+18   1.0209E+17
Aerosol I (atoms)       3.2522E+20   3.6753E+18
All Aerosols (kg)       1.5785E-02   1.5956E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =  19.4444      Filtered    Transported
Noble gases (atoms)     0.0000E+00   1.8292E+20
Elemental I (atoms)     3.1552E+15   3.4564E+13
Organic I (atoms)       9.7585E+13   1.0690E+12
Aerosol I (atoms)       5.2726E+15   6.0450E+13
All Aerosols (kg)       2.5498E-07   2.5776E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                          Pathway
Time (h) =  19.4444      Filtered    Transported
Noble gases (atoms)     0.0000E+00   2.0989E+19
Elemental I (atoms)     0.0000E+00   3.9661E+14
Organic I (atoms)       0.0000E+00   1.2266E+13
Aerosol I (atoms)       0.0000E+00   6.9363E+14
All Aerosols (kg)       0.0000E+00   2.9576E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =  19.4444      Filtered    Transported
Noble gases (atoms)     1.8605E+20   9.6644E+15
Elemental I (atoms)     4.0030E+14   0.0000E+00
Organic I (atoms)       1.2380E+13   0.0000E+00
Aerosol I (atoms)       7.5039E+14   0.0000E+00
All Aerosols (kg)       3.2390E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =  19.4444      Filtered    Transported
Noble gases (atoms)     0.0000E+00   3.4982E+17
Elemental I (atoms)     0.0000E+00   6.6101E+12
Organic I (atoms)       0.0000E+00   2.0444E+11
Aerosol I (atoms)       0.0000E+00   1.1561E+13
All Aerosols (kg)       0.0000E+00   4.9294E-10

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) =  19.4444      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
Aerosol I (atoms)       0.0000E+00   0.0000E+00
All Aerosols (kg)       0.0000E+00   0.0000E+00

Detailed model information at time (hr) =   23.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 5.1344E-01
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2210E+06

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ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019 at 10:14:05

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EAB with LOCA Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	3.5753E+00	5.6407E+00	3.7635E+00
Accumulated dose (rem)	2.6895E+01	5.3642E+01	2.9370E+01

LOCA @ LPZ Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	1.5076E-01	2.3786E-01	1.5870E-01
Accumulated dose (rem)	1.2915E+00	2.7518E+00	1.4214E+00

LOCA @ Unprotected CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE
Delta dose (rem)	6.7628E+00	2.0747E+01	7.4551E+00
Accumulated dose (rem)	7.3809E+01	2.1679E+02	8.3925E+01

LOCA @ CR Doses:

Time (h) = 24.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	9.4607E-02	4.7365E-01	1.1084E-01	3.7040E+00
Accumulated dose (rem)	9.5302E-01	5.2150E+00	1.2027E+00	2.9333E+01

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Environment Integral Nuclide Release (Ci): at Time (h) = 24.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	3.2072E-03	0.00000	0.00000
Co-60	1.3200E-04	0.00000	0.00000
Kr-85	1.1379E+04	0.00013	0.00000
Kr-85m	2.7985E+04	0.02142	0.00000
Kr-87	3.3811E+03	0.01662	0.00000
Kr-88	3.1663E+04	0.34890	0.00000
Rb-86	1.6718E-01	0.00001	0.00000
Sr-89	5.9390E+00	0.00255	0.00000
Sr-90	7.9626E-01	0.01070	0.00000
Sr-91	4.4059E+00	0.00010	0.00000
Sr-92	1.6528E+00	0.00003	0.00000
Y-90	6.1936E-02	0.00001	0.00000
Y-91	8.4227E-02	0.00004	0.00000
Y-92	1.4644E+00	0.00001	0.00000
Y-93	5.6275E-02	0.00000	0.00000
Zr-95	1.1218E-01	0.00003	0.00000
Zr-97	8.3786E-02	0.00000	0.00000
Nb-95	1.1282E-01	0.00001	0.00000
Mo-99	1.3791E+00	0.00006	0.00000
Tc-99m	1.2754E+00	0.00000	0.00000
Ru-103	1.2855E+00	0.00012	0.00000
Ru-105	3.1434E-01	0.00000	0.00000
Ru-106	5.0187E-01	0.00248	0.00000
Rh-105	7.8379E-01	0.00001	0.00000
Sb-127	1.4513E+00	0.00010	0.00000
Sb-129	1.5646E+00	0.00002	0.00000
Te-127	1.3567E+00	0.00000	0.00000
Te-127m	1.0919E-01	0.00002	0.00000
Te-129	2.1036E+00	0.00000	0.00000
Te-129m	7.5021E-01	0.00019	0.00000
Te-131m	2.6312E+00	0.00020	0.00000
Te-132	2.1428E+01	0.00213	0.00000
I-131	1.8874E+02	0.05939	0.00000
I-132	5.7383E+01	0.00097	0.00000
I-133	2.7663E+02	0.01659	0.00000

I-134	5.0874E+00	0.00009	0.00000
I-135	1.3430E+02	0.00290	0.00000
Xe-133	1.3896E+06	0.20230	0.00000
Xe-135	2.5674E+05	0.29270	0.00000
Cs-134	1.6146E+01	0.00786	0.00000
Cs-136	4.0221E+00	0.00035	0.00000
Cs-137	1.2389E+01	0.00413	0.00000
Ba-139	7.7539E-01	0.00000	0.00000
Ba-140	1.1082E+01	0.00044	0.00000
La-140	1.2725E+00	0.00007	0.00000
La-141	3.2888E-02	0.00000	0.00000
La-142	8.4568E-03	0.00000	0.00000
Ce-141	2.6449E-01	0.00002	0.00000
Ce-143	2.0956E-01	0.00001	0.00000
Ce-144	2.2114E-01	0.00086	0.00000
Pr-143	9.7917E-02	0.00001	0.00000
Nd-147	4.1231E-02	0.00000	0.00000
Np-239	2.7646E+00	0.00007	0.00000
Pu-238	6.5558E-04	0.00196	0.00000
Pu-239	6.1419E-05	0.00020	0.00000
Pu-240	1.0946E-04	0.00035	0.00000
Pu-241	2.6100E-02	0.00134	0.00000
Am-241	1.2929E-05	0.00006	0.00000
Cm-242	4.5643E-03	0.00082	0.00000
Cm-244	2.3334E-04	0.00060	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 24.0000	Total Release	Release Rate/s
Noble gases (atoms)	2.3959E+23	2.7731E+18
Elemental I (atoms)	4.3958E+18	5.0877E+13
Organic I (atoms)	1.3595E+17	1.5735E+12
Aerosol I (atoms)	3.7694E+18	4.3628E+13
All Aerosols (kg)	1.6417E-04	1.9002E-09

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.3958E+23
Elemental I (atoms)	4.0298E+20	4.3959E+18
Organic I (atoms)	1.2463E+19	1.3596E+17
Aerosol I (atoms)	3.2372E+20	3.7695E+18
All Aerosols (kg)	1.6241E-02	1.6419E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.3102E+20
Elemental I (atoms)	3.8629E+15	4.2904E+13
Organic I (atoms)	1.1947E+14	1.3269E+12
Aerosol I (atoms)	5.1687E+15	6.1153E+13
All Aerosols (kg)	2.5825E-07	2.6111E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.6508E+19
Elemental I (atoms)	0.0000E+00	4.9230E+14
Organic I (atoms)	0.0000E+00	1.5226E+13
Aerosol I (atoms)	0.0000E+00	7.0170E+14
All Aerosols (kg)	0.0000E+00	2.9961E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 24.0000	Pathway Filtered	Transported

```
Noble gases (atoms)      2.3918E+20   1.3860E+16
Elemental I (atoms)      5.0613E+14   0.0000E+00
Organic I (atoms)        1.5654E+13   0.0000E+00
Aerosol I (atoms)        7.6475E+14   0.0000E+00
All Aerosols (kg)        3.3011E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =  24.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   4.4180E+17
Elemental I (atoms)      0.0000E+00   8.2051E+12
Organic I (atoms)        0.0000E+00   2.5376E+11
Aerosol I (atoms)        0.0000E+00   1.1695E+13
All Aerosols (kg)        0.0000E+00   4.9936E-10

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) =  24.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =   95.5000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2391E+06

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EAB with LOCA Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.5468E+01  4.6148E+01  1.6894E+01
Accumulated dose (rem)  4.2363E+01  9.9790E+01  4.6263E+01

LOCA @ LPZ Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.1681E-01  9.4520E-01  3.4601E-01
Accumulated dose (rem)  1.6083E+00  3.6970E+00  1.7674E+00

LOCA @ Unprotected CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.0872E+01  9.4762E+01  2.3800E+01
Accumulated dose (rem)  9.4682E+01  3.1155E+02  1.0773E+02

LOCA @ CR Doses:

Time (h) =  96.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.6192E-01  1.1383E+00  1.9729E-01  6.9464E+00
Accumulated dose (rem)  1.1149E+00  6.3533E+00  1.4000E+00  3.6279E+01

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Environment Integral Nuclide Release (Ci): at Time (h) =  96.0000
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Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	3.2738E-03	0.00000	0.00000
Co-60	1.3476E-04	0.00000	0.00000
Kr-85	3.7293E+04	0.00021	0.00000
Kr-85m	2.9311E+04	0.01752	0.00000
Kr-87	3.3812E+03	0.01332	0.00000
Kr-88	3.1941E+04	0.28074	0.00000
Rb-86	1.7057E-01	0.00001	0.00000
Sr-89	6.0619E+00	0.00206	0.00000
Sr-90	8.1294E-01	0.00865	0.00000
Sr-91	4.4258E+00	0.00008	0.00000
Sr-92	1.6529E+00	0.00002	0.00000
Y-90	6.6385E-02	0.00000	0.00000
Y-91	8.6177E-02	0.00003	0.00000
Y-92	1.4663E+00	0.00001	0.00000
Y-93	5.6554E-02	0.00000	0.00000
Zr-95	1.1451E-01	0.00002	0.00000
Zr-97	8.4526E-02	0.00000	0.00000
Nb-95	1.1518E-01	0.00001	0.00000
Mo-99	1.4022E+00	0.00005	0.00000
Tc-99m	1.2977E+00	0.00000	0.00000
Ru-103	1.3120E+00	0.00010	0.00000
Ru-105	3.1459E-01	0.00000	0.00000
Ru-106	5.1237E-01	0.00201	0.00000
Rh-105	7.9522E-01	0.00001	0.00000
Sb-127	1.4772E+00	0.00008	0.00000
Sb-129	1.5657E+00	0.00002	0.00000
Te-127	1.3823E+00	0.00000	0.00000
Te-127m	1.1149E-01	0.00002	0.00000
Te-129	2.1149E+00	0.00000	0.00000
Te-129m	7.6567E-01	0.00015	0.00000
Te-131m	2.6650E+00	0.00016	0.00000
Te-132	2.1800E+01	0.00172	0.00000
I-131	3.9600E+02	0.06987	0.00000
I-132	5.7811E+01	0.00078	0.00000
I-133	3.7387E+02	0.01524	0.00000
I-134	5.0874E+00	0.00007	0.00000
I-135	1.4128E+02	0.00237	0.00000
Xe-133	3.9705E+06	0.30032	0.00000
Xe-135	3.4037E+05	0.26884	0.00000
Cs-134	1.6484E+01	0.00636	0.00000
Cs-136	4.1025E+00	0.00028	0.00000
Cs-137	1.2649E+01	0.00334	0.00000
Ba-139	7.7539E-01	0.00000	0.00000
Ba-140	1.1303E+01	0.00036	0.00000
La-140	1.3600E+00	0.00006	0.00000
La-141	3.2905E-02	0.00000	0.00000
La-142	8.4568E-03	0.00000	0.00000
Ce-141	2.6993E-01	0.00002	0.00000
Ce-143	2.1237E-01	0.00001	0.00000
Ce-144	2.2577E-01	0.00069	0.00000
Pr-143	1.0003E-01	0.00001	0.00000
Nd-147	4.2048E-02	0.00000	0.00000
Np-239	2.8092E+00	0.00006	0.00000
Pu-238	6.6932E-04	0.00158	0.00000
Pu-239	6.2709E-05	0.00016	0.00000
Pu-240	1.1175E-04	0.00028	0.00000
Pu-241	2.6647E-02	0.00108	0.00000
Am-241	1.3201E-05	0.00005	0.00000
Cm-242	4.6596E-03	0.00066	0.00000
Cm-244	2.3823E-04	0.00048	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 96.0000	Total Release	Release Rate/s
Noble gases (atoms)	7.7012E+23	2.2284E+18
Elemental I (atoms)	1.2172E+19	3.5220E+13
Organic I (atoms)	3.7645E+17	1.0893E+12

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Aerosol I (atoms)      3.8357E+18  1.1099E+13
All Aerosols (kg)      1.6761E-04  4.8498E-10

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   7.7015E+23
Elemental I (atoms)      9.2728E+20   1.2172E+19
Organic I (atoms)        2.8679E+19   3.7647E+17
Aerosol I (atoms)        2.3224E+20   3.8360E+18
All Aerosols (kg)        1.6546E-02   1.6763E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   4.7494E+20
Elemental I (atoms)      5.6828E+15   7.8721E+13
Organic I (atoms)        1.7576E+14   2.4347E+12
Aerosol I (atoms)        3.6486E+15   6.1366E+13
All Aerosols (kg)        2.5919E-07   2.6262E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   5.4497E+19
Elemental I (atoms)      0.0000E+00   9.0328E+14
Organic I (atoms)        0.0000E+00   2.7936E+13
Aerosol I (atoms)        0.0000E+00   7.0415E+14
All Aerosols (kg)        0.0000E+00   3.0134E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      5.2467E+20   8.3030E+16
Elemental I (atoms)      1.0062E+15   0.0000E+00
Organic I (atoms)        3.1119E+13   0.0000E+00
Aerosol I (atoms)        7.9366E+14   0.0000E+00
All Aerosols (kg)        3.3355E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.0828E+17
Elemental I (atoms)      0.0000E+00   1.5055E+13
Organic I (atoms)        0.0000E+00   4.6561E+11
Aerosol I (atoms)        0.0000E+00   1.1736E+13
All Aerosols (kg)        0.0000E+00   5.0223E-10

Secondary Containment to  Environment Transport Group Inventory:

                          Pathway
Time (h) =  96.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =  119.6500

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
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     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2452E+06

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EAB with LOCA Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.9222E+00  1.1028E+01  3.2583E+00
Accumulated dose (rem)  4.5285E+01  1.1082E+02  4.9522E+01

LOCA @ LPZ Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.1476E-02  8.1049E-02  2.3946E-02
Accumulated dose (rem)  1.6298E+00  3.7780E+00  1.7913E+00

LOCA @ Unprotected CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        3.1193E+00  1.7914E+01  3.6653E+00
Accumulated dose (rem)  9.7801E+01  3.2947E+02  1.1139E+02

LOCA @ CR Doses:

Time (h) = 120.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        1.6573E-02  1.4843E-01  2.1096E-02  7.4920E-01
Accumulated dose (rem)  1.1315E+00  6.5017E+00  1.4211E+00  3.7029E+01

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Environment Integral Nuclide Release (Ci): at Time (h) = 120.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     3.2738E-03     0.00000      0.00000
  Co-60     1.3476E-04     0.00000      0.00000
  Kr-85     4.5266E+04     0.00022      0.00000
  Kr-85m    2.9311E+04     0.01728      0.00000
  Kr-87     3.3812E+03     0.01314      0.00000
  Kr-88     3.1941E+04     0.27692      0.00000
  Rb-86     1.7058E-01     0.00001      0.00000
  Sr-89     6.0620E+00     0.00203      0.00000
  Sr-90     8.1295E-01     0.00854      0.00000
  Sr-91     4.4258E+00     0.00008      0.00000
  Sr-92     1.6529E+00     0.00002      0.00000
  Y-90      6.6393E-02     0.00000      0.00000
  Y-91      8.6178E-02     0.00003      0.00000
  Y-92      1.4663E+00     0.00001      0.00000
  Y-93      5.6554E-02     0.00000      0.00000
  Zr-95     1.1451E-01     0.00002      0.00000
  Zr-97     8.4526E-02     0.00000      0.00000
  Nb-95     1.1518E-01     0.00001      0.00000
  Mo-99     1.4022E+00     0.00005      0.00000
  Tc-99m    1.2978E+00     0.00000      0.00000
  Ru-103    1.3120E+00     0.00010      0.00000
  Ru-105    3.1459E-01     0.00000      0.00000
  Ru-106    5.1237E-01     0.00198      0.00000
  Rh-105    7.9523E-01     0.00001      0.00000
  Sb-127    1.4772E+00     0.00008      0.00000
  Sb-129    1.5657E+00     0.00002      0.00000
  Te-127    1.3823E+00     0.00000      0.00000
  Te-127m   1.1149E-01     0.00002      0.00000
  Te-129    2.1149E+00     0.00000      0.00000
  Te-129m   7.6568E-01     0.00015      0.00000
  Te-131m   2.6650E+00     0.00016      0.00000
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Te-132	2.1800E+01	0.00169	0.00000
I-131	4.4872E+02	0.07093	0.00000
I-132	5.7811E+01	0.00077	0.00000
I-133	3.7835E+02	0.01507	0.00000
I-134	5.0874E+00	0.00007	0.00000
I-135	1.4128E+02	0.00234	0.00000
Xe-133	4.5772E+06	0.30773	0.00000
Xe-135	3.4067E+05	0.26524	0.00000
Cs-134	1.6484E+01	0.00627	0.00000
Cs-136	4.1025E+00	0.00028	0.00000
Cs-137	1.2649E+01	0.00330	0.00000
Ba-139	7.7539E-01	0.00000	0.00000
Ba-140	1.1303E+01	0.00035	0.00000
La-140	1.3601E+00	0.00006	0.00000
La-141	3.2905E-02	0.00000	0.00000
La-142	8.4568E-03	0.00000	0.00000
Ce-141	2.6993E-01	0.00002	0.00000
Ce-143	2.1237E-01	0.00001	0.00000
Ce-144	2.2577E-01	0.00068	0.00000
Pr-143	1.0003E-01	0.00001	0.00000
Nd-147	4.2048E-02	0.00000	0.00000
Np-239	2.8093E+00	0.00006	0.00000
Pu-238	6.6933E-04	0.00156	0.00000
Pu-239	6.2710E-05	0.00016	0.00000
Pu-240	1.1175E-04	0.00028	0.00000
Pu-241	2.6647E-02	0.00107	0.00000
Am-241	1.3202E-05	0.00005	0.00000
Cm-242	4.6597E-03	0.00065	0.00000
Cm-244	2.3823E-04	0.00048	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 120.0000	Total Release	Release Rate/s
Noble gases (atoms)	9.2879E+23	2.1500E+18
Elemental I (atoms)	1.4086E+19	3.2606E+13
Organic I (atoms)	4.3564E+17	1.0084E+12
Aerosol I (atoms)	3.8357E+18	8.8790E+12
All Aerosols (kg)	1.6761E-04	3.8799E-10

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	9.2882E+23
Elemental I (atoms)	1.0260E+21	1.4086E+19
Organic I (atoms)	3.1731E+19	4.3565E+17
Aerosol I (atoms)	2.1171E+20	3.8360E+18
All Aerosols (kg)	1.6538E-02	1.6763E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	5.3759E+20
Elemental I (atoms)	5.8939E+15	8.6277E+13
Organic I (atoms)	1.8228E+14	2.6684E+12
Aerosol I (atoms)	3.3260E+15	6.1366E+13
All Aerosols (kg)	2.5906E-07	2.6262E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 120.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	6.1685E+19
Elemental I (atoms)	0.0000E+00	9.8998E+14
Organic I (atoms)	0.0000E+00	3.0618E+13
Aerosol I (atoms)	0.0000E+00	7.0414E+14
All Aerosols (kg)	0.0000E+00	3.0134E-08

```
Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      5.9538E+20   1.0613E+17
Elemental I (atoms)      1.1115E+15   0.0000E+00
Organic I (atoms)        3.4376E+13   0.0000E+00
Aerosol I (atoms)        8.0008E+14   0.0000E+00
All Aerosols (kg)        3.3360E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.0281E+18
Elemental I (atoms)      0.0000E+00   1.6500E+13
Organic I (atoms)        0.0000E+00   5.1030E+11
Aerosol I (atoms)        0.0000E+00   1.1736E+13
All Aerosols (kg)        0.0000E+00   5.0223E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) = 120.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =  239.9000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.2761E+06

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EAB with LOCA Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        9.8635E+00  4.1835E+01  1.1137E+01
Accumulated dose (rem)  5.5149E+01  1.5265E+02  6.0659E+01

LOCA @ LPZ Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.2490E-02  3.0747E-01  8.1853E-02
Accumulated dose (rem)  1.7023E+00  4.0855E+00  1.8732E+00

LOCA @ Unprotected CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.0529E+01  6.7958E+01  1.2598E+01
Accumulated dose (rem)  1.0833E+02  3.9743E+02  1.2399E+02

LOCA @ CR Doses:

Time (h) = 240.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        5.5325E-02  5.5696E-01  7.2286E-02  2.5402E+00
Accumulated dose (rem)  1.1868E+00  7.0587E+00  1.4934E+00  3.9569E+01
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Environment Integral Nuclide Release (Ci): at Time (h) = 240.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	3.2740E-03	0.00000	0.00000
Co-60	1.3477E-04	0.00000	0.00000
Kr-85	8.4535E+04	0.00026	0.00000
Kr-85m	2.9311E+04	0.01651	0.00000
Kr-87	3.3812E+03	0.01256	0.00000
Kr-88	3.1941E+04	0.26458	0.00000
Rb-86	1.7058E-01	0.00001	0.00000
Sr-89	6.0624E+00	0.00194	0.00000
Sr-90	8.1301E-01	0.00816	0.00000
Sr-91	4.4258E+00	0.00008	0.00000
Sr-92	1.6529E+00	0.00002	0.00000
Y-90	6.6441E-02	0.00000	0.00000
Y-91	8.6185E-02	0.00003	0.00000
Y-92	1.4663E+00	0.00001	0.00000
Y-93	5.6554E-02	0.00000	0.00000
Zr-95	1.1452E-01	0.00002	0.00000
Zr-97	8.4526E-02	0.00000	0.00000
Nb-95	1.1519E-01	0.00001	0.00000
Mo-99	1.4022E+00	0.00004	0.00000
Tc-99m	1.2978E+00	0.00000	0.00000
Ru-103	1.3121E+00	0.00009	0.00000
Ru-105	3.1459E-01	0.00000	0.00000
Ru-106	5.1241E-01	0.00189	0.00000
Rh-105	7.9523E-01	0.00001	0.00000
Sb-127	1.4773E+00	0.00007	0.00000
Sb-129	1.5657E+00	0.00002	0.00000
Te-127	1.3823E+00	0.00000	0.00000
Te-127m	1.1150E-01	0.00002	0.00000
Te-129	2.1150E+00	0.00000	0.00000
Te-129m	7.6573E-01	0.00014	0.00000
Te-131m	2.6650E+00	0.00015	0.00000
Te-132	2.1800E+01	0.00162	0.00000
I-131	6.5097E+02	0.07511	0.00000
I-132	5.7811E+01	0.00074	0.00000
I-133	3.8191E+02	0.01442	0.00000
I-134	5.0874E+00	0.00007	0.00000
I-135	1.4128E+02	0.00224	0.00000
Xe-133	6.6306E+06	0.33117	0.00000
Xe-135	3.4073E+05	0.25342	0.00000
Cs-134	1.6485E+01	0.00599	0.00000
Cs-136	4.1027E+00	0.00027	0.00000
Cs-137	1.2650E+01	0.00315	0.00000
Ba-139	7.7539E-01	0.00000	0.00000
Ba-140	1.1304E+01	0.00033	0.00000
La-140	1.3607E+00	0.00006	0.00000
La-141	3.2905E-02	0.00000	0.00000
La-142	8.4568E-03	0.00000	0.00000
Ce-141	2.6995E-01	0.00002	0.00000
Ce-143	2.1237E-01	0.00001	0.00000
Ce-144	2.2578E-01	0.00065	0.00000
Pr-143	1.0004E-01	0.00001	0.00000
Nd-147	4.2050E-02	0.00000	0.00000
Np-239	2.8093E+00	0.00006	0.00000
Pu-238	6.6937E-04	0.00149	0.00000
Pu-239	6.2715E-05	0.00015	0.00000
Pu-240	1.1176E-04	0.00027	0.00000
Pu-241	2.6649E-02	0.00102	0.00000
Am-241	1.3203E-05	0.00005	0.00000
Cm-242	4.6600E-03	0.00062	0.00000
Cm-244	2.3825E-04	0.00046	0.00000

Environment Compartment Group Inventory Distribution:

Total Release

```
Time (h) = 240.0000     Release     Rate/s
Noble gases (atoms)    1.6876E+24  1.9532E+18
Elemental I (atoms)    2.1374E+19  2.4738E+13
Organic I (atoms)      6.6105E+17  7.6510E+11
Aerosol I (atoms)      3.8358E+18  4.4396E+12
All Aerosols (kg)      1.6762E-04  1.9401E-10

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6876E+24
Elemental I (atoms)      1.2378E+21   2.1374E+19
Organic I (atoms)        3.8281E+19   6.6106E+17
Aerosol I (atoms)        1.3675E+20   3.8361E+18
All Aerosols (kg)        1.6504E-02   1.6764E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   8.3718E+20
Elemental I (atoms)      6.0772E+15   1.1505E+14
Organic I (atoms)        1.8795E+14   3.5583E+12
Aerosol I (atoms)        2.1482E+15   6.1366E+13
All Aerosols (kg)        2.5851E-07   2.6262E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   9.6061E+19
Elemental I (atoms)      0.0000E+00   1.3202E+15
Organic I (atoms)        0.0000E+00   4.0830E+13
Aerosol I (atoms)        0.0000E+00   7.0414E+14
All Aerosols (kg)        0.0000E+00   3.0134E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      9.3004E+20   2.2162E+17
Elemental I (atoms)      1.5223E+15   0.0000E+00
Organic I (atoms)        4.7083E+13   0.0000E+00
Aerosol I (atoms)        8.2853E+14   0.0000E+00
All Aerosols (kg)        3.3384E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   1.6010E+18
Elemental I (atoms)      0.0000E+00   2.2003E+13
Organic I (atoms)        0.0000E+00   6.8050E+11
Aerosol I (atoms)        0.0000E+00   1.1736E+13
All Aerosols (kg)        0.0000E+00   5.0224E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) = 240.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =  479.7000

     Natural deposition - Powers' Model, Compartment  1
```

```
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.3401E+06

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EAB with LOCA Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        7.5002E+00  4.3227E+01  8.8163E+00
Accumulated dose (rem)  6.2649E+01  1.9588E+02  6.9475E+01

LOCA @ LPZ Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        5.5122E-02  3.1769E-01  6.4795E-02
Accumulated dose (rem)  1.7574E+00  4.4032E+00  1.9380E+00

LOCA @ Unprotected CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        8.0062E+00  7.0219E+01  1.0144E+01
Accumulated dose (rem)  1.1634E+02  4.6764E+02  1.3413E+02

LOCA @ CR Doses:

Time (h) = 480.0000    Whole Body   Thyroid       TEDE        Skin
Delta dose (rem)        4.2056E-02  5.7549E-01  5.9578E-02  2.0700E+00
Accumulated dose (rem)  1.2289E+00  7.6342E+00  1.5530E+00  4.1639E+01

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

Environment Integral Nuclide Release (Ci): at Time (h) = 480.0000

 Nuclide    Compartment  Dose Fract   Dose Fract
            Atmosphere   Pathway  2   Pathway  7
  Co-58     3.2744E-03     0.00000      0.00000
  Co-60     1.3479E-04     0.00000      0.00000
  Kr-85     1.6015E+05     0.00035      0.00000
  Kr-85m    2.9311E+04     0.01594      0.00000
  Kr-87     3.3812E+03     0.01212      0.00000
  Kr-88     3.1941E+04     0.25541      0.00000
  Rb-86     1.7060E-01     0.00001      0.00000
  Sr-89     6.0630E+00     0.00187      0.00000
  Sr-90     8.1311E-01     0.00787      0.00000
  Sr-91     4.4258E+00     0.00008      0.00000
  Sr-92     1.6529E+00     0.00002      0.00000
  Y-90      6.6546E-02     0.00000      0.00000
  Y-91      8.6196E-02     0.00003      0.00000
  Y-92      1.4663E+00     0.00001      0.00000
  Y-93      5.6554E-02     0.00000      0.00000
  Zr-95     1.1453E-01     0.00002      0.00000
  Zr-97     8.4526E-02     0.00000      0.00000
  Nb-95     1.1520E-01     0.00001      0.00000
  Mo-99     1.4022E+00     0.00004      0.00000
  Tc-99m    1.2978E+00     0.00000      0.00000
  Ru-103    1.3123E+00     0.00009      0.00000
  Ru-105    3.1459E-01     0.00000      0.00000
  Ru-106    5.1247E-01     0.00182      0.00000
  Rh-105    7.9523E-01     0.00001      0.00000
  Sb-127    1.4773E+00     0.00007      0.00000
  Sb-129    1.5657E+00     0.00002      0.00000
  Te-127    1.3824E+00     0.00000      0.00000
```

Te-127m	1.1152E-01	0.00002	0.00000
Te-129	2.1150E+00	0.00000	0.00000
Te-129m	7.6580E-01	0.00014	0.00000
Te-131m	2.6650E+00	0.00015	0.00000
Te-132	2.1800E+01	0.00156	0.00000
I-131	8.6055E+02	0.07985	0.00000
I-132	5.7811E+01	0.00071	0.00000
I-133	3.8197E+02	0.01392	0.00000
I-134	5.0874E+00	0.00006	0.00000
I-135	1.4128E+02	0.00216	0.00000
Xe-133	8.1879E+06	0.34689	0.00000
Xe-135	3.4073E+05	0.24464	0.00000
Cs-134	1.6487E+01	0.00578	0.00000
Cs-136	4.1030E+00	0.00026	0.00000
Cs-137	1.2652E+01	0.00304	0.00000
Ba-139	7.7539E-01	0.00000	0.00000
Ba-140	1.1304E+01	0.00032	0.00000
La-140	1.3614E+00	0.00006	0.00000
La-141	3.2905E-02	0.00000	0.00000
La-142	8.4568E-03	0.00000	0.00000
Ce-141	2.6997E-01	0.00002	0.00000
Ce-143	2.1237E-01	0.00001	0.00000
Ce-144	2.2581E-01	0.00063	0.00000
Pr-143	1.0005E-01	0.00001	0.00000
Nd-147	4.2052E-02	0.00000	0.00000
Np-239	2.8093E+00	0.00005	0.00000
Pu-238	6.6946E-04	0.00144	0.00000
Pu-239	6.2723E-05	0.00014	0.00000
Pu-240	1.1178E-04	0.00026	0.00000
Pu-241	2.6653E-02	0.00099	0.00000
Am-241	1.3205E-05	0.00004	0.00000
Cm-242	4.6605E-03	0.00060	0.00000
Cm-244	2.3828E-04	0.00044	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 480.0000	Total Release	Release Rate/s
Noble gases (atoms)	3.0907E+24	1.7886E+18
Elemental I (atoms)	2.8912E+19	1.6731E+13
Organic I (atoms)	8.9419E+17	5.1747E+11
Aerosol I (atoms)	3.8360E+18	2.2199E+12
All Aerosols (kg)	1.6765E-04	9.7017E-11

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.0908E+24
Elemental I (atoms)	9.9069E+20	2.8912E+19
Organic I (atoms)	3.0640E+19	8.9420E+17
Aerosol I (atoms)	5.7742E+19	3.8362E+18
All Aerosols (kg)	1.6457E-02	1.6766E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.3912E+21
Elemental I (atoms)	4.4137E+15	1.4482E+14
Organic I (atoms)	1.3651E+14	4.4789E+12
Aerosol I (atoms)	9.0684E+14	6.1366E+13
All Aerosols (kg)	2.5775E-07	2.6263E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 480.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.5963E+20
Elemental I (atoms)	0.0000E+00	1.6617E+15

```
Organic I (atoms)        0.0000E+00   5.1393E+13
Aerosol I (atoms)        0.0000E+00   7.0414E+14
All Aerosols (kg)        0.0000E+00   3.0135E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      1.5489E+21   4.5260E+17
Elemental I (atoms)      2.0003E+15   0.0000E+00
Organic I (atoms)        6.1866E+13   0.0000E+00
Aerosol I (atoms)        8.7680E+14   0.0000E+00
All Aerosols (kg)        3.3431E-08   0.0000E+00

Environment to  Control Room ingress/egress Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       Filtered    Transported
Noble gases (atoms)      0.0000E+00   2.6605E+18
Elemental I (atoms)      0.0000E+00   2.7695E+13
Organic I (atoms)        0.0000E+00   8.5654E+11
Aerosol I (atoms)        0.0000E+00   1.1736E+13
All Aerosols (kg)        0.0000E+00   5.0225E-10

Secondary Containment to  Environment Transport Group Inventory:

                           Pathway
Time (h) = 480.0000       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
Aerosol I (atoms)        0.0000E+00   0.0000E+00
All Aerosols (kg)        0.0000E+00   0.0000E+00

Detailed model information at time (hr) =  719.8000

     Natural deposition - Powers' Model, Compartment  1
     Deposition Lambda (1 / Hours)
     Noble      Elemental  Organic    Aerosol
     0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00
     Deposition Net DF
     Noble      Elemental  Organic    Aerosol
     1.0000E+00 1.0000E+00 1.0000E+00 1.4073E+06

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EAB with LOCA Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.9261E+00  1.7382E+01  2.4553E+00
Accumulated dose (rem)  6.4575E+01  2.1326E+02  7.1931E+01

LOCA @ LPZ Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        1.4155E-02  1.2774E-01  1.8045E-02
Accumulated dose (rem)  1.7716E+00  4.5309E+00  1.9560E+00

LOCA @ Unprotected CR Doses:

Time (h) = 720.0000    Whole Body   Thyroid       TEDE
Delta dose (rem)        2.0560E+00  2.8235E+01  2.9157E+00
Accumulated dose (rem)  1.1839E+02  4.9588E+02  1.3705E+02

LOCA @ CR Doses:
```

Time (h) = 720.0000	Whole Body	Thyroid	TEDE	Skin
Delta dose (rem)	1.0792E-02	2.3140E-01	1.7838E-02	6.9050E-01
Accumulated dose (rem)	1.2397E+00	7.8656E+00	1.5708E+00	4.2329E+01

****

Environment Integral Nuclide Release (Ci): at Time (h) = 720.0000

Nuclide	Compartment Atmosphere	Dose Fract Pathway 2	Dose Fract Pathway 7
Co-58	3.2747E-03	0.00000	0.00000
Co-60	1.3481E-04	0.00000	0.00000
Kr-85	2.3203E+05	0.00044	0.00000
Kr-85m	2.9311E+04	0.01578	0.00000
Kr-87	3.3812E+03	0.01200	0.00000
Kr-88	3.1941E+04	0.25289	0.00000
Rb-86	1.7061E-01	0.00001	0.00000
Sr-89	6.0636E+00	0.00186	0.00000
Sr-90	8.1322E-01	0.00780	0.00000
Sr-91	4.4258E+00	0.00008	0.00000
Sr-92	1.6529E+00	0.00002	0.00000
Y-90	6.6648E-02	0.00000	0.00000
Y-91	8.6205E-02	0.00003	0.00000
Y-92	1.4663E+00	0.00001	0.00000
Y-93	5.6554E-02	0.00000	0.00000
Zr-95	1.1454E-01	0.00002	0.00000
Zr-97	8.4526E-02	0.00000	0.00000
Nb-95	1.1522E-01	0.00001	0.00000
Mo-99	1.4022E+00	0.00004	0.00000
Tc-99m	1.2978E+00	0.00000	0.00000
Ru-103	1.3124E+00	0.00009	0.00000
Ru-105	3.1459E-01	0.00000	0.00000
Ru-106	5.1254E-01	0.00181	0.00000
Rh-105	7.9523E-01	0.00001	0.00000
Sb-127	1.4773E+00	0.00007	0.00000
Sb-129	1.5657E+00	0.00002	0.00000
Te-127	1.3824E+00	0.00000	0.00000
Te-127m	1.1153E-01	0.00002	0.00000
Te-129	2.1151E+00	0.00000	0.00000
Te-129m	7.6586E-01	0.00014	0.00000
Te-131m	2.6650E+00	0.00015	0.00000
Te-132	2.1800E+01	0.00155	0.00000
I-131	9.4482E+02	0.08198	0.00000
I-132	5.7811E+01	0.00070	0.00000
I-133	3.8197E+02	0.01378	0.00000
I-134	5.0874E+00	0.00006	0.00000
I-135	1.4128E+02	0.00214	0.00000
Xe-133	8.5835E+06	0.35031	0.00000
Xe-135	3.4073E+05	0.24223	0.00000
Cs-134	1.6489E+01	0.00573	0.00000
Cs-136	4.1031E+00	0.00026	0.00000
Cs-137	1.2653E+01	0.00301	0.00000
Ba-139	7.7539E-01	0.00000	0.00000
Ba-140	1.1305E+01	0.00032	0.00000
La-140	1.3619E+00	0.00006	0.00000
La-141	3.2905E-02	0.00000	0.00000
La-142	8.4568E-03	0.00000	0.00000
Ce-141	2.6999E-01	0.00002	0.00000
Ce-143	2.1237E-01	0.00001	0.00000
Ce-144	2.2584E-01	0.00062	0.00000
Pr-143	1.0005E-01	0.00001	0.00000
Nd-147	4.2053E-02	0.00000	0.00000
Np-239	2.8093E+00	0.00005	0.00000
Pu-238	6.6955E-04	0.00142	0.00000
Pu-239	6.2731E-05	0.00014	0.00000
Pu-240	1.1179E-04	0.00025	0.00000
Pu-241	2.6656E-02	0.00098	0.00000
Am-241	1.3207E-05	0.00004	0.00000
Cm-242	4.6611E-03	0.00059	0.00000
Cm-244	2.3831E-04	0.00044	0.00000

Environment Compartment Group Inventory Distribution:

Time (h) = 720.0000	Total Release	Release Rate/s
Noble gases (atoms)	4.3983E+24	1.6969E+18
Elemental I (atoms)	3.1943E+19	1.2324E+13
Organic I (atoms)	9.8793E+17	3.8115E+11
Aerosol I (atoms)	3.8360E+18	1.4799E+12
All Aerosols (kg)	1.6767E-04	6.4686E-11

Secondary Containment to Environment - SGTS Lea Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	4.3983E+24
Elemental I (atoms)	6.0658E+20	3.1944E+19
Organic I (atoms)	1.8760E+19	9.8795E+17
Aerosol I (atoms)	2.4385E+19	3.8363E+18
All Aerosols (kg)	1.6424E-02	1.6768E-04

Environment to Control Room - Emergency Filtere Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	1.9075E+21
Elemental I (atoms)	2.6070E+15	1.5678E+14
Organic I (atoms)	8.0628E+13	4.8490E+12
Aerosol I (atoms)	3.8292E+14	6.1366E+13
All Aerosols (kg)	2.5721E-07	2.6264E-09

Environment to Control Room - Unfiltered Inleak Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	2.1887E+20
Elemental I (atoms)	0.0000E+00	1.7990E+15
Organic I (atoms)	0.0000E+00	5.5640E+13
Aerosol I (atoms)	0.0000E+00	7.0414E+14
All Aerosols (kg)	0.0000E+00	3.0136E-08

Control Room to Environment - CR Exhaust Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	2.1256E+21	6.8358E+17
Elemental I (atoms)	2.2569E+15	0.0000E+00
Organic I (atoms)	6.9800E+13	0.0000E+00
Aerosol I (atoms)	9.2091E+14	0.0000E+00
All Aerosols (kg)	3.3476E-08	0.0000E+00

Environment to Control Room ingress/egress Transport Group Inventory:

Time (h) = 720.0000	Pathway Filtered	Transported
Noble gases (atoms)	0.0000E+00	3.6478E+18
Elemental I (atoms)	0.0000E+00	2.9984E+13
Organic I (atoms)	0.0000E+00	9.2733E+11
Aerosol I (atoms)	0.0000E+00	1.1736E+13
All Aerosols (kg)	0.0000E+00	5.0227E-10

Secondary Containment to Environment Transport Group Inventory:

Time (h) = 720.0000	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
Aerosol I (atoms)	0.0000E+00	0.0000E+00
All Aerosols (kg)	0.0000E+00	0.0000E+00

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

Time (hr)	Primary Containment I-131 (Curies)	Secondary Containment I-131 (Curies)	Environment I-131 (Curies)
0.000	6.0244E+03	0.0000E+00	0.0000E+00
0.167	1.7026E+06	0.0000E+00	0.0000E+00
0.367	3.4918E+06	0.0000E+00	0.0000E+00
0.500	4.5493E+06	0.0000E+00	0.0000E+00
0.700	7.5570E+06	0.0000E+00	0.0000E+00
0.900	1.0425E+07	0.0000E+00	0.0000E+00
1.100	1.3154E+07	0.0000E+00	0.0000E+00
1.300	1.5749E+07	0.0000E+00	0.0000E+00
1.500	1.8215E+07	0.0000E+00	0.0000E+00
1.700	2.0557E+07	0.0000E+00	0.0000E+00
1.900	2.2781E+07	0.0000E+00	0.0000E+00
2.000	2.3851E+07	0.0000E+00	0.0000E+00
2.200	1.9562E+07	1.7281E+03	3.3708E-01
2.400	1.6099E+07	3.0829E+03	1.2498E+00
2.600	1.3304E+07	4.1380E+03	2.6125E+00
2.800	1.1048E+07	4.9525E+03	4.3241E+00
3.000	9.2268E+06	5.5742E+03	6.3038E+00
3.200	7.7565E+06	6.0416E+03	8.4867E+00
3.400	6.5695E+06	6.3857E+03	1.0821E+01
3.600	5.6111E+06	6.6316E+03	1.3265E+01
3.800	4.8374E+06	6.7994E+03	1.5786E+01
4.000	4.2126E+06	6.9052E+03	1.8358E+01
4.200	3.7080E+06	6.9620E+03	2.0960E+01
4.400	3.3005E+06	6.9805E+03	2.3576E+01
4.600	2.9714E+06	6.9690E+03	2.6194E+01
4.800	2.7054E+06	6.9342E+03	2.8802E+01
5.000	2.4906E+06	6.8815E+03	3.1393E+01
5.200	2.3816E+06	6.8182E+03	3.3963E+01
5.400	2.2856E+06	6.7490E+03	3.6508E+01
5.600	2.2010E+06	6.6752E+03	3.9026E+01
5.800	2.1265E+06	6.5979E+03	4.1515E+01
6.000	2.0608E+06	6.5178E+03	4.3975E+01
6.200	2.0028E+06	6.4358E+03	4.6405E+01
6.400	1.9517E+06	6.3525E+03	4.8803E+01
6.600	1.9066E+06	6.2685E+03	5.1170E+01
6.800	1.8668E+06	6.1843E+03	5.3506E+01
7.000	1.8316E+06	6.1002E+03	5.5810E+01
7.200	1.8005E+06	6.0166E+03	5.8082E+01
7.400	1.7730E+06	5.9339E+03	6.0324E+01
7.600	1.7486E+06	5.8521E+03	6.2534E+01
7.800	1.7271E+06	5.7716E+03	6.4714E+01
8.000	1.7080E+06	5.6925E+03	6.6864E+01
8.200	1.6910E+06	5.6149E+03	6.8985E+01
8.333	1.6810E+06	5.5641E+03	7.0383E+01
8.533	1.6684E+06	5.4893E+03	7.2456E+01
8.733	1.6571E+06	5.4164E+03	7.4501E+01
8.933	1.6468E+06	5.3454E+03	7.6519E+01
9.133	1.6375E+06	5.2762E+03	7.8511E+01
9.333	1.6291E+06	5.2090E+03	8.0478E+01
9.533	1.6214E+06	5.1436E+03	8.2419E+01
9.733	1.6144E+06	5.0800E+03	8.4337E+01
9.933	1.6081E+06	5.0184E+03	8.6231E+01
10.133	1.6022E+06	4.9585E+03	8.8102E+01
12.000	1.5658E+06	4.4820E+03	1.0459E+02
19.444	1.5073E+06	3.5503E+03	1.5940E+02

24.000	1.4798E+06	3.3346E+03	1.8874E+02
96.000	1.1260E+06	1.2244E+03	3.9600E+02
720.000	1.0540E+05	1.1461E+02	9.4482E+02

Time (hr)	Control Room I-131 (Curies)
0.000	0.0000E+00
0.167	0.0000E+00
0.367	0.0000E+00
0.500	0.0000E+00
0.700	0.0000E+00
0.900	0.0000E+00
1.100	0.0000E+00
1.300	0.0000E+00
1.500	0.0000E+00
1.700	0.0000E+00
1.900	0.0000E+00
2.000	0.0000E+00
2.200	8.6958E-05
2.400	3.0780E-04
2.600	6.1385E-04
2.800	9.6884E-04
3.000	1.3462E-03
3.200	1.7267E-03
3.400	2.0969E-03
3.600	2.4477E-03
3.800	2.7732E-03
4.000	3.0702E-03
4.200	3.3369E-03
4.400	3.5732E-03
4.600	3.7797E-03
4.800	3.9577E-03
5.000	4.1088E-03
5.200	4.2352E-03
5.400	4.3391E-03
5.600	4.4231E-03
5.800	4.4893E-03
6.000	4.5396E-03
6.200	4.5758E-03
6.400	4.5995E-03
6.600	4.6123E-03
6.800	4.6155E-03
7.000	4.6104E-03
7.200	4.5979E-03
7.400	4.5792E-03
7.600	4.5550E-03
7.800	4.5262E-03
8.000	4.4936E-03
8.200	4.1137E-03
8.333	3.8863E-03
8.533	3.5794E-03
8.733	3.3090E-03
8.933	3.0705E-03
9.133	2.8600E-03
9.333	2.6739E-03
9.533	2.5093E-03
9.733	2.3634E-03
9.933	2.2339E-03
10.133	2.1188E-03
12.000	1.4880E-03
19.444	9.7993E-04
24.000	9.0520E-04
96.000	1.9850E-04
720.000	1.5898E-05

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#################################################################
                    Cumulative Dose Summary
#################################################################
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	EAB with LOCA	LOCA @ LPZ	LOCA @ Unprotected 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
0.167	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.367	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
0.700	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
0.900	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.100	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.300	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
1.500	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
1.900	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
2.200	1.5219E-01	3.8011E-02	8.9848E-03	2.2440E-03	6.6194E-01	1.6532E-01
2.400	5.6334E-01	1.4439E-01	3.3257E-02	8.5241E-03	2.4502E+00	6.2800E-01
2.600	1.1756E+00	3.0887E-01	6.9401E-02	1.8234E-02	5.1130E+00	1.3434E+00
2.800	1.9426E+00	5.2265E-01	1.1468E-01	3.0855E-02	8.4492E+00	2.2732E+00
3.000	2.8275E+00	7.7819E-01	1.6692E-01	4.5941E-02	1.2298E+01	3.3847E+00
3.200	3.8006E+00	1.0690E+00	2.2437E-01	6.3107E-02	1.6530E+01	4.6493E+00
3.400	4.8386E+00	1.3893E+00	2.8565E-01	8.2022E-02	2.1045E+01	6.0428E+00
3.600	5.9226E+00	1.7345E+00	3.4965E-01	1.0240E-01	2.5760E+01	7.5440E+00
3.800	7.0379E+00	2.1002E+00	4.1549E-01	1.2399E-01	3.0611E+01	9.1345E+00
4.000	8.1727E+00	2.4827E+00	4.8249E-01	1.4657E-01	3.5546E+01	1.0798E+01
4.200	9.3179E+00	2.8791E+00	5.5009E-01	1.6997E-01	4.0527E+01	1.2522E+01
4.400	1.0466E+01	3.2864E+00	6.1789E-01	1.9401E-01	4.5522E+01	1.4294E+01
4.600	1.1612E+01	3.7022E+00	6.8553E-01	2.1857E-01	5.0506E+01	1.6103E+01
4.800	1.2751E+01	4.1247E+00	7.5278E-01	2.4350E-01	5.5460E+01	1.7940E+01
5.000	1.3880E+01	4.5518E+00	8.1942E-01	2.6872E-01	6.0370E+01	1.9798E+01
5.200	1.4997E+01	4.9822E+00	8.8534E-01	2.9413E-01	6.5226E+01	2.1669E+01
5.400	1.6099E+01	5.4144E+00	9.5044E-01	3.1964E-01	7.0022E+01	2.3549E+01
5.600	1.7188E+01	5.8473E+00	1.0147E+00	3.4520E-01	7.4757E+01	2.5432E+01
5.800	1.8261E+01	6.2799E+00	1.0781E+00	3.7074E-01	7.9426E+01	2.7314E+01
6.000	1.9319E+01	6.7115E+00	1.1405E+00	3.9622E-01	8.4028E+01	2.9191E+01
6.200	2.0362E+01	7.1411E+00	1.2021E+00	4.2159E-01	8.8562E+01	3.1060E+01
6.400	2.1389E+01	7.5683E+00	1.2627E+00	4.4680E-01	9.3027E+01	3.2917E+01
6.600	2.2399E+01	7.9923E+00	1.3224E+00	4.7184E-01	9.7423E+01	3.4762E+01
6.800	2.3394E+01	8.4129E+00	1.3811E+00	4.9666E-01	1.0175E+02	3.6591E+01
7.000	2.4373E+01	8.8294E+00	1.4389E+00	5.2126E-01	1.0601E+02	3.8403E+01
7.200	2.5336E+01	9.2417E+00	1.4958E+00	5.4560E-01	1.1020E+02	4.0196E+01
7.400	2.6284E+01	9.6495E+00	1.5517E+00	5.6967E-01	1.1432E+02	4.1969E+01
7.600	2.7217E+01	1.0052E+01	1.6068E+00	5.9346E-01	1.1838E+02	4.3722E+01
7.800	2.8134E+01	1.0450E+01	1.6609E+00	6.1695E-01	1.2237E+02	4.5453E+01
8.000	2.9037E+01	1.0843E+01	1.7142E+00	6.4014E-01	1.2629E+02	4.7162E+01
8.200	2.9494E+01	1.1210E+01	1.7335E+00	6.5562E-01	1.2797E+02	4.7895E+01
8.333	2.9794E+01	1.1452E+01	1.7462E+00	6.6582E-01	1.2908E+02	4.8378E+01
8.533	3.0239E+01	1.1811E+01	1.7649E+00	6.8095E-01	1.3072E+02	4.9094E+01
8.733	3.0677E+01	1.2165E+01	1.7834E+00	6.9588E-01	1.3233E+02	4.9801E+01
8.933	3.1109E+01	1.2514E+01	1.8016E+00	7.1060E-01	1.3391E+02	5.0497E+01
9.133	3.1533E+01	1.2858E+01	1.8195E+00	7.2510E-01	1.3547E+02	5.1182E+01
9.333	3.1951E+01	1.3197E+01	1.8371E+00	7.3940E-01	1.3701E+02	5.1858E+01
9.533	3.2364E+01	1.3531E+01	1.8545E+00	7.5349E-01	1.3853E+02	5.2524E+01
9.733	3.2770E+01	1.3860E+01	1.8716E+00	7.6737E-01	1.4002E+02	5.3179E+01
9.933	3.3170E+01	1.4185E+01	1.8885E+00	7.8104E-01	1.4149E+02	5.3825E+01
10.133	3.3564E+01	1.4504E+01	1.9051E+00	7.9451E-01	1.4294E+02	5.4461E+01
12.000	3.7003E+01	1.7270E+01	2.0502E+00	9.1117E-01	1.5559E+02	5.9959E+01
19.444	4.8001E+01	2.5606E+01	2.5139E+00	1.2627E+00	1.9604E+02	7.6470E+01
24.000	5.3642E+01	2.9370E+01	2.7518E+00	1.4214E+00	2.1679E+02	8.3925E+01
96.000	9.9790E+01	4.6263E+01	3.6970E+00	1.7674E+00	3.1155E+02	1.0773E+02
720.000	2.1326E+02	7.1931E+01	4.5309E+00	1.9560E+00	4.9588E+02	1.3705E+02

LOCA @ CR

Time (hr)	Thyroid (rem)	TEDE (rem)
0.000	0.0000E+00	0.0000E+00
0.167	0.0000E+00	0.0000E+00
0.367	0.0000E+00	0.0000E+00
0.500	0.0000E+00	0.0000E+00
0.700	0.0000E+00	0.0000E+00
0.900	0.0000E+00	0.0000E+00

1.100	0.0000E+00	0.0000E+00
1.300	0.0000E+00	0.0000E+00
1.500	0.0000E+00	0.0000E+00
1.700	0.0000E+00	0.0000E+00
1.900	0.0000E+00	0.0000E+00
2.000	0.0000E+00	0.0000E+00
2.200	8.1789E-04	1.4424E-04
2.400	5.8542E-03	1.0428E-03
2.600	1.7968E-02	3.2334E-03
2.800	3.8881E-02	7.0682E-03
3.000	6.9475E-02	1.2758E-02
3.200	1.1003E-01	2.0405E-02
3.400	1.6038E-01	3.0035E-02
3.600	2.2010E-01	4.1614E-02
3.800	2.8855E-01	5.5067E-02
4.000	3.6497E-01	7.0291E-02
4.200	4.4856E-01	8.7165E-02
4.400	5.3850E-01	1.0556E-01
4.600	6.3397E-01	1.2533E-01
4.800	7.3418E-01	1.4634E-01
5.000	8.3841E-01	1.6847E-01
5.200	9.4596E-01	1.9157E-01
5.400	1.0562E+00	2.1552E-01
5.600	1.1686E+00	2.4021E-01
5.800	1.2827E+00	2.6553E-01
6.000	1.3980E+00	2.9138E-01
6.200	1.5141E+00	3.1766E-01
6.400	1.6307E+00	3.4429E-01
6.600	1.7475E+00	3.7119E-01
6.800	1.8642E+00	3.9830E-01
7.000	1.9806E+00	4.2554E-01
7.200	2.0966E+00	4.5287E-01
7.400	2.2118E+00	4.8022E-01
7.600	2.3263E+00	5.0756E-01
7.800	2.4399E+00	5.3484E-01
8.000	2.5524E+00	5.6202E-01
8.200	2.6595E+00	5.8780E-01
8.333	2.7258E+00	6.0361E-01
8.533	2.8183E+00	6.2552E-01
8.733	2.9036E+00	6.4554E-01
8.933	2.9824E+00	6.6395E-01
9.133	3.0555E+00	6.8096E-01
9.333	3.1236E+00	6.9676E-01
9.533	3.1873E+00	7.1152E-01
9.733	3.2470E+00	7.2538E-01
9.933	3.3032E+00	7.3845E-01
10.133	3.3564E+00	7.5083E-01
12.000	3.7515E+00	8.4490E-01
19.444	4.7414E+00	1.0919E+00
24.000	5.2150E+00	1.2027E+00
96.000	6.3533E+00	1.4000E+00
720.000	7.8656E+00	1.5708E+00

```
#######################################################################
    ALION RADTRAD Version 3.10 Rev 4 run on 09/17/2019  at 10:14:08

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

            LOCA PPL-SSES   Primary to Secondary Containment to Environ. w/ SGTS

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

EAB with LOCA
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
    4.6   3.7333E+00   1.0787E+01   4.2901E+00

#####################################################################
                          Final Doses
#####################################################################

LOCA @ LPZ
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   1.7716E+00   4.5309E+00   1.9560E+00

LOCA @ Unprotected CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   1.1839E+02   4.9588E+02   1.3705E+02

LOCA @ CR
   Time   Whole Body    Thyroid        TEDE
   (hr)      (rem)        (rem)         (rem)
  720.0   1.2397E+00   7.8656E+00   1.5708E+00
```